Addis Ababa University, College of Health Sciences, School of Public Health

Ethiopian Field Epidemiology Training Program (EFETP)

Compiled Body of Works in field Epidemiology

By

Girma Birhanu

Submitted to the School of Graduate Studies of Addis Ababa University in Partial Fulfillment for the Degree of Master of Public Health in Field Epidemiology

June, 2018

Addis Ababa, Ethiopia

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Advisors

Prof. Ahmed Ali

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Approval by Examining Board

Chairman, School Graduate Committee _____ _____

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ACRONYMS

AACA	Addis Ababa City Administration
AACAHB	Addis Ababa City Administration Health Beraue
AAU	Addis Ababa University
AFI	Acute Febrile Illness
AFP	Acute Flaccid Paralysis
AIDS	Acquire Immuno deficiency Syndrome
ANC	Antenatal care
AOR	Adjusted Odds Ratio
ART	Anti-Retroviral Therapy
AWD	Acute Watery Diarrhea
BCG	Bacilli Chalmette Guerin
BPR	Business Process Reengineering
CBR	Crude Birth Rate
CDC	Centers for Disease Control and prevention
CDR	Crude Death Rate
CFR	Case Fatality Rate
CI	Confidence Interval
CMR	Chilled Mortality Rate
COR	Crude Odds Ratio
CTC	Cholera Treatment Center
DRC	Democratic Republic of Congo
E.C	Ethiopian Calendar
EDHS	Ethiopian Demographic Health Survey
EFETP	Ethiopian Field Epidemiology Training Program
EPHA	Ethiopian Public Health Association
EPHI	Ethiopian Public Health Institute
EPI	Expanded Program on Immunization
Epi Info	Epidemiological Information
EPR	Emergency Preparedness and Response
FDRE	Federal Democratic Republic of Ethiopia
FMOH	Federal Ministry of Health
FP	Family Planning
G.C	Gregorian Calendar
GIS	Geographic Information System
HC	Health Center
HAD	Health Development Armey
HEWs	Health Extension Workers
HF	Health Facility
HIMS	Health Information and Management System
HIS	Health Information System

HIV	Human Immune Deficiency Virus
HO	Health Office
HSDP	Health Sector Development plan
IDSR	Integrated Disease Surveillance and Response
IMR	Infant Mortality Rate
IPD	In patient Department
LBRF	Louse-Borne Relapsing Fever
MCH	Maternal and child Health
MMR	Maternal Mortality Rate
MPH	Master of Public Health
NGO	Non-Governmental Organization
NNT	Neonatal Tetanus
OPD	Out Patient Department
OPV	Oral Polio Vaccine
OR	Odds Ratio
ORS	Oral Rehydration Solution
PHEM	Public Health Emergency Management
PITC	Provider Initiated Testing and Counseling
PMTCT	Preventing Mather to Child Transmission
PVP	Predictive Value Positive
RDT	Rapid Diagnostic Test
RF	Relapsing Fever
RMSF	Rocky Mountain Spotted Fever
SAM	Sever Acute Malnutrition
SARS	Severe Acute Respiratory Syndrome
SNNPR	Southern Nations Nationalities and Peoples Region
SPH	School of Public Health
SPSS	Statistical Package for Social Science
TB	Tuberculosis
TBRF	Tick Born Relapsing Fever
VCT	Voluntary Counseling and Testing
WASH	Water Sanitation and Hygiene
WHO	World Health Organization

EXECUTIVE SUMMARY

The Ethiopian Field Epidemiology Training Program (EFETP) is a competency training program in field epidemiology modeled from on the mode of the United State Center for Disease Control and Prevention (CDC) Epidemic Intelligence Service (EIS). The Program is designed to assist the Ministry of Health in building or strengthening health systems by producing public health professionals with skills and competencies developed through applied learning. FETP consists of 25% class-based learning and 75% at a field base where residents are expected to apply the principles learned in class to solve real world public health issues. The EFETP residents Two years in a field epidemiology training program focusing on investigating outbreaks, analysis and evaluation of surveillance systems, and other public health activities and residents compile a body of works consisting of their outbreak investigation reports, surveillance analyses, etc.

This compiled body of works contains outputs done during my residency time in the Program. The body of works is categorized in to eight chapters as follows:

The first chapter contains two outbreak investigations: the first outbreak investigation conducted was Scabies outbreak in Dembiya District, North Gondar Zone, Amhara Region, August, 2017. The second investigated outbreak was Suspected AWD outbreak investigation in Wogera District, North Gondar Zone, October, 2017. The Second chapter is surveillance data analysis of Dysentery in Akaki Kality Sub City, Addis Ababa Ethiopia, 2012-2016. The third chapter is evaluation of Relapsing Fever surveillance system in Akaki Kality Sub City, Ethiopia, 2016

The fourth chapter is description of Health profile of Akaki Kality Sub City District Seven, Addis Ababa, Ethiopia 2016. The fifth chapter is development of Manuscript on Surveillance Data Analysis, Akaki Kality Sub City, and Addis Ababa-2016. The sixth chapters is development of abstracts for scientific presentations namely:-Surveillance Data Analysis of Dysentery, Akaki Kality Sub-city, Addis Ababa, Ethiopia, 2012-2016 and Outbreak Investigation of Scabies Disease in Dembiya District, North Gondar Zone, Amhara Region, Ethiopia, 2017.

The Seventh chapter is an Epidemiologic Protocol/Proposal for Epidemiologic Research Project namely: Assessment of Prevalence and Associated factors for diarrheal disease among under five children in Akaki Kality Sub city, Addis Ababa, Ethiopia, 2018. The last Chapter (Chapter Eight) contains other additional outputs during two years of my residency time.

CHAPTER I- OUTBREAK/EPIDEMIC INVESTIGATION

Outbreak investigation of Scabies, Dembiya District, North Gondar Zone, Amhara Region, Ethiopia, August 2017

Abstract

Background: Scabies affects people of all countries, particularly, children in developing countries are most susceptible, with an average prevalence of 5–10%. It is very common in Ethiopia, especially during natural or manmade disasters, such as flooding, drought, civil war and conflict, poor water supply and sanitation, and overcrowding living condition. This study aimed to investigate the contributing factors for the occurrence of the outbreak and provide appropriate control & prevention measures of the disease to stop the spread of outbreak.

Methods and materials: We conducted descriptive study followed by 1:2 unmatched case-control study from August 28-November 2, 2017 in Dembiya District, North Gondar Zone Amhara Region. 40 Cases and 80 controls were randomly selected from the community. We used structured questionnaire which were adopted from different studies. Sample size was calculated using Epi info 7.1.1 Calc. Statistical analysis was made using IBM SPSS statistics 23, with Epi info 7.1.1 and Arc Map 10.1.2. Odds Ratio, 95% CI and P-value were used in bivariate and multivariate analysis. Variables with p value of equal to or less than 0.05 were reported to be significantly associated with dependent variable.

Results: We identified a total of 141 Scabies cases with over all attack rate of 2% and Zero case fatality rate among which 40 of them were compared with 80 controls and interviewed for case control study. Of reported cases 55% of them were Male and the median age of the overall cases was 16yrs (IQR= 19yrs). Sex (AOR: 0.4, 95% CI: 0.1-0.7), Hand washing with soap (AOR: 0.6, 95% CI: 0.1--0.6), Body bath more than a week (AOR: 1.5, 95% CI: 1.2-4.1), Cloth exchange with infected person (AOR: 3.1, 95% CI: 2.0-4.0), contact history (AOR: 17.0, 95% CI: 13.4-20.0), and water shortage (AOR: 3.3, 95% CI: 2.4-4.5) were significantly associated with scabies.

Conclusion: In this study, we found poor hygienic practices, sharing of clothing materials, and sleeping with contracted scabies were significantly associated with higher frequency of scabies disease. Therefore, increasing awareness creation about the transmission, prevention and control methods of this scabies disease is recommended.

Key words: Scabies, case-control, Dembiya, Ethiopia, 2017

INTRODUCTION

Scabies is a neglected parasitic disease that is a major public health problem worldwide, particularly in resource-poor regions. It affects people of all age groups, races and socioeconomic levels. Approximately 300 million cases are reported worldwide each year [(1).] Human scabies is caused by an infestation of the skin by the human itch mite (*Sarcoptes scabiei* var.*hominis*). The adult female scabies mites burrow into the upper layer of the skin (epidermis) where they live and deposit their eggs [(2)]. The incubation period before symptoms occur is 3–6 weeks for primary infestation but may be as short as 1–3 days in cases of re-infestation [(3)]. The characteristic clinical feature is intense nocturnal pruritus. Diagnosis is made clinically, based on patient history and physical examination. It is confirmed by the demonstration of mites, eggs, or (black or brown football-shaped masses of scabies faeces) on microscopic examination [(1)].

The most commonly affected areas are the hands, feet, the inner part of the wrists and the folds under arms. It may also affect other areas of the body, like elbows and the areas around the breasts, genitals, umbilicus and buttocks [(4)]. A person infested with mites can spread scabies even if he or she is asymptomatic. Scabies has been classified as a water shortage disease because of its association with inadequate water supply leading to poor personal hygiene and thus increased risk of transmission[(5)]. Globally, it affects more than 130 million people at any time. Rates of scabies occurrence vary in the recent literature from 0.3% to 46% [(5)]. In the developed world, outbreaks in health institutions and vulnerable Communities contribute to significant economic cost in national health Services.

However, in resource-poor tropical settings, the sheer burden of scabies infestation, as well as their complications, imposes a major cost on health-care systems. In 2010, it was estimated that the direct effects of scabies infestation on the skin alone led to more than 1.5.million YLDS (years lived with disability), and the indirect effects of Complications on renal and cardiovascular function are far greater [(6).] Scabies affects people of all countries, particularly, children in developing countries are most susceptible, with an average prevalence of 5–10% [(6)]. The highest incidence is in tropical climates, with rates of up to 25% overall and up to 50% in some communities in the South Pacific and northern Australia [(5)]. Poverty and overcrowding are the main risk factors, and outbreaks in institutions and refugee camps are common. Scabies causes intense itch, severely affecting sleep and quality of life.

In Ethiopia, scabies is common, especially during natural or man-made disasters, such as flooding, drought, civil war and conflict, poor water supply and sanitation, and overcrowding living condition. For example, according to public health emergency measures surveillance report scabies is becoming beyond sporadic clinical cases, but turn to be a public health concern, affecting wider geographic areas and population groups, especially in drought affected nutrition hotspot woredas[8]. As global disease burden Health grove reported in 2013, the annual years of healthy life lost per 100,000 people from scabies has decreased by 30.1% since 1990, an average of 1.3 percent a year[9].

Statement of the problem

Scabies affects people of all races and social classes worldwide. It can spread easily under crowded conditions where close body and skin contact is common. Institutions such as schools, refugee camps, sanitarium and prisons are often sites of scabies outbreaks. The impact of the severe drought in Ethiopia attributed to El Niño weather conditions followed by high levels of malnutrition that increased the potential for diseases outbreak. Currently, Ethiopia is experiencing scabies outbreak in drought affected areas where there is shortage of safe water for drinking and personal hygiene as a result of direct impact of the drought [16]. In this regard, the Federal Ministry of Health (FMoH) in collaboration with partners is planning to respond and aims to rapidly stop community level transmission of scabies outbreak using multi-sectorial intervention approach in affected and high risk districts selected based on nutrition and scabies outbreak risk criteria [6]. Planned interventions include Health, WASH and Communication for development. In July, 2017 an increased case reports of scabies was reported to North Gondar Zonal Health Department from Dembiya District Health office. Hence, this study aimed to identify the risk factors of Scabies cases for intervention.

Significance of the study

Scabies is a highly contagious disease and it can affect Socio Economy of the Society if it is not Early Controlled. Risk factor identification is the major tool that helps to intervene & control any disease outbreaks. In this case, epidemiological assessment of communicable diseases like scabies surveillance and control interventions at community level in this district is necessary to employ the prevention and control measures, and to identify the gaps and intervene accordingly. Moreover, the result of this Study may provide important information for other researchers.

Literature Review

Scabies is commonly observed in very young children followed by older children and young adults [10]. Some immune compromised, elderly, disabled, or debilitated persons are at risk for a severe form of scabies known as crusted, or Norwegian, scabies. Persons with crusted scabies have thick crusts of skin that contain large numbers of scabies mites and eggs [11]. Multiple factors like poverty, low socioeconomic conditions, poor hygiene, illiteracy, lack of access to health care, frequent population movements, inadequate treatment, malnutrition, social attitudes, overcrowding, poor public health education , sleeping habits, and overcrowded sleeping space, sharing of clothes and sharing of towels have frequently been cited as risk factors for scabies throughout the world [12].

Scabies is endemic in many tropical and subtropical areas, such as Africa, Central and South America, northern and central Australia, the Caribbean Islands, India, and Southeast Asia. Scabies is listed among the top 50 most prevalent diseases worldwide, with a global prevalence of 100,625,000 in 2010 (1.5% of the world population) [13]. The International Alliance for the Control of Scabies (IACS) is a recently formed group from across the globe to advance the agenda of scabies control [14].

The alliance is committed to the control of human scabies infestation, and to promoting the health and well-being of all those living in affected communities [14]. Previous study reported that the prevalence of scabies in tropical counties was high, for example in Fiji the prevalence of scabies in school children was 18.5% [7]. A study in northern Ethiopia, Gonder Town among 'Yekolo Temari' revealed 22.5% scabies prevalence, however, another study conducted in southern Ethiopia revealed a prevalence of 5.5% among school children **[15, 16].**

Currently, Ethiopia is experiencing scabies outbreak in drought affected areas where there is shortage of safe water for drinking and poor personal hygiene as a result of direct impact of the drought caused by El Nino 2016 **[17].** The outbreak investigation conducted in Amhara Region, South Wollo Zone Bati District in 2016 shows the Scabies attack rate was higher among Males than females [19]. In the same year the study conducted in North West Ethiopia also reports high prevalence of Scabies among Male populations [19, 18]. As study done in SNNPR East Badowacho District in 2016, age-group less than fifteen years, family size > greater 5 members, and sleeping with scabies cases were found to be significantly associated with scabies infestation [17]. Accordingly, those persons aged less than 15 years were 2.6 times more likely to develop scabies with [AOR (95% CI) =2.62 (1.31-283 5.22)] compared with age >=15 years of age. The odd of developing Scabies Infestation was 2.6 284 among family members with size >= 5 persons compared to those whose family size <= 5 members 285 with [AOR (95%) =2.63 (1.10-6.27)] [17].

OBJECTIVES

General objective

- To investigate the outbreak and identify the risk factors for the occurrence of the outbreak to provide appropriate control & prevention measures of the disease

Specific objectives

- To confirm the existence of outbreak
- To determine the magnitude of the outbreak
- To describe the outbreak by time, place and person
- To analyze risk factors and measure the attack rate of the outbreak.
- To guide appropriate prevention and control measures to stop further spread of the disease.

METHODS AND MATERIALS

Study area and population

The outbreak investigation was conducted in one kebele, Atikilit Telemit of Dembiya District, North Gondar Zone, and Amhara Regional state. Atikilit Telemit-kebele is one of 57 kebeles of Dembiya district. The District is 215 km from the Regional City Bahir Dar. The District shares boundaries to East, Gondar Town and Gondar Zuriya district to the West, Chilga & Takusa district to the North Lay Armachiho District and to the South Lake Tana. The total population of the District was 334,216 males account for 168,779 (50.5%) of the population. The District has 49 Health posts, 9 health centers and 1 District Hospital. The physical health service coverage of the District was 100%. The District water coverage was 48% and latrine coverage of 51%.

Study period: The investigation was conducted from August 28- November 2, 2017

Study Design: Descriptive study followed by unmatched case-control study was used.

Target population: Population living in Atikilit Telemit Kebele

Study population: All population in Dembiya District where 40 cases and 80 controls selected

Sample size: Sample size was calculated by Epi-info 7 stat calc for unmatched case-control study

Two sided confidence level (1-α) =95%

Power (% chance of detecting) = 80%

Ratio of controls to case= 1: 2

From previous study result we took variables with high sample size:

- Proportion of controls with exposure = 16.2 %
- Proportion of case with exposure = 42 %

Table 1: Sample size Calculation assumptions for each hypothesized risky factor from previous study (Fleiss with continuity correction method)

Sr.No	**Variables**	**Assumptions from previous study results**		**Sample size at 95% CIL, 80% power and 1:2 case Control Ratio**		**Total**
		% Case Exposed	% control Exposed	# of Case Calculated	# of Control	
1	Hand washing without Soap [a]	42%	16.2%	40	80	120
2	Change Clothes at least weekly [b]	20.8%	79.2%	10	20	30
3	Contact History With Scabies case [b]	90.7%	9.3%	5	10	15
4	In frequent washing Clothes [a]	95%	50%	15	29	44
5	In frequent taking shower [a]	45%	16.2%	33	66	99
6	Wearing others Clothes [a]	52.5	22%	33	66	99

[a] Meklit.M, Scabies outbreak investigation, East Gojam Zone Amhara region, 2015

[b] Abebe. G, Scabies outbreak investigation, North wollo zone Amhara region, 2016

From the above table among the series of hypothesized variables used to calculate the sample sizes which adopted from different studies the variables with larger sample size was used. Therefore, the total sample size used in our study was 120 (40 cases and 80 controls).

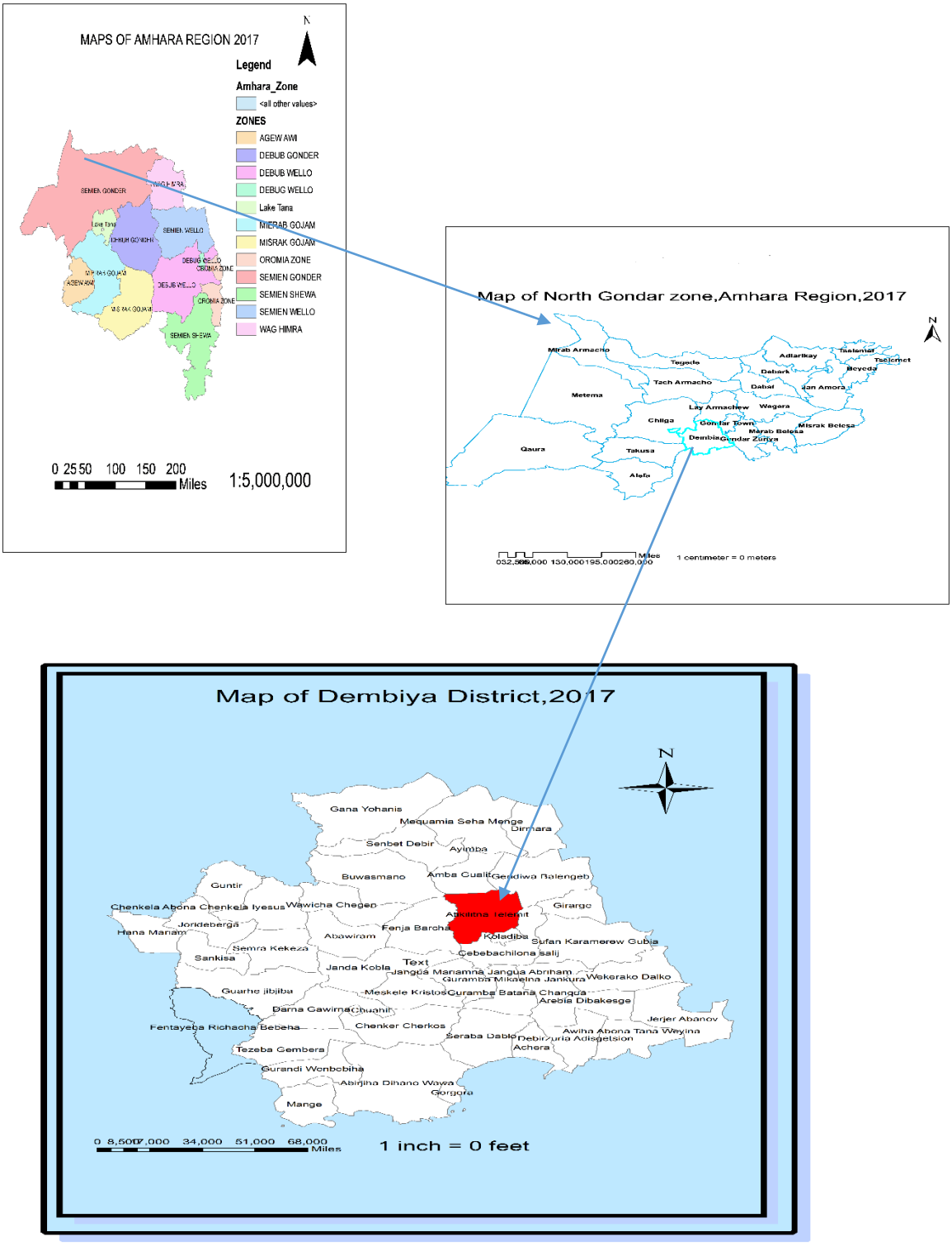

Figure 1: Location of Scabies outbreak conducted in Dembiya district, Ethiopia, 2017

Sampling techniques and procedures

We had conducted simple random sampling techniques because of we want to draw a sample of a scabies outbreak who were already identified and put on line list of cases by cluster health center personnel provided with onset of itching in the last 6 weeks to conduct a satisfaction of this study included. Procedures of selected sample units as follow:-

First, Sample size was calculated Epi-info 7 statCalc function for unmatched case-control study used different assumption, then we had calculated total sample size (n) is 120 (40 cases and 80 controls). Second, sampling frame was created, which means for cases from the collected line list names of all scabies cases who were identified in the last 6 weeks and for controls from neighbors of selected cases who did not develop scabies during the period of the study. Third, assign a number to each of the names of scabies cases in the sampling frame (line list of the cases). This could be done using a Microsoft excel sheet. Forth, we were randomly selected 40 cases of them by using Microsoft excel plus 2016 on data analysis.

Fifth, these selected cases were divided based on the number of data collectors and given for them after that regarding to the list of cases each data collectors with one community member are going to the selected Kebeles through house to house searching and recruited into the study. Controls were neighbors of cases who did not develop scabies during the period of the study.

Inclusion criteria &Exclusion criteria

Inclusion criteria: - Cases: any resident of Dembiya district who had symptoms of scabies based on WHO case definition and who agreed to participate in the study was included. However, control was resident of Atikilit kebele of Dembiya district during the study period who was a neighbor to a case and who did not develop signs and symptoms of scabies and zero case in family.

Exclusion criteria: Cases that did not fulfill the signs and symptoms of scabies based on WHO case definition was excluded from cases. Children those not accompanied with no family were excluded.

Case Definitions: We used the WHO standard case definition these are: -

Suspected case: Any person with generalized itching which often becomes worse at night, and abnormal skin lesions which are papules, pustules, nodules or urticarial.

Confirmed case: A person who has a skin scraping in which mites, mite eggs or mite feces have been identified by a trained health care professional.

Contact: A person without signs and symptoms consistent with scabies who had direct contact with a suspected or confirmed case in the two months preceding the onset of scabies signs and symptoms in the case. However, in our study we are used WHO suspected case definition and eye observation of the respondent's clinical features for cases were selected.

Variables

Dependent Variable: Scabies cases

Independent Variables

- Age
- Sex
- Size of family member
- Contact of the respondents
- Hygiene practices

Data collection method

The investigation was conducted through house-to-house searching for scabies case in selected kebele. We used semi-structured questionnaires which adopted and modified from previously used and interviewed cases and controls, and collected data. Data was collected by principal investigator, 1 district PHEM officer, and 2 heath center worker. Orientation was given for data collectors on the questionnaire. The collected data was checked and when entering the data in to the computer the missing variables and consistency of filling of questionnaires and completeness of data checked out carefully.

Data entry and Analysis

Data was checked, entered and analyzed on computer using Epi info7, IBM SPSS statistics 20, and Arc Map 10.2.2 software were used. Descriptive and advanced statically analyses were under taken. After data cleaning and recoding advanced statically analysis were done. Results were presented using graphs, tables, charts and attack rate was calculated. Odds ratio, 95% CI, and p-value were constructed to measure association and significance.

Ethical issue

The outbreak investigation was done after the approval of Support letter was obtained from MoH and North Gondar Zonal health department in order to technical support. Informed Consent was taken from all respondents for under 18 years old we obtained informed consent form their parents or guardians and study participants found scabies were linked to health centers (refer to health center).

RESULT

Descriptive Epidemiology

We identified a total of 141 scabies cases from 18th August to October 2/2017 with overall attack rate of 2% and Zero case fatality rate. In Atikilit Telemit Kebele the first date of onset of itching was presumed on August 18/2018 and the district was reported it incorporated with others reports in weekly report. The outbreak investigation was started August 28/2017 and intervention was under taken. The case reported arrive peak in September 9/2017 and started declining from the third of September. The outbreak ended in the first week of November, 2017.

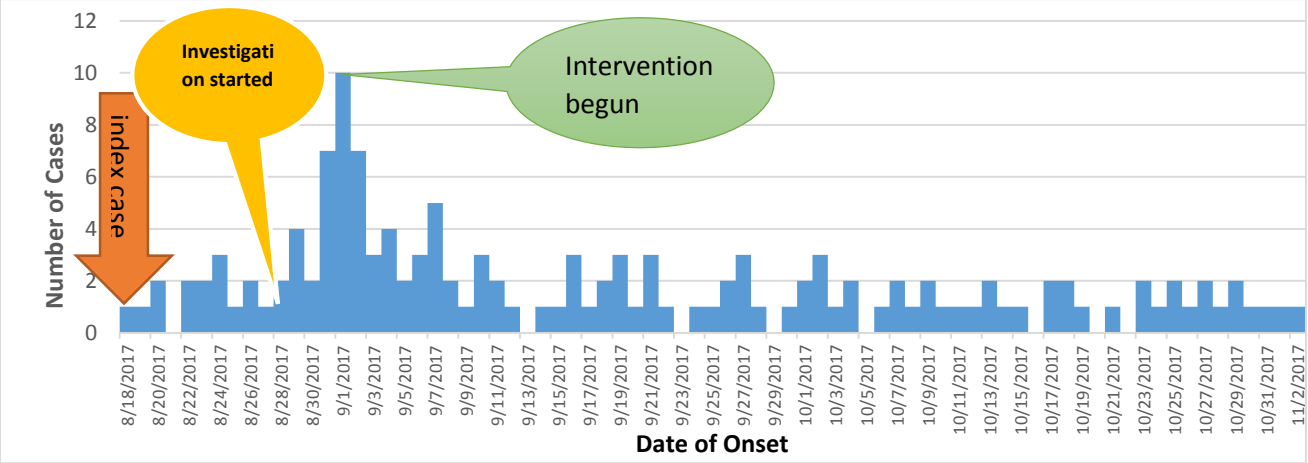

Figure 2: Epi curve of Scabies outbreak in Dembiya District, N/Gondar 2017

The median age of affected groups was 16yrs (IQR=19). Of affected age groups 5-14yrs old children were more affected, 45(32%), than other age groups and less than five children were less affected in our study area.

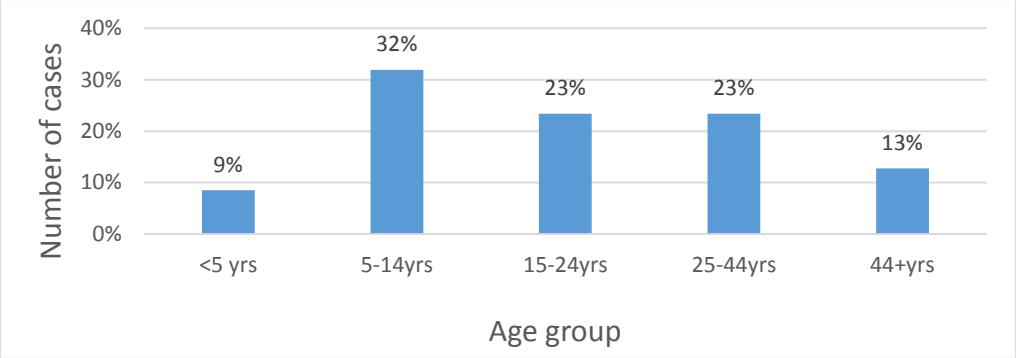

Figure 3: Distributions of cases by age group and AR/100000 in Dembiya District, Amhara, Ethiopia, 2017

Of total cases 64(45%) females and 77 (55%) were males. When we see the sex specific attack rate in the study area male are more affected than Females having AR of 1.9% and 1.6% respectively.

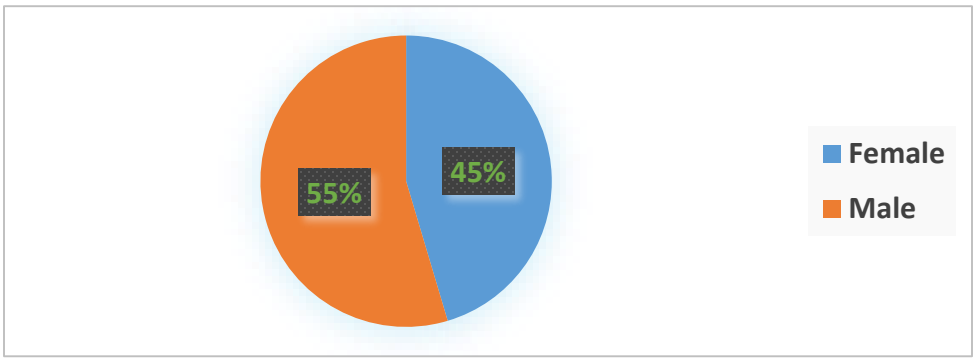

Figure 4: Distribution of Scabies cases by sex Dembiya District, N/Gondar, 2017

Figure 5 : Picture of scabies patient in Dembiya district, North Gondar zone, Amhara Region, Ethiopia, 2017

Mostly affected body Parts of the cases by skin sores were 12(30%) had skin sores on finger Web, 7(17.5%) had skin sores on wrist, 6 (15%) had Skin sores on Elbow and Anterior axillaries line.

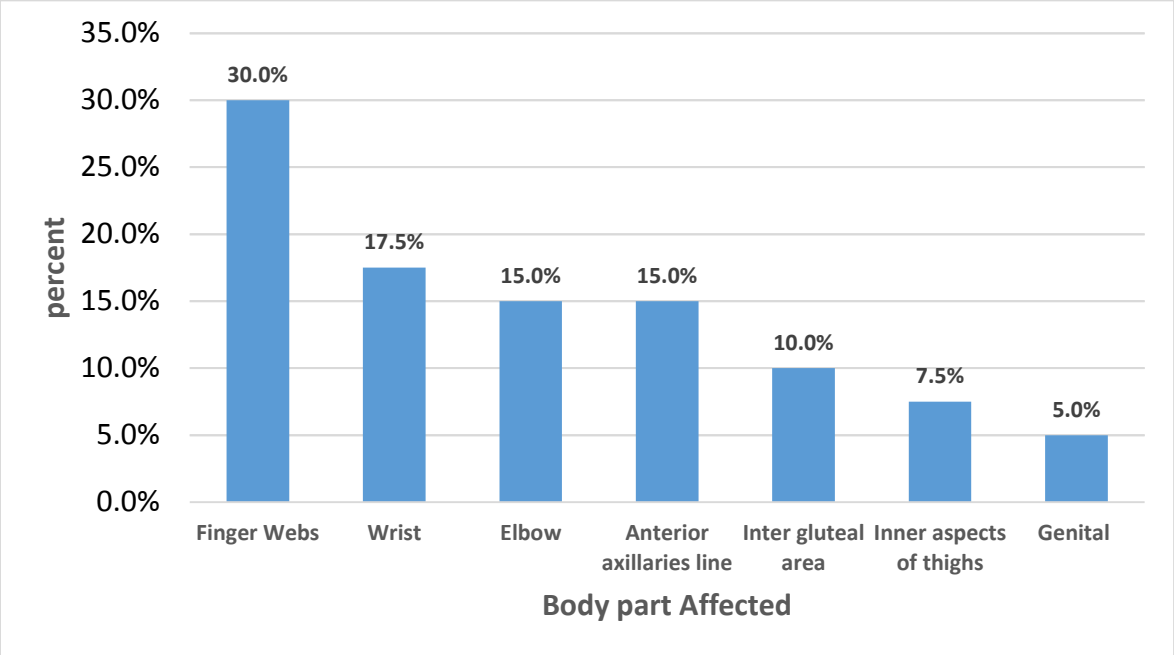

Figure 6: Body parts affected by scabies in Dembiya district, North Gondar, Ethiopia, 2017

The most lesion on the affected body was nodular type accounting 92%.

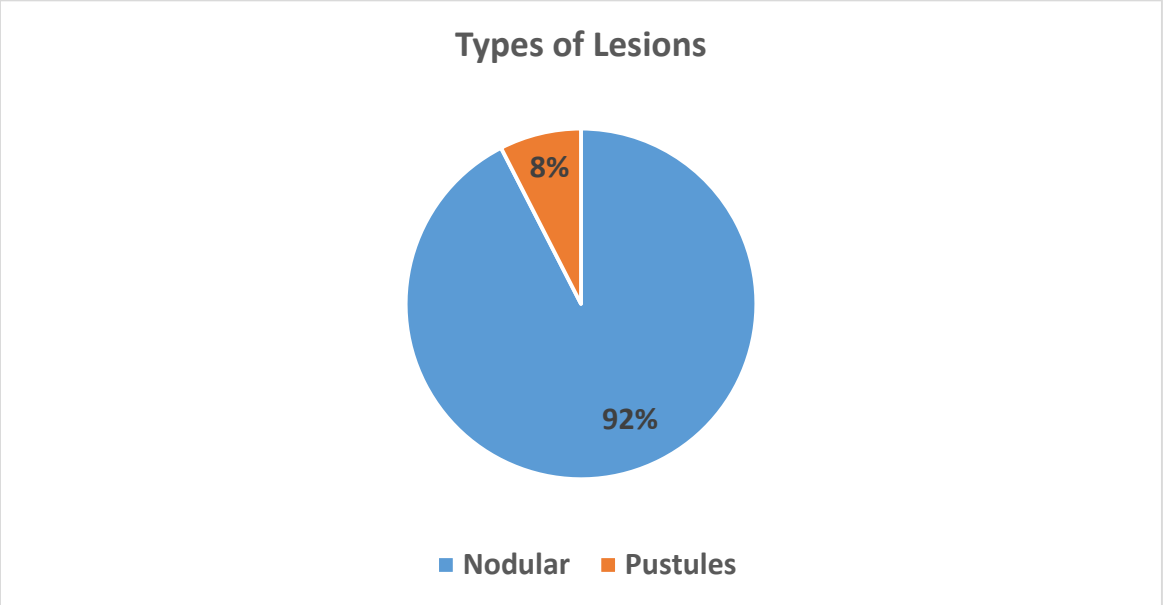

Figure 7: Types of lesions found in 40 cases with scabies in Dembiya district, North Gondar zone, Amhara region, 2017

Analytical study

We conducted unmatched case control study. 40 cases and 80 controls were selected in a ratio of 1:2 Case of scabies was defined as Any person with generalized itching which often becomes worse at night, and abnormal skin lesions which are papules, pustules, nodules or urticarial. Controls were defined as any person who has similar characteristics as that of cases except absence of the disease. Among the study participants 25(62%) of cases and 35(44%) of controls were Female participant. The participants' median age was 36yrs with interquartile range of 22yrs and age group of 15-24yrs were more affected. Of the participants most of them were farmers, 28(70%) of cases and 76(98%) controls.

Table 2: Distribution of respondents according to their Age group, sex, Family size & occupation, Dembiya District, North Gondar zone, Amhara region, 2017

Variables		Case (n=40)		Control (n=80)	
		Count	%	Count	%
Age group	5-14yr	11	27%	0	0
	15-44	19	48%	50	62%
	44 +	10	25%	30	38%
Sex	Female	25	62%	35	44%
	Male	15	38%	45	56%
Occupation	Farmer	28	70%	76	95%
	Civil servant	1	3%	0	0
	Student	9	22%	3	4%
	House wife	2	5%	1	1.25%
Family size	< 4	5	13%	18	22%
	4-10	35	87%	58	73%
	>10	0	0	4	5%

The significance association in bivariate analysis was observed among variables such as Contact history (COR= 10.9, 95% CI = 9.7-24, P value= 0.0000), Put on clothes of someone else with the diseases in the previous six weeks (COR= 4.1, 95% CI =1.7-10, P value=0.0009) to be potential risk factors of an outbreak of scabies diseases.

Table 3 Bivariate analysis of Scabies outbreak in Dembiya District, Amhara Region, 2017

Variables		Case(n=40)	Control(n=80)	Crude OR, 95% CIL	P Value
Sex	**Female**	25 (63%)	35 (44%)	**2.1(0.9,4.6)**	0.052*
	Male	15 (37%)	45 (56%)	**Reference**	
Age group	**5-14**	11(28%)	0	Undefined	0.0000*
	15-44	19(47%)	51(64%)	1.1(0.4,2.6)	0.86**
	>44	10(25%)	29(36%)	Reference	
Occupation	Farmer	30 (75%)	76 (95%)	0.4 (0.02,6.5)	0.5**
	Student	9 (22.5%)	3 (3.8%)	3 (0.1, 64)	0.46**
	House Wife	1 (2.5%)	1(1.2%)	Reference	
Family Size	<4	5(13%)	18(23%)	**0.5(0.2,1.4)**	**0.18***
	4-10	35(88%)	61(76%)	**Reference**	
	>10	0	1(1%)	**0(0,1E12)**	**0.97****
Hand wash with soap	Yes	32(80%)	65(81%)	0.9(0.4,2.4)	0.123*
	No	8(20%)	15(19%)	**Reference**	
Frequency of body bath	Every 2-3 days	11 (28%)	19 (24%)	**Reference**	
	Weekly	19(47%)	46 (58%)	**0.7(0.3,1.8)**	**0.123***
	More than week	10(25%)	15(18%)	**1.2(0.4,3.4)**	**0.131***
Frequency of washing cloths	**weekly**	33(83%)	66(83%)	**1(0.4,2.7)**	**0.142***
	More than a week	7(17%)	14(17%)	**Reference**	
Not Changing clothes daily	Yes	31(78%)	68(85%)	**1.6(0.6,4.3)**	**0.3****
	No	9(22%)	12(15%)	**Reference**	
Put on clothes of someone else with the diseases in the previous six weeks	Yes	17(43%)	12(15%)	**4.1(1.7,10)**	**0.0009***
	No	23(57%)	68(85%)	**Reference**	
Contact History	Yes	39 (97%)	21 (26%)	**10.9(9.7,24)**	**0.0000***
	No	1(3%)	59 (74%)		
Water shortage	Yes	6(15%)	7(9%)	**1.8 (0.6,5.9)**	**0.199***
	No	34(85%)	73(91%)	**Reference**	
Awareness About Scabies	Yes	33(82%)	68(85%)	**0.8 (0.3,2.3)**	**0.72****
	No	7(18%)	12(15%)	**Reference**	

Key: * Variables those run in multivariate
** Variables those excluded in Multivariate analysis because of P value >0.2

Potential risk factors that remained statistically significantly associated with the disease in multivariate logistic regression analysis were body bath more than week (AOR= 1.5, 95% CI = 1.2-4.1) Contact history AOR 17, 95% CI 13.4-20), Water shortage AOR 3.3, 95% CI 2.4-4.5). On the other hand, protective factors that remained statistically significantly associated with the

diseases on multivariate logistic regression analysis were Sex Female (AOR = 0.4, 95% CI= 0.1-0.7), Hand wash with soap (AOR 0.6, 95% CI (0.1-0.9)).

Table 4 Multivariate analysis of Scabies outbreak in Dembiya District, Amhara Region, 2017

Variables		Case(n=40)	Control (n=80)	Crude OR, 95% CIL	AOR 95% CI
Sex	**Female**	25 (63%)	35 (44%)	**2.1(0.9,4.6)**	0.4(0.1,0.7)
	Male	15 (37%)	45 (56%)	**Reference**	
Family Size	<4	5(13%)	18(23%)	**0.5 (0.2,1.4)**	1.2(0.9,4.3)
	4-10	35(88%)	61(76%)	**Reference**	
	>10	0	1(1%)	**0(0,1E12)**	0.0000
Hand wash with soap	Yes	32(80%)	65(81%)	0.92(0.35,2.4)	0.6(0.1,0.9)
	No	8(20%)	15(19%)	**Reference**	
Frequency of body bath	Every 2-3 days	11 (28%)	19 (24%)	**Reference**	
	weekly	19(47%)	46 (58%)	**0.7(0.3,1.8)**	1.3(0.8.5)
	More than week	10(25%)	15(18%)	**1.2(0.4,3.4)**	1.5(1.2,4.1)
Frequency of washing cloths	**weekly**	33(83%)	66(83%)	**1(0.4,2.7)**	0.9(0.18,5.0)
	More than a week	7(17%)	14(17%)	**Reference**	
Cloth exchange with infected person	Yes	17(43%)	12(15%)	**4.1(1.7,10)**	3.1(2,4)
	No	23(57%)	68(85%)	**Reference**	
Contact History	Yes	39 (97%)	21 (26%)	**20.5(14.1,30.2)**	17.0(13.4,20.0)
	No	1(3%)	59 (74%)	**Reference**	
Water shortage	Yes	6(15%)	7(9%)	**1.8 (0.6,5.9)**	3.3(2.4,4.5)
	No	34(85%)	73(91%)	**Reference**	

Intervention under taken

In a district or village with prevalence less than 15% the recommend treatment will be individual and contact (family member) management. Thus in Atikilit Kebele Dembiya district the prevalence rate was 2% so we declare to give treatment for all cases and contact. In addition to that, we were given health education on mode of transmission, prevention and control measures of scabies diseases for the affected communities in the district.

DISCUSSIONS

This study tried to identify the possible risk factors for contracting scabies pertaining to socio demographic characteristics living conditions, contact history and level of education, and access to water. We found that males are more affected (63%) than Females which is supported by study done in north western Ethiopia in 2016 [18] and Amhara region South Wollo, Bati District in 2016 [19]. In our study area Females were 60% less likely to be infected compared to Male populations. The possible assumption is females are more access to water every day than males and able to keep their personal hygiene relatively. Peoples those wash their hands/body with soap was found to be 40% less likely to acquire scabies (AOR= 0.6, 95% CI 0.1-0.9) which a lines with the study done in Enarj Enawuga Woreda, East Gojjam Zone, Amhara region, 2015. It reports those who were not using a soap for body bath/hand wash were 4.5 more affected than the counterpart (AOR 4.5, 95% CI (1.8, 11.4) [20].

The study conducted in North Gonder among "Yekolo temari" reveals that body bath above a week was 3.1 times risk for scabies infection (AOR = 3.2, 95% CI 1.2-8.5) than those take body bath frequently less than a week [14]. Our study result also agreed with this study (AOR=1.5, 95% CI 1.2-4.1). Similarly following the current El-Nino event which affects many countries globally including Ethiopia, drought and extreme water shortage is prevailing in wide area of the country

On the other hand, individuals those put on infected person's cloths were 4.1 times more infected than the other which is similar finding with the study done in North Gonder among "Yekolo temari" in 2015 (AOR =2.76 95% CI 1.04,7.41). Similar study conducted in Bedwecho district, Hadiya Zone, SSNPR Ethiopia in 2016 reported that individual those had Contact history with infected person contracts scabies 12.4 (AOR= 3.05, 50.9) times than counterpart. This study supports our study (AOR=17, 95% CI 13.4, 20). Age groups, Family size and frequency of cloth washing are not significantly associated with the occurrence of scabies outbreak in our study area which is different from the study done in Bedwecho district, Hadiya Zone in 2016. The difference may be due to difference in the life style of the community in Dembiya and Hadiya.

CONCLUSION

- The existence of Scabies was confirmed in the district
- In Dembiya district the AR of Scabies were higher in Males than Females
- Poor personal hygiene is significantly associated with the occurrence of Scabies in Atikilit Telemit, Dembiya district.

- Contact history with infected person, cloth exchange with infected person, infrequent body bath and infrequent cloth washing were found to be risk factors significantly associated with Scabies while washing hand/body with soap is found to be preventive factor.

RECOMMENDATION

- The district health office and cluster center health workers have to increase their surveillance activity particularly active surveillance especially HEW have to assess cases home to home actively since, scabies diseases affect more people because of late detection and response of outbreak.
- The district health office and health center has to Promote on hygiene and sanitation of the community.
- Increase awareness of the community on the modes of transmission of scabies to avoid or minimize contact with cases.
- The Zonal Health department should establish a mechanism to include scabies under the public health emergency management reporting system.

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Outbreak investigation of Suspected Acute Watery Diarrhea, Wogera district, North Gondar zone, Amhara, Ethiopia, October 2017

ABSTRACT

Introduction: Acute Watery diarrhea remains a major public health problem and affects primarily developing world populations with no proper access to adequate water and sanitation resources. Cholera represents an estimated burden of 1.4 to 4.0 million cases, and 21 000 to 143 000 deaths per year worldwide. The aim of our study was to describe AWD outbreak cases and identify possible source of the outbreak to take possible intervention measures at Wogera District.

Methods and materials: We conducted a descriptive cross-sectional study. The study was conducted from August 15/2017 - August 27/2017 at Wogera District. We reviewed all available epidemiological, and clinical data of Acute watery diarrhea cases. After cleaning and checking the data were entered to a computer using Excel spread sheet and analyzed by SPSS version20 software.

Result: A total of 84 suspected cases and with zero deaths were reported between July 4/2017 and October 8/2017. The overall attack rate and case fatality rate was 3% and Zero respectively with sex specific attack rate of 3 and 2.8 per 10,000 female and male population respectively. Among the total number of 84 cases, 71% used Hand pump water for drinking, cooking and other purposes.

Conclusion: There were a suspected Acute watery diarrhea outbreaks in Wogera District where Female and adult populations were more affected during outbreak. Hand pump water source was mostly suspected to be infected with cholera and Farmers were more affected than other. From this, we recommended that Keeping hand pump water source free of contamination from environment by securing the source and giving continuous health education regarding personal and environmental sanitation for at risk population is important to decrease further transmission of AWD.

Key words: *Acute watery diarrhea, Wogera District, outbreak*

Word count: 271

INTRODUCTION

Background

Acute Watery diarrhea (AWD) is an acute bacterial infection of the intestine caused by ingestion of food or water containing Vibrio cholera sero-groups either type O1 or O139. Both children and adults can be infected. It is one of the key indicators of social development and remains to be a challenge to countries where access to safe drinking water and adequate sanitation cannot be guaranteed [(1)]. Its short incubation period of two hours to five days enhances the potentially explosive pattern of outbreaks. AWD is transmitted through fecal contamination of water or food and can result in hypovolemic shock and death if not promptly treated with fluids. Transmission is closely linked to inadequate environmental management. Risk factors for AWD outbreaks include poor access to safe drinking water, contaminated food, inadequate sanitation, and large numbers of refugees or internally displaced persons (IDPs) [(1, 2).]

AWD represents an estimated burden of 1.4 to 4.0 million cases, and 21 000 to 143 000 deaths per year worldwide. In 2015, reported cases worldwide represented a 9% decrease compared to 2014 (172 454 vs. 190 549). An estimated 2.8 million AWD cases occur each year in endemic countries, and the average global annual incidence rate is 2.0 cases per 1000 people at risk [(2).] In 2015, 172 454 cases and 1304 deaths of AWD were reported to WHO worldwide. Outbreaks continued to affect several countries. Overall, 41% of cases were reported from Africa, 37% from Asia and 21% from the Americas [(3).]

In Ethiopia, it was indicated that, there was acute watery diarrhea (AWD) epidemic in 1990 which persisted with recrudescence of cases till 1998 [(4)]. Moreover, from July 2008 to June 2009 in Ethiopia, there were a total of 9485 cases and 193 deaths (with case-fatality rate 2.0%) of acute watery diarrhea in six regions including Addis Ababa Region took the country ‘s highest share of [2,988(31.5%)] and deaths [99 (51.25%)] of AWD case fatality rate of 3.3% [(4)]. This study helps to investigate AWD outbreak and identify possible source of the outbreak to take possible intervention measures at Wogera District in 2017.

Statement of the problem

There are an estimated 2.86 million cases of AWD annually in endemic countries. Countries with estimates of more than 100,000 cases annually include: India, Ethiopia, Nigeria, Haiti, the DRC,

Tanzania, Kenya, and Bangladesh [7]. In Ethiopia, "acute watery diarrhea" (AWD) and cholera have been used interchangeably, largely due to limited diagnostic capacity. Since 1993, yearly AWD outbreaks, encompassing various infectious etiologies including laboratory confirmed cholera, have affected numerous regions throughout sub Saharan Africa. Severe diarrhea caused by Vibrio cholera O1 has been an important cause of morbidity and mortality in Ethiopia, with the Federal Ministry of Health reporting over 22,000 cases and 219 deaths (case fatality rate 1%) in 2006[1]. AWD due to Vibrio Cholerie O1 has been reported in five regions, with the most populous region (Oromia) reporting cholera in five out of six years during the 2006–2011 period [1]. AWD outbreaks in developing countries occur in both endemic and epidemic settings (8). In July 2017 an increase number of AWD cases was reported to North Gondar Health Bureau from Wogera District [18]. To identify the cause of the outbreaks for intervention this study was conducted.

Significance of the study

Ethiopia is one of the countries with high burden of the disease experienced recurrent epidemic of AWD in different regions, including Amhara for many years. Since AWD is among the major widespread diseases affecting both young children and young adults as a result of many interrelated factors, such as inadequate facilities for processing human wastes and inadequate supply of water. Morbidity associated with the outbreak of AWD continues to be on the increase, in some cases resulting in death. It is difficult to evaluate AWD burden because of the very limited scope of studies the lack of coordinated epidemiological surveillance systems at all levels of government. Ongoing analysis of the outbreak is important for detecting the factors and cause of unexpected increases in the disease, monitoring disease trends, and evaluating the effectiveness of disease control programs . Thus, this outbreak investigation is very important to identify the possible associated risk factors of AWD outbreak so that it helps for early intervention and effective outbreak control to decrease the impacts of AWD.

Literature Review

AWD remains a significant public health problem in many parts of the world. In 2015, 42 countries reported a total of 172,454 cases including 1304 deaths, resulting in an overall case fatality ratio (CFR) of 0.8% [5]. Cases were reported from all regions, including 16 countries in Africa, 13 in Asia, 6 in Europe, 6 in the Americas, and 1 in Oceania. Afghanistan, the Democratic Republic of

the Congo (DRC), Haiti, Kenya, and the United Republic of Tanzania accounted for 80% of all cases [5].

A study conducted on a total of 603 cross-border cholera cases with 5 deaths were recorded in Malawi and Uganda in 2015 [6]. Uganda recorded 118 cases with 2 deaths and CFR of 1.7%. The under-fives and school going children were the most affected age groups contributing to 24.2% and 36.4% of all patients seen along Malawi-Mozambique and Uganda-DRC borders, respectively [6]. These outbreaks lasted for over 3 months and spread to new areas leading to 60 cases with 3 deaths, CFR of 5%, and 102 cases 0 deaths in Malawi and Uganda, respectively. Factors contributing to those outbreaks were: poor sanitation and hygiene, use of contaminated water, floods and rampant cross-border movements. The outbreak control efforts mainly involved unilateral measures implemented by only one of the affected countries [6].

A review study yielded eighteen studies, of which five studies reporting on health impact, four reported outcomes associated with water treatment at the point of use, and one with the provision of improved water and sanitation infrastructure as a significant measure in times of cholera outbreaks [7]. Hand washing and hygiene interventions address several transmission routes. A single study in an endemic setting compared a combination of interventions to improve water and sanitation infrastructure, and the resulting reductions in cholera incidence[7].

A house-to-house survey conduct in India 2013 shows drinking water from the overhead tank [Adjusted OR (AOR): 31.94, 95 % CI: 7.3-139.5] was associated with risk of developing illness[8]. Conditional logistic regression found that consuming unsafe water (matched odds ratio [mOR]: 3.4; 95% confidence interval [CI]: 1.1,11.0), street-vended water (mOR: 9.4; 95% CI: 2.0, 43.7), and crab (mOR: 3.3; 95% CI: 1.03, 10.6) were significant risk factors for cholera infection[9]. According to study report which was conducted in Sidama Zone in 2012 and Bahirdar, 2016 significant associated was observed among direct contact with food, water and full responsibility to care their children [14, 15]. In addition, the outbreak investigation conducted in Benishangul Gumuz in 2016 reports higher number of AWD cases was found among communities those drink river water, OR = 3.52 [17].

In 2012 the AWD outbreak was reported from Malawi around Lake Chilwa. A total of 1,171 cholera cases and 21 deaths were reported in the districts around the lake, with cases also being

reported on the Mozambican side of the lake. The attack rate was highest among people living on or around the lake, particularly among fishermen. Samples of lake water had high turbidity conducive to the propagation of Vibrio cholera [10].

Unsafe water sources, lack of maintenance of broken boreholes, frequent breakdown of piped water supply, low coverage of pit latrines, lack of hand washing facilities , salty borehole water, fishermen staying on Lake Chilwa, cross-border Malawi-Mozambique disease spread, and socio cultural issues were causes of persistent cholera outbreaks [11]. In DRC a strong seasonal component, suggest a potential Vibrio cholera reservoir in the Rift Valley lakes and the possible contribution of the lakes' fishing industry to the spread of cholera [12]. Practices predisposing communities to AWD outbreaks included the use of contaminated lake water, poor sanitation and hygiene. Additional factors were: ignorance, illiteracy, and poverty[13].

In Ethiopia it was indicated that as of week 20, 2016, a total of 1, 884 AWD cases and 19 deaths had been reported from eight zones in 25 woredas (districts) of three regions [from week 45/2015 up to week 20/2016]. The case fatality rate (CFR) and attack rate (AR) were 1.0% & 0.05% respectively. About 67.3% of the cases were 15 and above years old and 51.3% of them were male. In Oromia region, a total of 686 cases and 12 deaths [CFR=1.7%, AR=0.03%] were reported from 4 zones in 17 districts; and in Somali region, a total of 793 cases and two deaths [CFR=0.3%, AR=0.1%] were reported from two zones in three woredas (districts); and In SNNP region, a total of 405 cases and two deaths [CFR=1.2%, AR=0.05%] were reported in two zones of 5 Woredas (districts) [19].

OBJECTIVE

General objective

- To describe AWD outbreak cases and identify possible source of the outbreak to take possible intervention measures at Wogera district.

Specific objectives

- To describe the outbreak in terms of place, person and time variables at Wogera district in 2017
- To initiate prevention and control measure to stop further spread of AWD.

MATERIALS AND METHODS

Study area and period

The outbreak investigation was conducted in Wogera District, North Gondar Zone, Amhara Regional State. Wogera is one of the 23 District of North Gondar Zone. The District shares boundaries to South by Mirab Belesa, on the southwest by Gondar Zuriya, on the west by Lay Armachiho, on the Northwest by Tach Armachiho, On the North by Dabat, on the Northeast by Janamora and on the Southeast by Misraq Belesa. The District is located 787kms North of Addis Ababa, 220 km from the Regional City, Bahir Dar. The total population of the district is 274,384 males which account for 135,564 (49.4%) and Females are 135,820(50.6) of the population. The District has 44 health posts, 10 health centers. The physical health service coverage of the district is 86%. The study was conducted from August 15/2017 – August 27 /2017.

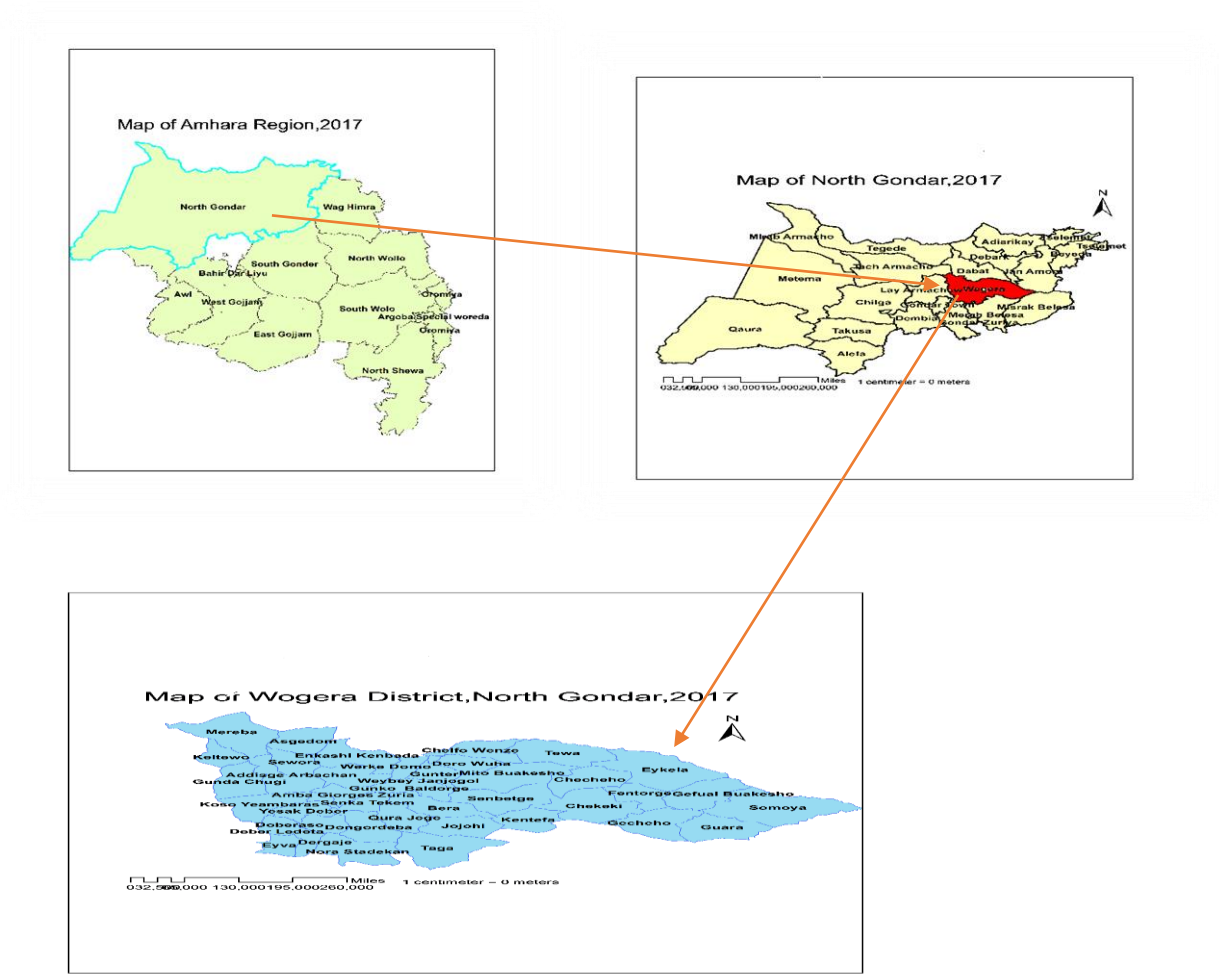

Figure 8: Location of AWD outbreak was conducted in Wogera District, Ethiopia, 2017

Source population: All Population found in Wogera District

Study Population: All patients presented to Health Facility with a compliant of having acute watery diarrhea since July 4 to October 8, 2017 and registered on Health facilities line list.

Study design: We conducted a descriptive study design.

Case definition (PHEM)

Suspected case definition: Any person >5 years of age or more with profuse acute watery diarrhea and vomiting

Confirmed case definition: A suspected case in which Vibrio cholerae O1 or O139 has been isolated from their stool.

Sampling technique and procedure

All AWD cases were included in the study by using standardized patient line list.

Variables in the study

The following variables were included in our study. Those included:

- Personal identification
- Clinical sign and symptom
- Source of drinking water
- Patient outcome
- Dehydration status

Data collection

Patient line list was used to collect data such as demographic, clinical symptoms, possible associated factors and other related variables.

Data Quality assurance: Line list was obtained from Wogera District and checked for inconsistencies and missing values.

Data Analysis: All collected data were checked and entered to a computer using Excel spread sheet and analyzed by SPSS version20 software. Descriptive statistics was conducted to calculate attack rate, proportion, rate, and frequency of acute watery diarrhea using SPSS version20.

Ethical issue: Support letter was obtained from MoH and North Gondar Zonal Health Department in order to collect data and confidentiality assured and no personal details was recorded or produced on this documentation. Not shared unnecessarily for third parties.

Dissemination of the result: There was meeting to debrief the finding of the investigation to the district, Zone and region. Written report of the investigation was submitted to the region, resident advisor and to the EFETP program coordinator of Addis Ababa University step by step.

RESULTS

Period of the outbreak

Acute watery diarrhea outbreak in Wogera District was reported after one suspected AWD case visited Ambagiorgis Health Center on July 4/2017. This one case was admitted and treated at Health Center and survived. Prior to the onset of diarrhea suspected case has no either history of travel to other AWD suspected place or history of contact with suspected cases. The common source of water for the index case was tap water. The number of AWD cases increased sharply and reached highest pick in August 18/2017 and decreased after 9/5/2017. One last AWD case was reported in October 8/2017.

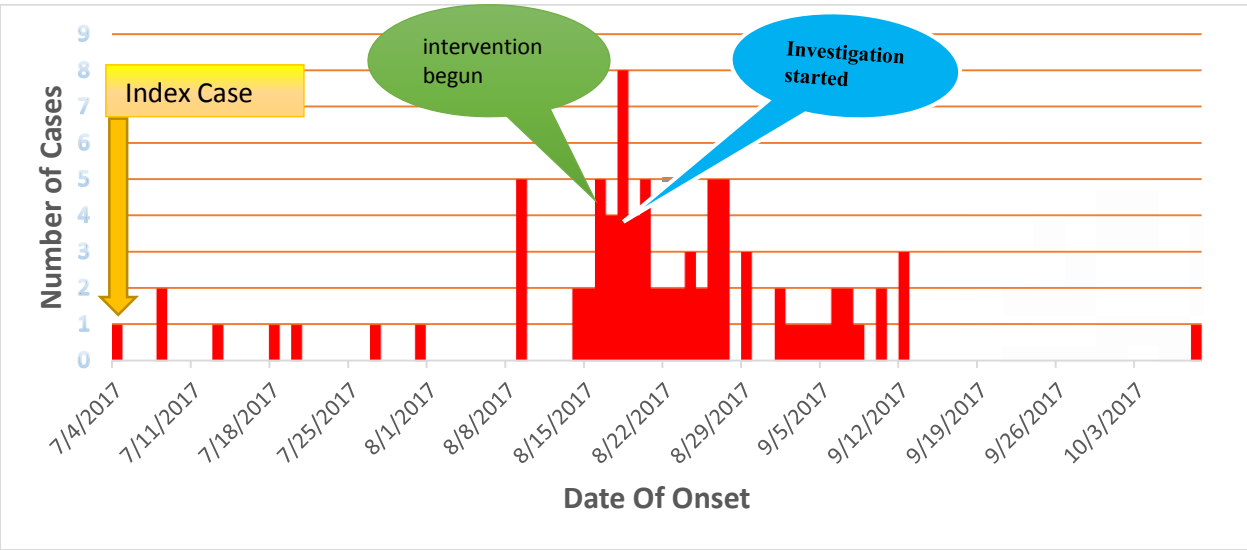

Figure 3: Epi curve of AWD outbreak in Wogera District, N/Gondar 2017

Within four months about 84 AWD Suspected cases were reported with overall attack rate of 3 per 10,000 populations among which 44(52%) were female population with Attack rate of 3 per 10,000 populations. The attack rate among Male population was 2.8 per 10,000 populations.

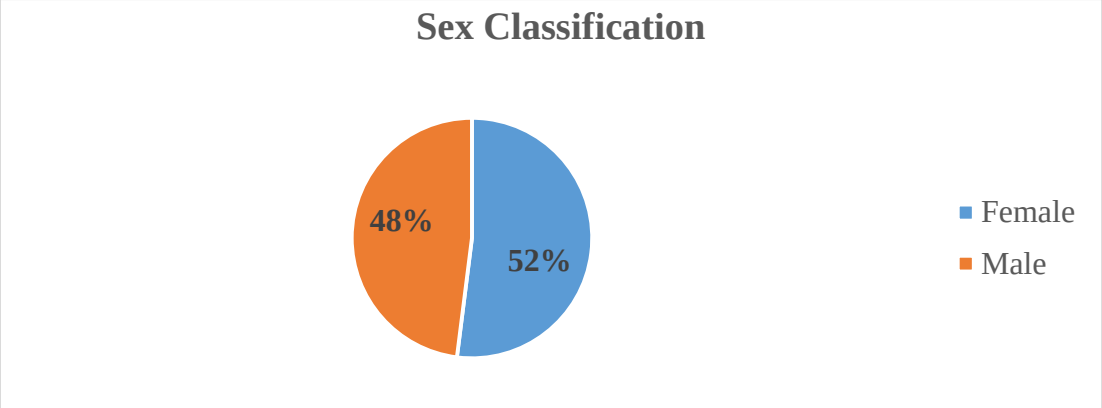

Figure 8: Distribution of AWD cases by sex Wogera District, N/Gondar, 2017

The affected ages ranged from 1 year to 80 years with median age of 36.5 (IQR = 28). Of 84 AWD suspected cases most of them,73(86.9%), was adult age group (greater than 14 yrs.) and the least was among less than five age group accounting 3(3.6%) of the total.

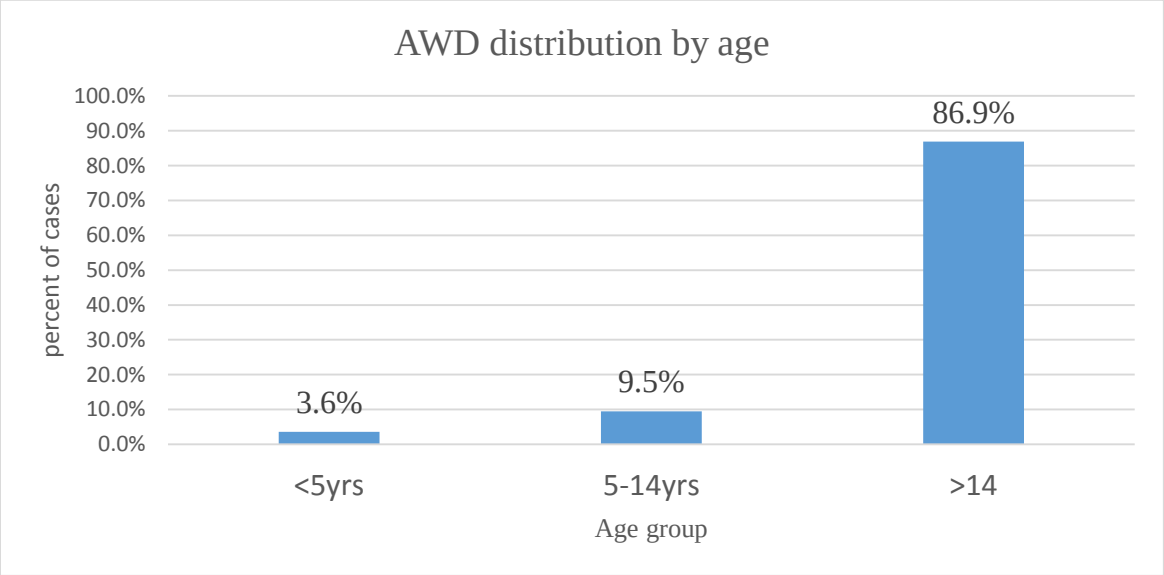

Figure 9 : Distribution of AWD cases by Age Wogera District, N/Gondar, 2017

Case distribution by place

Of 84 identified AWD Suspected cases from Wogera District the most of them 46(55%) were reported from Ambagiorgis town followed by Balderge 10(12%).

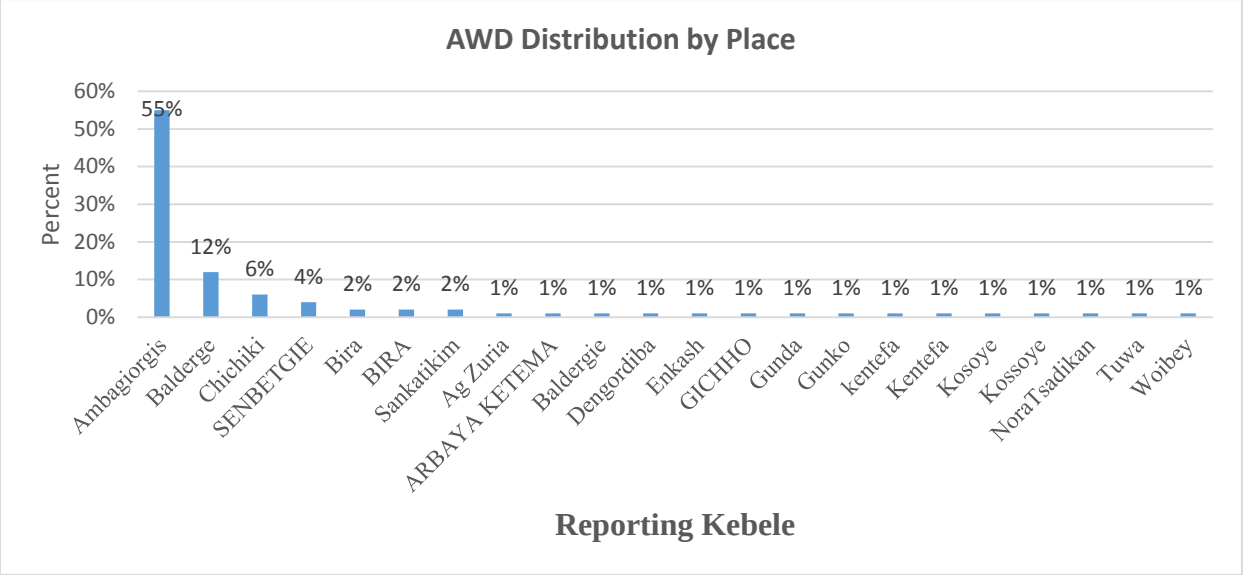

Figure 10: Distribution of AWD cases by residency area in Wogera District, N/Gondar, Ethiopia, 2017

Stay of patients in admission

The range of days stay in admission at treatment center was 1/2-7 days with mean 3.4 (SD 2.5 days). Among the total number of cases with acute watery diarrhea, 67 %(56) of cases were stay less than 3 days in cholera treatment center (CTC).

Table 5: Number of days stay in admission among AWD cases in Wogera District, N/Gondar, 2017

Number of days stay in admission	Number of cases in admission	percentage
0	17	20.2%
1	27	32%
2	12	14%
3	19	23%
4	1	0.011%
6	6	0.071%
7	2	0.023%
Total	84	100%

Risk factors and clinical symptoms

Water source

Among the total number of 84 affected AWD cases, 71 %(60) were used Hand pump water for drinking, cooking and other purposes.

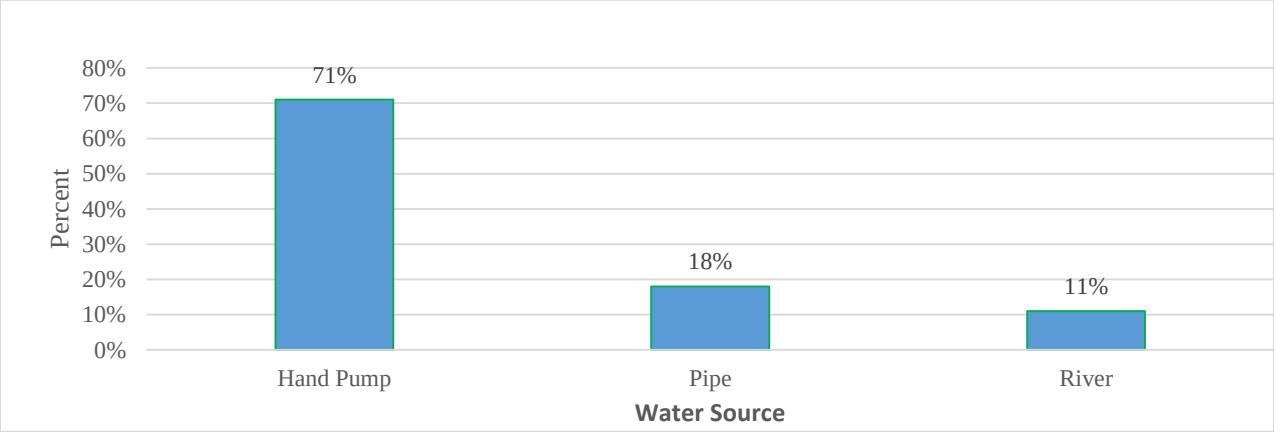

Figure 11 : Source of drinking water among AWD cases Wogera District, North Gondar, 2017

Occupation

Of the total suspected AWD Cases 62 (74%) of them were farmers. Food handlers and teachers were less affected group by the outbreak.

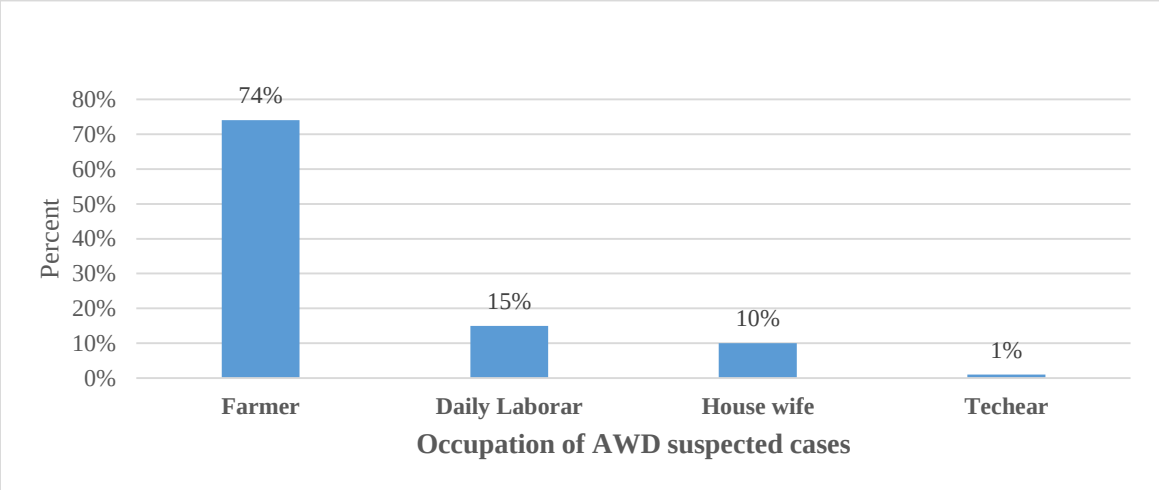

Figure 12 : Distribution of cases by occupation in Wogera District, Amhara, Region, 2017

Level of dehydration

Among the total cases admitted by acute watery diarrheal disease, 39%, 37% and 24% were some, sever and no dehydration respectively. Watery diarrhea and vomiting was manifested clinically by all admitted AWD cases.

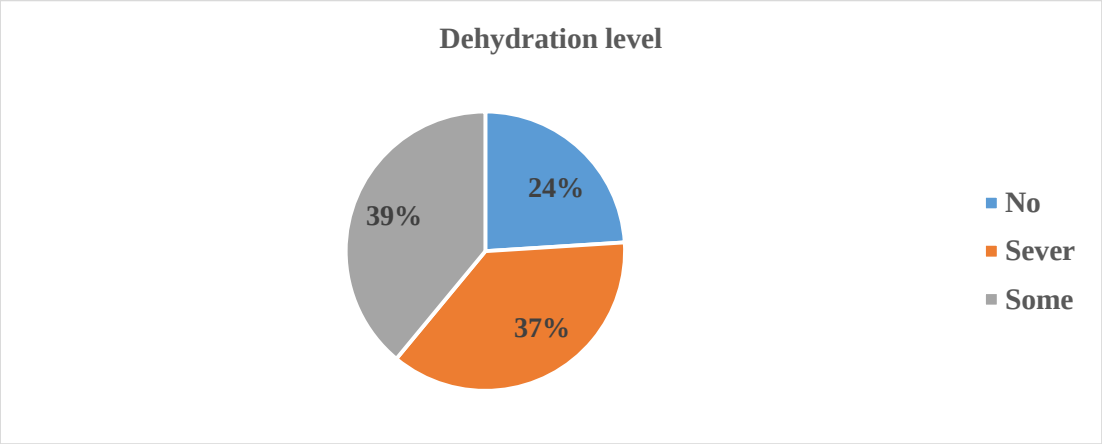

Figure 13**: Level of dehydration among AWD cases in Wogera, North Gondar, Ethiopia, 2017**

Interventions during this study

- Latrine constructed (by Woreda)
- Water schemes Maintained (by Woreda)
- Health Education given on the uses of Latrine, water and personal hygiene (13,210 people)
- Distribution of Water Guard done (investigator along with Woreda)
- In response to this outbreak there was a multi-sectorial committee formed from WHO, UNICEF, wash committee, the District and zonal administrations and health offices. There were meeting daily. The team was evaluating the CTC sites and was having discussion with community and religious leaders. They also worked on awareness creation on hand washing, water treatment, latrine usage, waste management and active case search.

Limitation

- We didn't conduct analytic study
- We didn't perform environmental assessment and laboratory diagnosis

DISCUSSION

The AWD outbreak which was reported from Ambagiorgis Town in Wogera District. It was rapidly distributed to the other neighboring Kebeles with a short period of time and covers about 22 Kebeles (41% of the total Kebeles in the Woreda). During the outbreak adult age group of >14yrs were more affected (87%) than the other age group which was similar with study done in Bahirdar Anadasa holy water 2016. Females are more affected than Males which accounted 3 per 10,000 populations. This may be due Female populations have more responsibility to handle food and have direct contact with food and water. This result is supported by the study done in Sidama Zone 2012. This may be due the direct contact with food and Water, and full responsibility to care their children. Similarly, case control study in Sidama Zone in 2012 and Bahir Dar in 2016 shows Females are more affected [14,15].

The overall attack rate (3 per 10,000) of AWD in our study area was lower than Bahirdar (2%) in 2016 and case fatality rate was similar which was Zero in both area [15]. The case fatality rate of Wogera District was in the range of the WHO guideline, which was supposed to be less than 1% [16]. This indicates the early care seeking behavior of the community.

Among the total AWD patients at Wogera District most of them (39%) were diagnosed to be Some Dehydrated which aligns with the expectation stated by the WHO guideline (16). The water source of most of the affected peoples were Hand pump water (71%) which is different from the study done in Benishangul Gumuz in 2016 (which was higher cases of AWD was those who drink river water, OR = 3.52) [17]. In the past surveillance activities there was no history of vibrio cholera reported by health facilities in the area as the same week of this year. Therefore, this abnormal number of cases was a clear indication of acute watery diarrhea outbreak in the area.

CONCLUSION

- There were a suspected AWD outbreaks in Wogera District
- Female and adult populations were more affected during outbreak
- Hand pump water source is mostly suspected to be infected with AWD
- Farmers are more affected than other

RECOMMENDATION

- Provision of Health education for the community about eating cooked foods by Wogera District.
- The district administration in collaboration with zonal and regional water bureau has to assign budget and provide safe water supply to the community.
- The health extension has to create awareness about hygiene and sanitation the Community.
- community mobilization to contract toilet and use the toilet appropriately
- provision of water purifier for these area who has serious safe water problem Provision

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CHAPTER II- SURVEILLANCE DATA ANALYSIS

Surveillance Data Analysis of Dysentery, Akaki Kality Sub-city, Addis Ababa, Ethiopia, 2017.

ABSTRACT

Background: Dysentery affects all ages but is more serious in children. In Ethiopia, dysentery is monitored through routine surveillance with a weekly reporting from all levels of the health system. We described the magnitude and characterized cases by place, person, and time

Method: we defined suspected cases as a person with diarrhea with visible blood in stool and confirmed cases as suspected case with stool culture positive for Shigella dysenteries. We reviewed the surveillance data during 2012-16 from the Sub-City surveillance system to characterize cases. We analyzed surveillance data and described proportion of cases. Data extracted from the surveillance record included personal characteristic of cases, geographic and trend of cases.

Results: We identified a total of 8,667(cases with 1,733 average cases per year. Admission rate was 119. An overall prevalence was 4% with increasing trend and zero case fatality rate. Highest and lowest number of cases were reported from Woreda seven (7%) and Woreda five (1%), respectively. Highest number of cases was reported during June to August

Conclusions: We observed the seasonality of Dysentery in the study area. We proposed focusing on dysentery prevention from June to August. We recommended improving the water quality and sanitation in the community.

Key words: - ***Dysentery, Data analysis, Surveillance, Addis Ababa Ethiopia***

Word Count: 215

INTRODUCTION

Background

Dysentery, defined as diarrhea with visible blood, can be caused by different organisms, including shigella spp, enterohemorrhagic, Escherichia Coli serotype O157:H7, Campylobacter jejuni, enteroinvasive E.coli, Salmonella spp and infrequently, Entamoeba histolytica. Of those organisms, the only ones known to cause large epidemics are shigella dysenteries serotype 1 (sd1), and much less frequently, E.coli O157:H7[(1)]. Dysentery is an infectious gastrointestinal disorder, characterized by inflammation of the intestine, mainly the colon. WHO defines dysentery as any episode of diarrhea in which there is blood in loose and watery stool [(2)]. Dysentery can mainly spread among people through contaminated food and water as well as poor sanitation. Humans are the only natural reservoir for the disease [(2)].

There are four species of Shigella: S. dysentery (serogroup A), S. Flexner (serogroup B), S. boydii (serogroup C), and S. sonnei (serogroup D). Groups A, B, and C cannot be distinguished biochemically; S. sonnei can be differentiated from the other serogroup with the expression of ornithine decarboxylase [(3)].

Bloody diarrhea (Dysentery) is a common but potentially serious disorder of the digestive tract that can lead to severe diarrhea with mucus or blood in the feces. Patients typically experience mild to severe abdominal pain or stomach cramps. In some cases, untreated dysentery can be life-threatening, especially if the infected person cannot replace lost fluids fast enough [(4)].

Shigella species are the common cause of bacterial diarrhea worldwide, especially in developing countries [(4)]. Shigella organisms can survive transit through the stomach since they are less susceptible to acid than other bacteria; for this reason, as few as 10 to 100 organisms can cause disease [(4)].

Bacillary dysentery is one of the most common causes of diarrhea, and the estimated annual incidence of *Shigella* episodes worldwide is about 164.7 million, of which 163.2 million cases have occurred in developing nations, resulting in 1.1 million deaths [(5)].

Inadequate sewage disposal is associated with high rates of Shigella transmission. A study conducted among children in the Peruvian Amazon noted an incidence of 0.34 episodes of Shigella diarrhea per year among children <6 years of age [(4)]. In a report from Bangladesh including 1756 children <4 years of age in regions where a sentinel Case of Shigella had been identified, 12 percent

of children developed Shigella diarrhea within one month, and an additional 13 percent had culture-negative dysenteric illnesses (many of which were probably due to Shigella) [(6)].

The mode of transmission in high prevalence areas may be more complex than simple person-to-person fecal-oral transmission; in Bangladesh, a poor correlation was found between the Shigella serotype of the sentinel case and the serotype of the secondary cases identified [(5)]. In contrast, a study in the U.S. observed that all familial secondary contacts of shigellosis index cases were infected with the same organism as the index case [(7)].

The typical course of the disease varies with age group. In a review of 318 infants and children hospitalized with shigellosis in Bangladesh, infants had fewer days with diarrhea (four versus six) and were more likely to have watery (as opposed to bloody) stools, hypernatremia, abdominal distension, and acidosis than older children[(7)]. Older children were more likely to have a leukemoid reaction than infants. The mortality rate for infants was twice that of older children. In another study conducted at the same institution, infants who were breastfed were less frequently infected and had a milder illness than infants who were not breastfed [(7)].

According to Centers for Disease Control and Prevention (CDC) 2012 GC reports, Compared with the previous 10 years (2002–2011), a larger portion of Shigella infections in 2012 were reported from January through March [(8)]. During 2012, the highest incidence rate of Shigella infection was in children under 5 years old [(8)]. Among ages 0 to 4 and 40 to 49 years, males had a higher incidence rate of Shigella infection than females. Among ages 5 to 29 and ≥80 years, females had a higher incidence rate of Shigella infection than males. In the remaining age groups (30–39 and 50–79), incidence rates were relatively similar (i.e., ≤10% difference) among both males and females [(8)].

Health service records and community-based surveys in the past years indicate that diarrheal diseases are major causes of morbidity and mortality in Ethiopia [[9]]. It is the fourth leading causes of child mortality in the country followed by Pneumonia, Neonatal conditions, and Malaria respectively. According to the report of FMoH, About 472,000 Ethiopian children die each year before their fifth birthday of which 20% is attributed to diarrhea. Its prevalence is mainly attributed to lack of access to safe water, sanitation, and hygiene. Only 55% of the general population has access to safe water and that percentage drops to 35% for those in rural areas [(9)]. This lack of access to safe water and adequate sanitation increases the morbidity and mortality from diarrheal disease [[9]].

Significance of the study

An ongoing surveillance data analysis is important for early detection of the outbreak which helps to monitor trends of the diseases and evaluating the effectiveness of disease control programs in the surveillance system. Dysentery is most common in the area of poor sanitation and low economic status of people. Since the Akaki Kality Sub City is under new settlement area the solid and liquid waste disposal system is poor, open field defecation is common, poor housing and there is low quality of water, poor food and drink establishment. There are also risky irrigation practices and the geohydrology susceptibility (19). This all factors favors the unexpected occurrence of Diarrheal disease. If not early identified and controlled, it may affect the socio economy of the community. Therefore, continuous and close trend follow up is very crucial to tackle the occurrence of outbreaks in the sub city. Accordingly, to strengthen disease surveillance system, under a supervision of PHEM and AAHB, Akaki Kality sub city establishes PHEM case team in early 2016. However, since this PHEM structure is established very recently, there were no trends of surveillance data analysis.

As sub city surveillance team document indicates Malaria, Typhoid, Typhus, and Dysentery are the front coming diseases in descending order [19]. Depending on this, while the first three diseases were done by another person I am interested in doing a retrospective study of surveillance data analysis in Akaki Kality Sub city from 2012-2016 on Dysentery by selection criteria of:

- Highly public concern.
- Reliability of the diagnosis.
- Highly contagiousness, but easily preventable by good sanitary conditions of the disease among others prioritized.

Hence, this surveillance data analysis study will help to identify the trends of Dysentery in Akaki Kality Sub City within the past five years and compare it with the current status of disease which may give information on the trends of Dysentery. It may also help to identify whether there was unrecognized out break or not and it uses to compare the trend of disease in Akaki Kality sub-city with that of another place which stated in different ways.

Literature review

Globally, diarrhea kills 2,195 children every day more than AIDS and measles combined its 1 in 9 children are dying due to diarrhea and 801 thousand child die every day in the world [10].

The DHS-based regional average and global median proportions of care-seeking for diarrhea among children under three years were highest in North Africa/West Asia/Europe (41.0%) and lowest in South/Southeast Asia (31.0%), West/Middle Africa (26.9%). The median global estimate of care-seeking for diarrhea among children under-five was 35.2% [(11)].

Shigellosis is one of the main public health problems throughout the world. In developing country More than 99 % of the world annual episodes of Shigella (with 1.1 million deaths) were reported [(12)]. The occurrence of Shigellosis in Canada was shown in increasing order from 1.8/100,000 in 2009 to 2.82/100,000 in 2012 [(13)]. High incidence rates of Shigella infection were also revealed among children under-5 years of age in Europe and six Asian countries (China, Thailand, Vietnam, Pakistan, Bangladesh, and Indonesia) [(14)].

In Ethiopia study in the Benishangul Gumuz Regional State, the prevalence of diarrhea was 22.1% [(15)]. The prevalence of diarrhea for under-five children in Debrebirehan Referral Hospital was found to 31.7% [(16)]. According to the study conducted in Mekele prevalence of Shigella that was 13.3 % among and the highest prevalence in the age group of 12–23 months (22.6 %) [(17)]. According to the EDHS, 2011 Ethiopian prevalence of diarrhea was 13 percent in under five children and 3 percent diarrhea with blood [(18)].

OBJECTIVES

General objective

- To describe the magnitude of Dysentery by the person, time and places over the last five years in Akaki Kality sub city, Addis Ababa.

Specific objectives

- To determine magnitude of Dysentery in the sub city
- To describe trends of dysentery in Akaki sub-city from 2012 to 2016
- To analyze and interpret the surveillance data in terms of time and place

METHODLOGY

Area of Study

The study was done in Akaka Kality Sub City, Addis Ababa City Administration. Akaki Kality sub city is one of the ten sub-cities of the Addis Ababa City Administration which is located in the southeastern part of the City, 20kms far from the center of the City and it is the largest sub city covering an area of 12,347 hectares (23.7% of the total land area of Addis Ababa City).

The Sub City is located latitudinal at 8°55' North and longitudinally 38°46'east. It is also bordered by Oromia Region in the south, the south East, and North West, by Nifas Silk Lafto sub City in the North East and by Bole sub-city in the North.

The altitude of the sub city ranges from 2050 to 2331 meters above sea level which makes the sub city into the "waynadega" locally climatic classification. The highly elevated land area is found in the northern and eastern part of the sub city, while relatively the low elevated area is found in the southern parts. It has 08 urban and 03 rural woredas (districts).

Due to the fact that there are 04 new settlement areas, a number of factories and universities & colleges etc. those affect the population number and characteristics, the total population expected to be more than 224,370 from the projection of only previous census with proportion of 48.5% and 51.5% of the population being male and female respectively [(19)].

In the Sub City, there are one governmental & one private hospital, 07 governmental & 01 NGO health centers (08 functional and 2 are under construction), and there are many private health institutions in each of the urban Districts with their different types and levels.

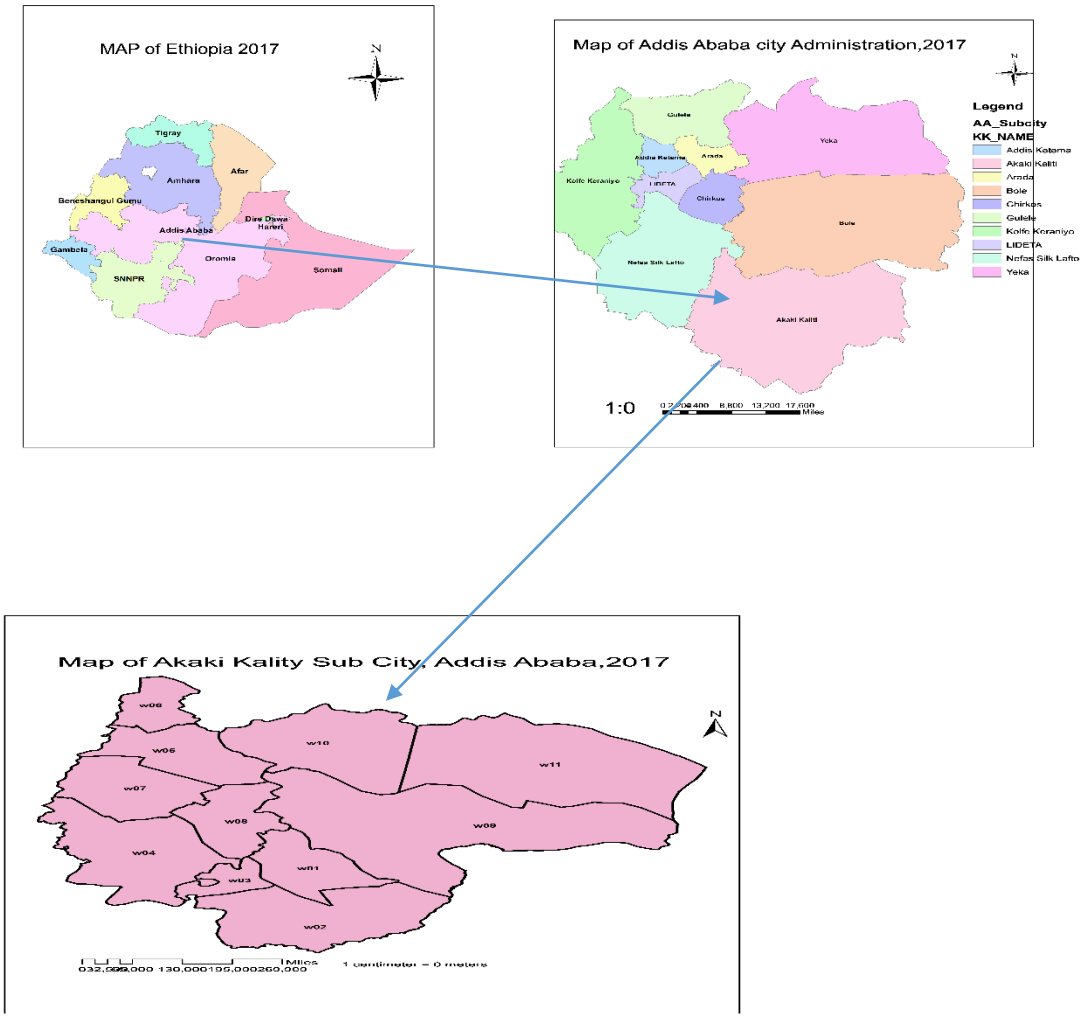

Figure 14**: Map of Akaki Kality Sub City 2016**

Study period

The study period was from Jan 17/2017 to April 20/2017

Case definitions (PHEM)

Suspected case: - A person with diarrhea with visible blood in stool.

Confirmed case: -Suspected case with stool culture positive for Shigella dysenteries.

Study design

A retrospective review study design was conducted to analyze Dysentery surveillance data in terms of time and place and person.

Source population

The residents of Akaki Kality Sub City or occasional travelers to this area in the specified period of time.

Study Population

Those individuals who developed a suspected or confirmed case and being investigated in any of the legally reporting institutions and recorded & reported as cases of Dysentery.

Sample size & sampling techniques

Since the aim of the study was to analyze and interpret the last five years surveillance data of Dysentery, there was no need to take sample from the reports rather, total cases of dysentery from case based and line list data of Akaki Kality sub city from July 2012 to 2016.

Inclusion & Exclusion criteria

Any value presented with the case in the reporting period of July 2012 to 2016 in Akaki Kality sub city PHEM Department Report registration book & case based reporting formats was included in the analysis: while those values with discrepancies in any of the variables needed were deliberately be excluded from the analysis to reduce bias.

Data collection procedure

A five-year (2012-2016) routine weekly surveillance data of a suspected dysentery (bloody diarrhea) cases were officially requested and received from the Addis Ababa Regional Health Bureau Public Health Emergency Management Department and triangulated with data from Akaki Kality Sub City Health Office Public Health Management Case Team. Secondary data of dysentery for the last consecutive five years from sub city PHEM and HMIS departments, and the hard copy of Dysentery reports at sub city health office reviewed.

The data included reports of health facilities of all woredas, Clinics, health centers and hospitals are included in the PHEM network in the respective woredas. All reported dysentery cases (confirmed and clinically treated), confirmed dysentery cases, dysentery outpatients, inpatients and deaths due to dysentery were included in this study.

Data quality control

Data quality was maintained in the collection from the line list register, case based disease report form, checked for completeness, during entry to Microsoft excel and in the analysis phase as well.

Plan for Data processing and analysis

After all information was Collected, Data cleaning were conducted prior to analysis. Then, data analysis was carried out using Microsoft office excel 2007, and description was done using frequency distribution, tables and graphs/charts.

Ethical considerations: Formal letters were written from AAU to Akaki Kality Sub city.

DISSEMINATION OF FINDINGS: Report /result of this Dysentery surveillance data analysis were submitted timely to AAU/School of public health/Department of EFETP, Akaki Kality Sub City Health office by hard copy and electronic soft copy.

RESULTS

Magnitude of dysentery cases by place

From 2012 to 2016, a total of 8667 dysentery cases were reported. As presented in the graph below the highest portion of cases were reported from Woreda Seven (25%) followed by Woreda six (21%) & Woreda one (17%), while Woreda Four & Woreda five shared the smallest portions of the case load. However, Woreda like Nine, Ten & Eleven were represented with pseudo zero case load due to the absence of governmental & non-governmental health facilities to diagnose & report cases. In almost all years Woreda seven, six & one have higher number of cases per 10,000 populations. Lesser cases per 10,000 populations were registered 2012 in Woreda 4, Woreda 5, Woreda two, nine, ten & eleven (Figure Below).

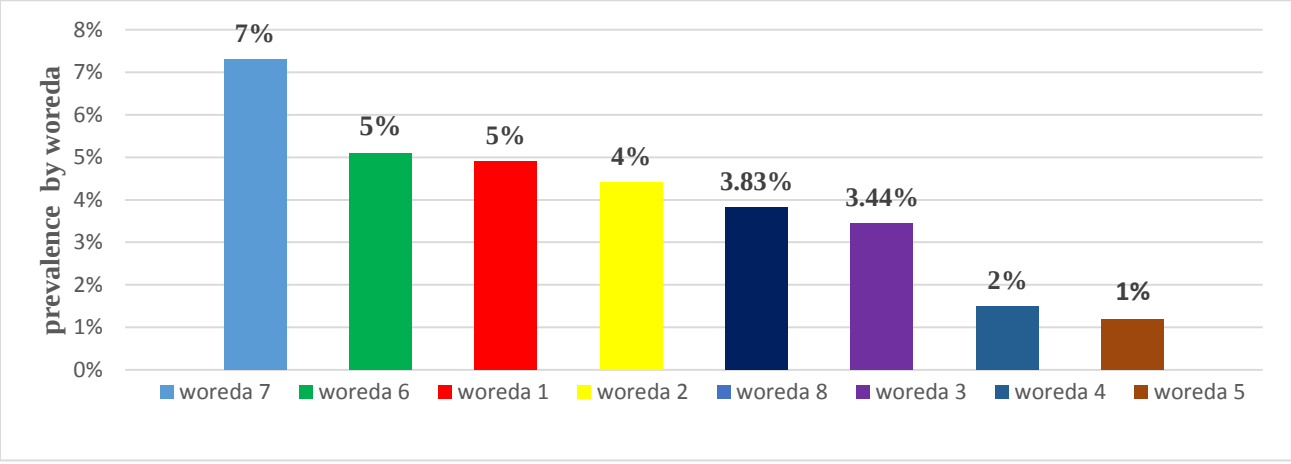

Figure 15: Number of cases per 10,000 per year by Woreda in Akaki Kality sub 2012 to 2016.

Description of dysentery cases in Akaki sub city by Time

Within the last five years, there were different trends of dysentery cases reported in Akaki Kality Sub City of which the highest number of cases were reported in 2016 and the lowest number of case were reported in 2014.

Table 6: Dysentery cases reported during the five years (2012-2016) period in Akaki Kality

Years	Population at Risk	Number of dysentery total cases reported	Out patient	In patient	Total death	Prevalence rate
2012	202,761	1767	1765	2	0	0.87
2013	207,959	1919	1889	30	0	0.92%
2014	213,292	1046	987	59	0	0.49
2015	218,761	1646	1646	0	0	0.75
2016	224370	1985	1985	28	0	0.88
Total		8,667	8,548	119	0	4%(Average)

Below the Figure in 2016 the highest cases were reported in the month of July (n=298), August (n=288), June (n=208), May (n=160) and the lowest cases reported were in the month of January 2016.

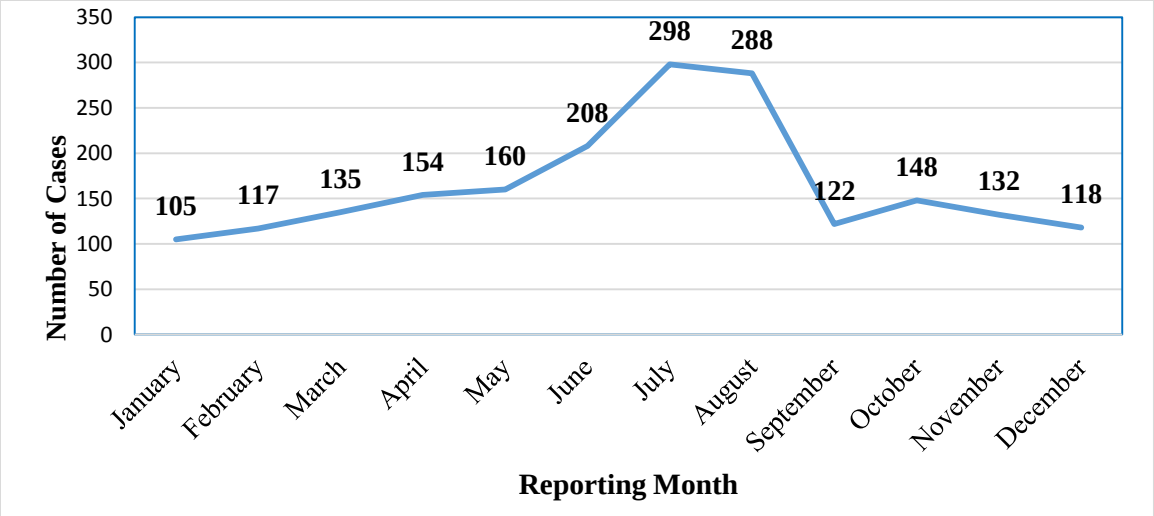

Figure 16: Trends of dysentery cases reported by months in Akaki Kality Sub City Addis Ababa, Ethiopia, 2016

As shown in line figure below, When we describe the trends of Dysentery using epidemic week those cases reported in 2016, the peak case were reported in week -31 which was 10 fold from the national thresholds and occurs during the epidemic weeks and also comparing from the previous weeks in the same year it shows marked increment in week -31 which showed an outbreak of dysentery probably left unnoticed in that year since there is no evidence recorded regarding the outbreak in both Akaki Kality sub city and Addis Ababa regional health bureau public health emergency department.

The number of cases by week is highest at week 31, as shown below for the year 2016. In 2016, the number of cases declined significantly starting from week 6. (Figure 20)

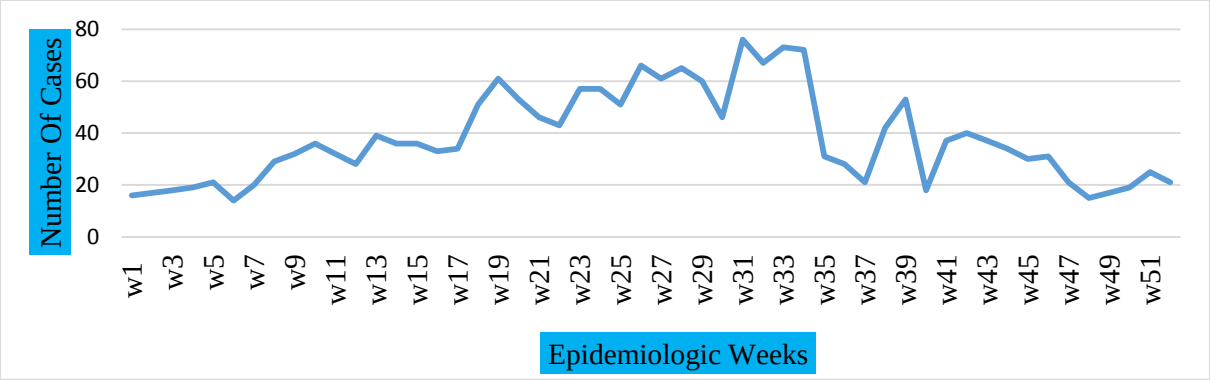

Figure 17: Trends of dysentery cases reported by time in Akaki Kality Sub City, Addis Ababa, 2016

Within the past Five years in Akaki Kality Sub City the lowest cases reported was in 2014, in the month of September and the highest reported cases were in July 2016. The trend shows that there is similar number of cases in 2012 and 2013 and there was a high decline in 2014. Then, the number of cases start to increase in 2015 and 2016. (Figure 21)

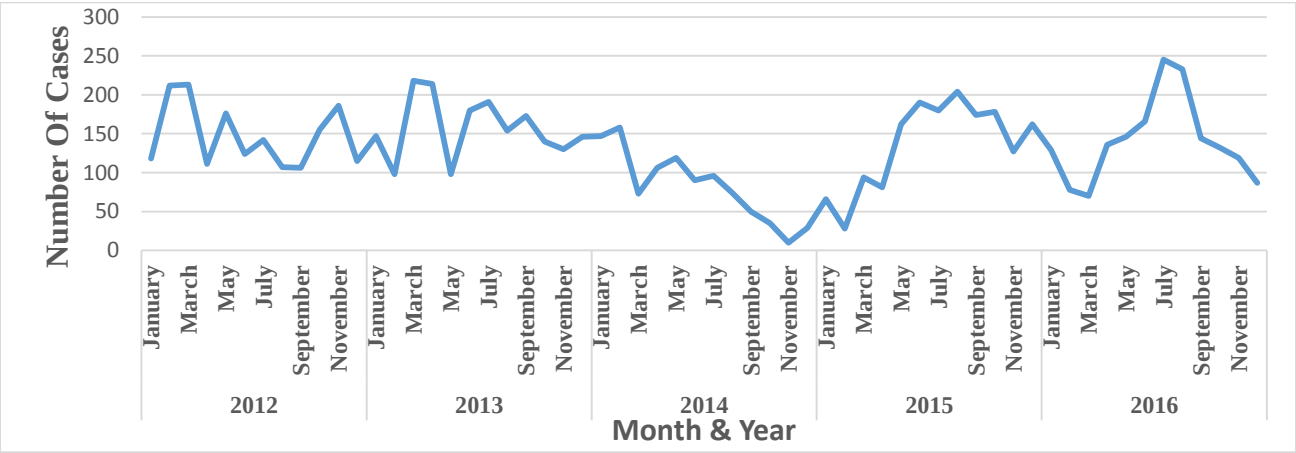

Figure 18: Trends of Dysentery cases by month in AACA, Akaki kality sub city, Addis Ababa, Ethiopia, 2012 to 2016.

Prevalence Rate of dysentery in Akaki Kality Sub City, Addis Ababa,

From the graph below which shows the five-year trends of dysentery cases which were reported in the sub city, we can identify that there is an increasing dysentery case from year 2012 to 2013 and decrease from year 2013 to year 20114. The highest and lowest cases were reported in 2014 and 2016 respectively. The lowest in 2014 with prevalence rate 0.49 % the highest is in 2013 with the prevalence rate of 0.92% and there was no reported case of death. (Figure 22)

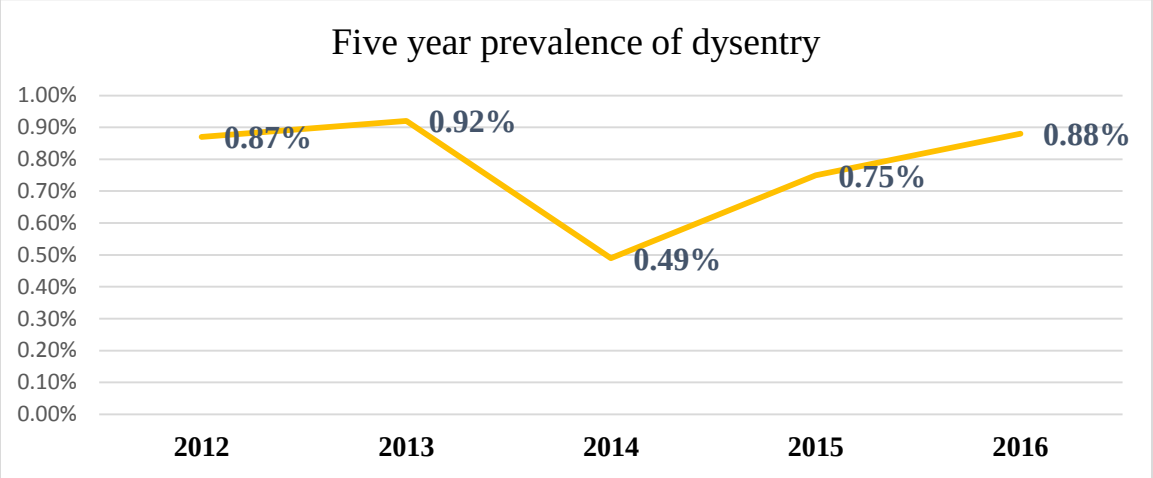

Figure 19: Prevalence Rate of dysentery in Akaki Kality Sub City, 2012-2016

DISCUSSIONS

As this surveillance data analysis shows the Five years (2012 to 2016) trend of dysentery cases in Akaki Kality sub city were increasing from 2014 to 2016 which needs the managerial discussion and decision to reduce the case. According to the report of FMoH, About 472,000 Ethiopian children die each year before their fifth birthday of which 20% is attributed by diarrhea. Its prevalence is mainly caused by access to safe water, sanitation, and hygiene problems. Only 55% of the general population has access to safe water and that percentage drops to 35% for those in rural areas. This lack of access to safe water and adequate sanitation increases the morbidity and mortality from diarrheal disease [9]. Our study shows, the highest dysentery cases were reported in rainy season of Ethiopia indicating the seasonality of the disease. This is due to the presence of flooding and contamination of water and food in this season and Akaki Kality Sub City is highly vulnerable for such conditions because of presence of many factories contaminating water and risky irrigation practice.

The overall prevalence of Dysentery in Akaki Kality Sub City was 4% which is less than Benishangule Gumuz(21.1%)[15] and Mekele (13.3)[17]. Compared to the other years, the prevalence of Dysentery was high in 2016 indicating unnoticed outbreak. In 2016, unlike 2014 the highest dysentery case was reported in July and the lowest case was reported in December. Again when we see the case reported in August, 2014, it shows slight decrease which is 23% lower than the same month of 2015. In 2012 again, based on our finding there were the highest dysentery case in June following rainy season of Ethiopia, which is the same phenomena throughout the five year.

In average, the dysentery case reported were mostly increased from May to September, which complies with a definition says dysentery case increased in rainy season and meets with WHO epidemiologic case definition of bacillary dysentery and opposes the result reported by CDC 2012 which says high case of dysentery were reported from January through March in 2012[(10,8)].

LIMITATION

- The data obtained is only aggregated data by time and place that is in epidemiological weeks, months and years
- The sub city surveillance reporting format didn't incorporate relevant variables like age, and sex.
- Under estimation of cases due to Majority of private clinics & all Factory clinics were not included in this surveillance data analysis because of either intermittent reporting or complete on- requesting them to report.

CONCLUSION

- Despite the fact that there is a plan to improve the health of the community & to reduce the burden of preventable diseases like dysentery still there is a continuous increment from year to year in the sub city.
- Some woredas such as Woreda seven and one have very high proportion of dysentery cases that requires further study on why these woredas have higher cases.
- Within the last five years in average the highest cases of dysentery were reported in the month of May to September.

RECOMMENDATION

- We recommended revision of reporting format to incorporate person variable (sex, age). (FMOH & EPHI).
- Availing Well documented hard and soft copy is important for action measurement at Sub City & Woreda level.
- Improving water and sanitation service is needed.
- Providing reports each week to the sub-city health officer responsible for monitoring the occurrence of cases and detecting outbreaks.
- All private health facilities need to report Dysentery cases to respective surveillance system and further study is needed to identify the possible factors associated with seasonal variability of dysentery cases.

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CHAPTER III- EVALUATION OF SURVEILLANCE SYSTEM

Surveillance System Evaluation of Relapsing Fever, Akaki Kality Sub City, Addis Ababa Ethiopia, 2017

ABSTRACT

Background: - Ethiopia is undertaking different strategies to have functional and effective surveillance system down from the community level up to the regional and national level. Currently, PHEM is implemented in the country to strengthen surveillance and early warning system for public health emergencies and events. However, the performance of core surveillance activities and quality of the system was not yet assessed, especially in the study area. Therefore, the aim of this study is to assess the performance of core activities and attributes of the surveillance system of Relapsing fever in Akaki Kality sub city, Addis Ababa, Ethiopia in 2017

Methods: - A Descriptive Cross-sectional Relapsing Fever surveillance system evaluation was conducted from May 16- July 30/2017 in Akaki Kality Sub City of Addis Ababa. Data were collected using Center for disease prevention and control updated checklists, Focal person in Woreda, Health Centers and Sub city Surveillance officer were interviewed. Data were entered in to a computer, edited and analyzed using Excel software.

Results: - Over the past 12 weeks reporting rate of health centers and districts were 95% and 98% respectively. All assessed districts reports with their personal mobile phones. Standard case definition and laboratory case confirmation was available in 6 facilities. Only one district (16%) performed data analysis and computer is available only at sub city level. The overall completeness of the reporting facilities at the level of districts and sub city was 98% and 95% respectively. The total completeness of cases in the last three-months (WHO week 1-12/2017) for all assessed health centers were 96%.

Conclusions & Recommendation: Relapsing fever was the major disease burden of the sub city. Reporting rate, completeness of health facilities and availability of laboratory case confirmation is good. There is poor utilization of surveillance data, absence of regular supervision, Poor data quality and inadequate resources. Depending on this we recommended that Districts and sub city health offices should conduct regular surveillance data analysis, perform supportive supervisions, avail budgets and mitigate resource constraints and improve data quality through on job training and supportive supervision.

INTRODUCTION

Background

Public health surveillance is the ongoing, systematic collection, analysis, interpretation, and dissemination of data regarding a health-related event for use in public health action to reduce morbidity and mortality and to improve health. Data disseminated by a public health surveillance system can be used for immediate public health action, program planning and evaluation, and formulating research hypotheses. A functional disease surveillance system is essential for defining problems and taking actions. Proper understanding and use of this essential epidemiological tool (public health surveillance) helps health workers to set priorities, plan interventions, mobilize and allocate resources, detect epidemics early, initiate prompt response to epidemics, and evaluate and monitor health interventions. It also helps to assess long-term disease trends. Surveillance should be conducted for diseases and conditions considered to be of public health importance. The list of diseases and syndromes in the national health information system (HIS) is useful for planning and routine management but too expensive for effective and useful surveillance in view of the limited human and financial resources. Therefore, depending on the objectives of the system, priority diseases for surveillance should be identified and reviewed regularly. This ensures that whether the diseases under surveillance remain to be considered as priority public health problems of that community. The selection of priority diseases for surveillance is based on criteria like epidemic potential, internationally concerned, disease under eradication and eliminations, disease with effective prevention and control measures [1].

Ethiopia introduced Integrated Disease Surveillance and Response (IDSR) in 1998, focusing on 17 priority communicable diseases for early detection and effective response (2). Recently the Federal Ministry of Health (FMoH) underwent the Business Process of Re engineering (BPR) and identified the IDSR to be one of the core processes of FMoH. Accordingly, IDSR was evaluated and recommended to establish Public Health Emergency Management (PHEM) in 2009 (2). One of the major activities of PHEM is to take over the diseases surveillance parallel to preparedness, response and rehabilitation in any health related emergencies and outbreaks.

Based on the assignment, PHEM identified 19 communicable diseases and two health problems (Sever Acute Malnutrition (SAM) and Maternal Death) based on their potential to cause outbreaks, became international concern and diseases on eradication/elimination and health burden for the country

(Table1). In addition to these 19 communicable diseases and two health problems, PHEM is also monitoring any clustering of diseases in the country. Other diseases, which are not included and monitored by PHEM, will be monitored through Health Management and Information System (HMIS) [2]. Relapsing fever is one among the 21 reportable diseases under surveillance in Ethiopia.

Table 7: **National weekly and immediately reportable diseases.**

Immediately reportable disease	Weekly reportable disease
1.Acute Flaccid Paralysis(AFP)	1.Dysentry
2.Antrax	2.Malaria
3.Avian Human Influenza	3.Meningitis
4.Cholera	4.Relapsing Fever
5.Dracunculiasis (Guinea worm)	5.Typhoid Fever
6.Measels	6.Typhus
7.Neonatal Tetanus	7.Severe Acute Malnutrition(SAM)
8.Pandemic Influenza	
9.Rabies	
10.Severe Acute respiratory Syndrome (SARS)	
11.Small Pox	
12.Viral Hemorrhagic Fever	
13. Yellow Fever	
14. Maternal death	

Source: PHEM Guideline

The identified 21 disease and conditions are classified in to two reporting periods depending on their epidemic potential, diseases targeted for elimination and eradication as indicated in the above table as immediately reportable and weekly reportable. For the immediately reportable diseases, a single suspected case is considered as a suspected outbreak. Therefore, suspected outbreak of these diseases should be notified from level to level within 30 minutes of identifications. These levels are: from community or health post or health center to Woreda health office, from Woreda health office to zone, from zone to regional office, from region health bureau to Ethiopian Public Health Institute(EPHI) within 30 minutes. EPHI reports to WHO within 24 hours of detection [2].

Reporting of the total number of cases and deaths seen within a week (Monday to Sunday) and should be reported to the next level as follows. Health facilities report data from Monday to Sunday to Woreda every Monday. Woreda report to zone every Tuesday and Zone report to region every Wednesday. Region report to EPHI every Thursday and EPHI report to stakeholders (WHO) every Friday [2].

Objectives of the Surveillance System in PHEM

The overall objective is to improve the ability of health workers to detect and respond to priority communicable diseases. Evidence based effective and timely decision increases efficient utilization of available resources for preventing and controlling communicable diseases and improving the health status of the population (2). PHEM is established with the following specific objectives:

- To establish robust early warning system
- To detect public health emergencies on a timely basis
- To strengthen communication/information exchange capacity at all levels
- To enhance community participation in Emergency Preparedness and Response (EPR) activities
- To establish and maintain coordination and collaboration framework
- To strengthen monitoring & evaluation capacity at all levels.
- The objective of relapsing fever surveillance is to detect cases and respond quickly when their alert threshold is observed. In addition, it strengthens the report of cases and diseases whenever outbreaks occurred.

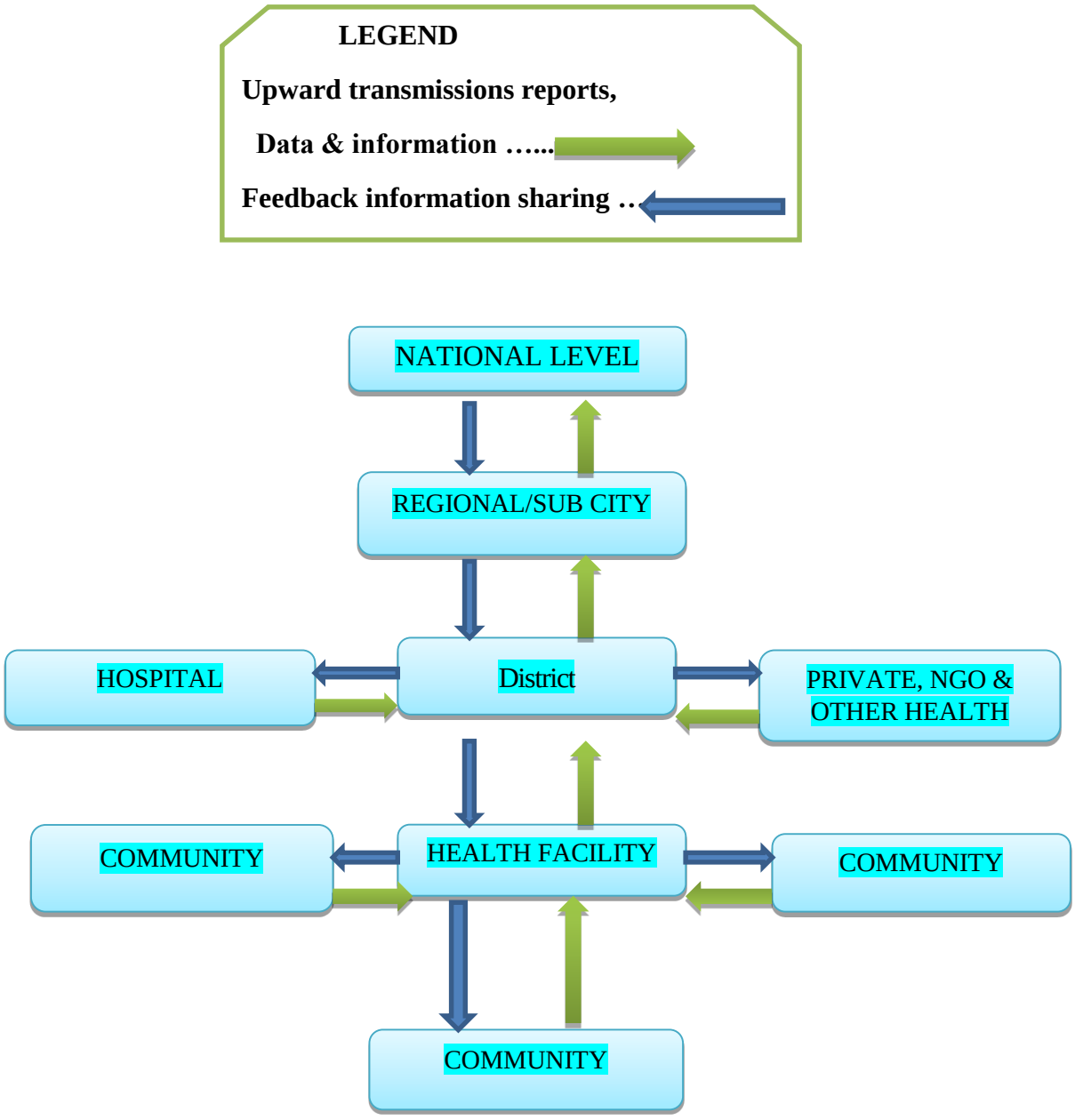


Figure 1: Diagram illustrating Of Surveillance data flow in the Sub city

(Source PHEM Guidelines for Ethiopia 2012)

The surveillance system of the sub city has not been evaluated before and relapsing fever selected as a tool, since the sub city is the oldest among all sub cities and there are a number of homeless people as a result there is high burden of relapse fever. There will be an especially aggressive response to

relapsing fever case build-ups and to epidemics within these areas. It is one of the main health problems in Akaki Kality sub city. Therefore, this study was conducted to evaluate the performance of core activities and attributes of the surveillance system, to see effectiveness and efficiency of the system and identify gaps for the better improvement of the surveillance system. The overall purpose of surveillance of these diseases is to monitor the trend against the established tolerance limits, as early warning and early response system, and pick any deviation from the limit at the earliest point in time for prompt response. Furthermore, as early warning system, it guides risk mapping and preparedness; and prevention and risk aversion actions like, immunization, vector control and so on. For these purposes, each of these diseases has case definition(s) and Public health emergency prone diseases reporting formats defined by the Ministry of Health and the WHO; and reporting is institutionalized into the health facilities and health offices.

Statement of the problem

Relapsing fever, especially LBRF is principally a disease seen in the developing world and it spreads from person to person by the body louse and can occur in epidemics, including large ones involving millions of people [3]. Louse-borne relapsing fever is more severe than the tick-borne variety with a mortality rate of 1% with treatment and 30–70% without treatment [4-6]. Even though LBRF cases declined significantly worldwide, due to the highly decreased incidence of body louse infestations after the 1940s, still now it remains to be the most important public health problem and a common cause of hospitalization and death in East African countries, particularly in Ethiopia [7]. B. recurrent is currently endemic in Ethiopia and Sudan (2). The highlands regions of Ethiopia may have hundreds to thousands of cases of LBRF annually (2). The highest incidence in this region is during the rainy season, when the poor gather in shelters. Lice move from one person to another, thus spreading the infection to new hosts [3]. Because of its public health importance, among diseases under surveillance in Ethiopia, relapsing fever is one of the weekly reportable disease. Therefore, this Surveillance System Evaluation assessed the Strength of Relapsing Fever Reporting System in this sub city.

Significance of the Evaluation

Evaluation of a public health surveillance system focuses on how well the system operates to meet its purpose and objectives (1). Among disease Under Surveillance in Ethiopia, Relapsing fever is one of the weekly reportable and government concern diseases. Therefore, this study was conducted to evaluate whether the system is in a way of performing to the set objective and to identify the gaps for

improving the surveillance system. Relapsing fever surveillance system has been useful in providing information of Relapsing fever trends and it provides magnitude of morbidity and mortality due to Relapsing fever in the sub city. The finding of this evaluation could be utilized for planning, effective health interventions and procurement of equipment that helps for diagnosis, treatment and prevention of Relapsing fever cases. Again, the Program implementers may use the output of this study as an input towards supporting and improving surveillance system for early outbreak detection and taking intervention in their district area accordingly.

OBJECTIVE

General Objective

- To evaluate existing surveillance system of relapsing fever in Akaki Kality sub city, Addis Ababa from May 11/2017 – August 10/2017.

Specific Objectives:

- To evaluate the attributes of relapsing fever surveillance system in the study area
- To assess the core activities of the surveillance system in the study area

METHODS AND MATERIALS

Study Area

This surveillance system evaluation was done in Akaka Kality Sub City, Addis Ababa City Administration. Akaki Kality sub city is one of the ten sub-cities of the Addis Ababa City Administration, which is located in the southeastern part of the City, 20kms far from the center of the city, and it is the largest sub city covering an area of 12,347 hectares (23.7% of the total land area of Addis Ababa city) [(8)]. Oromia Region borders the Sub City in the south, the south East, and North West, by Nifas silk lafto sub city in the North East and by Bole sub-city in the North. It has 08 urban and 03 rural woredas (districts). The total population is expected to be more than 229,080 from the population projection of only previous census with the proportion of 48.5% and 51.5% male and female respectively [(8)].

In the Sub City, there are one governmental & one private hospital, 09 governmental & 01 NGO health centers there are many private health institutions in each of urban Districts with their different types and levels.

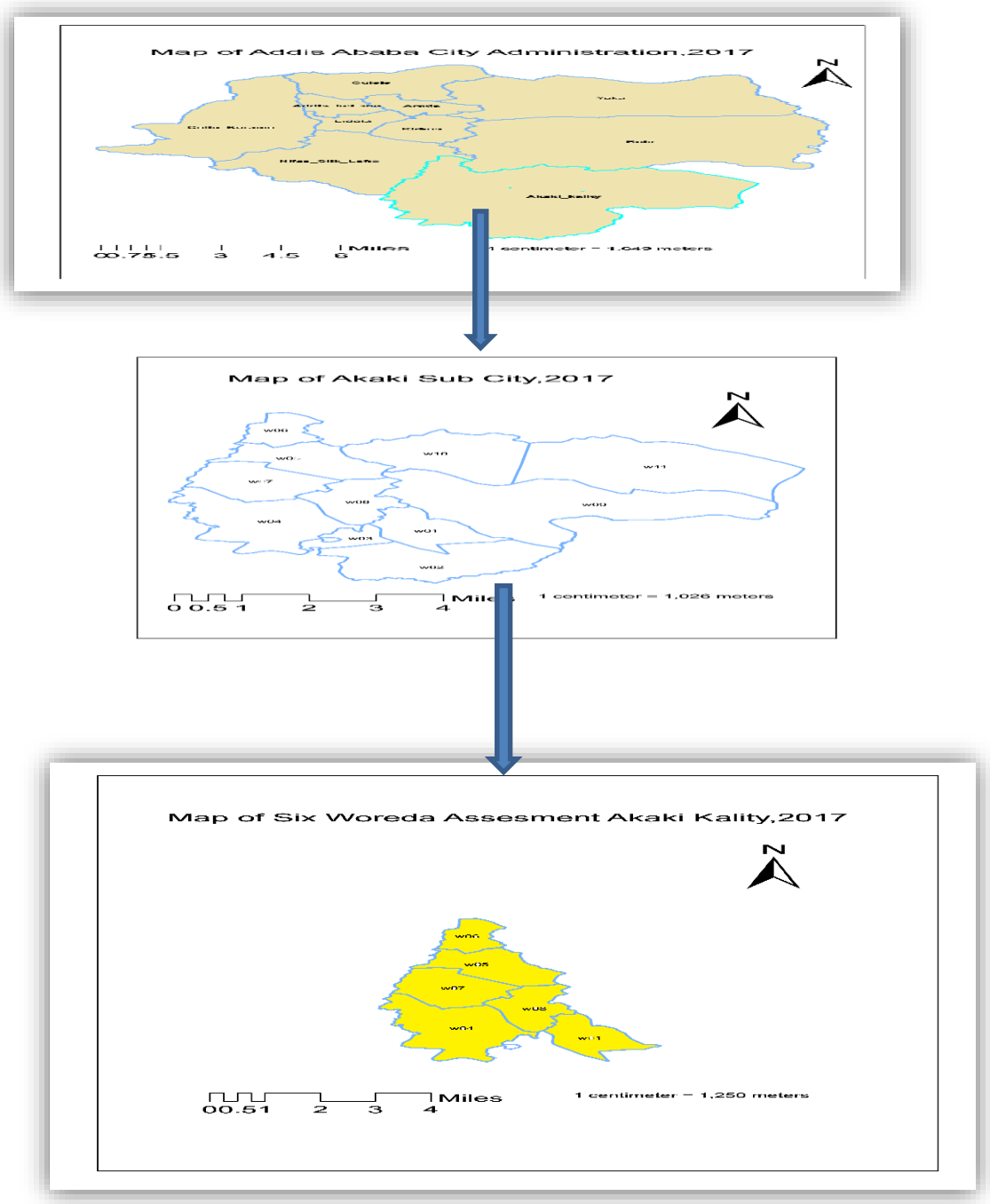


Figure 20: Map of five districts in Akaki Kality sub city A.A, 2017

Study Design and Period

A descriptive cross-sectional study was employed from June 16/2017 - July 30/2017 in Akaki Kality sub city, Addis Ababa.

Study Population

All health facilities and health offices of the Akaki Kality sub city, Addis Ababa City Administration were the study population. Only governmental heath centers and health offices were included in the study.

Study Unit and Sampling Method

Six Woreda health offices with their corresponding five health centers were selected randomly. In addition, the sub city health office was included in the study.

Sources of Data

Secondary data of Relapsing fever reports from the most recent four consecutive weeks during data collection were obtained from PHEM departments of health facilities, district and sub city health offices. Records of disease and laboratory registration books, feedback reports of surveillance, summery report sheet (weekly report format) of typhoid fever and line lists of outbreak investigation were reviewed. Focal persons of PHEM at sub city, districts and at health facility, levels and health professionals were interviewed to get the important data of the existing surveillance system of the sub city.

Data Collection Methods

Primary data were collected using semi-structured questionnaire. Interview was conducted with surveillance focal person (officers) in the selected health offices and health facilities from the study units. Secondary data sources such as surveillance report completeness and timeliness as well as relapsing fever surveillance data, supervision report, written feedbacks, preparedness plans were also reviewed.

Data Quality Management

After data were collected using WHO/CDC tools for surveillance evaluation by principal evaluator daily, Completeness and consistency of collected data were checked before data entry and analysis.

Data Analysis

The collected Quantitative data were entered and analyzed using the Microsoft Excel and qualitative data were summarized to supplement the quantitative findings.

Case Definitions

Standard Cases Definitions of Relapsing Fever. According to the National PHEM guideline, the case definitions were categorized in to two, Clinical and community case definitions.

Suspected: -Any person presented with an abrupt onset of rigors with fever, usually remittent, headache, arthralgia and myalgia, dry cough, epistatis.

Confirmed: - A suspected case with demonstration of Borrelia in peripheral blood film

Ethical Consideration

Ethical clearance to conduct the study was obtained from the Addis Ababa University School of Public Health. Letter of request was provided for the selected health department and health offices for their participation on the study.

Operational Definitions

Case detection: is the process of identifying cases and outbreaks.

Case registration: is the process of recording the identified cases.

Case/outbreak Confirmation: refers to the epidemiological and laboratory capacity for confirmation.

Reporting: Refers to the process by which surveillance data moves through the surveillance system from the point of generation.

Epidemic preparedness: Refers to the existing level of preparedness for potential epidemics

Stakeholders: The organizations or individuals that generate or use surveillance data for promotion of health, prevention and control of diseases

Usefulness: Usefulness of the surveillance system is reflected by documented changes in policies and procedures because of information generated by the system

Simplicity: Simplicity denotes the structure and ease of operation of the surveillance system.

Flexibility: Flexibility of a surveillance system is its capacity to adapt to changing information needs or operating systems within minimal additional time, personnel and funding.

Quality: The quality of data reflects the completeness and validity of the data recorded in the sub city health office.

Acceptability: Acceptability is the willingness of persons, institutions or organizations to participate in the surveillance system.

Sensitivity: Sensitivity refers to the ability of the system to detect cases or outbreaks through trends in the surveillance data.

Positive predictive value: Positive predictive value refers to cases that actually have the health condition.

Representativeness: Representativeness refers to the extent to which the surveillance system accurately describes the occurrence of medical condition over time and their distribution in the population by place and person.

Stability: Stability refers to the reliability (i.e., the ability to collect, manage, and provide data properly without failure) and availability (the ability to be operational when it is needed) of the public health surveillance system.

Data Dissemination

The result of this study was presented to the Addis Ababa University School of Public Health. It was communicated to the Akaki Kality Sub City Health Office, Addis Ababa City Administration Health Bureau PHEM Department and to other stakeholders by available means.

RESULTS

Meeting with Stakeholders

After we made a brief meeting with Head of the sub city health office, health promotion and disease prevention core process and PHEM case team who were working in area of surveillance, we started the process of evaluation. We identified areas of interest, got some important information about, and found no previous baseline assessments done on our study population. This meeting was also an important first step for our assessment and recommendations, which helped us for the implementation of recommendations and improvement of surveillance system.

Public Health Importance of Relapsing Fever in Akaki Kality sub city

Relapsing Fever is one of prioritized public Health problem which are under routine surveillance in Ethiopia. This disease is commonly being reported in Akaki Kality sub city. In 2016 and 2017 there

were Relapsing Fever out breaks in some Woredas. In Akaki Kality sub city, a total of 146 confirmed Relapsing fever cases were reported in 2016/17. On the other hand, HMIS report shows about 68 Relapsing fever cases which is much lower than that of the PHEM Report.

Table 8: Total relapsing fever Cases by Woreda, Akaki Kality sub city, 2016/17

No	Name of Health center	Suspected RF	Reported RF byPHEM	Reported by HMIS
1.	Woreda 1 (Akaki health center)	Difficult to determine	7	7
2.	Woreda 4 (Gelan health center)	Difficult to determine	0	2
3.	Woreda 5 (St. Gabriel health center)	Difficult to determine	0	0
4.	Woreda 6 (Saris Health center)	Difficult to determine	71	22
5.	Woreda 7 (Kality health center)	Difficult to determine	20	14
6.	Woreda 8 (Serti health center)	Difficult to determine	48	23
	Total	Difficult to determine	146	68

** There were no well documented number of suspected Relapsing fever cases.

Populations under surveillance

Akaki Kality sub city has a population of 229,081 of the total, male accounted 109,959 and Female accounted 119,122. Majority 79262 of the age distribution was found between 15-44 years. The Ethiopian PHEM targets all population in the country to be under surveillance for all twenty-two reportable priority diseases. Akaki Kality sub city follows the same procedure of twenty-two priority diseases under surveillance. In Akaki Kality sub city has, 11 woredas out of these three woredas (woreda6, woreda7 and Woreda 5) are at risk for relapsing fever outbreak, which means 27.2%of the population are at risk of relapsing fever. Relapsing fever is the major burden out of all 22-priority reportable disease in the sub city.

Table 9: Population under Surveillance by Woreda in the Area of Assessment.

Name of District	Total Populatio	Male	Female	<1yr	<3yr	<5yr	6-59M	<15yr	15-24yr	15-59yr	F(15-49)
W01	32,188	15450	16737	705	1,300	2,256	2,005	7,554	9,113	22,348	10,921
W04	26,735	12833	13902	586	1,080	1,874	1,665	6,274	7,569	18,563	9,071
W05	28,360	13613	14747	634	1,169	2,029	1,804	6,795	8,198	20,104	9,824
W06	33,530	16094	17436	750	1,383	2,399	2,133	8,034	9,692	23,769	11,615
W07	28,966	13904	15062	634	1,169	2,029	1,804	6,795	8,198	20,104	9,824
W08	26,735	12833	13902	586	1,080	1,874	1,666	6,275	7,570	18,564	9,072
Sub City	**229,081**	**5017**	**9252**	**16,056**	**14,270**	**53,759**	**64,857**	**159,050**	**77,722**	**5,231**	**9,783**

Description of Performance of Core and Supportive Surveillance Functions

Availability of national surveillance manual

From 11 visited health facility/office only 8 institutions (4 health center, 3 Woreda Health offices and sub city PHEM office) have the national surveillance manual. In The rest health institution National Surveillance Guide line (manual) was not available neither soft copy nor hard copy.

Table 10: Availability of guidelines and case definitions in visited HF of Akaki kality 2017.

S.No	Variable	Health Center n =6	%	Districts(n=6)	%	Sub City(n=1)	Sum (Total)	%
1	Availability of case definition of relapsing fever	5	83	4	67	1	10	77
2	Availability of clinical register	6	100	N/A		N/A	6	100
3	Availability of Different surveillance report format	5	83	4	67	1	10	77
4	PHEM guideline	4	67	5	83	1	10	77
5	Availability of management protocol of Relapsing fever Posted	0	0	N/A		N/A	0	0
6	Data reporting	6	100	6	100	1	13	100
7	Data analysis	0	0	1	17	1	2	33
8	Epidemic preparedness (relevant for epidemic prone diseases)	6	100	5	83	1	12	92
9	Response to epidemics	6	100	6	100	1	13	100

Case Detection and Registration

Relapsing fever case definition was available in all visited health centers at the office of surveillance focal person. But, it was not posted and distributed to all departments within the visited health centers. Case definitions of relapsing fever were easily understandable by the health care providers of the facilities but it is not specific enough to differentiate Relapsing Fever from other AFI diseases only by case definition in the absence of laboratory confirmation test. Community case definitions of relapsing fever was not available in visited health centers and it was not distributed to the community. In all visited health facilities. Health Extension workers were partially trained on community surveillance system and not engaged actively in community surveillance activities like community case detection or case reporting.

Clinical registers were available in all of the visited health facilities, but they used one registry (HMIS) for all the priority diseases that makes difficult to collect the data easily for all the diseases. All health centers have cold chain capacity and guideline to collect and ship samples of priority diseases like AFP, measles and cholera to conduct laboratory confirmation test at regional or national laboratory centers.

Reporting

There was shortage of reporting format in the past six months in all visited health centers and health offices. The weekly report rates of visited health centers over the past 12 weeks (WHO week 1-12/2017) prior to assessment were 95% and 98 percentage for district and sub city health offices. There were no community based surveillance report in all visited districts during the past 12 weeks. PHEM focal person sent all reports to the next level via personal mobile phones, except sub city health office uses personal e-mail and telephone service to report to the regional health bureau.

Data Analysis and Interpretation

In all visited health centers no data analysis were conducted. Only two (15.3%) sub city and one district health office had analyzed relapsing fever data trends over the past two months. Sub city health office PHEM case team performed analysis of relapsing fever surveillance data and attempted to prepare weekly bulletin since January 2017. All assessed district health of PHEM had no computers for single use purpose. There were no action threshold for relapsing fever in all visited health centers and health offices.

When we examined relapsing fever reported cases in past two years, the cases were high from September to January; similarly, it again increases between April to June.

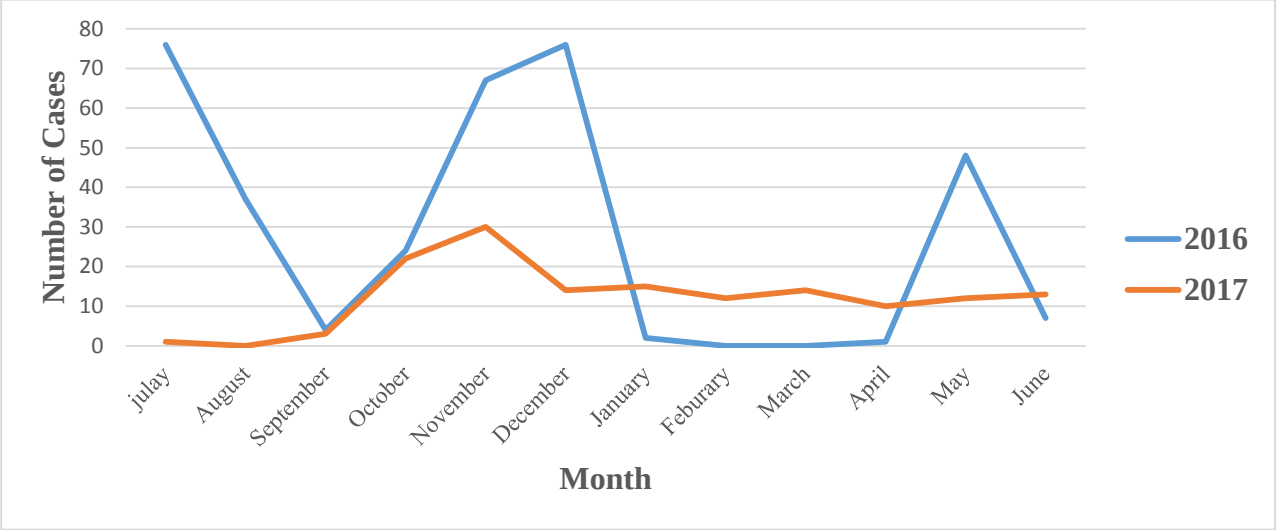


Figure 21: trend of Relapsing fever in Akaki Kality sub city, Addis Ababa,2016 and 2017

When we see the cases of relapsing fever in 2017 even though it is lower than 2016, the cases still higher than expected thresholds. Mainly cases from week 15 to week 19 were very high.

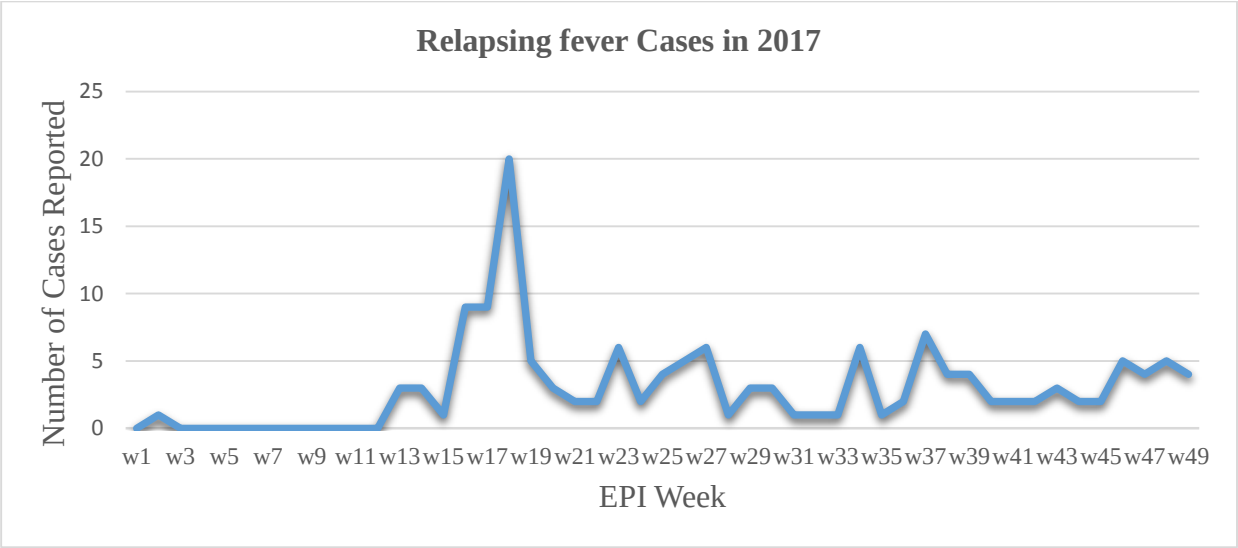


Figure 22: Relapsing fever cases reported in Akaki Kality sub city during WHO week 1-49/2017.

Outbreak investigation

All districts of the sub city experienced two outbreaks in the previous year. It was Acute Watery Diarrhea (AWD) outbreak and relapsing fever (Woreda 6, & 8) 2016 & 2017. The outbreak was

reported within 48hrs to respective health offices. Immediately after the occurrence of the out breaks Investigation was done by Addis Ababa Health Bureau incorporation with Sub city and St. Paul Millennium college Field Epidemiology residents for AWD and for Relapsing Fever outbreak investigation was done by Woreda health office in corporation with Health centers. There was no emergency stocks of drugs and supplies during response.

All visited health facilities and health offices had rapid response team that was established during the 2016 acute watery diarrhea outbreak, but it is not functional during these evaluations at all levels. There were no any rumor logbook and written plan of action in all visited health facilities and district health offices, but there was an attempt to prepare the rumor logbook in the sub city health office PHEM case team.

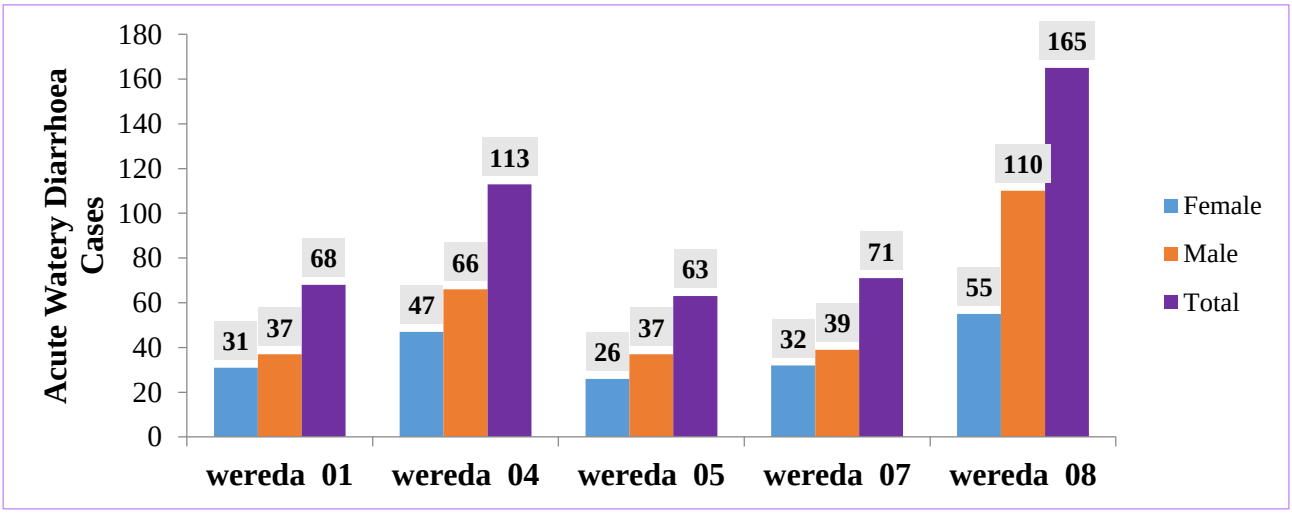


Figure 23: AWD outbreak in five Woreda of Akaki Kality 2016/17

Epidemic Preparedness & Response

Plan: Except in Sub City level and two Woredas, the rest had no written document of preparedness plan in any of the surveillance units and health departments assessed.

RRT and Epidemic management: there is document that showing the establishment of the RRT as well as epidemic management committee, but there is no minute or any evidence for practical actions in all level.

Budget: no budget is allocated for epidemic response in all level. But in case of emergencies, resources collected from different roots and allocated.

Epidemic response and control

In all assessed Woredas and Health centers, immediate response was given and controlled previously mentioned outbreaks. Only 2(40%) of Woredas have Epidemic preparedness and response plan while

none of health facilities have. In the past six months none of health facilities Experience emergency drug supplies. RRT is established in all levels (Sub city, Woreda and Health facility).

Table 11: Epidemic preparedness and response status of Akaki Kality, Addis Ababa, 2017

Activities	Sub City health office(n=1)	Woreda(n=6)	Health center (n=6)
Prepare epidemic preparedness and response plan	1	2	0
Presence of emergency drugs and supplies	1	0	6
Experienced shortage of supplies	0	0	0
Existence of RRT	1	6	6
Presence of regular meeting by RRT	1	2	3
Allocate budget for epidemic response	0	0	0
Existence of case management protocol for Epidemic prone diseases	1	3	3
Car assigned for PHEM	1	0	0

Supporting Functions of the Surveillance System

Feedback and Supervisions

Dissemination of surveillance information and supervision at all levels of health system were limited. All visited health offices conduct supervision every two –four weeks without support of checklist, except sub city health offices. There were no written and regular feedback given to district health office from sub city health offices in the past three months. Only one Health office (Woreda 8) provided feedback to its districts health facilities twice in the past three months.

Training

Except one Woreda health office, all of assessed sub city health offices and health facilities responded that all the staffs working on the surveillance units got training on surveillance and surveillance system by regional health bureau and partners, but they didn't get refresher training. In addition, most of the

health personnel providing services at the health facilities and sub cities have basic training on surveillance.

Material Resources Available for Surveillance

Resources for data management, communication, and logistics were available at the Sub City level. However, they are very scarce down in the ladder. In most of Health facilities and woredas there is no Computer, and were not functional where it was available. Communication of clinicians and focal person during immediately reportable diseases were through personal telephone (100%). The logistic and budget constraints were complained by the all assessed health center, Woredas and sub city. Those were mentioned frequently as the reasons for poor supervision, and monitoring of the health facility reports. Weekly report, monthly and other reports were sent from health facilities by hard copy and telephone. Inadequate and lack of resources, logistics, on job training and communication at all levels were the main complaints of surveillance focal persons at Woreda level which in turn is the reason for poor supervision, reporting and monitoring of health facility. In addition to the above-mentioned challenges late reporting (timeliness) were the primary challenges that affected the surveillance system because of lack of communication at the health center level.

Description of Performance of Surveillance System Attributes

Usefulness

All the interviewed respondents agreed that early detection of disease under surveillance is useful. The data were collected through surveillance system were useful for health policy decision making. The reported data expected to be employed by higher officials for decision making like the sub city administration, and health department to formulate prevention and control program. However, from the interviewed focal person in the visited sites, responded that the surveillance system was helpful at Sub City, district and health facility level.

Simplicity

All respondents agreed that the case definitions of Relapsing fever for identification of suspected cases are easy to understand and apply by all levels of health professionals. However, to confirm cases, it was found that sometimes there is shortage of reagent, thus Relapsing fever cases were not detected easily only by case definition because of similarity with other AFI . The route of data flow is clear and simple as it was set in the surveillance guideline. There was lack of reporting format and collecting

weekly report was also a challenge and took 30 min or more to fill a single report by collecting data from registers. The major problem mentioned here was lack of reporting means to report cases to the next higher bodies especially from the health facilities and district health office. Logistics like telephone, public transport and internet were indicated as constraints. This influenced timeliness of the report. The health workers at the health facility and districts usually use their personal mobile phones.

Data Quality

The reporting formats for weekly and immediately reportable diseases are well understood at all levels of the surveillance system. During the evaluation we observed common data quality problems in all levels; mostly of blank spaces on the reported formats. Common surveillance data quality problems identified on filled reporting formats during the assessment were; address of reporting sites not recorded, the starting and ending dates of the week not recorded, date report sent, report prepared by and zero reports were not recorded.

In addition, at most health centers and district health offices didn't record the number of sites expected to report and number of sites reported on time on the form that are important variables to determine completeness and timeliness of the reporting. The main reasons for poor data quality were lack of training for Surveillance focal persons, work overload, lack of commitment, lack of supervision and feedbacks specific to surveillance.

Acceptability

Acceptability of surveillance reflects the willingness of persons and organizations to participate in the surveillance system. Acceptability is a largely subjective attribute that encompasses the willingness of persons on whom the public health surveillance system depends to provide accurate, consistent, complete, and timely data. Among the health sectors available in Akaki Kality Sub city all district health offices (100%) were active participant whereas Health centers, Hospitals and other private and NGO health facilities participation on average were 100%, 100%, 90% respectively in the past 12 weeks prior to the evaluation. Overall participation rate of all health sectors found in the Sub city were 96%. However, there were factors influencing sites to participate in the surveillance system like; lack of understanding on relevance of data by these facilities, competing priorities, lack of supervision and feedbacks and poor monitoring system of governmental organizations.

Flexibility

All respondents reported that the current reporting format (weekly and immediately) is not difficult to use for new diseases or events. Some gaps raised by the respondents were no place is available for personal variables like age and sex in the current reporting format for weekly reportable diseases that makes difficult to analyze the personal variables. However, adding new variables like age and sex for weekly reportable diseases is difficult for implementation but it is easy for immediately reportable diseases (case based format).

Sensitivity

The sensitivity of a surveillance system can be considered at two levels. At the level of case reporting, sensitivity refers to the proportion of cases of a disease (or other health-related event) detected by the surveillance system. Second, sensitivity can refer to the ability to detect outbreaks, including the ability to monitor changes in the number of cases over time. However in this evaluation it was difficult to evaluate sensitivity of the system quantitatively without knowing false negatives and true positives that identified by the system, which requires collection or access to data external to the system (Eg. population survey) to determine the true frequency of reported health conditions and validation of data collected by the system.

PVP

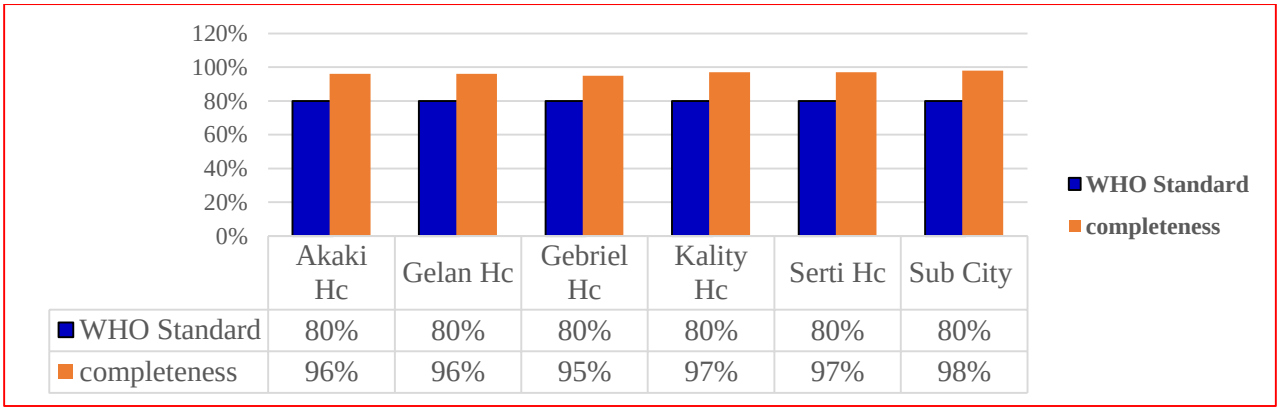
It was not possible to measure the positive predictive value of the surveillance system in our assessment. Because, the laboratory confirmation of all suspected cases by the case definition were not done in all assessed health centers. In addition, there were no well documented number of suspected Relapsing cases.

Representativeness

The representativeness of the surveillance system was related to the health service coverage, the reporting rate of the health facilities, the health seeking behavior of the community, and the technical capacity of the health care providers and so on. Relapsing fever cases are currently being reported from whole health centers in sub city and about 96% of private clinics. In reporting system some traditional healers and holy water places are not engaged which may decrease the representativeness of Relapsing fever report.

Timeliness and Completeness

Timeliness of reporting was measured according to the National PHEM. It was found that Timeliness and completeness of the sub city health office report to Regional health bureau was 98% and 95% respectively. This shows the sub city completeness does maintain 80% minimum requirement expected by WHO. The number of facility reported on time or late was not kept recorded and difficult to identify for the reason that date of reported were not recorded.



	Akaki Hc	Gelan Hc	Gebriel Hc	Kality Hc	Serti Hc	Sub City
WHO Standard	80%	80%	80%	80%	80%	80%
completeness	96%	96%	95%	97%	97%	98%

Figure 24: Timelines & completeness of Governmental Health Facility Akaki Kality, Addis Ababa, Ethiopia, 2017

Stability

After the introduction of the BPR, the system is well established and structured. Recently district level PHEM officer were employed to perform surveillance activities in Addis Ababa city administration. Their employments had increased surveillance performance especially completeness of data were improved. But budget constraints are affecting stability of the system and further change in this system and the work force will make the system more unstable and resource intensive.

DISCUSSIONS

The main goal of performing public health Surveillance is to assess the health status of the community, establish public health priorities and reduce the burden of disease in a community by making necessary public health actions. Supportive super vision and feedback are a key function of public health surveillance system. In our study area the understanding Relapsing fever case definition by health care providers including, health extension workers (HEW) was found to be good but collection and registration of data was incomplete and clinical registers and reporting formats were not uniform. The structure of data reporting flow from the lower to the upper level was well organized

with multidirectional fluctuation of data, in simple and defined role and responsibility of each reporting entities. However, flow has so many obstacles with reporting means and infrastructure like transport, telephone, and computers for data management and analysis for Woreda. These impacts the overall generation of report by the expected health facilities. This low reporting rate coupled with delayed (or no analysis) of the collected data will make the surveillance system less useful to meet its objective. This could be due to poor orientation of all parties, inadequate supportive supervision and feedback system, low or no legal enforcement to the surveillance activities, lack of incentives, appropriate training, sense of ownership and logistics. The epidemic preparedness of the sub city and Woreda did only planning with no financial and /or logistics support, besides, the epidemic committees did not review their plan actions and learned experiences. This will make the sub city and woredas to wait and see the support of the Regional Health Bureaus in case of epidemic and make responses to be late and give epidemic to take the chance to progress. Furthermore, the Woreda health offices were allowed for emergency budget from the Woreda and sub city administration office only after an event has occurred; this impedes timely investigation, and mitigation of expected events in the Woreda by the Woreda health office. In cases of epidemics, rapid response usually focuses on case management with no any protocol for investigation of risk factors and targeting response based on investigation. The sub city and Woreda biannual review of the health sector activities did not have detailed revision of all activities related to surveillance, plans and epidemic preparedness and response. This indicates low attention given to surveillance and response of epidemic prone disease like relapsing fever.

LIMITATION OF THE STUDY

- Unable to determine report timeliness of districts and health centers due to poor data Quality (absence of variables needed timeliness)
- Unable to determine sensitivity and Positive predictive Value of the system quantitatively.
- Most weekly report are incomplete particularly at health center level.

CONCLUSIONS

- Our study showed lack of regular supervision and feedback to reporting units by their supervisors. Also, it showed that only few of the visited health facilities had supervision checklists and plans
- Relapsing Fever was detected early in all assessed woredas Using Standard Case definition for Health facilities.
- Poor trend data analysis performance was observed in most of Visting HFs Health especially for Relapsing fever.
- There is good epidemic preparedness in sub-city, Woredas, and Health centers.
- In the study Year, two outbreak (AWD & relapsing fever) was happened and investigation with intervention was done accordingly.
- The completeness of Relapsing Fever Reports in all assessed woredas and health facilities was more than expected national standard.
- Acceptability of Relapsing Fever Surveillance is very high in the Sub city.
- Poor Flexibility of reporting format was identified.

RECOMMENDATIONS

- Regular supervision and Feedback provision to strengthen the system from higher level (Woreda, Sub city, Health bureau).
- Regular trend analysis to detect possible out breaks at Health facility level, Woreda level, and Sub city level.
- Expanding disease detection and reporting system to traditional healers and religious organization
- Availing communication system for health centers and Woreda for early information sharing with higher level.
- Strengthen linkage between HEW; PHEM officer; surveillance focal persons; and the HMIS unit.
- It is highly recommended that the Sub city health office has to avail logistics and facilities such as transport, fax, internet and emergency drugs to strengthen the system.

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CHAPTER IV-HEALTH PROFILE DISCRIPTION

Health Profile Description of Akaki Kality Sub City Woreda 07 Administration Addis Ababa, Ethiopia, 2017

Abstract

Back ground: A health profile of a given community is a comprehensive compilation of information about a community. The data in a profile reflects the health of a given community from many different aspects. Assessing the health profile of a community is very crucial to understand the health status of the community and clearly present their needs and issues which helps to plan, prioritize public health action and interventions. However, in Addis Ababa particularly in Akaki Kality sub city, Woreda seven Administration, such important information is not available in a complete, organized and updated form. This assessment aimed to assess and describe the current health profile of Woreda 7 Administration, Akaki Kality sub city Addis Ababa, Ethiopia, 2017.

Method: Descriptive cross-sectional study design was conducted from 17 January to 20 March 2017. Both Filling semi-structured questionnaire, specifically developed for collecting the district health profiles and making interview with responsible district personnel were used as a tool to collect the required data. Data were collected, compiled and analyzed using Microsoft Excel and GIS. Frequency distribution, table and figures were employed. Official letter was obtained from Akaki Kality Health office to the study Woreda health office and other relevant offices to accept the legality of this study.

Results: From ten top diseases seen in 2016, upper respiratory tract infection was the leading cause of morbidity, accounting for 19.2%, followed by Trauma 14%, diarrhea 11% and dyspepsia 10.1%. Contraceptive acceptance rate of the Woreda seven was 35% that was below 50% of the 2016 Plan of Addis Ababa city Administration Health Beraue of 65% respectively. There was better health Service improvement in ANC follow up as well as in immunization coverage. Most of TB cases reported in Woreda seven in 2016 were EPTB accounting for 42% of the total TB cases.

Conclusions: In Akaki Kality Woreda seven communicable diseases like Acute Upper Respiratory Infection, Diarrhea, pneumonia and trauma were the leading causes of Morbidity in the Woreda and the most frequently occurring disease both in adult and pediatric population. Family planning in the Woreda was low, but there was better health Service improvement in ANC follow up as well as in immunization coverage.

Key Words**: **Health profile, Akaki Kality, Woreda Seven, 2017

INTRODUCTION

Background

Health description is crucial for prioritizing health and health related problems of the community at any level. Housing is one of the critical problems of Addis Ababa. Most houses of the City are old, unplanned and inconvenient for living. Because of rural-urban migration and natural increase there is an alarming population increase in the City. This causes shortage of social utilities including housing. Sanitation and sewerage management and disposal is a serious socio economic problem of the City [(1)].

Addis Ababa lies 9°1′48″N latitude and 38°44′24″E longitude. The city is located at the heart of the Country, at an altitude ranging from 2,100 meters at Akaki in the south to 3,000 meters at Entoto Hill in the North[(1)]. This makes Addis Ababa the third highest city in the world, after La Paz and Quito in Latin America [(1)]. Its time zone categorized in East Africa Time. The city occupies a total area of 540 Km2 with a Sub-tropical highland climate [(1)]. The city has a complex mix of highland climate zones, with average temperature differences of up to 12.2°C, depending on elevation and prevailing wind patterns. The high elevation moderate's temperatures year-round, and the city's position near the equator means that temperatures are very constant from month to month [(2)]. The day to day life activities of the City's population is predominantly based on different sorts of occupation. These, include 119,197 in trade and commerce; 113,977 in manufacturing and industry; 80,391 homemakers of different variety; 71,186 in civil administration; 50,538 in transport and communication; 42,514 in education, health and social services; 32,685 in hotel and catering services; and 16,602 in agriculture[(3)]. Besides, the residents of rural parts of Addis Ababa, the city dwellers also participate in animal husbandry and cultivation of gardens. Currently, 677 hectares of land irrigated annually, on which 129,880 quintals of vegetables are cultivated [(3)].

The health institutions in Addis Ababa, include hospitals, health centers, health stations, clinics and drug vendors, which are run by the government, NGOs and private health institutions. According to Addis Ababa Health Bureau, currently there are 1192 health service rendering institutions in Addis Ababa [(4)]. Those include, 58 hospitals (11 governmental owned general and 5 Specialized hospitals, 39 private and 3 NGO), 90 health centers (82 are run by government, 5 private and 3 NGO), 592 clinics (6 governmental owned 586 private clinics)) and 452 drug vendors [(4)].

Akaki Kality sub city has 07 Woreda with an area of 9.9 sq.km with the population of 28,360 (male: 13, 613, female: 14,747) and the population density per sq.m:22, 805.1 [5].

It is important to have Health description of a community for prioritizing health and health related problems of the community at any level. Related to this, there is no organized, completed and well-documented health profile data in Woreda 7 of Akaki Kality Sub City. Therefore, describing the health profile of the Woreda is helpful to give evidence-based information for prioritizing and conducting appropriate public health interventions in the Woreda.

Literature Review

Healthcare Situations of the Addis Ababa City

Health institutions, infrastructure and personnel are important inputs that help to ensure healthy society. Modern health care institutions commenced in the Reign of Menilik II marked by the opening of the first modern hospital, Menilik II in 1900. In this regard, recently the city administration has been making efforts to render health care access services based on prevention policy. The health facilities of Addis Ababa improved in service and increased in number in the past five years [5]. The health institution present in Addis Ababa includes hospitals, health centers, health stations, clinic and drug vendors, which are run under government, NGO and private health institutions. According to the information obtained from the Addis Ababa Health Bureau, currently, there are 1192 health service rendering institutions in 2015. It comprises 58 hospitals (11 governmental owned general and 5 Specialized hospitals, 39 private and 3 NGO),90 health centers (82 are run by government, 5 private and 3 NGO),592 clinics (6 governmental owned 586 private clinics)) and 452 drug vendors [1].

Health Access Indicators

Acute upper respiratory infection (41,334), (217,979) and (233,334) is by far the most frequent disease in the years mentioned followed by other or unspecified diseases of the eyes which is (19,946), (84,964) and (100,067) and pneumonia (15,504), and (69,560) in 2010, 2011, and 2012 EFY were the top ten causes of morbidity in the city in the past three years respectively [9].

HIV/AIDS Situation in the City

HIV/AIDS is a deadly disease prevailing in developing nations. The rate of HIV/AIDS prevalence is high in urban centers. As Addis Ababa is the political and economic Centre of the country, the rate of HIV/AIDS prevalence is expected to be high. Recent reports and assessments showed, that have been marked increases in the number of health facilities and sites providing HCT, PMTCT, and ART services result in a decline of newly infected people [(10)].

Housing, Status of Housing facilities and Tenure of the City

Housing is one of the most important basic services, which affects the life of most of the population of the city. According to the 2010 welfare Monitoring Survey of central statistics agency, the available stock of houses can only sufficiently accommodate about 73% of the households and the remaining 27% are homeless people(6). Therefore, housing is one of the critical problems of the city. Most houses of the city are old, unplanned and inconvenient for living [(6)]. Similar study was conducted by the Addis Ababa Housing Project Office. According to the study from the total of 387,000 houses in the city, about 238,000 of them or 61.5% were residential (6). It was only 53% of them were used for living. According to this study 150,000 of houses under government tenure, 76% were older and without any maintenances. Furthermore, 31% of the houses were with single room, 25% without toilet and 27% without kitchen. Generally, 75% of the houses were made of mud and wood. Because of rural-urban migration and natural increase there is an alarming population increase in urban areas. This causes shortage of social utilities, including housing in the urban centers. Likewise, housing is the major problem of Addis Ababa [(6)].

Water Resource, Water Supply and Sanitation

Water access and adequacy is one the conditions that makes an urban Centre comfortable place to live in. Accordingly, the City Administration of Addis Ababa worked hard to meet the ever-growing need of its residents. Potable water is one of the favorable conditions of urban centers that attract people to live in. In this regard, the City Administration is working aggressively to meet water need of the growing population. The City Administration provided water for its residents from underground (70,152,807 m3) and surface water sources (42,062,760 m3) [(7)]. Regarding water coverage, it had risen from 52% in 2000 E.C to73percentage in the 2003 E.C and made outstanding performance in the year 2004 and reached 94% [(7)]. The amount of water production per day also shows a significance improvement from 232,000-m3in 2000 to 374,000 m3in the year 2004 E.C [(7)].

Sanitation and Sewerage

Sanitation and sewerage management and disposal is a serious socio economic problem of the City. The system is not well developed. Recently, efforts were made to restructure and improve the system. The sewerage disposal capacity of the City Administration showed progress in the past five years. The performance of the year under discussion was much better than the previous years. According to the 2013 survey study of Central Statistics Agency, 14.9% of housing units of Addis Ababa had flush toilets, 70.7% pit toilets (both ventilated and unventilated), and 14.3% had no toilet facilities [7].

Rationale of the Description

The purpose of collecting health profile data is to identify strategies that improve the access of every member of the community to effective health care and health promotion. Akaki Kality Woreda 7 Administration health profile was not done before and also there is no organized health and health related information. No organized health and health related indicator which determine the health status of the community and those contribute to a gap in planning and taking evidence based information for action.

OBJECTIVE

General objective

- To assess and describe the health profile of Woreda 7 Administration Akaki Kality sub City Addis Ababa, Ethiopia, 2016.

Specific objectives

- To gather community health and health related information and make ready for use at each level.
- To lay the basis for the Community Health development Plan.
- To make straightforward health information and communicate the local burden of disease and other health related information in a practical, accessible format.
- To identify the availability of major health infra structures and problems in the Woreda.

METHODS AND MATERIALS

Area of Study

The study was conducted in Woreda 7 Administration Akaki Kality sub city, Addis Ababa. Woreda 7 Administration is one of 11 woredas of Akaki Kality sub city, Addis Administration which is located in the southern part of the city, 20kms far from the center of the city and have total of 28,370 populations. The total area of the Woreda is 7.8 Km2, the Woreda cover 15.8% of Akaki Kality sub city. The population density of the Woreda is 52.6 people / hectare.

The Woreda is located latitudinal 8°55' North and longitudinally 38°46' east. It is also bordered by Woreda 4 Administration on the south, Woreda 8 Administration on the south west and Woreda 5 Administration on the North East and by Nifas silk lafto sub city on the North directions.

The latitude of the Woreda ranges from 2050 to 2331 meters above sea level which makes the sub city into the "waynadega" climatic class. The highly elevated land area is found in the northern and eastern part of the sub city, while relatively low elevated area is found in the southern parts and the Woreda has 9 Ketenas, all urban Ketenas.

In spite of the fact that there were 04 new settlement areas, a number of factories and universities & colleges etc. that affect the population number and characteristics, the total population is expected to be more than 28,370 from projection of only previous census with the proportion of 48.5% and 51.5% male and female respectively. In the Woreda there were one governmental Health center & 7 different private health facilities, 01 Lab diagnostic center.

Study period

The study period was from Jan 17/2017 to April 20/2017

Study design

Descriptive cross sectional study was conducted using semi-structured questionnaire, check list, review hard copy and soft copy of available data in health office, health institution, education, and water office. In addition, interviewing and discussion with concerned bodies was also be conducted.

Data Collection Tools and Procedure

Both Filling semi-structured questionnaire, specifically developed for collecting the district health profiles and making interview with responsible district personnel were used as tools to collect the required data. Before starting filling the questionnaire on the brief discussion was conducted with Woreda Health office. Health and health related data were collected using check list. The data sources were Woreda health office, education sector, agriculture and rural development, district finance, water office and other sectors.

Data Analysis Procedure

Data were analyzed using Microsoft Excel. Frequency distribution, tables and figures (descriptive statistics) were used to show the results.

Ethical Considerations

Official letter was written from Akaki Kality sub city Health office to the study area of Woreda health office and other relevant offices to accept the legality of this study. The purpose and objective of the study was briefly explained to the respective Officials based on their level of responsibility.

Plan for Dissemination of Findings

As soon as the Health profile data description was finalized, the report was prepared and shared to Addis Ababa University School of Public health FETP, Woreda-7 Health Office and other relevant offices.

Operational Definitions

Demography: The study population and its characteristics, with reference to such factors: size, age structure, density, fertility, mortality, growth and social and economic variables.

Child mortality rate: The number of Child death occurring in 2008EC per 1000 women in the reproductive ages (i.e. women aged 15-49).

Crude birth rate: The number of births in a population during 2006 divided by the number of person-years-lived by the population during the same period. It is frequently expressed as births per 1,000 populations.

Crude Death Rate: The number of deaths in a population during 2008 is divided by the number of person-years-lived by the population during the same period. It is expressed as deaths per 1,000 populations.

Infant Mortality Rate (IMR): The ratio of the number of deaths under one year of age occurring in 2008E.C. to the number of births in the same year.

Clean and safe delivery: Proportion of deliveries attended by HEWs.

Contraceptive prevalence rate: Proportion of women of reproductive age (15-49 years) who are using (or whose partner is using) a contraceptive method, on the year 2008 determined by couple years of protection.

Contraceptive acceptance rate: Proportion of women of reproductive age (15-49 years) who are accepting a modern contraceptive method (new and repeat acceptors) at least once in the reporting period whether they are pregnant or not at this time.

First ANC coverage rate: Proportion of pregnant women attended ANC, at least once during the current pregnancy, by a health professional, for reasons related to pregnancy.

Skilled delivery: Proportion of deliveries attended by skilled health attendants.

A skilled birth attendant: is an accredited health professional – such as a midwife, doctor or nurse – who has been trained in the skills needed to manage normal (uncomplicated) pregnancies, child birth and the immediate postnatal period, and in the identification, management and referral of complications in women and newborns. (Exclude TTBA and HEWs)

Tuberculosis (TB) case detection rate: Number of new smear positive TB cases detected, among the new smear-positive TB cases expected to occur in the sub city for the year 2008E.C.

TB treatment success rate: Percentage of a cohort of new smear positive TB cases registered in a specified period that successfully completed treatment.

Successful completion: entails clinical success with or without bacteriological evidence of cure.

TB cure rate: Percentage of a cohort of new smear-positive TB cases registered in a specified period that were cured as demonstrated by bacteriologic evidence (a negative sputum smear result

recorded during the last month of treatment and on at least one previous occasion during treatment).

TB defaulter rate: Percentage of a cohort of new smear-positive TB cases registered in 2008 that interrupted treatment for more than 2 consecutive months.

Leading causes of morbidity: The frequently occurring causes of morbidity (10) among patients, of which the greatest number of cases have been reported during the year.

Fully vaccinated: Surviving infants who received all doses of vaccine antigen The Infant Antigens are: BCG, Pentavalent (DPT-HepB, Hib), doses 1 -3; OPV, doses 1—3; and Measles.

Postnatal care (PNC) coverage: Proportion of women who seek care at least once during postpartum (42 days after delivery) from skilled health attendants including HEWs for reasons relating to post-partum.

Leading causes of mortality: The most frequently occurring causes of mortality (10) under which the greatest number of deaths have been reported during a given year.

Maternal mortality rate: The number of maternal death while pregnant or within 42 days after termination of pregnancy from any cause related to pregnancy or its management per 100,000 populations.

RESULT

Background of the Woreda

Woreda 7 Administration is one of 11 Woredas of Akaki kality sub city Administration which is located in the southern part of the city, 20kms far from the center of the city Administration and has a total population of 28,370. As the Woreda health office mentioned verbally, it was established seven years ago. There is no documented data how and why the name was given. The community has an access to participate on planning, implementing, and evaluating activities of the Woreda through different associations, like community forum, youth association, women's association, women league, youth league. One of the most important association for the health sectors' is Women Development Army who are graduate women by HEWs on 16 health extension packages, and they work as voluntary community health workers, there are 46 Women's Development Army in the Woreda 7.

Geography and climate

The altitude of the Woreda ranges from 2050 to 2331 above sea level which make the Woreda categorized as the "woinadega" climate class. The total area of the Woreda is 7.8 Km2, the Woreda cover 15.8% of Akaki kality. It is also bordered by Woreda 4 Administration on the south, Woreda 8 Administration on the south west and Woreda 5 Administration on the North East and by Nifas Silk Lafto Sub City on the North directions.

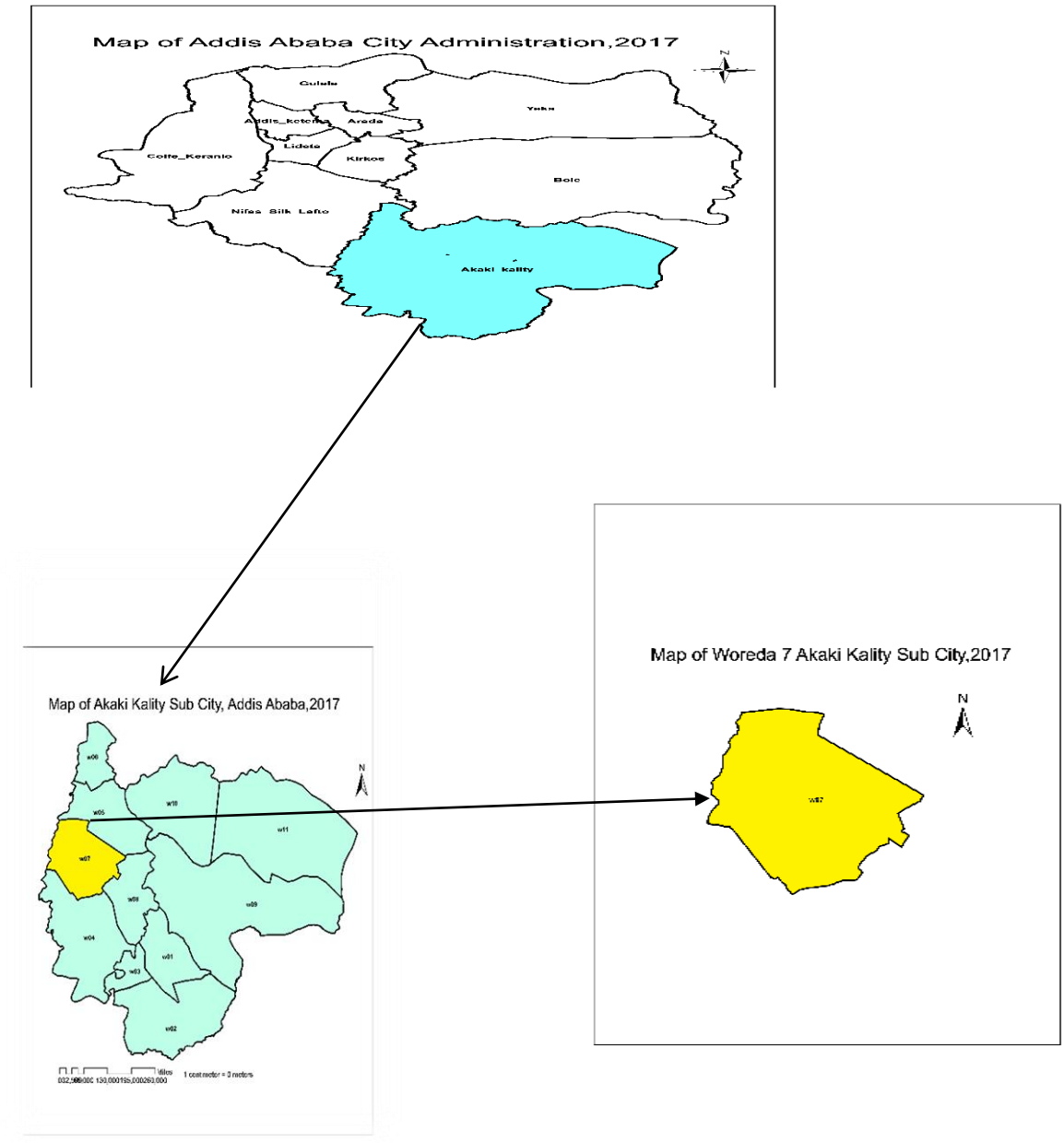


Figure 25: Maps of Akaki Kality Sub City Woreda 7 Administration 2016

Demographic Information

Akaki kality, Woreda 07 has a total estimated population of 28,370 with 13,617 Male and 14,753 Female in 2016. Male to Female sex ratio is 1:1. From the total population, under one year old children constitute 635 (2.24%), under five 2030 (7.16%), less than 15 years old 6778(23.9%), women of child bearing age 9823 (34.64%) and pregnant women were 660(2.33%). The annual growth rate is considered to be 2.1% per year, average fertility rate was 2.8 children per women in life during the reproductive ages and average house hold size was 4.1 per house hold.

Table 12: Population Profile of Akaki Kality Sub City Woreda 7 Addis Ababa, 2016

S/N	Description	Conversion Factor	Expected Level	Remark
1	Total Population	100.0%	28,370	
2	Male	48%	13,613	
3	Female	52%	14,747	
4	Population growth rate	2.1%		
5	Expected Pregnancy	2.33	660	
6	6-59 months' age group	6.36%	1803	
7	24-59-month age group	4.44%	1259	
8	Surviving infant	2.24%	635	
9	Under three years	4.12%	1168	
10	Under five years	7.16%	2030	
11	Women 15-49 years	34.64%	9,823	
12	< 15 years	23.9%	6778	
13	15-24 age group	28.9%	8,196	
14	15-59 age group	70.8%	20078	
15	House Hold	4.1%	6,917	

The population profile shows relatively narrower in both ends and wider at the middle this might be in migration of working forces from other parts of the country for work and living condition or can be the reduced crude birth rate. Less than fifteen populations represents 7659 (27%) while greater than sixteen is 1,446(5.1%) which brings the approximated total dependency ratio of the Woreda to be 32.14% with a young age & old age dependency ratio of 39.8 % & 7.6% respectively. The total number of house- holds in the Woreda is 6,919 on average every family constitutes of 4.1, people, women in reproductive age represents 34.64% (9,827/28,370).

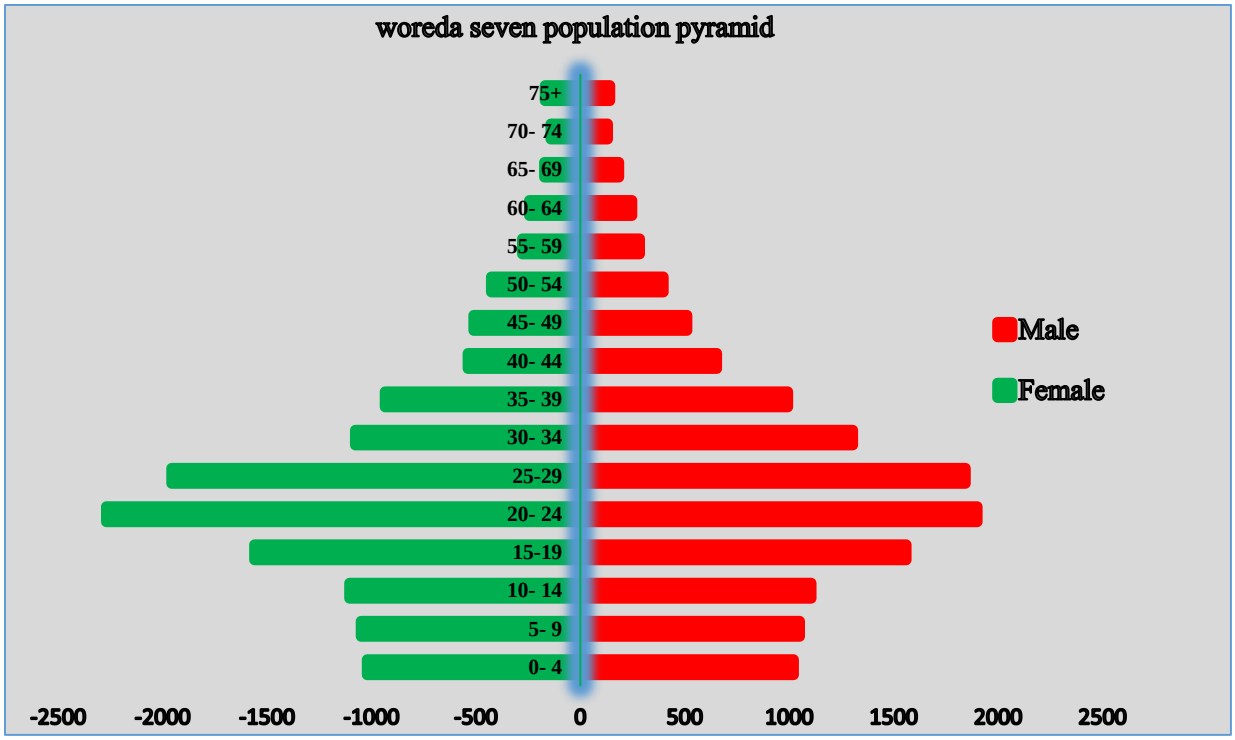


Figure 26: Population Pyramid by Sex & Age Category in Woreda 7, Akaki Kality 2016

According to information taken from Woreda Health Extension worker Woreda population house to house count was performed in 2015 by UHEW under supervision of Woreda Administration which is done every two years. Among 9 Ketenas, Ketena 07 has the largest population size (4,470) in the district followed by ketena 6 (3,600) and ketena 4 (3,748), the least population has in ketene 2 (2,491).

Table 13: Estimated Population Size Per House Hold By "Ketena" In Woreda 07 2016

Sr.no	Name of Ketena	Male	Female	Total	
1	ketena1	1322	1434	2756	
2	ketena2	1196	1295	2491	
3	ketena3	1279	1386	2665	
4	ketena4	1799	1949	3748	
5	ketena5	1499	1623	3122	
6	ketena6	1728	1872	3600	
7	ketena7	2146	2324	4470	
8	ketena8	1412	1530	2942	
9	ketena9	1236	1340	2576	

Religion & Ethnic Composition Distribution

Religious and ethnic compositions are the major components of demographic feature of a nation, in Akaki kality Woreda 7, 50% of the population is Oromo, 15 % are Amara, and 10% are Tigre and other Ethiopian ethnic origin and 25 % religion follower by Orthodox 43.5%, Muslim 34.3 %, and Protestant 19.5% and Catholic 2.7% and are other religion follower 1.4%.

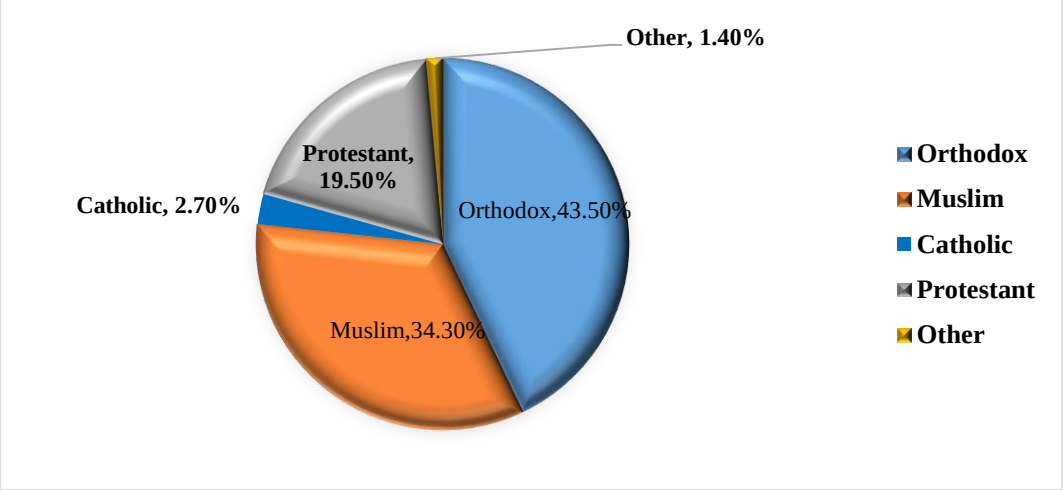


Figure 27: Religion Composition of Woreda 7 Population *(Source: - Woreda Tourism Office)*

Administrative and Political Structure

Akaki 07 Woreda has nine ketena and all sector offices are concentrated in one building. The Woreda is divided in to nine urban sub- woredas, 135 sefers & 162 blocks. All the sector offices of the district are responsible for the Akaki Kality sub city office. Engender Health, Emanuel teradeo organization and Tesfa hulegeb are the main supporting organization in the Woreda. The ruling political party is EPDRF with a power shared between its four major parties (TPLF, APDM, and OPDO & SPDM).

Economic Situation

Although there is no detail data from the Woreda regarding the economic status of the population, Studies like the 2012 survey on Ethiopian progress Towards Eradicating Poverty, Interim Report, 28.1% of the residents of Addis Ababa were under general poverty. On the other hand, 26.1% of the residents were under food poverty. When we compare poverty in terms of sex, females were more affected by poverty than males. (2)Regarding unemployment status, there is temporal variation in unemployment condition, in the past three years from 2002-2004 E.C. Even though, unemployment existed in the Woreda, the total number of unemployed persons increased every year. With regard to sex, females were more vulnerable than males. (2)

Education

Akaki Kality Woreda 07 has a total of 34 schools (22 kinder gardens, 10 elementary, 2 secondary school are available in the Woreda and 10013 students are learning in these schools among those 49% (4909) are males and 51% (5104) are females. Totally, 546 teachers worked in the schools and females account 80%. In Woreda 7, private schools have a great contribution on educating the community by accepting a large number of students than the government schools, in the Woreda 7 there is no private secondary School. From the total enrolled students, 2.3% (158) are dropped out due to economy, health problems and unknown reasons. Among 34 schools 21 % (6) have no water supply and 3.6%(1) school have no toilet facility ,but the rest have water supply and toilet facilities . All the schools (10 elementary and 2 secondary) have Anti HIV/AIDS clubs, except 6 adult schools. Total educated population 9884 (male 5564 & female 4319) sources from Baseline data collected by HEW in 2016 [(2)].

Table 14: Description of Education of Woreda 07, Akaki Kality 2016. (Source sub city Education office)

School type	No of schools			Enrollment student		Student	Teachers		Total No of teachers	Drop out rate
	Governments'	Private	Total	Male	Female		Male	Female		
kinder gardens	3	19	22	1329	1264	2593	42	172	214	59
Primary	4	6	10	2926	3092	6018	114	156	270	138
secondary school	2		2	654	748	1402	42	21	63	32
Preparatory	0	0	0	0	0	0	0	0	0	0
College/University	0	1	1	112	139	251	12	7	19	0
TVET	0	0	0	0	0	0	0	0	0	0
Total	9	25	34	4909	5104	10013	198	349	547	229

Transport and Electric Power

Since the Woreda Administration is the oldest and the main import and Export Center of Addis Ababa and as well as historical site all ketena in the Woreda have transport and electric access to the main road and the Woreda is overcrowded by city minibus, city bus and other vehicles. The governmental health center and all private clinics have 24 hr. electric and water access.

Communication and Utilities

Provision of requisite infrastructure is in Akaki 07 district medium. Even though the power of electric city were on & off, all ketenas has electricity. Most of the Woreda had accessed to wireless telephone communication but sometimes it becomes nonfunctional. Also recently, mobile service is introduced. Computers, postal, internet, fax, bank service is almost exist.

Disaster Status in the Woreda

The Woreda was affected by acute watery diarrhea by the month of June 2016 to September 2016. Through this period a total of 71 cases are seen. Out this, 39 are ale and 32 are female, no death,

all were treated accordingly, the suspected source of the infection was vegetables, raw meat and holly water. More adults were affected than other age groups.

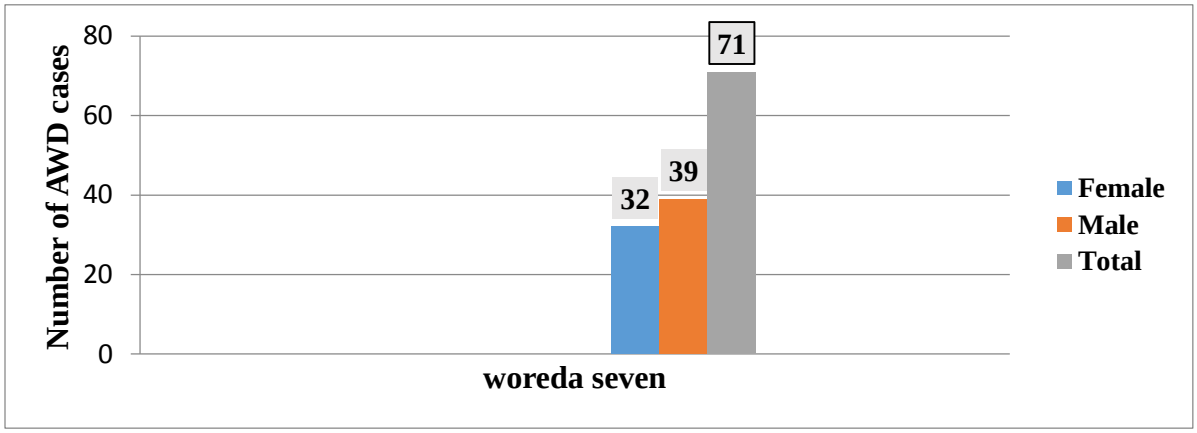


Figure 28: AWD outbreak in Woreda Seven, Akaki Kality 2016. (Source: S/City Health Office)

Vital Stastics

Since the center for vital statistics of the Woreda (health Center) does was fully operating it was hard to get data on death, birth, marriage, divorce & migration statistics to compute crude birth rate, crud death rate, infant mortality rate, child mortality rate, maternal mortality rate. The ANC coverage >100%, contraceptive prevalence rate 35% & fully immunization of the Woreda was >100% respectively.

Table 15: Vital Static of Woreda 7 Administration, Akaki Kality Sub City, 2016.

Sr.No	Indicator	Number	Percentage
1	Infant Mortality Rate	No data	No data
2	Child mortality rate	No data	No data
3	Crude Birth Rate	22.5	24.9
4	Maternal mortality Rate	No data	No data
5	Crude Death Rate	No data	No data
6	Immunization coverage	2151	>100%
7	Contraceptive prevalence		35%

Health Services

The health infrastructure development for the Woreda shows a great improvement in the past five years than ever before. A decades before only 01 health centers not more than 2 clinics working in the Woreda but currently there were one governmental health centers, 10 –private clinics & 1-Factory- clinic, 4 drug stores & 1 diagnostic laboratories.

Table 16: Number of Health Facilities in Akaki Kality Woreda 07 In 2016(source: kality HC)

S/no	Type of Health facilities	Number	Ratio Health facility: population
1	Hospital Gov.	0	
2	Health center Gov.	1	1:40,000
3	Private clinic	10	1:4,556
4	Private pharmacy	0	0
5	Gov. pharmacy	0	
6	Private Drug store	4	1:6833
7	Diagnostic laboratories	1	
8	Private hospital	0	
9	NGO Clinic	0	
10	Factory clinic.	1	
	TOTAL	17	

The number of health professional to population ratio was similar with the standard when it is compared to Service provision structure of national standard health provision to population ratio.

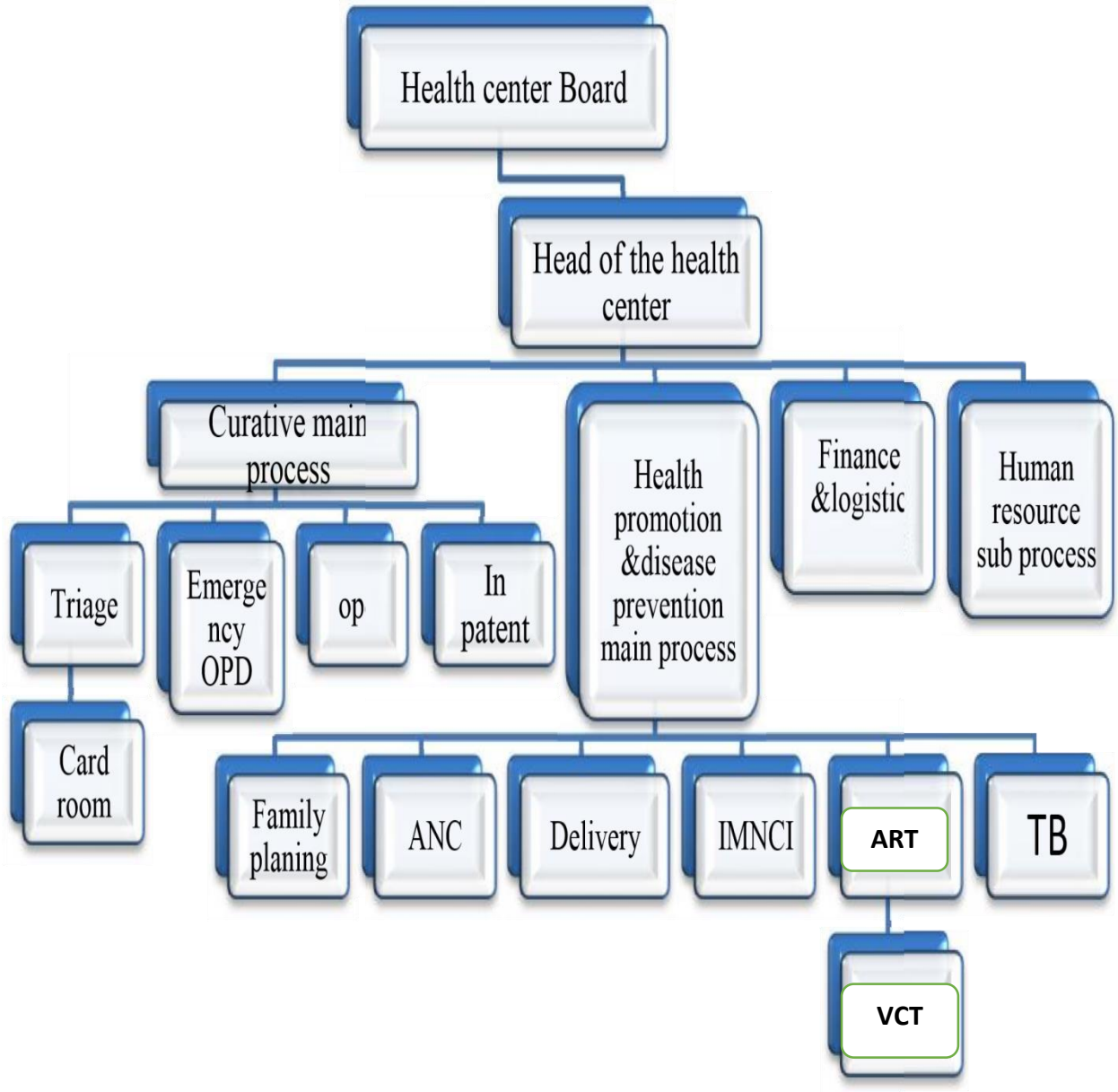
Table 17: Man Power of Woreda 7 Kality Health Center In 2016(Source: Kality Hc)

S/no	Type	Male	Female	Total	Ratio
1	Physicians	0	0	0	
2	Health officer	4	7	11	1:3077
3	Laboratory technician/technologist	4	2	6	1:5128
4	Pharmacy technician/pharmacist	4	3	7	1:4396
5	Nurse	7	11	18	1:1399
6	Midwife	5	7	11	1:5128
7	X-ray technician	0	0	0	0
8	Environmental Health worker	1	0	1	1:15385
9	HEWs	0	11	11	1:2564
10	Other health workers	0	0	0	0
11	Supportive staffs.	20	46	66	559
	TOTAL	45	87	131	

Under kality health center there are 2 main core process which is Health Promotion Disease Prevention and curative core process.

Under each core process there are case team which include:- OPD case team, Admission case team, Laboratory case team, Pharmacy case team, Triage case team and Disease prevention and control case team, Family health case team, IMNCI case team.

Figure 29: Woreda 7 Kality Health Center Structure



Leading Cause of Morbidity in the Woreda Seven Administration

In Woreda 07 Administrative office URTI, Trauma and dyspepsia were the top leading cause of adult morbidity and similarly acute respiratory tract infection, diarrhea (non- bloody) and were top Pneumonia leading causes of morbidity in under five children's.

TABLE 18: Top Ten Leading Causes Of OPD Visit (Morbidity) Akaki Kality Woreda 07 2016

S/N	Adult cases.	Number	%	Under 5 years old cases	Number	%
1	Acute upper respiratory infection	4243	19.2	Acute upper respiratory infections	2565	28.04
2	Trauma(injury Fracture)	3104	14	Diarrhea (non-bloody)	1242	19.7
3	dyspepsia	2475	11.2	Pneumonia	964	15.01
4	Other or unspecified diseases	2280	10.3	Infections of the skin and subcutaneous tissue	206	5.22
5	disease of musculoskeletal system and connective tissue	2248	10.1	Other unspecified diseases of the eye and adnexa	225	4.25
6	Other unspecified infectious parasitic diseases	2125	9.63	Acute bronchitis	197	3.16
7	Urinary tract infection	1918	8.69	Acute Febrile Illness (AFI)	266	3.14
8	Acute febrile illness	1722	7.8	Other Unspecified Diseases of the digestive system	159	3.01
9	Diarrhea (non bloody)	1001	4.5	Other Unspecified Diseases of the skin and subcutaneous tissue	159	3.01
10	Other or Unspecified disease other respiratory system	961	4.35	Otitis	131	2.48
	Total Leading causes of Morbidity	22,077	100	Total Leading Causes	6114	

Top Ten Causes of Admissions (Morbidity)

No death report was available on the Woreda health office found, 2016.

Health budget allocation

The Woreda Administration budget for all sectors in 2015 was 21,546,459 Ethiopian birr while in 2016 is 24,212,407 Ethiopian birr of which budget allocation for health it shows increment. (Table below)

Table 19 : Budget Allocation for Health, Woreda 7 in Akaki Kality, 2016((Source: Woreda 7 Finance Office)

Sr.no	Institutes	Budget allocation in Birr	
		2015	2016
1	Woreda Administrative budget	21,546,459	24,212,407
2	Woreda Health Office	309,559	367,211
3	Health Center	6,737,593	7,992,400
4	Percentage of budget allocation for Health	33%	34.5%

Community Health Services

The status of community health services by urban health extension Professionals (HEP) like health education on the 16 packages were more than 16134 population got health education & 65 referrals, school health program is active in all primary & secondary schools. At this time federal ministry of health implemented developmental army in each Woreda starting from 2010. Therefore, all Community health workers are replaced by those developmental armies all over the country.

Primary Health Care Services

Immunization Coverage

Immunization is one of the medical technologies used to protect the life of infants and children's against disease. The Woreda Health Office has been delivering vaccination for children for preventing and control of vaccine-preventable diseases. The immunization coverage in the Woreda in 2016 were for BCG, 2216 (>100%) for Measles, 2151 (>100%) for penta3, 2583 (>100%) for

PCV3, 2573 (>100%) for fully immunization, TT2+ 1764(>100) the Woreda immunization coverage was more than the Region (98%) and the National immunization coverage (90%) respectively. The vaccination coverage presented as follow by type of antigen in table (20).

Table 20: Immunization Coverage Of In Woreda7 Kality Hc 2016 (Source: Kality Hc)

Sr.no	Types of vaccine	2016		
		Plan	Performance	Achievement(%)
1	BCG	954	2216	232
2	Measles	954	2139	224
3	OPV-0	954	2583	270
4	penta-1	954	No data	No data
5	penta-3	954	2583	270
6	PCV-1	954	No data	No data
7	PCV -3	954	2573	269
8	Rota-2	954	2533	265
9	Fully vaccinated	954	2151	225
10	TT2+	795	1764	221

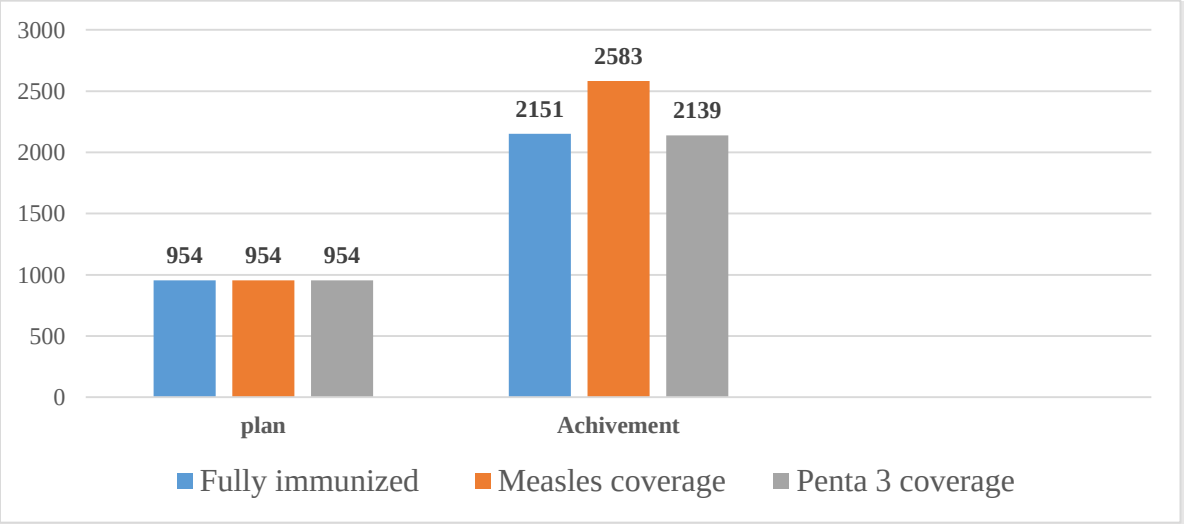


Figure 30: Immunization Status of Woreda 7 Akaki Kality 2016

Maternal Health

As of 2015/2016 there were 954 eligible pregnant women in the Woreda. Of this 2175(>100%) received antenatal care service at least once during their pregnancy when we compare the Woreda figure with country figure in 2015 it is similar which is 98.1% and 954(97%) attended their delivery by skilled health professional. Comparing this figure with sub city based on 2016 report; antenatal coverage of the sub city was 7976(>100%), delivery by skilled health professional 3320(64%) which is better when we comparing with the regional figure (72.9%) and postnatal coverage 2335(45%) which is less when we comparing with regional figure (47.8%) (11). In general, this indicated that maternal health service delivery relatively better in Woreda 07 in comparison with the sub city figure. Moreover, among pregnant women attended for ANC follow up at health center, 470(100%) were tested for HIV and 13(2.7%) positive for the test and all of them received ARV prophylaxis at the health center and contraceptive acceptance rate of the Woreda seven is 35% that is below 50% of the 2016 Plan of Addis Ababa City Administration Health Bureau of 65% respectively [(8)].

Table 21: Maternal Health Activities Report In Akaki Kality Woreda 7 2016. (Source: Kality HC)

s/no	Type of Activity	plan	Achievement	Percentage	Remark
1	ANC 1st	658	2175	330	
2	ANC 4th	658	1133	172	
3	PMTCT	658	2016	306	
4	option B+	10	30	300	
5	PNC	658	1274	193	
6	contraceptive short	4914	2627	53.4	
7	contraceptive long	4914	4028	82	
8	skilled delivery	658	954	144	
9	Syphilis screening	658	1994	303	

When we compare ANC4th with Addis Ababa and Akaki Kality Sub City >100% Addis Ababa also 98% Woreda seven >100% it is more than Addis Ababa and Akaki kality sub city

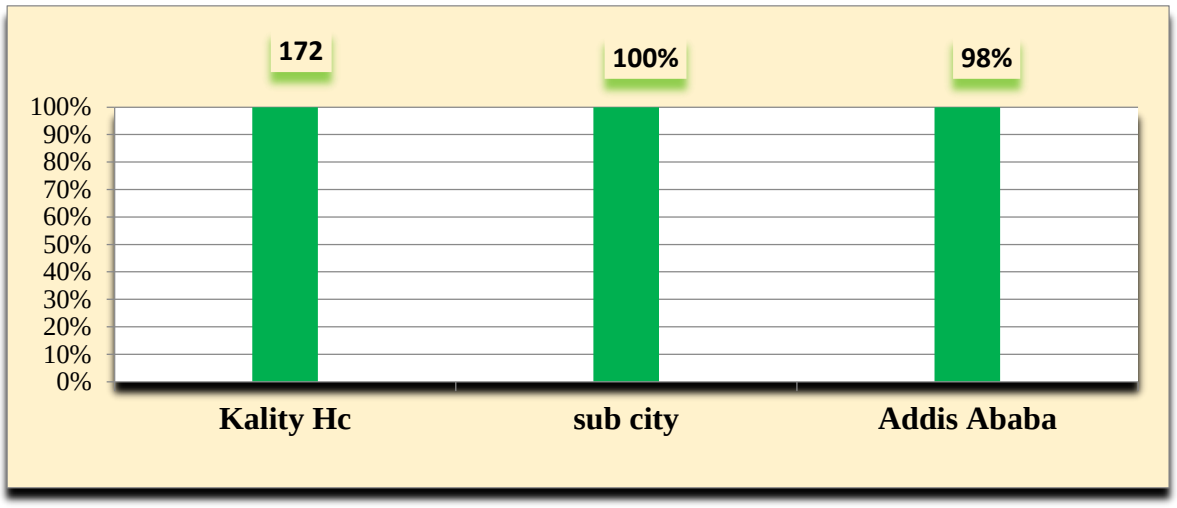


Figure 31: Antenatal Coverage in Woreda 7 Kality Hc as Compared Addis Ababa and Sub City 2016.

When we compare Contraceptive acceptance rate with Addis Ababa and Akaki Kality Sub City 40.1% Addis Ababa also 38% Woreda seven 35% it is lower than Addis Ababa and Akaki kality sub city.

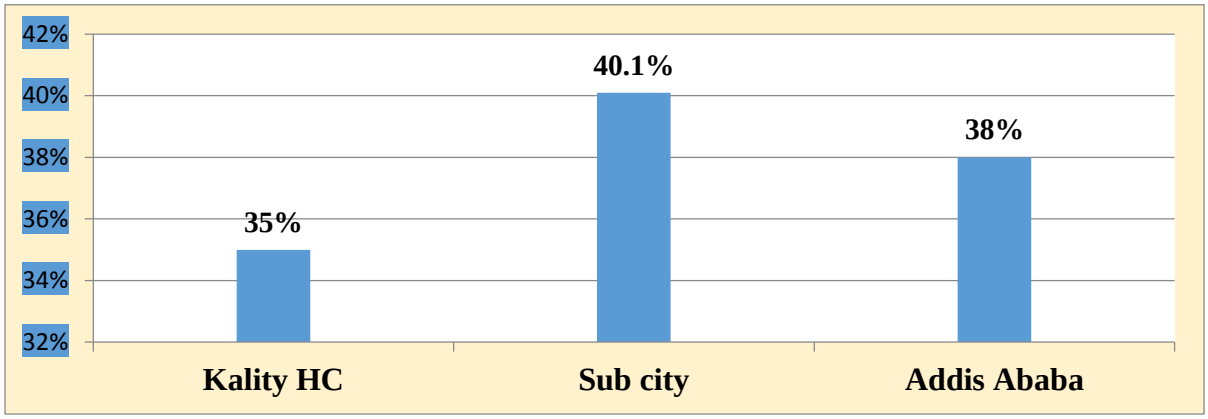


Figure 32: Contraceptive Acceptance Rate in Woreda 07 Compared Sub City And Addis Ababa 2016.

Environmental Health and Availability of Safe Water

In the Woreda there are 6919 household but the households' latrine, solid waste management disposal system in their household and liquid waste management disposal system not known but I have get an information from health extension workers and In order to achieve the Woreda environmental health and hygiene there were 6642 households who use water pipe and make the Woreda safe water coverage 98%. Woreda 7 Administration is the large industry zone among eleven Woreda selected for special Woreda from Sub City. The health extension workers are not sufficient to the Woreda population covers only 73% this lead to spicily at ketene six and ketene eight environmental sanitation is poor over all solid and liquid management, safe water supply and latrine coverage have clear limitation.

Table 22: Environmental Sanitation and Availability of Safe Water in 2016

Sr.no	Description	Number	%
1	Total house hold	6919	
2	Number of latrine	5881	85
3	Number of house hold without latrine	1037	15
4	Number ketene access to safe water supply	9	100
5	Number of house hold access to safe water supply	6780	98
7	Total factory in the Woreda	107	100
8	Sewerage system of the factory	69 are good and 38 are bad	64.4%
9	Coverage HEW in the Woreda	11	73%

Health Education

Health education was given to the community on different topics such as ANC, PNC, post abortion care, EPI, F/P, STD, HIV/AIDS and others health problems for a total of 75,123 in 2016 at different places like at health facilities, schools during associations and others meeting and so on.

Endemic Diseases

Nine Ketena of the Woreda are under risk of malaria infection throughout the Year with a 28,370 of total Population Under risk and the total malaria Case/Year Was 69. The malaria prevention & control strategy in the Woreda shows sum activities by health extension professionals, no ITN provision, and no insecticide chemical spray. When we comparing malaria cases with other months there was an increase cases of p.vivx in month of feburary.the lowest cases of p.vivax seen May & October When we see p.faliciparium the case seen only in February, August & October.

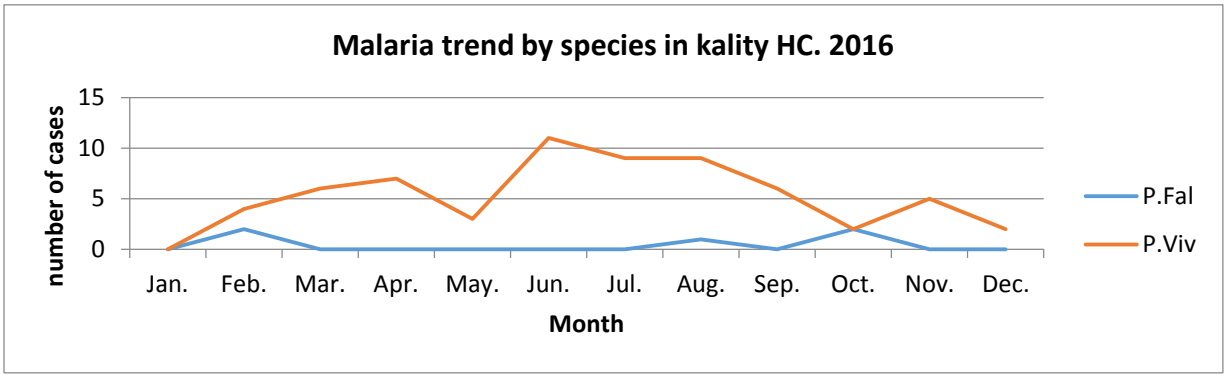


Figure 33: Trends of Malaria in Woreda 07 Akaki Kality Sub City by Month 2016. (Source: Kality Hc)

Zoonotic Disease of the Woreda

In the Woreda even though the number of cases was not clearly registered.

Tb and Leprosy

A total of 196 new TB cases were reported in the Woreda of this 44 %59) Pulmonary TB negative, 98 %(46) are pulmonary TB positive 100 %(50) are extra pulmonary TB cases. Number of new smear TB positive cases detected , among the new smear–positive TB cases estimated in the Woreda (TB detection rate) is 53.8%.in the Woreda from the total 196 TB cases 100 %(196) were screened for HIV.

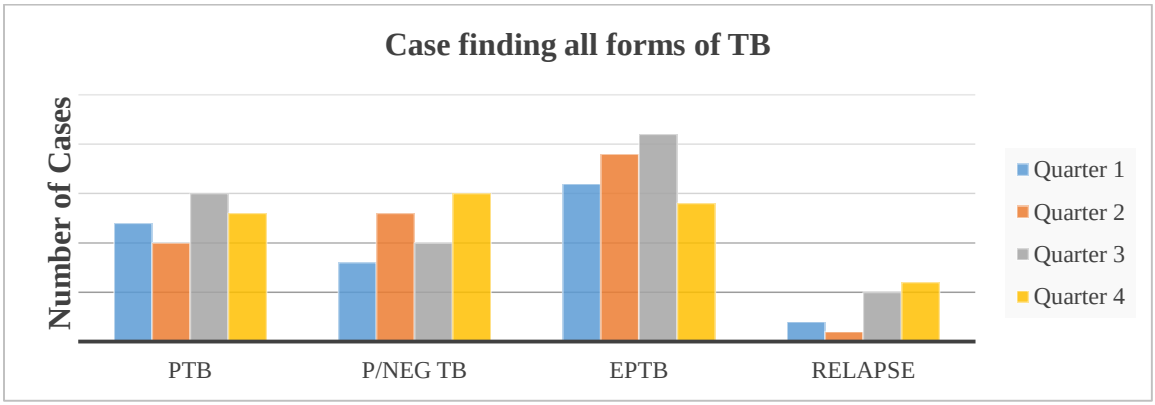


Figure 34: Case Finding of New TB Cases Kality Health Center in Quarters Of 2016 (source: Kality HC)

Table 23: TB/Leprosy Indicator, Woreda 07 Administration, Akaki Kality Sub City, 2016.

TB and Leprosy Indicator	Number	Percentage (%)
Total TB case	196	
PTB Negative case	46	98%
PTB Positive case	50	100%
Extra PTB case	72	100%
TB detection rate		53.8%
TB treatment completion rate	84	76%
TB cure rate	35	98%
TB treatment success rate	119	75%
TB defaulter rate	No data	22.2%
Death on TB Rx	3	2.8%
Total TB case screened for HIV	196	100.0%
HIV positive from screened Tb patients	6	5 %
New case of leprosy	No data	No data
Grade II disability rate among new cases of leprosy	No data	No data
Leprosy treatment completion rate	No data	No data

Immediately & Other Weekly Reportable Diseases

Nationally there 21 immediately and weekly reportable disease from this seven were seen at Akaki kality Woreda seven with different distribution the rest of 14 were not report in the health center from reported disease Typhoid fever, Dysentery and Typhus were the leading one 662 and 378 Respectively.

Table 24: Immediately and Weekly Reportable Diseases Woreda 07, Akaki Kality, 2016

PHEM immediately and weekly reportable disease	Case	Death
AWD	134	0
Measles	4	0
NNT	0	0
Malaria	69	0
Meningitis	0	0
Dysentery	378	0
RF	14	0
Typhoid Fever	662	0
Epidemic Typhus	375	0
SAM	51	0
MDSR	0	0

HIV/AIDS

In Woreda 07 Administration, Akaki kality sub city, kality health center is the only health center in the Woreda provides VCT integrated MCH, PMTCT and ART service to the public. As of in 2016 96 STI cases syndromically treated in the health center but there is no documented data whether they tested for HIV or not. On the other way, the health center provides PITC and VCT service for 2616 people in the same year. Of which 57(2.2%) were tested HIV positive. In the Woreda 3311 people live with HIV/AIDS and the prevalence is 5.3%. From the total 1522 positive cases 1407(36%) are enrolled in antiretroviral therapy (ART) and 115 are on pre ART stage.

Nutrition Intervention

Akaki 07 district is considered food secured area no supplementary feeding programs were established. The health center have outreach therapeutic program.

Essential Drug

In regards of essential drug, frequently used and available essential drugs in the health facility of Woreda 07 Administration to treat disease occurring and for prevention is Amoxicillin, Oral Rehydration Salt (ORS), Artemisia / Lumphantrine (Coartam), Mebendazole Tablets, Tetracycline Eye Ointment, Medroxyprogesterone (Depo-Provera) Injection, and Ferrous Salt Plus Folic Acid. Generally, no shortage of essential drug was encountered during the year in 2016.

Problem Identification and Priority Setting

In general, from our study as stated in the following table there are different problems identified in this Woreda. Among them Low family planning (CAR) Service utilization is the leading followed by Weak Management system (Planning, implementation, M&E) and HMIS (table26).

Table 25: Problem Identification and Priority Setting

	Identified Problems	Magnitude	Severity	Feasibility	Community Concern	Gov't Concern	Total	Rank
1	Weak Planning and implementation	3	4	5	2	4	18	2
2	Resource shortage (Human, transportation and other materials	3	2	3	4	4	16	4
3	Proper liquid & solid waste management System	3	4	4	2	4	17	3
4	Low family planning (CAR) Service utilization	2	4	3	5	5	19	1

DISCUSSIONS

Ratio of Health center to population reached 1:40,000 which was almost equivalent the national standard (1:40,000). The findings verified that; the potential health service coverage of Woreda reached 100%. This description is similar with the HSDP III target to attain 100 % of potential health service coverage at national level.

The assessment verified health professional to population ratio in 2016 were Health Officer-1:3077; Environmental Health Officer-1:15385; Nurse-1:1399, Mid Wife Nurse-1:5128; Pharmacy technician-1:4396; Medical Laboratory technician- 1:5128 and Health Extension Worker-1:2564.

Appropriate budget allocation is very important for quality health service. In 2016, Akaki Woreda seven health office received the second big slash of budget (34.5%) next to Akaki Woreda Seven Education, public Service Office (40.1%). This was above the WHO standard that declares >15% of the budget should be allocated for health care.

ANC1st and ANC4th services in Woreda seven is more than 100% of the expected plan of the Woreda Health office and it is similar result from Akaki Kality sub city. Therefore, all pregnant women in the Woreda seven registered by urban health extension professional in each Ketena and Other pregnant comes from out of Woreda seven catchment areas were receiving four focused Antenatal care visits.

Contraceptive acceptance rate of the Woreda seven is 35% that is below 50% of the 2016 Plan of Addis Ababa city Administration Health Beraue of 65% respectively. More than 100% of Woreda plan birth was attended by skilled health professional. This may be due to the Woreda health office plan were not considered populations who are not from Woreda Seven. The fully immunization coverage of the Woreda increases from 95% in 2015 to >100% in 2016.When we compare the fully immunization coverage in the same year for Akaki kality sub city, it is similar to Woreda seven >100% while the regional coverage were 98%. In general, this indicated that maternal health service delivery relatively better in Woreda seven in comparison with the sub city figure.

Acute upper respiratory tract infection was the leading causes of morbidity both in under five and general population 19.2%. Diarrheal disease and Pneumonia were also found to be an important

cause of morbidity in under five children. This finding is similar to the national top causes of morbidity. Unlike the national data, in Woreda seven Trauma is one of the top ten causes of morbidity in the sub city which can be explained by the urban nature of the city which makes it vulnerable with road traffic accidents and construction related traumas. There were AWD outbreaks in Woreda seven in 2016.

Due to no vital event registration in the Woreda data on top ten cause of mortality in adult and pediatric population in the health office and at the health facility is difficult to determine the main causes of mortality. The Woreda seven health office should also be supported by the higher level government entities and stakeholders to have less than one year, less than five year death and other death records for better planning and success.

Among TB cases reported in the Woreda 27.4% were Pulmonary TB negative, 30% were pulmonary TB positive, 42% were extra pulmonary TB cases. Among the new smear–positive TB cases estimated in the Woreda (TB detection rate) was >100% which is more than both the regional TB detection rate (90.6%) and national (58.6%) (6). TB treatment completeness and TB cure rate were 50% and 70% respectively. All TB patients were screened for HIV; out of those 3.5% were positive.

LIMITATION

- The death rate was not recorded in the district in 2016; because of this it was difficult to measure the death rate.
- The Woreda Administration office data could not be found from the main data base (source).
- Some of the experts from different offices in the Woreda have less knowledge of their office information.
- Getting appropriate person on time on their seat was very difficult.

CONCLUSION

- In Akaki Kality Woreda seven communicable disease like Acute Upper Respiratory Infection, Diarrhea and pneumonia were the leading causes of Morbidity in the Woreda are the most frequently occurring disease both in adult and pediatric population. This is directly related to lack of personal and environmental sanitation.
- In Woreda seven Trauma is one of the top ten causes of morbidity in the sub city which can be explained by the urban nature of the city which makes it vulnerable with road traffic accidents and construction related traumas.

- There was better health Service improvement in ANC follow up as well as in immunization coverage.
- Poor vector control activity and low Family planning in the Woreda was observed.

RECOMMENDATION

- The Woreda health office is better to work strongly on sanitation to solve future problems of the community.
- The Woreda has to work with other stakeholders to increase family planning Coverage
- It is better to Increase the number of Urban Health Extensions to Scale Up the coverage of primary health care in the Community.

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CHAPTER V – SCIENTIFIC MANUSCRIPTS FOR PEER REVIEWED JOURNALS

Surveillance Data Analysis of Dysentery, Akaki Kality Sub-city, Addis Ababa, Ethiopia, 2012-2016

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ABSTRACT

Background: Dysentery affects all ages, but is more serious in children. In Ethiopia, dysentery is monitored through routine surveillance with a weekly reporting from all levels of the health system. We described the magnitude and characterized cases by place, person, and time

Method: we defined suspected cases as a person with diarrhea with visible blood in stool and confirmed cases as suspected case with stool culture positive for Shigella dysentery. We reviewed the surveillance data during 2012-16 from the Sub-City surveillance system to characterize cases. We analyzed surveillance data and described proportion of cases. Data extracted from the surveillance record included personal characteristic of cases, geographic and trend of cases.

Results: We identified a total of 8,667(cases with 1,733 average cases per year. Admission rate was 119(24 cases per year). The Overall prevalence was 4% with increasing trend and zero case fatality rate. Highest and lowest number of cases were reported from Woreda seven (7%) and Woreda five (1%), respectively. Highest number of cases were reported between June and August which is the Ethiopian rainy season and water contamination is high due to flood.

Conclusions: We observed the seasonality of Dysentery in the study area. We proposed focusing on dysentery prevention from June to August. We recommended improving the water quality and sanitation in the community.

Key words: - ***Dysentery, Data analysis, Surveillance, Addis Ababa Ethiopia***

BACKGROUND

Dysentery is an infectious gastrointestinal disorder, characterized by inflammation of the intestines, mainly the colon. WHO defines dysentery as any episode of diarrhea in which there is blood in loose and watery stool. Dysentery can mainly spread among people through contaminated food and water as well as poor sanitation. Humans are the only natural reservoir for the disease[1].

Shigella species are the common cause of bacterial diarrhea worldwide, especially in developing countries[2]. The estimated annual incidence of *Shigella* episodes worldwide is about 164.7 million, of which 163.2 million cases have occurred in developing nations, resulting in 1.1 million deaths[3]. According to Centers for Disease Control and Prevention (CDC) 2012 GC reports, Compared with the previous 10 years (2002–2011), a larger portion of Shigella infections in 2012 were reported from January through March[4]. During 2012, the highest incidence rate of Shigella infection was in children under 5 years old. Among ages 0 to 4 and 40 to 49 years, males had a higher incidence rate of Shigella infection than females. Among ages 5 to 29 and ≥80 years, females had a higher incidence rate of Shigella infection than males. In the remaining age groups (30–39 and 50–79), incidence rates were relatively similar (i.e. ≤10% difference) among both males and females[4].

Health service records and community-based surveys in the past years indicate that diarrheal diseases are major causes of morbidity and mortality in Ethiopia[5] It is the fourth leading causes of child mortality in the country followed by Pneumonia, Neonatal conditions, and Malaria espectively. According to the report of FMoH, About 472,000 Ethiopian children die each year before their fifth birthday of which 20% is attributed by diarrhea[5].

In Benishangul Gumuz Regional State, a prevalence of diarrhea is 22.1% in 2014 [6]. The prevalence of diarrhea for under-five children in Debrebirehan referral hospital was found 31.7% in 2014[7]. According to the study conducted in Mekele in 2015 the prevalence of Shigella was 13.3 % among this high prevalence of Shigella was revealed from the age group of 12–23 months (22.6 %) [8]. According to EDHS, 2011 Ethiopian prevalence of diarrhea was 13 percent in under five children and 3 percent diarrhea with blood [9].

METHODOLOGY

We reviewed documents from Sub City and District Health Office to compiled five years Surveillance data of Dysentery from 2012- 2016. We defined a suspected case of dysentery as occurrence of diarrhea with visible blood in stool. Average population under surveillance was 213,429 (48.5% Male and 51.5% Female). Dysentery case reports received from a total of 92 Health Facilities (governmental 11, private 81). All reported dysentery cases (confirmed and clinically treated), confirmed dysentery cases, dysentery outpatients, inpatients and deaths due to dysentery are included in this study. We entered collected data in to Microsoft excel 2010 to perform analysis in terms of place, time and person.

RESULT

Magnitude of dysentery prevalence by place

From 2012 to 2016, a total of 8667 dysentery cases were reported. As presented in the graph below the highest portion of prevalence was reported from Woreda Seven (7%) followed by Woreda six (5%) & Woreda one (5%).

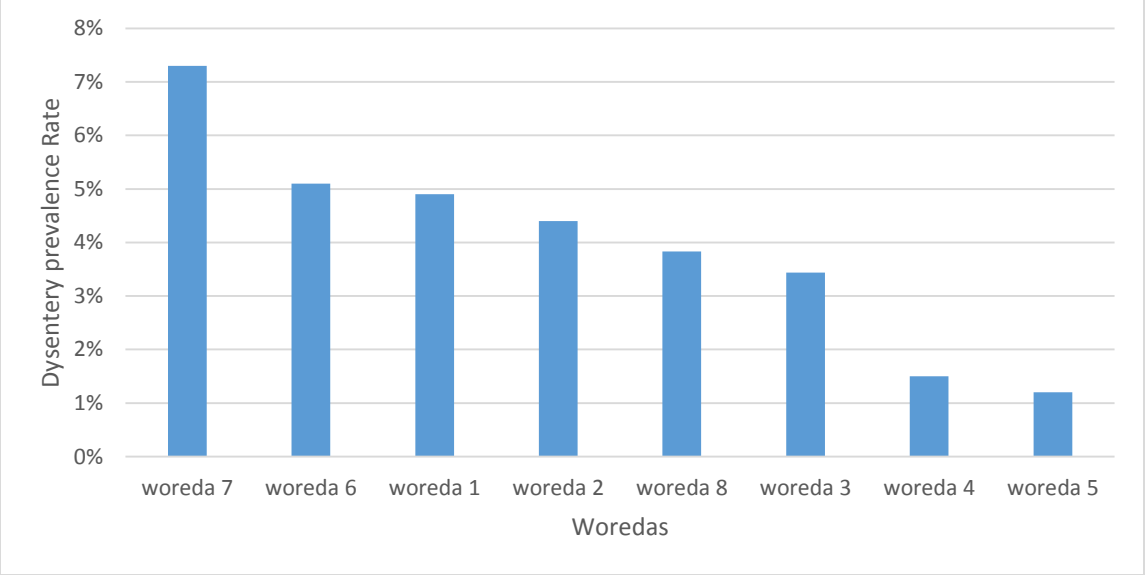

Figure 35: Distribution of Dysentery prevalence by Woreda Akaki Kality 2012 to 2016

Description of dysentery cases in Akaki sub city by Time

Within the last five years, the highest number of cases were reported in 2016 and the lowest number of case were reported in 2014.

Table 26: Dysentery cases reported during the five years (2012-2016) period in Akaki kality

Years	Population at Risk	Number of dysentery total cases reported	Out patient	In patient	Total death	prevalence rate
2012	202,761	1767	1765	2	0	0.87
2013	207,959	1919	1889	30	0	0.92%
2014	213,292	1046	987	59	0	0.49
2015	218,761	1646	1646	0	0	0.75
2016	224370	1985	1985	28	0	0.88
Total		8,667	8,548	119	0	4%(Average)

The Figure below shows the number of dysentery cases reported by month. The highest number of cases occurred from June to August in 2014, 2015 and 2016. In 2012, the highest number reported is in February and March and in 2013, the highest is in March and April. The lowest number of cases reported in the majority of the reporting periods was from October to December. (Figure 40)

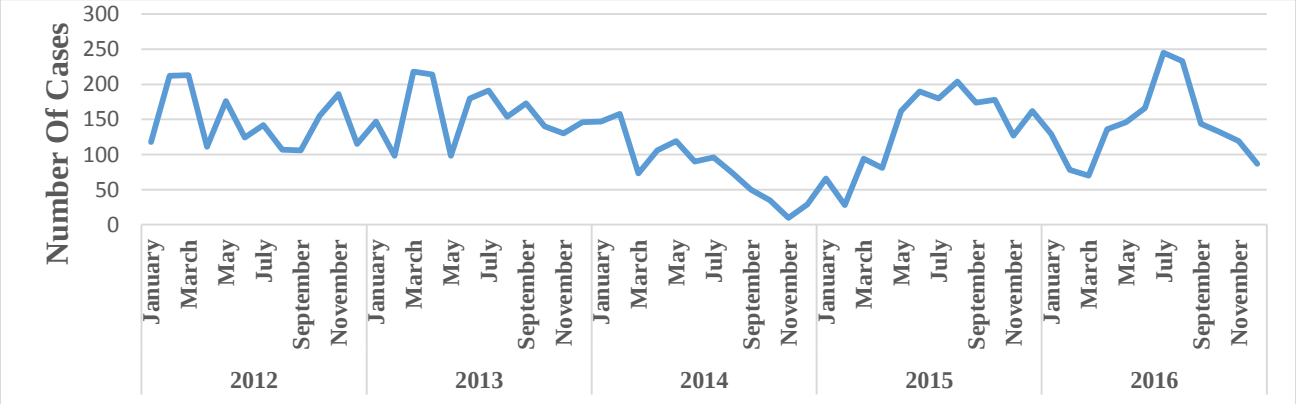

Figure 36: Trends of Dysentery cases by month in AACA, Akaki Kality sub city 2012 to 2016.

As shown in line Figure below, When we describe the trends of Dysentery using epidemic week those cases reported in 2016, the peak case were reported in week -31 which was 10 fold from the national thresholds and occurs during the epidemic weeks and also comparing from the previous weeks in the same year it shows marked increment in week -31 which showed an outbreak of dysentery probably left unnoticed in that year since there is no evidence recorded regarding the outbreak in both Akaki Kality sub city and Addis Ababa regional health bureau public health emergency department. The number of cases by week is highest at week 31, as shown below for the year 2016. In 2016, the number of cases declined significantly starting from week 6 (Figure 39).

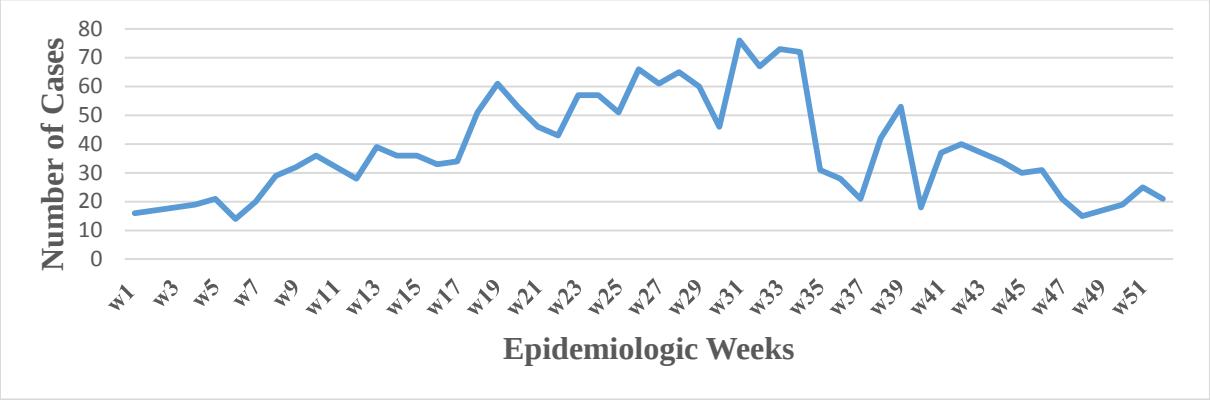

Figure 37: Trends of dysentery cases reported by time in Akaki Kality, Addis Ababa, 2016

Prevalence Rate of dysentery in Akaki Kality Sub City, Addis Ababa

From the graph below which shows the five-year trends of dysentery cases which were reported in the sub city, we can identify that there is an increasing dysentery case from year to year with highest and lowest cases reported in 2014 and 2016 respectively. The lowest in 2014 with prevalence rate 0.49 % the highest is in 2013 with the prevalence rate of 0.92% and there was no reported case of death.

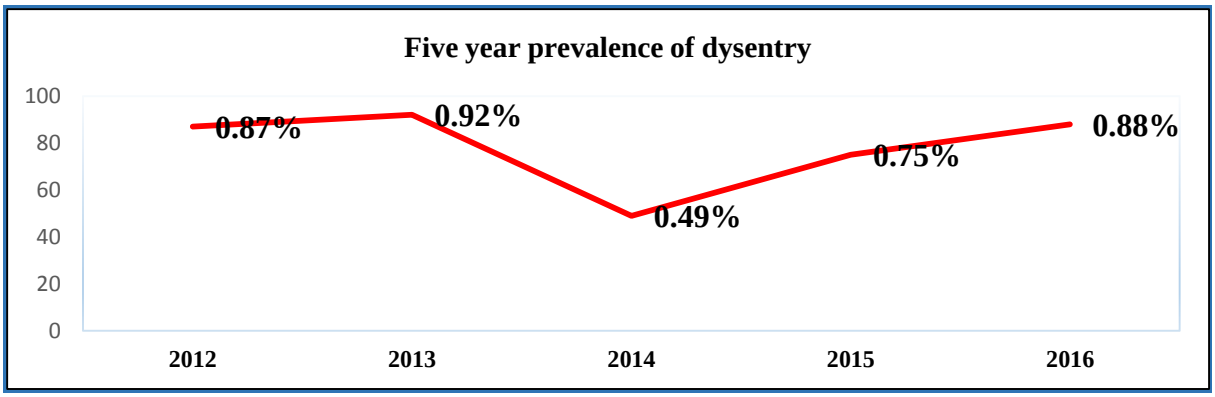

Figure 38: Prevalence Rate of dysentery in Akaki Kality Sub City, 2012-2016

DISCUSSIONS

As this surveillance data analysis shows the Five years (2012 to 2016) trend of dysentery cases at Akaki Kality sub city were increasing from Year to Year which needs the managerial discussion and decision to reduce the case. According to the report of FMoH, About 472,000 Ethiopian children die each year before their fifth birthday of which 20% is attributed by diarrhea. Its prevalence is mainly caused by access to safe water, sanitation, and hygiene problems. Only 55% of the general population has access to safe water and that percentage drops to 35% for those in rural areas. This lack of access to safe water and adequate sanitation increases the morbidity and mortality from diarrheal disease [5]. Our study shows, the highest dysentery cases were reported in rainy season of Ethiopia indicating the seasonality of the disease. This is due to the presence of flooding and contamination of water and food in this season and Akaki Kality Sub City is highly vulnerable for such conditions because of presence of many factories contaminating water and risky irrigation practice. The burden of dysentery case in the sub city is 0.87%, 0.92%, 0.49%, 0.75% and 0.88% from 2012-2016 respectively which becomes increasing from time to time. The overall prevalence of Dysentery in Akaki kality Sub City was 4% which is less than Benishangule Gumuz(21.1%)[6]and Mekele (13.3)[8]. Compared to the other years, the prevalence of Dysentery was high in 2016 indicating unnoticed outbreak. The sub city surveillance reporting format didn't incorporate relevant variables like age, sex, that were not accessed from AARHB, PHEM department. This Surveillance data were collected from those Health facilities actively reporting. There were private health facilities those are not reporting this could decrease the actual number of the cases.

CONCLUSION/ RECOMMENDATION

Despite the fact that there is a plan to improve the health of the community & to reduce the burden of these preventable diseases like dysentery still there is a continuous increment of year to year in the sub city. In 2016 the Higher number of dysentery cases occurs during the rainy seasons, Some districts such as district seven and one have very high proportion of dysentery cases that requires further study on why these districts have higher cases. We recommended revision of reporting format to incorporate person variable (sex, age). Improving water and sanitation service is needed. Strengthen regular supervision and inspection of food and drinking establishments. All private health facilities need to report Dysentery cases to respective surveillance system. Further study is needed to identify the possible factors associated with seasonal variability of dysentery cases.

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CHAPTER VI- ABSTRACTS OF SCIENTIFIC CONFERENCES

Surveillance Data Analysis of Dysentery, Akaki Kality Sub City, Addis Ababa, Ethiopia, 2012-2016

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Background: Dysentery affects all ages but is more serious in children. In Ethiopia, dysentery is monitored through routine surveillance with a weekly reporting from all levels of the health system. We described the magnitude and characterized cases by place, person, and time.

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Key words: - ***Dysentery, Data analysis, Surveillance, Addis Ababa Ethiopia***

Word count: 215

Outbreak investigation of Scabies, Dembiya District, North Gondar Zone, Amhara Region, Ethiopia, November 2017,

Authors: Girma Birhanu[1], Ahmed Ali[2], Girma Taye[2]
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ABSTRACT

Background: Scabies affects people of all countries, particularly, children in developing countries are most susceptible, with an average prevalence of 5–10%. It is very common in Ethiopia, especially during natural or manmade disasters, such as flooding, drought, civil war and conflict, poor water supply and sanitation, and overcrowding living condition.

Methods and materials: We conducted 1:2 unmatched case-control study from August 28-November 2, 2017 in Dembiya District, North Gonder Zone Amhara Region. 40 Cases and 80 controls were randomly selected from the community. Data was collected using structured questionnaire. Analysis was made using Epi Info and SPSS software. Odds Ratio, 95% CI and P-value were used to measure the significance of association in bivariate and multivariate analysis. Variables with p value of equal to or less than 0.05 were reported to be significantly associated with dependent variable.

Results: We identified 141 Scabies cases with over all attack rate of 2% and Zero case fatality rate. Of reported cases 55% of them were Male and the median age of affected population was 16yrs (IQR= 19yrs). Sex (AOR: 0.4, 95% CI: 0.1-0.7), Hand washing with soap (AOR: 0.6, 95% CI: 0.1--0.6), Body bath more than a week (AOR: 1.5, 95% CI: 1.2-4.1), Cloth exchange with infected person (AOR: 3.1, 95% CI: 2.0-4.0), contact history (AOR: 17.0, 95% CI: 13.4-20.0), water shortage (AOR: 3.3, 95% CI: 2.4-4.5) were significantly associated with scabies.

Conclusion: we found poor hygienic practices, sharing of clothing materials, sleeping with contracted scabies associated with higher frequency of scabies disease. Therefore, increasing awareness creation about the transmission, prevention and control methods of this scabies disease is recommended.

Key words: Scabies, case-control, Dembiya, Ethiopia, 2017

CHAPTER VII- PROTOCOL /PROPOSAL FOR EPIDEMIOLOGIC RESEARCH PROJECT

Assessment of Prevalence and Associated factors for diarrheal disease among under five children in Akaki Kality Sub city, Addis Ababa, Ethiopia, 2018.

Addis Ababa University Faculty of Medicine School Of Public Health Master of Public Health

Research Project

This Proposal Submitted to the School of Public Health Addis Ababa University in

Partial Fulfillment of the Requirements for the Degree of Masters in Field Epidemiology.

Name of investigator	Girma Birhanu
Name of advisors	Prof. Ahmed Ali & Dr.Girma Taye
Full title of the research project	Assessment of Prevalence and Associated factors for diarrheal disease among under five children in Akaki Kality Sub city, Addis Ababa, Ethiopia, 2018.
Duration of the project	Three Months
Study area	Akaki Kality Sub City Administration
Total cost of the project	2,331.62 USD
Address of the investigator	Phone 0937450410 Email- abeniz2003@gmail.com

EXECUTIVE SUMMARY

Background: Diarrheal disease is the second leading cause of death for children under five years old and it is responsible for killing around 760,000 under five children every year worldwide. As estimated by WHO more than 90% under- five diarrheal disease is due to poor sanitation, poor hygiene, and unsafe drinking water. The under-five diarrheal prevalence is 13% in Ethiopia overall the country and 9.4% in Addis Ababa.

Objectives: The aim of this study is to assess the Prevalence and Associated factors for diarrheal disease among under five children in Akaki Kality Sub city, Addis Ababa, Ethiopia, 2018.

Methods: A community based cross sectional Study design will be conducted. Data collection will be started in August 2018 and the final study finding will be submitted in October 2018. The study sample size is determined by single population proportion formula. Since the under-five diarrhea prevalence in Addis Ababa is 9.4% according to EDHS 2011, the 9.4% proportion is used. Therefore, at 95% confidence level, and 5% margin of error, the sample size is calculated and using simple random sampling method 448 households that have at least one under five children are selected as sample. Data will be collected using a pre-tested questionnaire by public health professionals.

Estimated Budget: To complete this study 2,331.62 USD will be required.

Key words: - Prevalence, diarrhea, risk factor, under-five, Akaki Kality.

BACKGROUND

Diarrhea is defined as the passage of three or more loose or liquid stools per day. It is usually a symptom of an infection in the intestinal tract, which can be caused by a variety of bacterial, viral and parasitic organisms. Diarrhea is a rare occurrence for most people who live in developed countries where sanitation is widely available, access to safe water is high and personal and domestic hygiene is relatively good. World-wide around 1.1 billion people lack access to improved water sources and 2.4 billion have no basic sanitation. Data from over 50 countries show low levels of hand washing in many countries [(1).]

There is on average 2.9 episodes of diarrhea per child per year and it is responsible for an estimated 1.87 million deaths among children under 5 years of age [(2).]It occurs worldwide. WHO estimate that more than 90% under five diarrheal diseases is due to poor sanitation, poor hygiene, or unsafe drinking water [(3).] Worldwide diarrhea causes about 11% of under-five deaths with nine-tenths of these deaths occurring in Sub-Saharan Africa. Sub-Saharan Africa is where 1 in 3 children in the world is born and rapid growth of under-five population is occurring. In Sub-Saharan Africa 1 in 9 children dies before age five, more than 16 times the average for developed regions [(5).]

In Ethiopia, 13 percent of children under age five were reported to have had diarrhea, and 3 percent had diarrhea with blood. It was most common among children age 6–23 months (23-25 percent). Diarrhea prevalence is highest among children residing in households that drink from unprotected wells (18%), those residing in rural areas (14%), and children residing in BenishangulGumuz and Gambela (both 23 percent). In Addis Ababa the prevalence is 9.4% [(6).] More than half of the households in Ethiopia (57 percent) have access to an improved source of drinking water, with a much higher proportion among urban households (94 percent) than among rural households (46 percent). Only 4 percent of households use improved toilet facilities that are not shared with other households, 11 percent in urban areas and 2 percent in rural areas [(7).]

Hand washing may seem simple; it is one of the most important factors in stopping the spread of germs and staying healthy. Washing hands after using the bathroom, before and after preparing and

Eating food, whenever hands are visibly soiled, and more frequently during times of illness can help stop the spread of disease from person to person [8]. Hand washing with soap, especially after defecation reduce diarrhea morbidity by 44%. The more households washed their hands with soap after defecation, the less they had diarrheal diseases [9]. Hand washing with soap shows a reduction in diarrhea by 42–48%. Using improved water source reduces diarrhea among children under five children by 7%. Sanitation has effect of 36% reduction [10]. Simple hygiene behaviors, especially hand-washing with soap, have been suggested to reduce the occurrence of water-washed infections [11]. Though studies on the relationships between WASH factors and the occurrence of diarrhea in under-five children have been conducted and documented elsewhere, but there is a limited resource in Ethiopia, specifically in mothers and care givers of Akaki Kality sub city, Addis Ababa City administration.

Statement of the Problem

Globally diarrheal disease is the second leading cause of death in under-five year children and it account for one in nine child deaths worldwide. It is responsible for 1.7 billion morbidity and 760, 000 mortality of children every year and kills 2,195 children every day more than malaria, measles, and AIDS combined [1, 4]. About 88% of diarrhea-associated deaths are attributable to unsafe water, inadequate sanitation, and insufficient hygiene. Most diarrheal germs are spread from the stool of one person to the mouth of another. These germs are usually spread through contaminated water, food, or objects [12].

Human excreta can contain over 50 known bacterial, viral, protozoan and helminthes pathogens. The majority of excreta-related infections are obtained through ingestion, less often through inhalation. Excreta-related infections travel through a variety of routes from one host to the next, either as a result of direct transmission through contaminated hands, or indirect transmission via contamination of drinking water, soil, utensils, food and flies [2].

The majority of child deaths occur in poor countries of Asia and Africa (90%), where safe water, sanitation and access to urgent medical care are limited [13]. In Africa 9% of childhood deaths are associated with diarrhea which remains the second leading cause of under-five mortality attributed to poor water, sanitation and hygiene [14].

Ethiopian DHS 2011 shows that there is high prevalence of under- five childhood diarrhea country wide (13%) as well as in Addis Ababa (9.4%) [6].

Addis Ababa is one of the cities where there are many in-migrants resulting in severe overcrowding, shortage of housing, shortage of water and sanitation service and high unemployment rate exist. The city

water supply authority can supply 350,000 cubic meters water per day out of the total demand of 670,000 cubic meters according to special bullet on December 2015. Therefore because of this gap there exists intermittent supply leading to cross contamination due to leakage, deterioration etc. in the supply chain and also because of this intermittent the community are forced to store water for their daily consumption and this can expose to contamination to house hold level and even there is still open defecation in the city because sanitation coverage is 57% in according to health bureau 2015 report and also according to the document presented by FMOH on training on the second health transformation plan in September 2016 ,the urban Health extension program was not as effective as rural extension program to improve the community health.

Akaki Kality sub city is an industrial area and infrastructures are found more scattered and rarely available, aggravating the health problem of the local community, especially children. Majority of the inhabitants of Akaki Kality sub city are migrants, coming from other regions and rural areas of the country in search of jobs in the factory and are daily laborers. The sub city is characterized by densely populated slum houses with no improved water sources and proper waste disposal system Akaki Kality Health Office 2015[(30)]. Therefore, this study will provide the important information on the status of diarrheal disease in Akaki Kality and what are the major exposing factors among under Five Children.

Significance of the Study

As several studies have shown, the causes of child mortality and morbidity in developing countries is multi-factorial. Interventions for improving the quantity and quality of domestic water supply, ensuring the use of improved sanitation and safe hygiene practices, can reduce diarrhea prevalence by one-third or more [(19)].

Therefore, it is very important to assess the prevalence and associated factors for diarrheal disease to children's health condition. Very limited information on the magnitude and effects of socio-economic and environmental factors is incorporated in few studies conducted on childhood diarrhea. As primary caregiver to under-five children in Ethiopia, mothers'/care givers 'water handling, sanitation and hygiene practice are important to minimize the effects of morbidity and mortality associated with diarrheal diseases. Determining the association of these factors with childhood diarrhea helps to find possible intervention methods. So, this study will have important policy implications for WASH and under-five childhood diarrhea intervention programs and with a view of adding to the existing body of knowledge in the study area in particular and in the country in general. Furthermore the result of this study may use to other researcher for hypothesis development and reference.

Literature Review

Prevalence of Under- Five Children Diarrheal Morbidity

Worldwide diarrheal disease is the second leading cause of death in under-five year children and it account for one in nine child deaths worldwide. It is responsible for 1.7 billion morbidity and 760, 000 mortality of children every year and kills 2,195 children every day more than malaria, measles, and AIDS combined [(1)].

Evidence from 51 countries around the world showed existence of substantial variation in diarrhea prevalence across countries from 4.5% in Maldives to 26.2% in Bolivia. Households that used a shared toilet facility in most countries the prevalence of diarrhea was higher. Countries in Africa, those that use a shared toilet had a 10–32% higher prevalence of diarrhea than those that do not use a shared toilet. The prevalence of diarrhea was 10% lower among households that used a non-shared improved facility compared with facilities that were shared but otherwise improved [(20)].

In Ethiopia, according to the 2011 Ethiopian Demographic Health Survey, the prevalence of diarrhea among children under age five was reported as 13 percent. In Addis Ababa the prevalence was 9.4% [(6)]. A comparative study conducted in Hawassa, Southern Ethiopia reported the prevalence of diarrhea in under five children is 40(9%) in model and 61 (14%), in non-model HHs [(16)]. The same study done in Sheko district, Southern Ethiopia, shows the occurrence of diarrheal disease among children‘s whose families were non-model for health extension program was 25.5%, which is much more common than children‘s whose families were model for the program was 6.4% which is much less than the study conducted in Hawassa [(15)]. Another study conducted in Mecha District, west Gojam, Ethiopia showed 18.0% prevalence of diarrhea among under-five children [(8)]. A facility based cross sectional study in Debrebirehan Referral Hospital revealed that the prevalence of diarrhea in under-fives was 31.7 percent [(17)]. Studies done showed the diarrhea prevalence among children aged under- five was 32.6% in rural Burundi and 21% in Ghana [(21, 22)]. A study in Assosa District, Western Ethiopia showed one-third (33.2%) of under-five children had diarrhea during the past two weeks prior to the study [(22)].

The comparative study in Hawassa showed maternal diarrheal morbidity, covering drinking water collection container, covering drinking water storage container and maternal education as being risk factors related to under -five diarrhea [(16)].

Diarrheal Morbidity and Socioeconomic Factors

Children living in households without latrine facilities were about 92% more likely to develop diarrhea than children living in households with such facilities. The odds of getting diarrhea in children whose mothers had diarrhea increase in fivefold (8). Also children whose mothers can‘t read and write were more likely to have diarrhea when compared with children whose mothers were literate [15].

Only 4 percent of households in Ethiopia use improved toilet facilities that are not shared with other households, 11 percent in urban areas and 2 percent in rural areas. Eight percent of households (31 percent in urban areas and 1 percent in rural areas) use shared toilet facilities. The vast majority of households, 88 percent, use non-improved toilet facilities (97 percent in rural areas and 58 percent in urban areas). The most common type of non-improved toilet facility is an open pit latrine or pit latrine without slabs, used by 58 percent of households in rural areas and 44 percent of households in urban areas [7].

Several studies revealed that the age of the under-five child has effect on the prevalence of under-five childhood diarrhea, that is the likelihood of diarrhea in the two week period reaches its peak at 12–23 months of age and began to fall after 24 months of age [8,22,23]. Another study showed that the risk of diarrheal morbidity being higher at age categories of 6–11 months and 12–23 months and lower on the age of 24 months and above compared to 0–5 months of age [25]. With more similar fashion study in Indonesia reveal the diarrhea prevalence is higher in 6-11 month (12.4%) and 12-23 month (11.7) aged children and is lower in 48-59 month (4.6%) age group [18].

Maternal education status is highly associated with under five diarrhea prevalence; children whose mothers can‘t read and write were more likely to have diarrhea when compared with children whose mothers were literate [15, 21, 23]. Similarly study in BenshanGul-Gumiz regional zone, North West Ethiopia shows children of none educated mothers were about two times more likely to have diarrhea when compared to children of mothers who had primary education and above [24]. A prospective study in Bolivia showed for care givers having 5-10 years of formal education was protective for childhood diarrhea [25]. The income level is also has association; children in the poorest wealth quintile are at higher risk than those in the poor quintile and poor quintile worse than the middle quintile and so on [15, 17, 22].

About mothers occupation children whose mothers were private workers were about two times more likely to had diarrhea compared to children whose mothers were housewives [17].

An observational study in rural Bangladesh reported households with mothers/care givers having formal education greater than grade 7 and having better wealth index were significantly associated with less child diarrhea [26].

Diarrheal Morbidity and Water handling, Sanitation and Hygienic Practices

A prospective case-control study conducted in Ibadan, Nigeria identified six important risk factors that could predispose under- five children to the incidence of diarrhea. The factors include: poor drinking water handling; lack of hand- washing with soap at critical times specifically after defecation and before food preparation; clogged drainage around or near the house; breeding places for flies/insects near the house; and total hygiene practice level [11]. Under five children Diarrhea is a rare occurrence for most people who live in developed countries where sanitation is widely available, access to safe water is high and personal and domestic hygiene is relatively good [4].

According to the data from nationwide inventory of sanitation facility the 2014 sanitation coverage status in Ethiopia is 73% of urban and 77% of rural population used unimproved sanitation facilities, with 8% in urban and 43% in rural communities practicing open defecation. In Addis Ababa only 11.4% in the urban slums and 41.2% of the city had access to improved sanitation. Most people in the urban slums 80.4% used unimproved sanitation facilities and 8.2% practiced open defecation. Dry pit latrines (improved pit latrines and pit latrines) are the most common and widely used toilet facilities in Ethiopia [27].

According to Mini-EDHS 2014 more than half of the households in Ethiopia 57% have access to an improved source of drinking water, with a much higher proportion among urban households (94%) than among rural households 46%. The most common source of improved drinking water in urban households is piped water, used by 87 percent of urban households [7].

Studies had showed a remarkable difference of childhood diarrhea among children that whose mothers/care givers not practiced hand washing at critical times with soap were more likely to develop diarrhea when compared to children whose mothers/care givers were practiced hand washing at critical time with soap [15,28] . Observational study in rural Bangladesh showed the importance of washing hands with soap and without and not washing hands. Children who lived in households where mothers/care givers observed at least one hand washed with soap after defecation experienced substantially less diarrhea compared with children who lived in households where only one hand was washed with water after

defecation. In households where food is preparing without washing hands children had diarrhea in 12.5% of monthly assessments compared with 8.3% in households where one hand was washed with water only, 6.9% where both hands were washed with water only, and 3.7% where at least one hand was washed with soap [28] . Washing hand with soap had showed a reduction in diarrhea by 42–48%; Water quality improvements can be expected to be associated with a reduction of some 17% in diarrhea risk and improving sanitation reduces diarrhea risk by about 36% [10]. Study conducted in Assosa District showed only water source for the communities, placement of water-storage container, and knowledge of mothers to have a strong statistically significant association with prevalence of diarrhea. Under-five children who use from unprotected water sources have 8 times higher odds of having diarrhea than those who use from protected sources [22]. Only 4 percent of households in Ethiopia use improved toilet facilities that are not shared with other households, 11 percent in urban areas and 2 percent in rural areas. Eight percent of households (31 percent in urban areas and 1 percent in rural areas) use shared toilet facilities. The vast majority of households, 88 percent, use non-improved toilet facilities (97 percent in rural areas and 58 percent in urban areas). The most common type of non-improved toilet facility is an open pit latrine or pit latrine without slabs, used by 58 percent of households in rural areas and 44 percent of households in urban areas [7]. A study conducted in Benin shows that more than 49 % of the household used unimproved water sources for their daily needs, only 8.7 % of the household had improved sanitation facilities at home and 9.7 % had improved hygiene behavior [28].

A population-based study conducted in Indonesia to show an independent association between lack of an improved latrine and under-five child mortality showed that lack of an improved latrine has association with both histories of under-five child diarrhea morbidity and mortality [18]. Children from those households who had no toilet facility are about six times more likelihood to have diarrhea than children from households who had toilet facility [23]. Evidence from demographic and health survey on child feces disposal shows among mothers 4.72 % reported their child used latrine for defecation while 27.84 % of children‘s stools were put/rinsed into toilet/latrine [29] . Several studies revealed that maternal history of recent diarrhea had a significant association with under- five childhood diarrhea [8, 17]. In another study in Debrebirehan town shows maternal diarrheal diseases were significantly associated with childhood diarrheal diseases [17]. The analysis from a population-based study conducted in Indonesia showed about a 60% reduction of childhood diarrhea in households who disposed the stool of children in a safe way than those children from households who disposed stool in an unsafe manner [24]. A community based cluster randomized trial conducted to assess the effectiveness of household water treatment with chlorine in reducing diarrhea among children under-five years of age in rural of Ethiopia shows that, household

water treatment has a 58% overall reduction in the incidence of diarrhea. Household water chlorination reduces diarrhea disease burden in 63% and 53% among children 24 to 47 months and 12 to 23months respectively but the reduction was lesser in 0 to 11 month children (44%) (30).

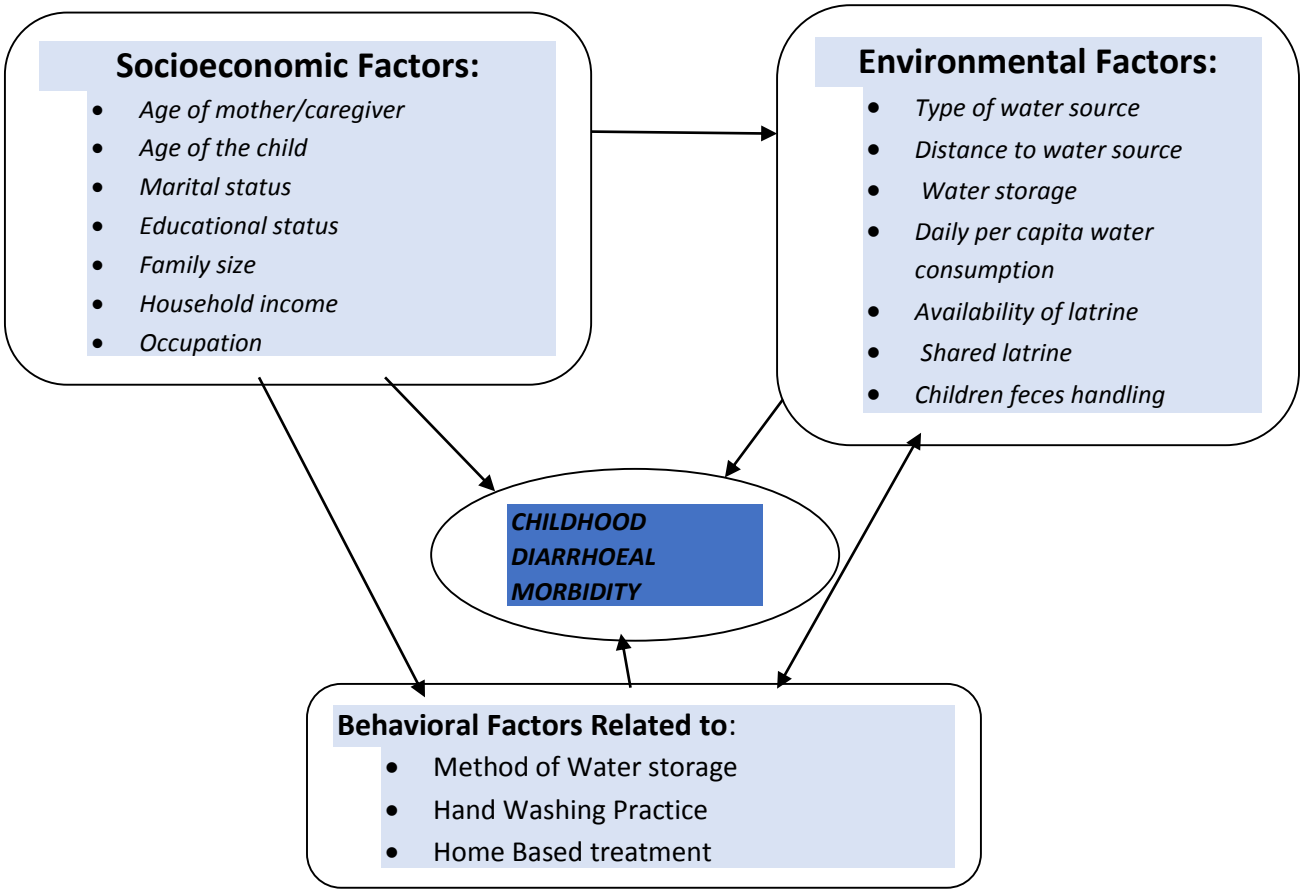

Figure 39: Conceptual framework of potential determinants of childhood diarrheal morbidity

OBJECTIVE

General Objective

- To assess the Prevalence and Associated factors for diarrheal disease among under five children in Akaki Kality Sub city, Addis Ababa, Ethiopia, 2017.

Specific Objectives

- To measure the prevalence rate of under-five childhood diarrhea in Akaki Kality Sub City.
- To identify factors associated with diarrheal diseases

METHODS & MATERIALS

Study Area and Period

We will conduct the study in Akaki Kality Sub City, which is one of the ten sub cities in Addis Ababa city Administration with a total population of 229,082 of which women account for 52.4% according to the projected population of CSA 2016 report. The annual population growth rate is estimated to be 2.1 %. Youths from 15-24 are 28.1% and women of child bearing age contribute for 34.6 %. The sub city has 8 governmental and one NGO health center together with 92 private different level clinics which are performing both curative and preventive services. The study period is February, 2018 to October 2018.

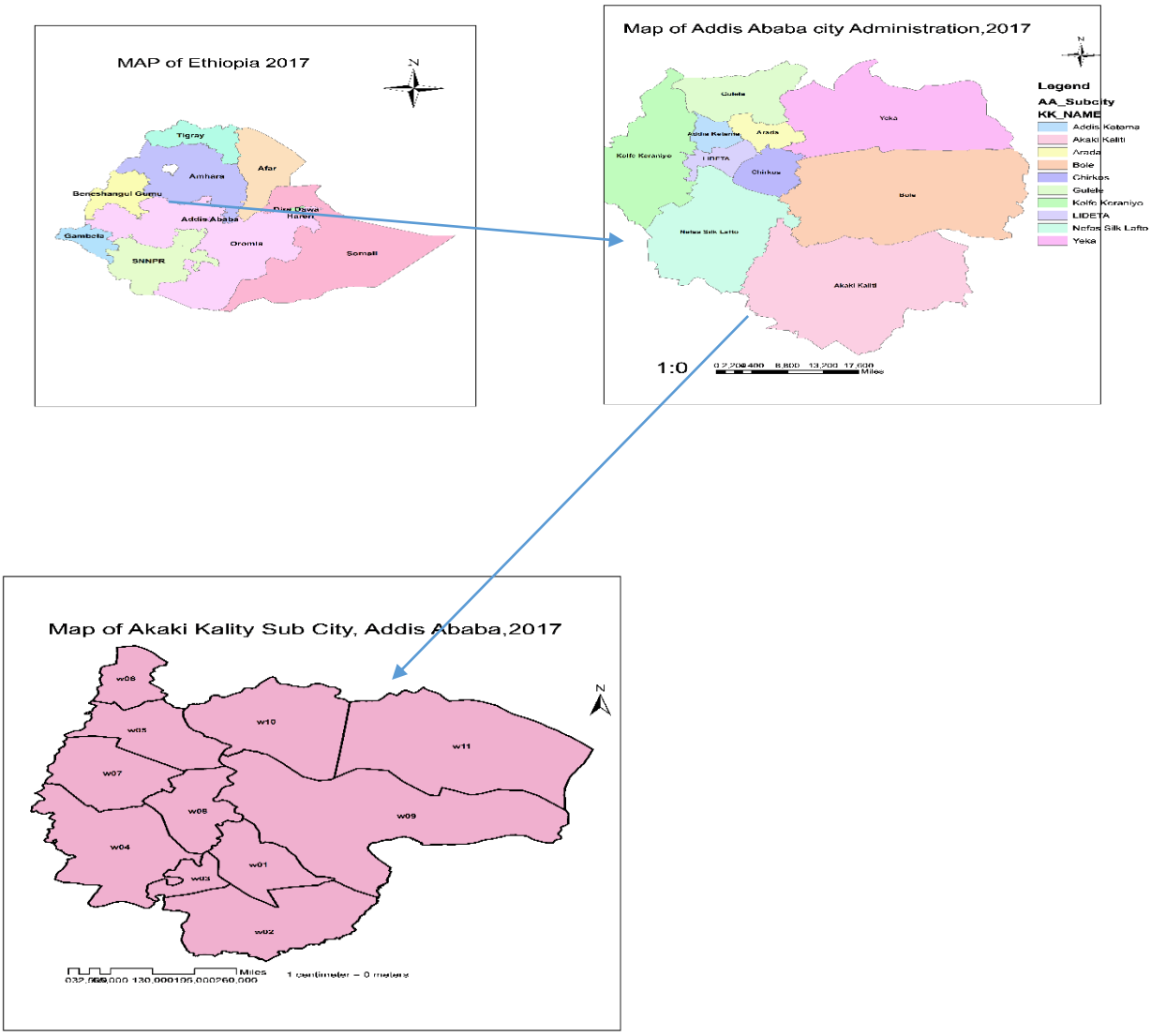

Figure 40**: Map of Akaki Kality Sub city, Addis Ababa, Ethiopia, 2018**

Study Design

A community based cross sectional Study design will be conducted in Akaki Kality Sub-City; Addis Ababa to determine the Prevalence and Associated Factors for Diarrheal Diseases among Under Five Children of Akaki Kality Sub City.

Source Population

All under five children in Akaki Kality **S**ub City.

Study Population

Selected Mothers/ caregivers of under five children in the Sub City will be selected randomly.

Sample Size determination

The study sample size is determined by single population proportion formula. Since the under-five diarrhea prevalence in Addis Ababa is 9.4% according to EDHS 2011, the 9.4% proportion (9.4% of the respondents 'under-five years old children considered to be having diarrhea and 90.6% of the respondents 'under-five years old children considered to be not having diarrhea within two weeks prior to the data collection) is used. Therefore, at 95% confidence level and 5% margin of error, the sample size is calculated below.

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

Where:-

n=sample size

p= 0.094 assumed proportion of diarrhea among under five years old children. The proportion of 9.4% was considered for this study because of the Addis Ababa's under-five childhood diarrhea prevalence from the 2011 Ethiopian Demographic and Health Survey.

d= 5% (Margin of error)

Table 27: Sample size calculation

Sr.no	Study finding Variables	P	q	Z	Z*Z	d	d*d	Single-population proportion Sample size	Non-response	NRR	Total sample size
Objective 1	Diarrhea prevalence (In Addis Ababa) (Ethiopia 2015	0.094	0.906	1.96	3.8416	0.05	0.0025	$n=Z^2 (p\times q)/w^2$	131	10%	13	144
Objective two	Mother Education (Debirebirhan 2014)	0.164	0.836	1.96	3.8416	0.05	0.0025	$n=Z^2 (p\times q)/w^2$	211	10%	21	232
	Washing practice with Soap (Debirebirhan 2014)	0.061	0.939	1.96	3.8416	0.05	0.0025	$n=Z^2 (p\times q)/w^2$	88	10%	9	97
	Types of toilet(Shared) (Ethiopia 2015)	0.063	0.937	1.96	3.8416	0.05	0.0025	$n=Z^2 (p\times q)/w^2$	91	10%	9	100

From the above table, to achieve our objectives we will use the variables with larger sample size. Hence including 10% Non-respondent rate the final sample size will be 232.

Sampling method

Simple Random sampling technique will be employed. In Akaki Kality sub city there are 8 Health centers. All the Woreda will be included in the study. The mothers who bring her child to under five clinics will be selected randomly and interviewed.

Data Collection Tools and process

The data will be collected at health facility level for seven days. Eight data collectors will be selected from health professionals and half day orientation will be given to them. Structured questionnaire which is adopted from different literature and edit as our objectives will be converted to local language (Amharic) to minimize language barrier. The data collectors will interview the randomly selected participant using questionnaire. One supervisor for two data collectors will allocated to follow the process. One coordinator will control the overall process.

Inclusion and Exclusion Criteria

Inclusion criteria

- Mothers of age 15-49 years who had child of under-five in the Akaki Kality Sub City.

Exclusion criteria

- Children accompanied other than mother or constant care giver will be excluded**.**
- Seriously ill children at where mother is not able to give information due to stress of her child illness will be excluded.
- Mother accompanied child but has mental problem will be excluded.

Study Variables

Dependent/outcome variables

- Diarrhea among under five children within the past two week prior to the study

Independent/explanatory variables

- Socioeconomic/ demographic status (includes family economic status, maternal/care giver age, education, ethnicity, number of children, marital status, religion etc.)
- Environmental factors (include type of water source, distance to the water source, amount of daily water consumption, method of water drawing and storage, availability of latrine, type of latrine, hand washing and the like)

Data Analysis

Data entry, cleaning, editing and analysis will be done using SPSS statistical software version 23. The frequency distribution of all variables will be examined to check for data entry errors (e.g. unrecognized or missing codes, out of range values). Degree of association between dependent and independent variables for each variable will be computed and expressed by OR, and P value. Independent variables which had statistically significant association with the presence or absence of diarrhea diseases will be identified. The data will be described and presented using narrative text, charts, graphs and tables.

Data Quality Control Methods

To ensure the quality of data, first the questionnaire will be pretested. The pretest will be conducted in 5% of the participants at randomly selected sub city away from the study sub city. Training will be given for the data collectors and supervisors before the actual data collection. Every day after data collection, questionnaires will be reviewed and checked for completeness, accuracy and clarity by the supervisors and principal investigator. If there is any incomplete information it will be excluded from the entry.

Operational Definition

- **Diarrhea:** is defined as having three or more loose or watery stool in a 24-hour‘s period in the household within the two weeks period prior to the survey, as reported by the mother/caretaker of the child.
- **Prevalence of diarrhea**: the total number of diarrhea cases at the time of the interview divided by the total number of under-five children included in the study area.

Ethical Considerations

Ethical clearance will be obtained from the Institutional Review Board of Addis Ababa University College of Health Sciences, school of Public health. Formal letter will be written to Akaki Kality Sub City from School of Public Health and this official written letter will be distributed to all Woreda. Verbal consent will be obtained from each study participants. Confidentiality will be maintained by omitting their names and personal identification. Study participants have the right to participate on the study or not and they can withdraw at any time of the study they wish. There is no risk to the study participants because of this study other than taking their time for interview not more than 10 minutes.

Data dissemination

The study result will be disseminated to Addis Ababa City Administration Health Beraue, Akaki Kality Health office. One day briefing will conduct in Akaki Health Office staffs related to the study result.

Work plan and Budget

This study is planned and Budgeted of three-month duration to conducting from pre preparation of proposal, to data collection, analyze and the major activities and implementation that will be done throughout project with estimated cost of that needed. See in table-2. And will be overseen by the collaboration of National and Regional Public Health Emergency Management (PHEM) department.

Work Plan

Table 28: work plan for the assessment of prevalence and risk factors associated with diarrhea among under five Children in Akaki Kality Sub City, Addis Ababa, Ethiopia, 2018.

Sr.No	Activity to be performed	Responsible Person	February	March	April	May	June	July	August	September	October
1	Topic selection	Mentors and Principal Investigator									
2	Proposal. Development	P.I									
3	Prop. defense and submission	P.I									
4	Ethical clearance from AAU and respective study sites	P.I & R.P									
5	Preparation of supplies and tools	P.I									
6	Selection and training of data collectors	P.I									
7	Pre-test of questionnaire	P.I									
8	Data collection	D.C									
9	Data entry and cleaning	P.I									
10	Data analysis and result writing	P.I									
11	Submission of thesis up to result to advisors and coordinator	P.I									
12	Submission of thesis all part to advisors and coordinator	P.I									
12	Final thesis submission	P.I									
13	Thesis defense	P.I									
14	Dissemination of report	P.I									

Key: P.I = Principal Investigator, R.P= Responsible Person, D.C. = Data Collection

Budget

Table 29: Budget Breakdown for Personal cost, Equipment's and supplies cost, Transport and Communication cost and the Total Cost

Personnel costs					
Title	Qualification	Number of personnel	Rate in Birr	Duration of work in days	Total cost
Training of supervisors and data collectors	health professionals	2	10.54	1	21.48
	health professionals	8	3.63	1	47.27
Data collection	health professionals	8	10.54	10	843.20
Supervisor	health professionals	4	10.54	10	421.60
P.I	Researcher	1	10.54	15	158.1
Sub total					**1,491.65**

Equipment and Supplies				
Category	Units	Quantity	Unit cost	Total cost
Printing	Page	2	9.09	18.18
Duplication	Page	4000	0.36	145.45
Stapler	Number	1	5.45	5.45
Staples	Pack	4	0.54	2.18
Eraser	Number	15	0.18	2.72
Pen	Number	15	0.18	2.72
Marker	Number	15	0.72	10.90
Pencils	Number	15	0.18	2.72
Binder	Number	15	1.81	27.27
Note book	Number	15	0.72	10.90
Sub Total				**228.54**

Transport and Communication				
Category	Unit	Quantity	Unity cost	Total cost
Cell-phone Card	Card	5	3.63	18.18
Vehicle	trip	7	55.55	381.80
Sub total				**400.00**
TOTAL BUDGET OF THE PROJECT				
1. Subtotal cost for personnel				1,491.65
2. Subtotal cost for materials and supplies				228.00
3. Subtotal cost for transport and communication				400.00
4. Contingency (10%)				211.97
Grand total				**2,331.62 USD**

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CHAPTER VIII – OTHER ADDITIONAL OUTPUT REPORTS / WORKS

Trainings Provided on Residency times in Akaki Kality Sub City, 2017-2018

Program Specific Trainings

Akaki Kality Sub City Health Office (PHEM) in collaboration with the Addis Ababa City Administration Health Beraue organized on job training for Woreda and health center public health emergency management focal persons.

Training days were from 23-28/03/2017, Training venue, CCRDA training hall, Participants were selected from Akaki Sub City Health office, 11 health centers, 1 Hospital and 90 Health Extension Workers.

General Objective:

- To strengthen Public Health Emergency Management activities, such as Risk assessment, Early Warning, Preparedness, prompt response, and rehabilitation at the Woreda and Facility Level.

Specific Objectives

- To introduce PHEM core process guide lines.
- To develop baseline data, determine resources needed and information on health sector emergency preparedness.
- Understand the steps of outbreak investigation and management.
- To improve the ability of health workers to detect and respond to priority communicable diseases.
- To strengthen the capacity of HF to conduct effective surveillance activities.
- To create linkage between the community and health delivery system.
- To reduce mortality and disability by ensuring proper case management.
- To improve the use of information for decision making,
- To improve timeliness and Completeness of weekly PHEM report.

The main training Topics were: -

- Early Warning & Emergency Communication
- Public Health Risk Assessment
- Public Health Emergency Preparedness
- Public Health Surveillance & lab. Investigation
- Priority Reportable diseases & case Definitions
- Community Surveillance
- Responding to an Outbreak
- Post Epidemic Evaluation
- PHEM Formats & Reporting systems

- Monitoring & Evaluation

Methodology

- Power point Presentation
- Participatory/Two way
- Experience sharing
- Group work and Discussion
- Pre & Post- test Evaluation

Topics we prepared and presented were List of Priority diseases, Case Definition of priority diseases and Preparedness.

Engaged in Weekly PHEM Bulletins preparation each week together with other public health emergency management officers.

PHEM Sub City Review Meeting

We have attended PHEM annual review meeting from August 15-19, 2018.

Supportive supervision on PHEM

PHEM specific Supervision from October 10-24/2018 11 districts of Akaki Kality Sub City and 9 Health Centers.

Participate in 1st EFELTP Annual Scientific Conference

I attended the 1st EFELTP Annual Scientific Conference in Addis Ababa from 27-30 June, 2017. The five days Conference provided a platform for hundreds of participants including trainees and graduates from various Field Epidemiology and Laboratory Training programs to benefit from oral and poster presentations presented. Presenters, key note speakers, public health professionals and trainees from Field Epidemiology and Laboratory Training Programs from Eight Universities attended the Conference and Exhibition. The Conference was concluded on a high note, with a closing ceremony at the TOT Hotel in which representatives from the various groups presented dances reflecting a variety of cultures. Awards and certificates were given to the best oral and poster presenters and different contributors for the success of Conference.

ANNEXES

Annex 1: Data collection tools for case control study on scabies

Case status: Case _____Control_____

Patient Name_____ Code____ date of Data collection_____ Zone ----------
---------- Woreda_____ kebele_____Gote_____

I. **Socio-demographic Characteristics**

S. No	Questions	Alternatives
1.1	Sex	1.Male 2.Female
1.2	Age	years___ Months_____
1.3	Resident	1. Urban 2. Rural
1.4	Religion	1 orthodox 2. Muslim 3. Protestant 4. Others
1.5	Occupation	1.farmer 2.civil servant 3.student 3.house wife 4.merchant 5.other
1.6	Educational status	
1.7	Marital status	1. Single 2.married 3.divorced 4. Widowed
1.8	Family size	_____
1.9	Is there any sick person with scabies in family?	1. Yes 2. No
1.10	If yes, number of sick person	_____

II. **Clinical History of Diseases:**

2.1	Do you have any itching or rash in your body?	1.Yes 2.No
2.2	Which sign and symptom did you experience first?	1. Itching 2. Rash
2.3	Date of onset of	1.Itching----------(dd/mm/yy) 2.Rash ---------- (dd/mm/yy)
2.4	During at what time the itching intense?	1.At day 2.At night

2.5	Can you see scabies lesion on infected person?		1.Yes 2.No
2.6	If yes, how many is there?		1. Mild (5 or less) 2.moderate (6-10) 3. Severe (11-49) 4. very severe(50 and more)
2.7	Which body part is mostly affected?	1.finger webs 2.ulnar border of the hand 3.elbow 4.wrist 5.anterior axillaries line	6.umbilicus 7. inter gluteal area 8.genital (male) 9.inner aspects of thighs 10.face palm and sole(children)
2.8	What type of skin lesion?		1. Nodular 2. pustules
`2.9	Is there filled sores or crusted sores over the scabies lesion?		1. Yes 2. No
2.10	Did you take treatment?		1.Yes 2.No
2.11	If yes, what type?		1. Ivermectine 2. BBL 3.Sulphur 4.premethrine

III. Risk factors

3.1	Did you have been infected Previously?	1.Yes2.No 3.Unknow
3.2	With whom do you sleep?	1.Alone2.wife/husband 3.brother/sister 4.friend
3.3	Has the person whom you are sleeping with contracted scabies	1.Yes 2. No
3.4	How often you take shower?	1,2-3 days 2,weakly 3,more than a weak
3.5	What do you use detergent to take shower?	1.Water only 2.water with soap other
3.6	Do you wash your clothes?	1.Yes 2.No
3.7	If yes, when do you wash your clothes?	1. Weakly 2. more than a weak
3.8	Have you put on clothes of someone who was diseased in the previous 6 weeks?	1, Yes 2,No
3.9	When do you change your clothes that you wear now?	1.everyday 2.weakly 3.more than a weak

3.10	Is there any shortage of water to wash your body and clothes?	1.Yes 2.No
2.11	What is the source of water for your drinking?	1.Pipe2.well3.spring 4.river

IV. Knowledge of patient on Scabies like illness

1	Do you hear about scabies?	1.Yes 2.No
2	From whom did you heard	1.Friends 2.Family member 3 HEW 4 Teacher 5. Health workers
3	Do you know the causes of scabies?	1.Yes 2.No
4	If Yes? What it is?	
5	What are the Signs and symptoms of scabies?	1. Itching 2, skin lesion 3, Don't know 4.
6	How do you think this disease transmit from person to persons?	1,.Contact with infected patient 2, sleeping with infected person 3. Don't know 4.Other(specify)----------

Annex 2: Data collection tools for surveillance system evaluation

SUB CITY LEVEL QUESTIONNAIRE

Identifiers: --------- Date: ----------Respondent name: ----------

Responsibility: ----------

A. Surveillance system

1. Is there national guideline?	1. Yes 2.No 3. Not applicable 4.Unknown
2. Do you have standard case definitions for the Country's priority diseases like relapsing fever?	1. Yes 2.No 3. Not applicable 4.Unknown
3. Is the central level responsible for providing surveillance reporting forms to the health facilities?	1. Yes 2.No 3. Not applicable 4.Unknown
4. If yes, have you lacked appropriate surveillance forms (Line list, weekly reporting form, and epidemic reporting form, rumor investigation) at any time during the last 6 months?	1. Yes 2.No 3. Not applicable 4.Unknown
5. What are the reporting entities for the surveillance system?	1. Public health facilities 2. NGO health facilities 3. Military health facilities Private health facilities 4. Others (Specify)_____
6. Percent of woreda reports (either directly or through an intermediate level) received during each reporting period at the central level during the past 1year:	
6.1. Number of reports in the last 1year compared to expected number (completeness)	No report----------expected----------
6.2. Weekly: /12 times the number of districts (timeliness)	
6.3. Immediately: /------ times the number of districts	
7. Was there any report of the immediately reportable diseases in the past 1 year?	1. Yes 2. No
8. If yes, with in what time is the report received after detection of the case/ diseases?	1. Less than 1 hour 2. 2-24 hours 3. 1- 2 days

	4. 3- 7 days 5. after 1 week
9. How do you report? (Multiple responses are possible)	1. Mail 2. Fax 3. Telephone 4. Radio 5. Electronic 6. Other (specify)_____
A. Data analysis	
1. Does the sub city level describes the data by age, sex, time and places:	1. Yes 2. No 3.Unknown 4.Not applicable
2. List disease(s) for which line graph is observed	1. 2. 3.
3. If they do not made analysis for relapsing fever ask the reason why they Don't	Reason------
4. Do you have an action threshold defined for, relapsing fever?	1. Yes 2. No
5. Who is responsible for the analysis of the collected data?	
6. How often do you analyze the collected data?	1. Daily 2. Weekly 3. Every 2 weeks 4. Monthly 5. Quarterly 6. as needed
7. Do you have appropriate denominators?	1. Yes 2. No
8. Do you give feedback for woredas?	1. Yes 2. No
9. If the answer is yes for Question 8, how often?	1. Daily 2. Weekly 3. Monthly 4 .Quarterly
B. Outbreak Investigation	
1. Percent of suspected outbreaks that were investigated in the past one year	_____ (# of suspected outbreak) _____ (# of investigated) _____ (%)
2. List the diseases:	_____
C. Epidemic Preparedness (relevant for epidemic prone diseases	
1. Existence of a sub city plan for epidemic preparedness and response	1. Yes 2. No 3. Unknown 4. Not applicable

2. Has the sub city had emergency stocks of drugs and supplies at all times in past one year (2016)?	1. Yes 2. No 3.Unknown 4.Not applicable
3. Has the Sub City experienced shortage of drugs, vaccines or supplies during the most recent epidemic (or outbreak)?	1. Yes 2.No 3.Unknown 4.Not applicable
4. Existence of standard case management protocol for relapsing fever	1. Yes 2.No 3.Unknown 4.Not applicable
5. Is there budget line for epidemic response?	1. Yes 2.No 3.Unknown 4.Not applicable
6. Does the Sub City have rapid response team for epidemic?	1. Yes 2.No 3.Unknown 4.Not applicable
D. Response to Epidemics	
1. Existence of standard case management protocol for relapsing fever	1. Yes 2.No 3.Unknown 4.Not applicable
2. Ability of the Sub City level to respond within 48 hours of notification of most recently reported outbreak	1. Yes 2.No 3.Unknown 4.Not applicable
3. How many feedback bulletins or reports had the Sub City level produced in the last year?	_____
4. How many supervisory visits have you made in the last one year?	_____
5. The most usual reasons for not making all required supervisory visits:	_____
6. Have you been trained in disease surveillance?	1. Yes 2.No 3.Unknown 4.Not applicable
7. If yes, specify when, where, how long, by whom?	
8. What percent of your subordinate personnel have been trained in surveillance?	_____
9. Have you received any post-basic training in epidemic management?	1.Yes 2. No 3.Unknown 4.Not applicable
10. If yes, specify when, where, how long, by whom?	
Percent of sites that have:	
1. Data management	1. Computer: 2. Printer: 3. Photocopier: 4. Data manager: 5. Statistical package
2. Communications	1. Telephone service: 2. Fax: 3. Radio call: 4. Satellite phone: 5. Computers that have modems
3. Logistics	
Surveillance	
1. Do you have computerized surveillance network at this level?	1. Yes 2.No 3.Unknown 4.Not applicable
F. Budget for surveillance	

1. Is there a budget line for surveillance in the Sub City Health Office?	1. Yes 2.No 3.Unknown 4.Not applicable
1. If yes describe total budget allocated	
3. How could surveillance be improved?	
G. Questionnaire for Attributes and level of Usefulness:	
1. Total population under surveillance	
2. What is the incidence / Prevalence of relapsing fever in your area/Sub City level?	Relapse fever _____cases _____Deaths _____
I. Level of Usefulness of the Surveillance System for these selected priority diseases	
Does the surveillance system help?	1. Yes 2.No
1. To detect outbreaks of these selected priority diseases early.	1. Yes 2.No
2. To estimate the magnitude of morbidity and mortality related to these diseases, including identification of factors associated with these diseases?	1. Yes 2.No
3. To permit assessment of the effect of prevention and control programs.	1. Yes 2.No
4. To Observe (confirm): interventions and diseases trends analyzed	1. Available 2.Not available
II. Describe Each System Attributes:	
i. Simplicity:	
1. Is the case definition of relapsing fever and case detection known by all level health professionals?	1. Yes 2. No
2. What are the organizations, which need to receive reports of the surveillance data?	
3. Do you feel that additional data collected on a case are time consuming?	1. Yes 2. No
4. How long it takes to fill the format.	1. <5 minute 2.-10-15minuts 3.->15 minutes
5. How long does it take to have laboratory confirmation of Relapsing fever?	1. <5 minute 2.-10-15minuts 3.->15 minutes
ii. Flexibility:	
1. Can the current reporting formats be used for other newly occurring health event (disease) without much difficulty?	1. Yes 2. No
2. Do you think that any change in the existing procedure of case detection, reporting, and formats will be difficult to implement?	1.Yes 2.No
iii. Data Quality:	
(Completeness of the reporting forms and validity of the recorded data)	
1. Are the data collection formats for these priority diseases clear and easy to fill for all the data collectors/ reporting sites?	1. Yes 2.No
2. Are the reporting site / data collectors trained/ supervised regularly?	1. Yes 2.No

3. Observe: Review the last months report of these diseases	A. Average number of unknown or blank responses to variables in each of the reported forms------ B. Percent of reports which are complete(that is with no blank or unknown responses) from the total reports-------
Acceptability	
1. Do you think all the reporting agent accept and well engaged to the surveillance activities?	1. Yes 2.No
2. If yes, how many are active participants (of the expected total)?	
3. If No, what is the reason for their poor participation in the surveillance activity?	A. Lack of understanding of the relevance of the data to be collected B. No feedback or recognition given by the higher bodies for their contribution; i.e. no dissemination of the analyzed data back to reporting facilities C. Reporting formats are difficult to understand D. Report formats are time consuming E. Other(specify):_____
v. Representativeness:	
1. What is the health service coverage of the sub city?	_____(#) _____%
2. Do you think, the population under surveillance have good health seeking behavior for these diseases?	1. Yes 2. No
3. Whom do you think the sub city is well represented by the surveillance data? What is the reason?	1. Urban 2. Rural 3. Equal
vi. Timeliness:	
Timeliness of reporting in the past one year (by sub city and Woreda	1. On time---------- 2. Late
vii. Stability:	
1. Was the new BPR restructuring affected the procedures and activities of the surveillance of these diseases?	1. Yes 2. No
2. Was there lack of resources that interrupt the surveillance system?	1. Yes 2. No

HEALTH FACILITY QUESTIONNAIRE

Identifiers:

Assessment team: **Type of health facility:**

Date: sub city:

Interviewer: Region/province:

Respondent: Country:

Name of health facility: Surveillance system:

1. Is there national manual for surveillance at this site?	1. Yes 2.No 3. Not applicable 4.Unknown
I. Case detection and registration	
2. Percent of health facilities that have a clinical register	1. Yes 2.No 3.Unknown 4.Not applicable
3. Percent of health facilities that correctly register cases filling of the clinical register during the previous 30 days	1. Yes 2.No 3.Unknown 4.Not applicable
4. Do you have a standard case definition for RF?	1. Yes 2.No 3.Unknown 4.Not applicable
II. Case confirmation	
5. At this facility are you able to collect	
Sputum:	1. Yes 2.No 3.Unknown 4.Not applicable
Stool	1. Yes 2.No 3.Unknown 4.Not applicable
Blood	1. Yes 2.No 3.Unknown 4.Not applicable
CSF:	1. Yes 2.No 3.Unknown 4.Not applicable
6. Observation: Observe the presence of materials required to collect	
Sputum:	1. Yes 2.No 3.Unknown 4.Not applicable
Stool:	1. Yes 2.No 3.Unknown 4.Not applicable
Blood/serum:	1. Yes 2.No 3.Unknown 4.Not applicable
CSF:	1. Yes 2.No 3.Unknown 4.Not applicable
7. Do you have the capacity to handle sputum, stool, blood/serum and CSF until shipment at this facility?	1. Yes 2.No 3.Unknown 4.Not applicable
8. Do you have Reagent to test relapse fever at this facility?	1. Yes 2.No 3.Unknown 4.Not applicable
9. Do you have functional microscope to test for relapse fever at this facility?	1. Yes 2.No 3.Unknown 4.Not applicable
10. Observation: Observe presence of functional cold chain at health facility	1. Yes 2.No 3.Unknown 4.Not applicable

11. Is there transport media for stool at health facility?	1. Yes 2.No 3.Unknown 4.Not applicable
12. Observation: Observe presence of packing materials for shipment of specimens at health facility	1. Yes 2.No 3.Unknown 4.Not applicable
III. Data reporting	
13. Have you faced lack of appropriate surveillance forms at any time during the last 1year?	1. Yes 2.No 3. Unknown 4.Not applicable
14. Is the last monthly report agreed with the register for relapse fever diseases; major public health importance Observation:	1. Yes 2.No 3.Unknown 4.Not applicable
15. Percent of sites that reported each reporting period to the next higher level during the past 1year	
Number of reports in the last 1year compared to expected number	Observe Weekly: /12 times the number of sites Observe immediately: /-- times the number of sites
16. On time (use national deadlines)	Number of weekly reports submitted on time:-_____ /12 times the number of sites Number of immediately reports submitted on time: ___/-- times the number of sites
17. How do you report?	1. Mail 4. Telephone 2. Fax 5. Radio 3. Electronic 6.Other(specify):_____
18. Strengthening reporting	
How can reporting be improved?	
IV. Data analysis Percent of sites that:	
19. Describe data by person, place and time	
20. Do you have an action threshold for any of the Country priority diseases?	1. Yes 2.No 3.Unknown 4.Not applicable
21. If yes, what is it (Ask for relapse fever diseases)?	_____cases ____ % increase _____rate
22. Who is responsible for data analysis?	_____
23. How often do you analyze the collected data?	1. Daily 4. Monthly 2. Weekly 5. Quarterly 3. Every 2 weeks 6 .As needed……..
24. Do you have appropriate denominators? Observe demographic data at site (E.g. population <5 yr., population by village, total population)	1. Yes 2.No 3.Unknown 4.Not applicable
V. Epidemic preparedness	
25. Is there written case management protocol for relapse fever epidemic prone disease?	1. Yes 2.No 3.Unknown 4.Not applicable

VI. Epidemic response	
26. Has the health facility implemented prevention and control measures based on local data for at least one epidemic prone disease?	1. Yes 2.No 3.Unknown 4.Not applicable
VII. Feedback	
27. How many feedback bulletins or reports has the health facility received in the last year? ___	
28. How many meetings has this health facility conducted with the community members in the past 1year	
VIII. Supervision:	
29. How many times have you been supervised in the last 1year?	
IX. Training	
30. Have you been trained in disease surveillance and epidemic management?	1. Yes 2.No 3.Unknown 4.Not applicable
31. If yes, specify when, where, how long, by whom?	
X. Resources Percent of sites that have:	
32. Logistics	1. Electricity 3. Motor cycles 2. Vehicles 4.Bicycles
33. Data management	1. Stationery 3.Computer 2. Printer 4.Calculator
34. Communications	1. Telephone 3.service Radio call 2. Fax 4.Computers that have modems
35. Information education and communication materials	1. Posters 2. Megaphone 3. Flipcharts or Image box 4. Projector (Movie 5. Screen 6. Generator
36. Hygiene and sanitation materials	1. Spray pump 2. Disinfectant
37. List Protection materials	_____
38. Are you satisfied with the surveillance system?	1. Yes 2.No 3.Unknown 4.Not applicable
39. If no, how can the surveillance system be improved?	_____

Annex 3: Data collection tools for health profile description

1. **Historical Aspects of the area (if available)**

- The name how and why_____
- How was the district formed_____
- Any other historical aspect_____

2. **Geography and Climate**

- Area of the district ----------
- Distance from ----------
- Altitude _____
- Latitude_____
- Average Annual rain fall _____
- Average Annual temp _____
- Land bodies_____
- Water bodies_____

3. **Demographic information**

- Total Population size----------
- male_____
- female_____
- urban_____
- rural_____
- Sex ratio_____
- Age structure: - percentage of children < 1yr ____<5yrs _____< 15 yrs -------
- Percentage of old people >65 years_____
- Women of child bearing age
- Percentage of pregnant women----------
- Dependency ratio_____
- Population size by religion
- Orthodox_____
- Catholic_____

- Protestant_____
- Muslim_____
- Others_____

4. **Estimated Population size by "ketena"**

Serial	Name of " ketena"	Population Male	population Female	Total
1				
2				
3				
4				
5				
6				
7				
8				
9				
	TOTAL			

5. Administrative setup

Total no. of kebele rural _____Urban_____

Wereda Boundaries_____

6. Health status

Number of health facilities

S/no	Type of Health facilities	Number	Ratio
1	Hospital Gov.		
2	Health center		
3	Private clinic		
4	Private pharmacy		
5	Gov. pharmacy		
6	Drug store		
7	Diagnostic laboratories		
8	Private hospital		
9	NGO Clinic		
10	NGO H/center		
11	Factory clinic.		

7. Man power of district health office and health facility in 2016

S/no	Type	Number	Ratio
1	Physicians		
2	Health officer		
3	Laboratory technician/technologist		
4	Pharmacy technician/pharmacist		
5	Nurse		
6	Midwife		

7	X-ray		
8	Sanitarian		
9	Hews		
10	Other health workers		
11	Supportive staffs.		

8. Top ten leading causes of OPD visit (morbidity) Akaki kality woreda 7 district, in 2016 G.C.

S/no	Adult	number	%	Pediatrics	number	%
1						
2						
3						
4						
5						
6						
7						
8						
9						
10						

9. Top ten causes of deaths (mortality).

S/no	Adult	number	%	Pediatrics	number	%
1						
2						
3						
4						
5						
6						
7						
8						
9						
10						

9. Vital statistics

- Infant Mortality Rate (IMR) _____ (total <1 yr deaths

  2006 E.C ……. 2007 E.C…… 2008 E.C… …….

- Child Mortality Rate_____ (this year's total <15 yr deaths

  2006 E.C ……. 2007 E.C…… 2008 E.C… …….

- Crude Birth Rate_____

  2006 E.C ……. 2007 E.C…… 2008 E.C… …….

- Crude Death Rate_____ (total deaths)

  2006 E.C ……. 2007 E.C…… 2008 E.C… …….

- Maternal Mortality Rate_____ (total maternal deaths)

  2006 E.C ……. 2007 E.C…… 2008 E.C… …….

- ANC rate (how many of the total expected pregnancies attended 1st ANC)

  2006 E.C ……. 2007 E.C…… 2008 E.C… …….

- ANC rate (how many of the total expected pregnancies attended 4th ANC)

  2006 E.C ……. 2007 E.C…… 2008 E.C… …….

- Percentage of deliveries attended by skilled birth attendants

  2006 E.C ……. 2007 E.C…… 2008 E.C… ……

10. MCH and EPI coverage of AKAKI 07 woreda in 2016

S/no	Description.	Percentage (coverage)	Remark
1	ANC FIRST		
2	ANC 4TH		
3	PMTCT		
4	Option B+		
5	PNC		
6	BCG		
7	MEASELES		
8	OPV O		
9	PENTA 1		
10	PENTA 3		
11	ROTA		
12	PCV1		
13	PCV 3		
14	FULLY VACCINATED		

15	TT2+ PW		
16	TT2+ NPW		
17	CONTACEPTIVE SHORT		
18	CONTRACEPTIVE LONG		

11. Environmental sanitation and availability of safe drinking Water in 2016

S/No	Description.	Number (%)
1	Latrine coverage	
2	Number of house hold with latrine.	
3	Safe water supply coverage.	
4	Number of ketenas accessed to safe water supply	
5		
6		

12. Malaria prevention and control program of Akaki 07 in 2016

S/No	Description	Number of population.
1	No of malarias areas.	
2	ITN coverage.	
3	Coverage of Insecticide chemical spray.	
4	Total number of case per year.	
5	Case fatality rate.	
6	Cases treated clinically.	
7	Cases treated based on lab finding.	
8	Plasmodium Falciparum	
9	Plasmodium vivax	
10	Mixed	
11	Other	
12	Supply(drugs)	
13		

13. Prevalence of TB/Leprosy:

S/No	Description		Population No. (%)
1	Prevalence of TB		
2	Pulmonary TB -	Smear positive	
		Smear negative	
3	Extra PTB		
4	TB detection rate		
5	TB Rx completion rate		
6	TB cure rate		
7	TB Rx success rate		
8	TB defaulter rate		
9	Death on TB Rx		
10	Total TB patients screened for HIV		

11	HIV prevalence rate among TB cases	
12	Prevalence of Leprosy	

14. HIV/AIDS;

S/no	Activities	Male	female	Total	Remark
	Total people screened for HIV				
	VCT				
	PICT				
	PMTCT				
	HIV Prevalence				
	Total PLWHIV				
	On ART				
	ON PRE-ART				
	Condom Distribution				
	Health education coverage				

Socio economic conditions

- Education and school Health

S/No	Type of School	Number School	Number of teachers	Male Students.	Female students.	Total student
1	Primary					
2	Secondary.					
3	Tertiary.					
4	College					

- School health activities:
  - ✓ schools with water supply_____
  - ✓ Schools with functional latrines _____
  - ✓ Schools with HIV/other Health clubs_____
  - ✓ Literacy ratio_____
- Employment
  - ✓ Number of people employed_____
  - ✓ Number of people un employed_____
  - ✓ Ratio of Employed to un employed_____
  - ✓ Income
- Main source of income
  - ✓ Agriculture _____ Civil servant _____ Others (specify)_____
- Yearly income per house hold_____
- Average income per capita _____

16. **Communication and Utilities**

How many of the health facilities have access to transportation_____ (%)

Telecommunication_____ (%)

Electric power_____ (%)

17. **Health sector expenditure and financing resource**

1. Total woreda budget

2. Allocated to health sector

3. Total per capital health expenditure

18. **Disaster situation in the wereda**

- Was there any disaster (natural or manmade) in the wereda in the last one year?

  YES (specify) _____

  No_____

- Any recent disease outbreak/other public health emergency?

  Yes (specify) _____

  No_____

- If yes cases_____ and deaths_____

19. **What do you think the major Health problem/s of the district?**

_____

_____

_____

_____

_____

20 What do you think solutions of the encountered addressed problems?

_____

_____

21. Discussion of the high lights and the main findings of the health profile assessment and description

22. Problem Identification and Priority Setting health problems based on the public health importance, magnitude, seriousness, community concern, feasibilities.

23. What are the main zoonotic diseases in the woreda?

a._____

b._____

c._____

d._____

Annex 4. Questionnaires for Epidemiological Research Project

Addis Ababa University; School of Public Health, Department of EFETP
The Questionnaire was prepared for Assessment of Prevalence and Associated factors for diarrheal disease among under five children in Akaki Kality Sub city, Addis Ababa, Ethiopia.

Hello. My name is _____ we are conducting the Assessment of Prevalence and Associated factors for diarrheal disease among under five children in Akaki Kality Sub city, Addis Ababa, Ethiopia in your Sub City. The information we collect will help the government to plan the health services. Your household is selected for the survey. The survey usually takes about 15 to 25 minutes. We do not write your name, all of the answers you give will be confidential and will not be shared with anyone. You have to right to disagree on the survey, but we hope you will agree to answer the questions since your views are important. If I ask you any question you don't want to answer, just let me know and I will go on to the next question or you can stop the interview at any time. Do you have any questions?

Are you willing to participate in the interview?

Yes

No (Thank and stop)

Name and Signature of interviewer _____

Date_____

Name and Signature of the supervisor _____

Questionnaires for Assessment of Prevalence and Associated factors for diarrheal disease among under five children

PART I. SOCIOECONOMIC CONDITIONS

First I would like to ask you some questions about your background information
Code---------

S/No	**Questions And Filters**	**Responses**
101	Relation of respondent to the child	Mother--------1 Caretaker-----2
102	Age of the mother/caretaker	
103	Marital status of the mother /caretaker	Married----1 Single----2 Divorced----3 Widowed----4
104	Religion of parents/caretaker	Christian---1 Muslim-----2 Protestant --------3 Other---4
105	Ethnic group of parents/ caretakers	Oromo----1 Amhara----2 Tigray-----3 Gurage----4 Others---------5
106	Educational status of mother/caretaker	Literate --------1 Illiterate --------2
107	Occupation of the mother/caretaker	Housewife—1 Government employee—2 Private work---3 Other-----4
108	Educational status of fathers	Literate --------1 Illiterate --------2
109	Occupation of fathers	Merchant—1 Government employee—2 Private work---3 Other-----4
110	Family size of households	≤ 4----------1 5 – 8----------2 ≥ 9----------3
111	Perceived economy (compared to neighbors)	V/ poor---1 Poor---2 Average---3 Rich---4 V/ rich---5 No response---6
112	Does the family have livestock?	Yes-------1 No------2 No response-------3

PART II. ENVIRONMENTAL HEALTH CONDITIONS

S/No	Questions And Filters	Coding category	Skip
201	Type of floor material of living house (OBSERVATION)	Mud----1 Wood----2 Cement----3 Other----4	
203	Do animals live in the same house where members of family live? (OBSERVATION)	Yes---------1 No---------2	
204	Number of rooms in the house	_____	
205	Is latrine available?	Yes-------1 No----2 (If No, skip to Q207)	
206	Ownership of the latrine	Private--------1 Shared----------2	
207	Are feces seen around pit-hole (or on floor)? (OBSERVATION)	Yes----------1 No----------2	

208	Are feces seen around house (in compound)? (OBSERVATION)	Yes---------1 No----------2	
209	If family has no latrine, where do you dispose human waste?	Open field----1 Other (specify)-----2	
210	How do you dispose refuse?	Pit---1 Burning--2 Open field---3 Garbage can---4 Other-----5	
211	From where do you get water for drinking? (OBSERVATION)	Pipe-----1 Protected well/spring------2 Unprotected well/spring---3 Other-----4	
212	Type of collection container	Jerry can--1 Plastic bucket--2 Iron bucket—3 Other--4	
213	Capacity of container, which you used to collect drinking water?	_____ Liters	
214	How many times did you collect water for drinking per week?		

PART III. Child Handling Behaviour

S/No	Questions And Filters	Response	Skip
301	Does the child take other food than breast milk?	Yes----1 No--2 (If No skip to Q305)	
302	Do you separately prepare food for a child, using a separate material?	Yes-------1 No--------2	
303	What food/fluid is the child mostly receiving (if the child is not on exclusive breastfeeding)?	Cow's milk--1 Adults' food----3 Powder milk—2 Gruel---4 Other---5	
304	What do you use to feed the child?	Hand----1 Bottle---2 Cup-----3 Cup & spoon----4 Other-------5	
305	Does drinking-water storage container have a cover? Ask respondent to show you.	Yes---------1 No--------2	
306	Is there a separate can for taking drinking water from storage container?	Yes----------1 No--------2	
307	How do you take water from the drinking water storage container?	Pouring------1 Dipping------2	
308	Do you know that flies can transmit diseases?	Yes--------1 No----------2	

309	If "Yes", can you tell me the name of the diseases?	Diarrhea---1 Trachoma----4 Typhoid fever--2 Do not know---5 Cholera---3 Other---------6	
310	Do you know that excreta of children can be a cause of diseases?	Yes-------1 No---------2	
311	If "Yes", what do you do to avoid this problem?		
312	When did you wash your hands?	Before food preparation -----1 After toilet visiting ----2 Before child feeding ----3	

PART IV. INFORMATION OF THE INDEX CHILD

Ask mother/caretaker about the child with diarrhea, or if there is no child with diarrhea, ask about child who is younger than others.

S/No	Questions And Filters	Response	Skip
401	Age of index child	_____ Months	
402	Sex of index child	Male--------1 Female---------2	
403	Where was your child born?	Health institution-----1 Home-----2	
404	Do you (mother/caretaker) have history of diarrhea in past 2 weeks?	Yes-------1 No----------2	
405	Have you ever breast-fed your child?	Yes-----1 No------2 (Skip to Q409)	
406	For how long did you breastfed your child?	_____Months	
407	What is his/her current breastfeeding status?	EBF-----1 partial BF----2 Not BF----3	
408	At what age a child started supplementary /weaning food?	_____ Months	
409	Did the child receive measles vaccination? (children of age greater than nine months)	Yes----1, (by respondent &checking card) No---------2	
410	Does your child have diarrhea today?	Yes---------1 No---------2	
411	If child has diarrhea today, how many times a day he/she passes stool?	Three times---1 More than three times---2 Don't know-------3	
412	The type of diarrhea that the child had	Watery----1 Blood and mucus------2	
413	For how long the diarrhea last?	<14 days-------1 > 14 days------2	
414	What actions do you take to treat/stop the diarrhea?	Take him/her health institution------1 Take him/her to traditional healer---2 Give him/her ORS & increase feeding------3 Give him/her cereal based fluids-----4 Other (specify)----------5	

Thank you very much!!

Checked by supervisor: Name---------- Signature---------- Date----------

Annex 4.2

Consent form and Information (Amharic version)

በአዲስ አበባ ዩኒቨርስቲ የህብረተሰብ ጤና ትምህርት ክፍል. የምርምር/ጥናት/ ማብራሪያና የስምምነት መግለጫ ቅጽ

ይህ ቅፅ የተዘጋጀው በአዲስ አበባ ዩኒቨርስቲ የህብረተሠብ ጤና ሳይንስ ኮሌጅ የፊልድ ኢፒደሚዮሎጅ ትምህርት ክፍል የሁለተኛ ዲግሪ የመጨረሻ ዓመት የማህበረሰብ ጤና አጠባበቅ ተማሪ ሲሆን የጥናቱ ርዕስም፡- "የተቅማጥ በሽታ ክስተትና ተዛማጅ መንስኤዎቹን ከአምስት አመት በታች ዕድሜ ባላቸው ህጻናት መካከል ያለውን ግንኙነት በአቃቂ ክፍለ ከተማ በአዲስ አበባ መመዘን" ነው።

መግቢያ

የዚህ የምርምር ማብራሪያና የስምምነት ቅጽ ዓላማ አሁን እርሰዎ እንዲሳተፉበት የምንጠይቀዎትን የምርምር ጥናት ምንነት ማብራራት ነው፡፡ በዚህ የምርምር ፕሮጀክት ለመሳተፍ ከመወሰንዎ በፊት ይህንን የማብራሪያ ቅጽ በጥንቃቄ በማንበብ ጥያቄዎች ካሉዎት ይጠይቁ፡፡ በተጨማሪም በጥናቱ መሳተፍ ከጀመሩ በኃላ በማንኛውም ጊዜ ጥያቄዎች ካሉዎት መጠየቅ ይችላሉ፡፡

የጥናቱ ዓላማ፡- የጥናቱ ዓላማ በአዲስ አበባ ከተማ አስተዳደር በአቃቂ ክፍለ ከተማ ውስጥ የተቅማጥ በሽታ ክስተትና ተዛማጅ መንስኤዎች ምንነት ከአምስት አመት በታች ዕድሜ ባላቸው ህጻናት መካከል ምን እነደሚመስል ማጥናት ነው፡፡

<u>የአሰራር ሂደት</u>

መረጃ ሰብሳቢው ባለሙያ ከዚህ በታች የተዘረዘሩን ነጥቦች በተገቢው ምላሹን ለሚሰጡ ተሳታፊዎች ማስረዳት ይጠበቅበታል፡፡ በጉለሌ ክፍለ ከተማ ውስጥ የተቅማጥ በሽታ ክስተትና ተዛማጅ መንስኤዎች ምንነት ከአምስት አመት በታች ዕድሜ ባላቸው ህጻናት መካከል ምን እነደሚመስል ማጥናት ሲሆን እርስዎም በዚህ ጥናት ውስጥ እንዲሳተፉ ተመርጠዋል፡፡ፈቃደኛ የሚሆኑ ከሆነ መልስዎ ለመረጃ ሰብሳቢው እንዲሰጡ ቃለ መጠይቅ ይቀርብልዎታል፡፡ስምዎን ለመረጃ ሰብሳቢው የመስጠት ግዴታ አይኖርብዎትም፡፡የሚሰጡት ምላሽም ምስጢራዊነቱ የተጠበቀ ይሆናል፡፡

ሊኖሩ የሚችሉ አደጋዎችና ጉዳቶች

በጥናቱ ውስጥ በመሳተፍ ወርቃማ የሆነ ጊዜዎን መጠይቁን በሚሞሉበት ወይም በሚጠየቁበት ጊዜ ወደ ሃያ ደቂቃ የሚጠጋ ጊዜ ከማጥፋትዎ በቀር ምንም አይነት ጉዳት የለውም ፤ በመሆኑም በጥናቱ የሚገኘውን ውጤት መሰረት በማድረግ ለመሳተፍ ፈቃደኛ እንደሚሆኑ ዕምነታችን ነው፡፡

ከጥናቱ የሚያገኙት ጥቅም

በጥናቱ ውስጥ በመሳተፍዎ በቀጥታ አሁን የሚያገኙት ጥቅም ባይኖርም ፤ የተቅማጥ በሽታና ተዛማጅ መንስኤዎች መካከል ያለው ግንኙነት እድሜያቸው ከአምስት ዓመት በታች በሆኑ ህጻናት ላይ ለሚያደርገው ጥናት የራስዎን አስተዋጽኦ ያደርጋሉ፡፡ ይህም እየተከናወነ ባለው ተግባር ላይ ያሉትን ክፍተቶች በመለየት ለቀጣይ ጤናን በመጠበቅና በማሻሻል ረገድ ከሚኖረው ከፍተኛ ሚና ከሚያገኙት የአእምሮ እና የመንፈስ እርካታ ውጪ ሊከፍልዎት የሚችል ዋጋ አይኖርም፡፡

<u>ማካካሻ</u>፤- በዚህ ጥናት በመሳተፍዎ ምንም ዓይነት ማካካሻ አይሠጥዎትም፡፡ ነገር ግን በጥናቱ በመሳተፍዎ ምስጋናችን ከፍተኛ ነው፡፡

<u>ምስጢር ጠባቂነት</u> ፡- የሚሰጡት መረጃ ምስጢራዊነቱ በሚገባ የሚጠበቅና ለማንም ይፋ የማይደረግ መሆኑን ስም አልባ በሆነ የመጠይቅ ቅፅ መሞላቱ ከምንም በላይ ማስረጃ ይሆኖታል፡፡

<u>የመቃወም ወይም ከጥናቱ የመውጣት መብት</u>

በጥናቱ ላለመሳተፍ ሙሉ መብት ያለዎት ሲሆን እንደ ፈቃድዎ ለአንዳንድ ጥያቄዎች ሙሉ በሙሉም ምላሽ ላይሰጡባቸው ለሚፈልጉት ጉዳይ መልስ አለመስጠት የሚችሉ ሲሆን በዚህም የሚደርስብዎት ችግር አይኖርም። በዚህ ጥናት መሳተፍም ሆነ አለመሳተፍ በእርስዎ ልባዊ ፈቃድ የሚወሰን ነው፡፡ ስለሆነም በቅድሚያ ለፈቃደኝነትዎ እያመሰገንኩ ለማቀርብልዎ ጥያቄዎች ተገቢውንና ትክክለኛውን መልስ በመስጠት እንዲተባበሩኝ በትህትና እጠይቃለሁ። ለበለጠ መረጃ

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ለትብብርዎ ከፍተኛና ልባዊ ምስጋና አቀርባለሁ!!

ክፍል ነ ማህበራዊና ኢኮኖሚያዊ ባህሪያት ላይ ያተኮሩ መጠይቆች

በመጀመሪያ ስለ እርስዎ መሰረታዊ እና መንደርደሪያ ጥያቄዎችን እጠይቀዎታለሁ

ተ.ቁ.	ጥያቄዎችና ማጣሪያዎች	አማራጭ መልሶች
ጥ101	መላሹ ከህፃኑ ጋር ያላቸው ግንኙነት	እናት--------ነ ሌላ አሳዳጊ----------2
ጥ102	የህፃኑ እናት/አሳዳጊ ዕድሜ	ዓመት
ጥ103	የህፃኑ እናት/አሳዳጊ የጋብቻ ሁኔታ	ያገባች-----ነ የፈታች----2 ያካገባች-----3 ባል በሞት የተለያት----4
ጥ104	የህፃኑ ወላጆች/አሳዳጊዎች ኃይማኖት	ክርስቲን----ነ ሙስሊም-----2 ሌላ (ይገለጽ)-------3
ጥ105	የህፃኑ ወላጆች/አሳዳጊዎች ዘር/ጎሳ	ኦሮሞ-----ነ አማራ-----2 ትግራይ-----3 ጉራጌ------4 ሌላ----5
ጥ106	የህፃኑ እናት/አሳዳጊ የትምህርት ደረጃ	መደበኛ ት/ት---ነ ማንበብና መፃፍ---2 ማንበብ ብቻ---3 ያልተማረ---4
ጥ107	የህፃኑ እናት/አሳዳጊ የሥራ ሁኔታ	የቤ/እመበት----ነ የመን/ሰራተኛ---2 የግል ሰራተኛ----3 ሌላ------4
ጥ108	የርስዎን የኑሮ ደረጃ በንጽጽር ከየትኛው ይመድቡታል?	በ/ድሃ---ነ ድሃ-----2 መካከለኛ---3 ሀብታም---4 በ/ሀብታም-----5 ፈቃደኛ አይደሉም-----6
ጥ109	ቤተሰቡ የቤት እንሰሳት አለው	አዎን---ነ የለም-----2 ለመመለስ ፈቃደኛ አይደሉም---3

ክፍል ሁለት፡- የአካባቢ ጤና ሁኔታ

ተ.ቁ.	ጥያቄዎችና ማጣሪያዎች	ኮድ ቁጥር	ቀጣይ ማሳያ
ጥ201	የመኖሪያ ቤቱ ወለል (በምልከታ)	አፈር---ነ እንጨት(ጣውላ)---2 ሲሚንቶ----3 ሌላ----4	
ጥ202	እንሰሳት በቤት ውስጥ ከሰው ጋር አብረው ይኖራሉ? (በምልከታ)	አዎን---------ነ አይኖሩም---------2	
ጥ203	ቤት ውስጥ ያሉት ክፍሎች ብዛት		
ጥ204	ቤተሰቡ መፀዳጃ ቤት	አለው--ነ የለም--2(የለም ከሆነ ወደ ጥ207)	
ጥ205	የመፀ/ቤቱ ባለቤትነት ሁኔታ	የግል-----ነ የጋራ------2	
ጥ206	በመፀ/ቤቱ አካባቢ አ/ምድር ይታያል? (በምልከታ)	አዎን-----ነ አይታይም------2	
ጥ207	በመሮ/ቤቱ አካባቢ ዓ/ምድር ይታያል? (በምልከታ)	አዎን-----ነ አይታይም------2	
ጥ208	መፀ/ቤት ከሌለ በተሰቡ የት ይጠቀማል?	በየሜዳው---ነ ሌላ(ይገለጽ)------2	
ጥ209	ደረቅ ቆሻሻን እንዴት ያስወግዳሉ?	በጉድጓድ---ነ በማቃጠል---2 በየሜዳው--3 በዕቃ---4 ሌላ--5	
ጥ210	የመጠጥ ውሃ የት ያገኛሉ?	ከቧንቧ--ነ ከተጠበቀ ጉድጓድ/ምንጭ---2 ካልተጠበቀጉድጓድ/ምንጭ---3 ሌላ---4	

ጥ211	ትናንት የመጠጥ ውሃ የቀዱበት ዕቃ ምን ዓይነት ነበር?	ፕላስቲክ ባልዲ--1 ብረት ባልዲ--2 ጄሪካን---3 ሌላ---4	
ጥ212	የመጠጥ ውሃ የቀዱበት ዕቃ የሚይዘው የውሃ መጠን	ሊትር	
ጥ213	በሳምንት ስንት ጊዜ ውሃ ቀዱ /አመላለሱ	ጊዜ	

ክፍል ሦስት፡- የሕፃናት አያያዝ ልምድና እውቀት

ተ.ቁ.	ጥያቄዎችና ማጣሪያዎች	ኮድ ቁጥር	ቀጣይ ማሳያ
ጥ301	ህፃኑ ከጡት ወተት ሌላ ይውሰዳል?	አዎን---1 የጡት ወተት ብቻ ነው---2 (ወደ ጥ305 እለፍ)	
ጥ302	ህፃኑ ለብቻው ምግብ ያዘገጃለታል?	አዎን-----1 አላዘጋጅም-------2	
ጥ303	ህፃኑ ምን ዓይነት ተጨማሪ ምግብ ይወስዳል? (ከ መልስ በላይ ይቻላል)	የላም ወተት---1 የዱቄት ወተት---2 ከጥራጥሬ የተዘጋጀ----3 ለአዋቂ የተዘጋጀ---4 ሌላ----9	
ጥ304	ህፃኑ በምን ይመግቡታል?	በእጅ--1 በሲኒና በማንኪያ---2 በኩባያ---3 በጡጦ---4 ሌላ----9	
ጥ305	የመጠጥ ውሃ ማምጫው/ ማጠራቀሚያው ክዳን አለው? (ምልከታ)	አለው----1 የለም-------2	
ጥ306	ተለይቶ የተቀመጠ የውሃ መቅጃ ዕቃ አለ? (ምልከታ)	አለ-----1 የለም---------2	
ጥ307	የመጠጥ ውሃ ከማጠራቀሚያው እንዴት ነው የሚቀዱት?	በማንቆርቆር---1 በመጥለቅ----2	
ጥ308	ዝንብ በሽታ ልታስተላልፍ እንደምትችል ያውቃሉ?	አውቃለሁ--1 አላውቅም---2 (ወደ310)	
ጥ309	መልስዎ አውቃለሁ ከሆነ ልታስተላልፍ የምትችለው የበሽታ ስም ሊነግሩን ይችላሉ?	ተቅማጥ--1 ታይፎይድ---2 ኮሌራ---3 ስማቸውን አላውቅም---4 ሌላ----5	
ጥ310	የህፃናት ዓ/ምድር በሽታ እንደሚያስተላልፍ ያውቃሉ?	አውቃለሁ---1 አላውቅም---2 (አላውቅም ከሆነ ወደጥ312 እለፍ)	
ጥ311	አውቃለሁ ከሆነ የሚያመጣው ችግር ለማቃለል ምን ያደርጋሉ?		
ጥ312	መቼ ነው እጅዎትን የሚታጠቡት?		

ክፍል አራት፡- ስለ ሕፃኑ አጠቃላይ መረጃ (ከዚህ በታች ያለው መጠይቅ የሚሞላው ተቅማጥ ለያዘው ህፃን ወይም በቤቱ ውስጥ ተቅማጥ የያዘው ህፃን ከሌለ በዕድሜ አነስተኛ ለሆነው ህፃን ነው) ::

ጥ401	የህፃኑ ዕድሜ	ወር
ጥ402	የህፃኑ ጾታ	ወንድ------1 ሴት-----2
ጥ403	ህፃኑ የት ነው የተወለደው?	በጤና ድርጅት----1 በቤት ውስጥ----2
ጥ405	እናትየዋ/አሳዳጊዋ ባለፈው ሁለት ሳምንት ጊዜ ውስጥ ተቅማጥ ይዟቸው ነበር?	አዎን---1 አልያዘኝም-------2
ጥ406	ህፃኑ ከተወለደ ጀምሮ ጡት ጠበቶ ያውቃል?	አዎን---1 አያውቅም-----2 (አያውቅም ከሆነ ወደጥ409 እለፍ)
ጥ407	ህፃኑ ለስንት ጊዜ ያህል ጡት ጠባ?	ወር
ጥ408	በአሁኑ ጊዜ ህፃኑ ያለው አመጋገብ ሁኔታ	የጡት ወተት ብቻ--1 (ወደጥ410) በከፊል የጡት ወተት--2 የጡት ወተት አይመገብም---3
ጥ409	ህፃኑ በስንት ወሩ ነው ተጨማሪ ምግብ የጀመረው?	ወር
ጥ410	ህፃኑ የኩፍኝ መከላከያ ክትባት ተከትቧል?	አዎን---1 (ከመላሹና ከካረድ) አልተከተበም---2
ጥ411	በአሁኑ ጊዜ ህፃኑ ተቅማጥ ይዞታል?	አዎን--1 አልያዘውም---2 (ከሆነ የቀሩትን ጥያቄዎች እለፋቸው)
ጥ412	ተቅማጡ ለስንት ጊዜ ቆየበት?	ከ14 ቀን በታች---1 ከ14 ቀን በላይ--2
ጥ413	በቀን ስንት ጊዜ ያስቀምጠዋል?	ሶስት ጊዜ---1 ከሶስት ጊዜ በላይ---2 አላውቀውም----3
ጥ414	ምን ዓይነት ተቅማጥ ነው?	እንደ ውሃ የቀጠነ---1 ደምና ምግል ያለው---2 ሌላ----5
ጥ415	ተቅማጡን ለማቀቅም ለህፃኑ ምን አድርገውለታል? (አማራጮቹን አታንብቡላቸው)	ወደ ጤና ድርጅት ወስጄዋለሁ---1 ወደ ባህል ህክምና ወስጄዋለሁ---2 ወትሮ ከሚበላው ምግብ ተጨማሪና ኦ.አር.ኤስ አሰጠዋለሁ---3 ከጥራጥሬ የተዘጋጀ ፈሳሽ አሰጠዋለሁ---4 ሌላ----5

አመሠግናለሁ!!

መጠይቁ ያረጋገጠው ሱፐርቫይዘር ስም ---------- ፊርማ---------- መጠይቁ የተደረገበት ቀን----------

Declaration

I, the undersigned, declare that this is my original work and has never been presented by another person in this or any other University and that all the source materials and References used for this thesis have been duly acknowledged.

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