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

Debalke Abate Chekol

Submitted to the School of Graduate Studies of Addis Ababa University in partial fulfillment of the degree of Master of Public Health in field Epidemiology

June, 2018

Addis Ababa, Ethiopia

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Approval by Examining Board

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ACRONYMS

A.A	Addis Ababa
AAHB	Addis Ababa Health Bureau
AFI	Acute Febrile illness
AFP	Acute febrile illness
AIDS	Acquired immune deficiency syndrome
ANC	Antenatal care
AOD	Adjusted odd ratio
AAUSP	Addis Ababa university school of public health
AWD	Acute watery diarrhea
CAC	Contraception accepting rate
CDC	Center for disease control and Prevention
CFR	Case fatality rate
CI	Confidence interval
COR	Crude odd ratio
CTC	Cholera treatment center
Dr	Doctor
DRC	Democratic republic of Congo
EFETP	Ethiopia filed epidemiology training program
EPHA	Ethiopia public health association
EPHI	Ethiopia public health institution
EPI	Expanded program of immunization
FDRE	Federal democratic republic of Ethiopia
FMOH	Federal ministry of health
FP	Family planning
GOE	Government of Ethiopia
HAART	Highly active anti-retroviral therapy
HEW	Health extension worker
HIV	Human immune virus
HMIS	Health monitoring information system
IDSR	Integrated disease surveillance system

IHR	International health regulation
IMNCI	Integrated management of neonatal and child health
IP	In patient
IQR	Inter quartile range
IRS	Indoors residual spray
ITN	Insecticidal treated mosquito net
LBRF	Louse born relapsing fever
LLINS	Long lasting insecticidal net
MA	Master of art
MAM	Moderate acute malnutrition
MD:	Medical doctor
MDG	Millennium development goal
MIS	Health management information system
MMR	Maternal mortality rate
MOH	Ministry of health
MDG	Millennium development goal
MDSR	Maternal death surveillance response
MPH:	Master of public health
MR	Mortality rate
MS	Micro soft
NDRMC	National disaster risk management commission
NGO	Nongovernmental organization
NNT	Neonatal tetanus
OPD	Outpatient department
OR	Odd ratio
ORS	Oral rehydration salt
PAP	Protected at birth
PCV	Pneumococcal conjugated vaccine
PF	Plasmodium falciparum
PHD	Doctor of philosophy in public health
PNC	Post-natal care

PHEM:	Public health emergency management
PICT	Provider initiative counseling and testing
PLWHIV	Patient live with HIV/AIDS
PMTCT	Prevention of mother to child transmission
PPT	Power point
PV	Plasmodium vivax
RRT	Rapid response team
RDT	Rapid diagnostic test
RF	Relapsing fever
SAM	Sever acute malnutrition
SD	Standard deviation
SPSS:	Statical package for social science
TB	Tuberculosis
TBRF	Tick borne relapsing fever
UFMR	Under five mortality rate
VHF	Viral Haemoregic Fever
VDRL	Venereal disease research laboratory
WHO	World health organization

EXCUTIVE SUMMARY

The Ethiopia Field Epidemiology Training Program is two years' competency based Master's program adopted from the United States Centers for Disease Control and Prevention (CDC). This program is run by Ethiopia Federal Ministry of Health and partners (EPHI, EPHA, United States Centers for Disease Control and Prevention Ethiopia and Regional Health Bureau). This program is currently going on eight universities in the nation including our Addis Ababa University. It comprises of 25% class learning and 75% field activities, working in public health emergency and other health related priority issues. It is designed to assist the Ministry of Health in building or strengthening health systems by selecting promising health workers and building their competencies through on the job mentorship and training. Ethiopia adopted the field epidemiology training program to help improve leadership in the public health emergency management system. This compiled body of works composed of nine chapters accomplished during the two years' residency period. It comprises outbreak investigations, surveillance data analysis report, surveillance system evaluation, health profile description report, scientific manuscript for peer reviewed journals, abstracts for scientific presentation, narrative summary of disaster situation, proposal for epidemiologic research project and Additional output (bulletin preparation and training). All the outputs during the residency period were compiled as single document. The first chapter consists of outbreak investigations. Two outbreaks were investigated; cholera outbreak investigation in Benishangul Gumuz state Dangur woreda 2017 and Relapsing fever outbreak investigation in Akaki Kality sub city woreda six administrations 2017. The second chapter is Surveillance data analysis of epidemic typhus at Akaki Kality sub city health office 2016, the fourth chapter was. Malaria Surveillance System Evaluation conducted in Akaki Kality sub city 2016, the 5th chapter was Health profile description report was conducted in Akaki Kality sub city woreda six administration 2016. Two manuscripts and one abstract were prepared for peer reviewed journals and Visited Disaster situation secondary to Akaki river over flow in Akaki Kality sub city woreda eight and woreda three 2017. The seventh chapter is Proposal for epidemiologic research project by the topic to assess malaria vector control (ITN/IRS) owner ship, utilization and affecting factors in Akaki Kality sub city, Addis Ababa, 2017. And finally additional outputs weekly bulletin and training were accomplished.

CHAPTER I OUT BREAK INVESTIGATION

1.1. Cholera outbreak investigation and Response in Benishangul Gumuz regional state Metekel zone Dangur woreda, 2017

ABSTRACT

Background: Cholera is a diarrheal disease caused by infection with the gram-negative bacterium Vibrio cholera. It is characterized by severe watery diarrhea which can rapidly lead to dehydration and death in untreated patients. Unusual increase in cases of Watery diarrhea was reported to Metekel Zone in August, 2017 from Dangur woreda. We aimed to verify the existence of outbreak. In this Woreda and identify the factor(s) associated with increasing of acute watery diarrhea.

Methods: Unmatched case control study was conducted with 1:2 cases to control ratio in Benishangul Gumuz region Metekel zone Dangur woreda in the time period of September 30/2017-October 14/2017. Case and controls were selected at random from the cholera treatment center and the. Associations between risk factors were analyzed by Epi info version7. Multivariate analysis was employed for variables with p-value < 0.2 in bivariate analysis to identify the associated risk factors. The variables with p value of less than 0.05 in Multivariate analyses was reported as significantly associated factor with the cholera outbreak

Result: We recruited 50 cases and 100 controls with the median age of 22years old (IQR 20 years old). Multivariate analysis of Drinking Basso (AOR = 5.2, 95% CI [1.3, 20.2), Eating fruit (AOR= 3.7,95% CI [1.3,10.3]), and Milk (AOR = 11.9, 95% CI [1.5- 96.8] were found to be risk factors while having separate latrine in compound (AOR=0.2,95% CI [0.1,0.5]), and washing hands with soap (AOR=0.2,95% CI [0.1,0.9]) were found to be preventive factors with cholera.

Conclusion: There were cholera outbreaks with CFR of 0.7%. Availability of private/communal latrine and washing hands regularly with soap after defecation provide protection against the disease. Drinking basso and milk are significantly associated with cholera. We recommended that the woreda has to give health education on personal and environmental hygiene.

***Key Words**: AWD, Case Control, Unmatched, Outbreak, Dangur woreda.*

Word count: 294

INTRODUCTION

Cholera is a diarrheal disease caused by infection of the intestine with the gram-negative bacteria *Vibrio cholera*, either type O1 or O139. Both children and adults can be infected. It is one of the key indicators of social development and remains a challenge to countries where access to safe drinking water and adequate sanitation cannot be guaranteed. It is characterized by severe, watery diarrhea, which can rapidly lead to dehydration and death in untreated patients Cholera is usually transmitted through fecal contamination of water or food and remains an ever-present risk in many countries. New outbreaks can occur sporadically in any part of the world where water supply, sanitation, food safety, and hygiene are inadequate. The greatest risk occurs in over-populated communities and refugee settings characterized by poor sanitation, unsafe drinking-water, and increased person-to-person transmission. The incubation period of cholera is very short (2 hours to 5 days), the number of cases can rise quickly. Cholera 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%. 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. Of cases reported globally, 41% were from Africa, 37% from Asia and 21% from Hispaniola. Imported cases were reported from 13 countries[(1)]. There are over 100 Vibrio species known but only the "cholera" species are responsible for cholera epidemics. About 20% of those who are infected develop acute, watery diarrhea 10–20% of these individuals develop severe, watery diarrhea with vomiting. If these patients are not promptly and adequately treated, the loss of such large amounts of fluid and salts (more than 10-20 liters/day in severe forms) can lead to severe dehydration and death within hours. The case-fatality rate in untreated cases may reach 30–50%.Treatment is straightforward (basically rehydration) proper management can keep the case-fatality rate below 1 % [(2)]. Risk factors for the outbreak implicated from initial assessments include drinking water from unprotected sources; exposure to rivers, springs and holy water sites; Contamination of water sources can be explained by the high level of open defecation due to lack of latrines, poor solid waste collection and disposal, poor food hygiene, and overcrowding [(2)]. Humans are the main reservoir of *Vibrio cholera*. Asymptomatic (healthy) carriers and patients carry huge quantities of Vibrio in feces and in vomit; up to 100,000,000

bacteria can be found in1 ml of cholera liquid. Other potential reservoirs are water, fish, and aquatic plants. The infective dose depends upon individual susceptibility, but in general a 1,000,000 dose is needed to cause the illness [(2)].

Statements of the study

Cholera remains a significant public health problem in many parts of the world. In 2015 From 42 countries total of 172,454 cases including 1304 deaths, resulting in an overall case fatality ratio (CFR) of 0.8%. 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. Of cases reported globally, 41% were from Africa, 37% from Asia and 21% from Hispaniola. Imported cases were reported from 13 countries(1).Both children and adults can be infected. It is one of the key indicators of social development and remains a challenge to countries where access to safe drinking water and adequate sanitation cannot be guaranteed. About 20% of those who are infected develop acute, watery diarrhea10–20% of these individuals develop severe, watery diarrhea with vomiting. If these patients are not promptly and adequately treated, the loss of such large amounts of fluid and salts (more than 10-20 liters/day in severe forms) can lead to severe dehydration and death within hours. The case-fatality rate in untreated cases may reach 30–50%.

In Ethiopia by the years of 2008, 2016 and 2017 number of cases was reported and responsible for death in different region of the country including Addis Ababa. In 2016 in Benishangul Gumuz similar cholera outbreak was occurred. In this region there are many predisposing factors such as unsafe water, open defecation and poor infrastructure for health care system. Therefore this study gives a clue on the major risk factors for responsible for cholera outbreak.

Significance of the study

In Ethiopia, cholera is a mandatory, notify able disease. All suspected cases of cholera must be reported immediately to the appropriate authority and all cases should be managed accordingly. If not the nature of the disease is easily transmittable from person to person and can kill mass population if early prevention measure and management is not applied. In Dangur woreda Metekel zone Benishangul Gumuz regional state a significant number of cholera was reported

since August, 2017. Thus this study helped to identify the possible associated factors and to control further transmission of the disease.

LITRATURE REVIEW

Globally there are 1.3 billion people at risk for cholera in the 69 countries classified as cholera-endemic. And 99 million persons are at risk in the three countries the model predicted as non-endemic (i.e., Bolivia, Pakistan, and Sri Lanka). There are twenty-three endemic countries that have over 10 million persons at risk. India, Nigeria, China, Ethiopia, and Bangladesh are the countries with the highest number of people at risk for cholera. There are an estimated 2.86 million cases of cholera annually in endemic countries. With estimates of more than 100,000 cases annually include: India, Ethiopia, Nigeria, Haiti, the Democratic Republic of the Congo, Tanzania, Kenya, and Bangladesh. The average incidence rate in endemic countries is 2.3 cases/1,000 populations at risk per year. Although classified as non-endemic, Pakistan, Bolivia and Sri Lanka were estimated to have a cumulative average of 2,737 cases reported annually. [8] Other study conducted in Tanzania, Lack of access to safe drinking water, together with inadequate sanitation and hygiene, has been identified to be the main contributor to diarrhea infection and deaths globally (5). In rural areas of developing countries, drinking contaminated water is an important cause of diarrhea (6). Lack of access to basic water supply and sanitation is a major problem in both rural and urban Tanzania. Less than half of the rural population in Tanzania has access to safe drinking water (7). Access to clean and safe water in rural areas has declined since 2001 – from 46% to 40% in rural areas [8]. About 20% of those who are infected develop acute, watery diarrhea 10–20% of these individuals develop severe, watery diarrhea with vomiting. If these patients are not promptly and adequately treated, the loss of such large amounts of fluid and salts (more than 10-20 liters/day in severe forms) can lead to severe dehydration and death within hours. The case-fatality rate in untreated cases may reach 30–50%.Treatment is straightforward (basically rehydration) proper management can keep the case-fatality rate below 1% (9). Risk factors for the outbreak implicated from initial assessments include drinking water from unprotected sources; exposure to rivers, springs and holy water sites; Contamination of water sources can be explained by the high level of open defecation due to lack of latrines, poor solid waste collection and disposal, poor food hygiene, and overcrowding (2).

The weekly situation report is prepared by World Health Organization and Ministry of Health, Somalia 2017. A total of 9573 suspected AWD/ cholera cases and 228 deaths (CFR–2.4%) have been recorded from 45 districts across 11 regions since the beginning of the year. However, the trend of cholera cases recorded in the last 8 weeks has increased significantly compared to cases reported during the same period in 2016 It is important to note that the current cholera cases are a spill-over from last year's major cholera outbreak, which recorded 15 619 cases and 548 deaths. (CFR=3.5). Last year's outbreak was one of the largest and longest in which the country has experienced in the last five years [9]. When we come to Ethiopia Acute Watery Diarrhea Outbreak Were Challenges to Control at Afar region, Ethiopia, 2009 total of 1076 cases and 48 deaths were registered during April 29 to May 16, 2009 in the three districts of Afar with an attack rate (AR) and case fatality rate (CFR) of 0.85% and 4.4% respectively. Among cases, 945 (87.8%) were males and 561(52.1%) were in the age category of 15-44 years old (15-44 years old was also the median interval age) [4]. And when we come to Addis Ababa In 2008 AWD outbreak existed there were 9662 Cases and 21 deaths had been reported. Case fatality rate was 0.2% [3]. The outbreak Investigation done in Amara Region, Rayo Kobo District reports exposure to dirty latrine [OR = 7.67, 95% C.I (1.56, 37.78), P = 0.011] and contact of patient with diarrhea and vomiting at home [OR = 9.0, 95% C.I (1.61, 50.27), P = 0.014] were independent determinants for cholera outbreak.

OBJECTIVE

General objective

- To Verify the existence of outbreak and identify the risk factor of cholera outbreak in Benishangul Gumuz region Metekel zone Dangur woreda, Ethiopia, October 2017

Specific Objectives

- To verify the existence of outbreak
- To describe the outbreak in terms of time, place and person.
- To analysis the risk factor and its association to cholera out breaks.
- To take possible control and prevention measures

METHOD AND MATERIAL

Study area: Benishangul Gumuz is one of the nine regions in Ethiopia. It is divided in to five zones. Metekel is the one out of five zones which have five woreda. Among woreda in Metekel Dangur is the place where a high number of cholera cases reported. This woreda located 570 KM from Addis Ababa Capital city of Ethiopia and 23 KM from Gilgel bles the capital city of Metekel zone. The total populations of Dangur are 6595 within 49.2% 51.8% female and male respectively. The woreda located at south west of the zonal. In the woreda there are three health centers and five health posts no hospital at all.

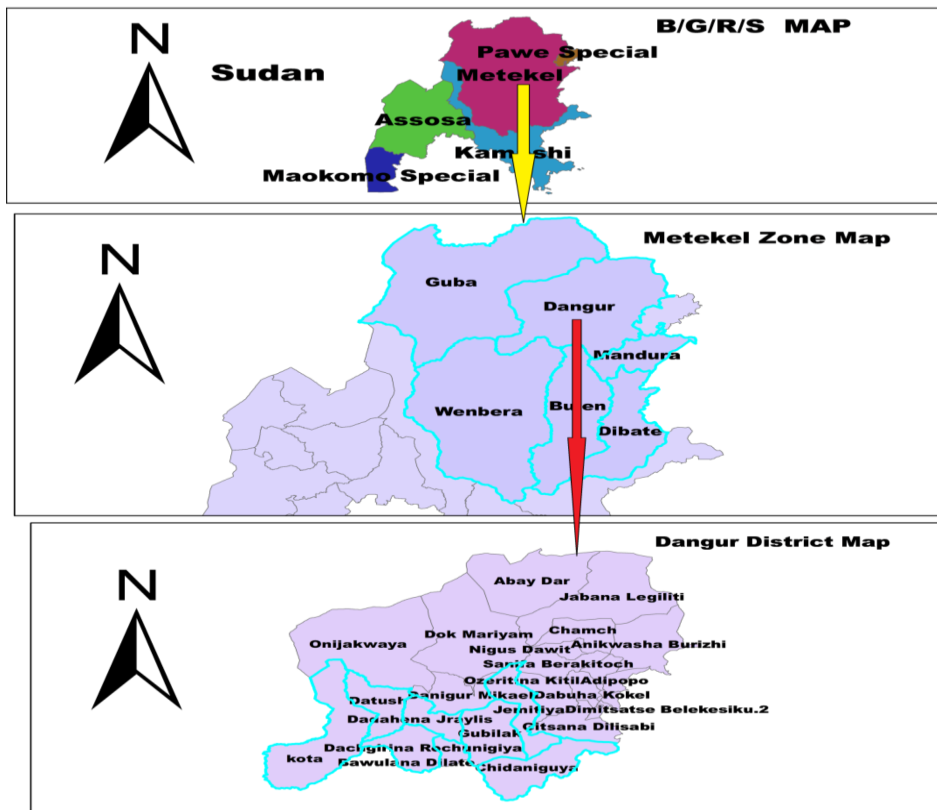

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Figure: - 1. 1 Dangur Woreda Administrative map

Study period: From September 30/2017 to October 14/2017

Study design: Facility based Unmatched case-control study was conducted

Study population: Dangur woreda population were our study population

Case Definition

Cases: Suspected: In a patient age 5 years or more, with severe dehydration or death from acute watery diarrhea. If there is a cholera epidemic, a suspected case is any] person age 5 years or more with acute watery diarrhea, with or without vomiting.

Confirmed: A suspected case in which Vibrio cholera O1 or O139 has been isolated by culture in the stool

Controls: all people have no sign and symptoms of Acute watery diarrhea during the study

Inclusion and Exclusion criteria

Inclusion criteria

Cases: All patients full fill case definition.

Controls: were recruited who did not report clinical symptoms of cholera in the previous two weeks.

Exclusion criteria

Cases: The cases admitted with complication such as shock, psychiatric problem, comma and patients discharge from the CTC center before the arrival of the investigator

Controls: those who are suspected to cholera as well as family member for cases which excluded in the study.

Sampling Technique

Cases and control were randomly selected in Health facility at the same day. All randomly selected cases and controls were interviewed using structured questionnaire. For every selected case two Controls were recruited based on their clinical features. Data collectors were given a half day orientation on questionnaires.

Sample size Determination

Sample size was calculated using Epi info 7 statcalc for unmatched case control study by taking two sided Confidence interval level of 95%, Power 80%, Case to control Ratio 1:2, Proportion of Controls with exposure 85%, Proportion of Cases with exposure 62.8% and OR =0.29 [10]. Accordingly, a total of 150 sample sizes were used to assess the risk factor (50 cases and 100 controls).

Data collection Tools and Procedure

Descriptive: The line list of Cholera cases was taken from Woreda PHEM Department. Data were entered in Excel and descriptive analysis was done. We described the outbreak over time by date of onset. We calculated the attack rate by sex, and place.

Analytical Study: We adopted a structured questionnaire from WHO to interview cases and controls. Cases were identified using the WHO case definition and controls were recruited from Health facility after they are clinically confirmed not to have cholera. The designed questionnaire includes Socio demographic information, Personal Risk factors, Environmental risk factors, and clinical features of the participant.

Laboratory investigation:

To identify the causative agent of the acute watery diarrhea water samples from different site and stool samples from ill patient were collected. Eleven stool sample was taken among which six sample tested by RDT and Five tested by Culture.

Environmental Assessment

Following the reports of unusual increment of Acute Watery Diarrhea Rapid response team was activated and moved to community to assess the situation of the case. Along with the team we observed Environmental sanitation around the schools, Toilet, dining room, and water source. The water source for community and prison was also assessed by the team.

Variable

Dependent variable: cholera illness

Independent Variable

- Age
- Sex
- Educational status
- Occupation
- Water source
- Food and Food hygiene
- Personal Hygiene
- Environmental Sanitation
- Contact history
- Waste disposal

Data analysis and clearance

The data entered into Epi-Info version 7, exported to excel sheet to be cleaned. After data cleaned for completeness it was analyzed using epi info. Univarate analysis used to describe and summarized basic characteristics of the participants using descriptive statistics such as percentages, median and cross tabulation made for most selected variables. Bivariate analysis was done and Variables with p-values less or equals to 0.2 in bivariate analyses was fitted in the final multiple logistic regression models to assess the strength of association and control confounding effects. Multiple logistic regression analysis used to assess the association between the dependent variable and each independent variable. Both Crude Odds Ratio (COR) and Adjusted Odds Ratio (AOR) with 95% confidence interval (CI) were used to show an association between selected variables. Variables having p-value less or equals to 0.05 in the final model was taken as significant determinants.

Ethical issues

Legal letter was written from EPHI to Dangur woreda for possible cooperation. Verbal informed consent was obtained from each participant prior to data collection. The confidentiality of the participants was secured.

RESULT

Descriptive Study

About 570 suspected cholera cases were identified in Benishangul Gumuz, Dangur Woreda from August 18, 2017 to October 23, 2017. Index cases was observed on August 18, 2017 in Chidanguia Keble Dangur Woreda and distributed to other Kebeles. The cases ceased after September 2 and reemerged after September 10 of 2017. It increases and arrived peak at October 1, 2017 after when it starts decreasing and ended at the end of the month. In collaboration with other stake holders Dangur woreda health office implemented different intervention within three days of outbreak notification. CTC was established for medical intervention and aqua tabs were distributed for community (Figure 1.3).

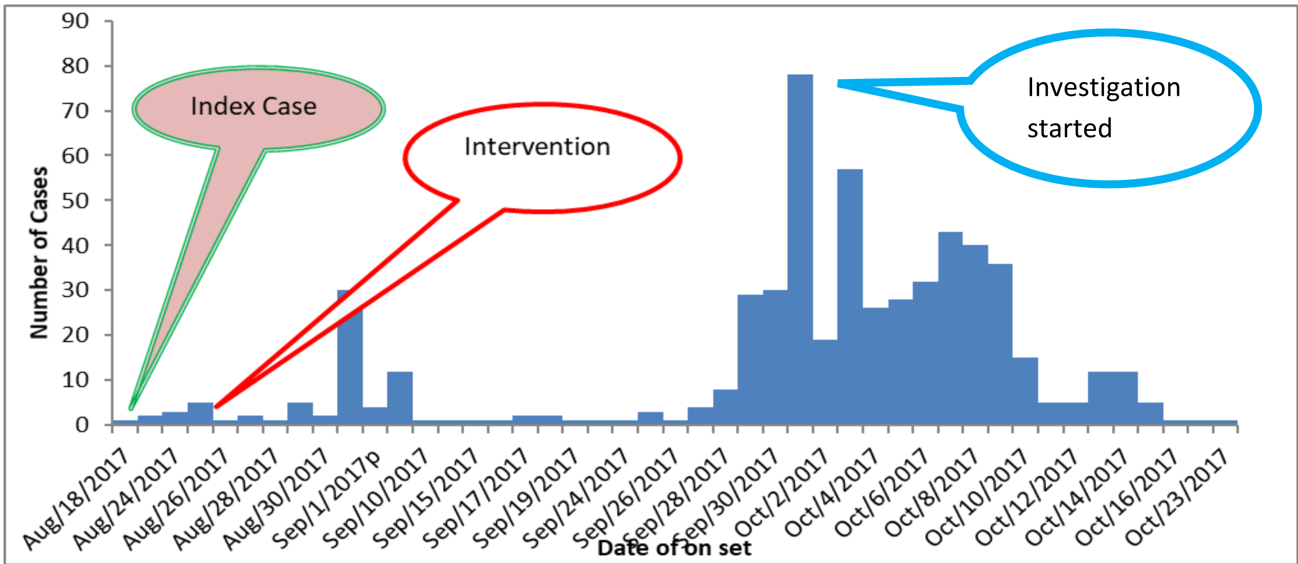

Figure: - 1. 2 Epi curve of cholera outbreak, Dangur District, Benishangul Gumuz, Ethiopia, 2017

Of 570 identified cases 76(13) cases were under Five age groups, 5-14 yes accounts 123 (22%) and the highest cases were among 15-44 yrs. old which is about 327 (57%). The median affected age was 22yrs with IQR of 20 (Figure 1.4)

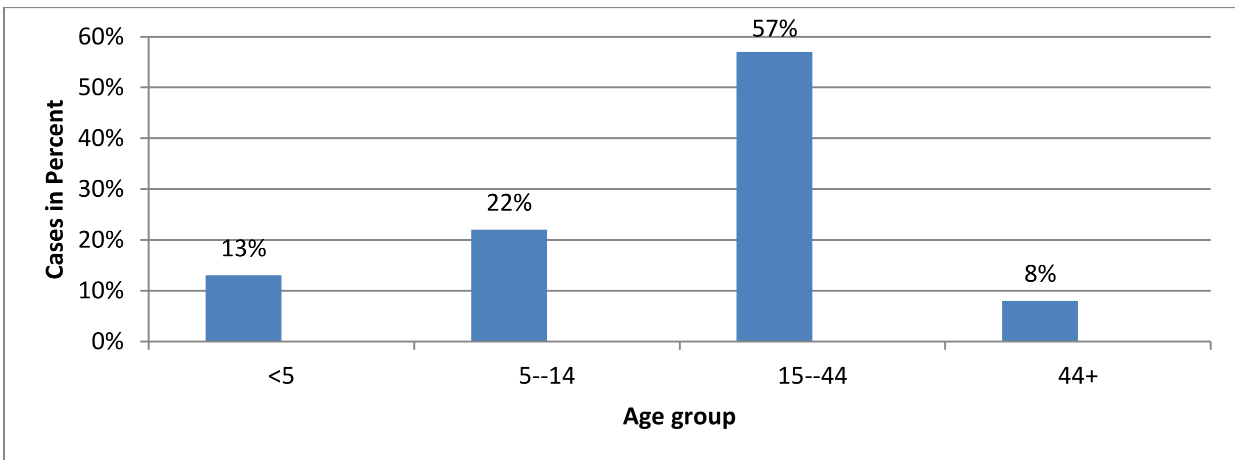

Figure: - 1. 3 Cholera Distribution by age groups, Dangur District, Benishangul Gumuz, Ethiopia, 2017

The overall attack rate of cholera was 8.6% with CFR of 0.7%. Of identified cases Females are more affected than Male with AR of 9.7% among Females and 7.6% among Male population. From a total of 570 observed cases most of the cases 453(79%) was admitted with some dehydration and the rest 117(21%) are severely dehydrated. From a total of 570 cases 353(62%) are farmers and 125(22) are students. The rest of 92 (16%) are Children and No occupation. (Table 1.1)

Table: - 1. 1 ***Demographic and Dehydration status of the cholera Patients, Dangur, Benishangul Gumuz, 2017***

Variables		Frequency	Percent	Total pop	AR
Sex	Female	310	54%	3179	9.7%
	Male	260	46%	3416	7.6%
Occupation	Farmers	353	62%		
	Student	125	22%		
	No occupation	92	16%		
Level of DHN	Sever DHN	117	21%		
	Some DHN	453	79%		
	No DHN	0	0		

Among cholera reporting Kebeles in Dangur Woreda most of the cases was reported from Gublak followed by Chidanguia and Aysica. The index case was reported from Chidanguia and it spread to the neighboring Kebeles with in the short period of time (Figure 1.5).

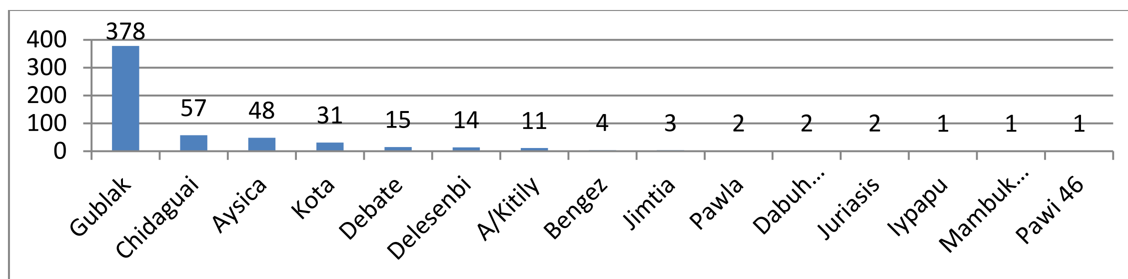

Figure: - 1. 4 ***cholera distribution among Keble Dangur Woreda, Benishangul Gumuz, Ethiopia, 2017***

Laboratory

Of 570 identified suspected cases 11 were tested (5 Culture, and 6 RDT) and seven of them were found to be positive (3 culture, and 4 RDT). The rest were treated clinically (Figure 1.2).

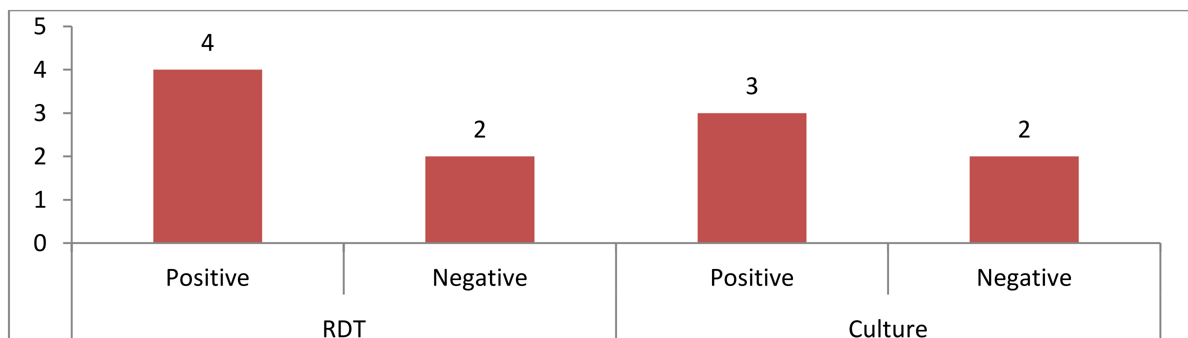

Figure: - 1. 5 Number of cholera suspected cases tested, Dangur Woreda, Benishangul Gumuz, Ethiopia, 2017

Analytical study

We recruited 50 cases and 100 controls with a median age of 27 Yrs. (IQR =21) and 30yrs (IQR=16) respectively. Of 50 Cases and 100 controls 42(84%) and 97(97%) of them were Male respectively. Of Socio demographic Variables cross tabulated with dependent variables in bi variate analysis, significant association was found among groups. Bi-variate logistic regression analysis shows, of the respondents 12(24%) cases and 73(73%) controls have a latrine within the compound (Private) (COR = 0.1, 95% CI [0.05, 0.2], 38 (76%) of Cases and 27 (27%) of controls were using open defecation (COR = 7.9, 95% CI [2.6, 23], 38(76%)of cases and 42 (42%) of controls were using River water for Domestic use (COR = 3.9, 95% CI [1.3,8.5], and 12(24%) cases and 57 (57%) controls were treat water before use(COR = 0.23 , 95%CI [0.1,0.5]) and the associations were statistically significant. Variable those have a P value of equals to or less than 0.2 are run in Multivariate analysis to avoid possible confounder.

Table: -1. 2 Bi variate analysis of Cholera outbreak associated factors, Dangur Woreda, Benishangul Gumuz, 2017

Variables	Category	Case (n=50)	Control (n=100)	**P Value**	**Crude OR, 95% CIL**
Age group	**5-14**	**8(16%)**	**3(3%)**		**1**
	>14	**42(84%)**	**97(97%)**	**0.0039**	**0.16 (0.04, 0.64)**
Sex	Male	21(42%)	**52(52%)**		**1**
	Female	29(58%)	**48(48%)**	**0.248**	**1.5 (0.75,2.96)**
Latrine availability in compound	Yes	12(24%)	73(73%)	**0.000**	**0.1 (0.05,0.2)**
	No	38 (76%)	27(27%)		**1**
Type of Latrine	Communal	5(10%)	28(28%)		**1**
	Open defecation	38(76%)	27(27%)	**0.002**	**7.9(2.6, 23)**
	Private	7(14%)	45(45%)	**0.83**	**0.87(0.25,3)**
Water source for domestic use	Communal tap water	11(22%)	**52(52%)**		**1**
	House hold tap water	1(2%)	**6(6%)**	**0.832**	**0.8(0.1,7.2)**
	River	38(76%)	**42 (42%)**	**0.0001**	**4.3 (1.9,9.4)**
Water treating (Boiling/Chemical)	Yes	12(24%)	**57(57%)**	**0.0001**	**0.23(0.1,0.5)**
	No	38(76%)	**43(43%)**		**1**
Raw Meat	Yes	25(50%)	**30(30%)**	**0.0165**	**2.33(1.1,4.6)**
	No	25(50%)	**70(70%)**		**1**
Basso	Yes	12(24%)	**11(11%)**	**0.037**	**2.6(1.03,6.1)**
	No	38(76%)	**89(89%)**		**1**
Milk	Yes	8(16%)	**3(3%)**	**0.004**	**6.15(1.5,24)**
	No	42(84%)	**97(97%)**		**1**
Contact Hx	Yes	16(32%)	10(10%)	0.0008	4.2(1.8,10.22)
	No	34(68%)	90(90%)		**1**
Fruit	Yes	24(48%)	**35(35%)**	**0.124**	**1.7(0.8,3.4)**
	No	26(52%)	**65(65%)**		**1**

Multivariate analysis of Drinking Basso (AOR = 5.2, 95% CI [1.3, 20.2]), Eating fruit (AOR= 3.7, 95% CI [1.3,10.2]), Milk (AOR = 11.1, 95% CI [1.5- 96.8], having separate latrine in compound (AOR=0.2,95% CI [0.1,0.5]), and washing hands with soap after defecation (AOR=0.2, 95% CI [0.1,0.9]) showed a statistically significant association with AWD. No statistical difference was found among Age groups, using river water for domestic use, treating water before drinking, and eating raw meat when compared among both cases and control.

Table: - 1. 3 Multi-variate analysis of cholera outbreak, Dangur Woreda, Benishangul Gumuz, 2017

Variables		**Case (n=50)**	**Control(n=100)**	**COR, 95% CI**	**AOR, 95% CI**	**P-Value**
Age group	5-14	8(16%)	3(3%)	1	1	
	>14	42(84%)	97(97%)	0.16(0.04,0.64	0.1(0.01,1.2)	0.0686
Basso	Yes	12(24%)	11(11%)	2.6(1.03,6.1)	5.2(1.3,20.2)	0.0167
	No	38(76%)	89(89%)	1	1	
Fruits	Yes	24(48%)	35(35%)	1.7(0.8,3.4)	3.7(1.3,10.3)	0.0141
	No	26(52%)	65(65%)	1	1	
Milk	Yes	8(16%)	3(3%)	6.2(1.5,24)	11.9(1.5,96.8)	0.0209
	No	23(46%)	62(62%)	1	1	
River Water for Domestic Use	Yes	38(76%)	42(42%)	4.4(2,9)	1.2(0.4,4.3)	0.7342
	No	12(24%)	58(58%)	1	1	
Water treating (Boiling/Chemical)	Yes	12(24%)	57(57%)	0.023(0.1,0.5)	0.6(0.2,2.2)	0.4631
	No	38(76%)	43(43%)	1	1	
Latrine Availability	Yes	12(24%)	73(73%)	0.1(0.05,0.2)	0.2(0.1,0.5)	0.0007
	No	38(76%)	27(27%)	1	1	
Contact Hx	Yes	16(32%)	10(10%)	4.2(1.8,10.22)	3.5(1.1,11.4)	0.0358
	No	34(68%)	90(90%)	1	1	
Raw meat	Yes	25(50%)	30(30%)	2.3(1.1,4.6)	1.1(0.4,3.0)	0.7857
	No	25(50%)	70(70%)	1	1	
Hands wash with soup	Yes	4(8%)	45(45%)	0.1(0.03,0.31)	0.2(0.1,0.9)	0.0377
	No	46(92%)	55(55%)	1	1	

Intervention

- Rapid response team established at region, zone, and woreda level
- Prisons, governmental and nongovernmental school checked for their latrine and restaurant utilization as well as discussion made with respective concerned body how to prevent acute watery diarrhea and to follow strictly their students.
- CTC established and cases treated according cholera guide line

- Aqua tab distributed to the community for water treatment.
- To identify the source of outbreak, bless river water sample send for investigation
- Training given to health professionals, guards and cleaners how to accomplish their task.
- Logistics like bleach, gloves, boots, linen and drugs were supplied to CTC by EPHI, region and zonal health office.

DISCUSSION

Cholera outbreak was reported in different parts of Ethiopia in different time most problems occurred during rainy Season and since August, 2017 high numbers of AWD cases were reported from Dangur Woreda, Benishangul Gumuz regional State. After taking some stool sample, we verified the existence of outbreak.

During the outbreak case fatality rate was 0.7% which is within the Expected range during cholera management as WHO guide line and EPHEM guide line [(2)], but this is higher than reports from Addis Ababa outbreak in 2016 which was 0.2% [(3)] and lower than 2017 Somali outbreak which was 2.4% [(9)]. With prompt proper treatment, the case fatality rate could be remaining below 1% [(2)]. This may be due to good case management, early investigation and interventions with high community involvement. The attack rate of the outbreak was 8.6 % this is very high compared to study report from Afar region (4.4%) in 2017 [(4)]. This may due to some Keble are far from Health facility and roads are remote to the woreda town. In our study area during the outbreak, Females are more affected than males having sex specific attack rate of 9.7% and 7.6% respectively. This may be due to most of the time, Females are a front line population to prepare food and have direct contact with food and drinking. Our study result is not supported by the study done in Afar Region in 2009 in which males were more affected than females (Male 87%, Female 13%) [(4)]. the outbreak investigation conducted in Afar region in 2017 reported Males were more affected by cholera than Females during the outbreak. In the same manner the most Affected age group in Dangur Woreda during the outbreak was 15-44yrs which accounts 57% of the total cases. This might be this age groups have a chance to exposure to eating food outside due to their job.

The analysis shows that from total cases 79% of cholera patients was diagnosed to be moderately dehydrated and the rest 21% are severely dehydrated. This result is opposing with Study done at afar region by 2017 and the affected age group 15-44 were similar to study done in Ethiopia afar region by 2017 as of both study conclude that this age group are vulnerable to cholera. This might

be the age groups have a chance to expose open defecation and eating food without proper hand washing. And the status of severe dehydration is higher than Ethiopia cholera outbreak management manual 2011. In our study area among cholera patient identified, 21% were diagnosed to be severely dehydrated which is higher than the maximum expected as National Guide line which is 20% (2). The increment reason may be secondary to road in accessibility; the patient cannot reach at health facility early as much as possible and poor understanding of the community about the disease.

Analytical study identified, drinking Basso, milk, and eating Fruits were independent risky Factors to be infected by cholera. The odds of developing cholera were 5.2 times higher among individuals who drink basso at 95% CI of 1.3-20.2 than those who does not drink. The odds of contracting cholera infection were also 3.7 times more among individuals consumed Fruits than the counterpart at 95% CI of (1.3-10.3). Contact History was also identified as independent risky factors to cholera outbreak in Dangur woreda. The odds of developing cholera were 3.5 times more among those have contact history (AOR=3.5, 95% CI [1.1-11.4]) than those who have no contact history with diarrheal cases. This result in line with the study done in Somali in 2017 (9). On the other hand, our study result revealed that Hand washing with soap and availability of latrine were preventive factors for cholera. The odds of developing cholera were 80% less (AOR=0.2, 95% CI [0.1-0.9]) among individuals those wash their hands with soap. This is similar report with situation report of WHO in Somali in 2017 [9] and case control study report from Amara region, Raya Kobo in 2016 (OR=0.78, 95% C.I (0.14, 0.81) (11).

LIMITATIONS

- Controls may be asymptomatic cholera cases as only 20% of infected person develops Symptoms.
- Poor line list data handling system

CONCLUSION

- There was cholera outbreak in Dangur Woreda
- Females were most affected
- We identified the source of the outbreak may be contaminated foods.
- Exposure to basso, milk, fruit, and contact history, were found to be independent Risk factors for cholera

- Hand washing and having private latrine were found to be preventive

RECOMMENDATION

- Metekel zone and Dangur woreda should provide health education on safe food consumption and disadvantage of open defecation.
- Metekel zone health office and Dangur woreda were advised to use standard line list format develop by EPHI/PHEM (2011).
- Increasing safe water access for all Kebeles is important to decrease the risk of cholera (Benishangul Gumuz regional water authority).

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1.2. Relapsing fever outbreak investigation and Response in woreda six, Akaki Kality sub-city, Addis Ababa, Ethiopia, 2017

ABSTRACT

Background: -Louse born Relapsing Fever is endemic in the mountains of Ethiopia and it accounts 27% of hospital admission. Most of the times, it occurs in the form of outbreak. In February 2017, a rise of louse-born Relapsing Fever cases was reported to Akaki Kality sub city from Akaki Kality woreda six districts. The aim of this investigation was to identify the source of infection, risk factors and recommend preventive measures to challenge the problem.

Methods: - We defined suspected cases as abrupt onset of rigors with remittent fever, headache, arthralgia and myalgia and compared each of them to two unmatched Controls randomly selected from health facilities based on screening result. A total of 37 cases and 74 Controls (screened negative for Relapsing Fever clinically and by the laboratory) were interviewed. We run a Bivariate and Multivariate test to identify risk factors. We assessed the residency place, living condition, environmental sanitation and personal hygiene of the participants.

Results: -We identified 70 total cases and interviewed 37 cases. The median age of cases was 20 (IQR=4). The attack rate was 16/100,000 population. Participant who was slept with greater six persons were 5.5 times more likely to develop relapsing fever than control (95% CI, 1.1, 28.0; P value 0.0379). Those individuals bathed at least weekly were 96% less likely to be affected, than those who do not take body both at all (AOR= 0.04(0.002,0.8). No significant association was observed with monthly income, contact history, change cloth at night or not, washing clothes frequently or not, age groups and sex of the respondent. We verified the existence of Relapsing fever outbreaks in Akaki Kality Sub city Woreda six which was significantly associated with mass sleeping and poor Hygiene. Close follow up of disease trend is recommended to minimize the impact.

***Key Word**: - Out break investigation, Case control, LBRF, Akaki Kality woreda six, 2017*

Word Count: 297

INTRODUCTION

Louse-borne relapsing fever (LBRF) is an acute febrile infection. It is caused by Borrelia recurrentis, a motile spirochete that measures 5 to 40 µm in length. The microorganism is transmitted from person to person by the human body louse (Pediculus humanus) (1).

Louse born Relapsing Fever was once a disease of global epidemic importance. Among twenty-seven borrelia species, fifteen are known to be associated with Relapsing Fever. Borrelia recurrentis is the only etiologic agent of LBRF. And humans are the only known reservoirs. The pathogen multiplies in the gut of the louse and is transmitted when an infected louse is crashed or scratched while feeding in the human host. Louse-borne relapsing fever has been restricted to countries with poor socio economic status, the most affected countries are Burundi, Rwanda and Ethiopia. Borrelia recurrent is the etiologic agent for louse-borne relapsing fever and occurs as epidemic under conditions of overcrowding, poverty, draught and famine. Homeless people in crowded shelters are also at risk of louse born relapsing fever (2, 3).

The incubation period is usually between four and eight days. The onset of symptoms is generally sudden, associated with circulation of bacteria in the blood, and include high-grade fever, malaise, chills and sweats, headache, meningism, myalgia/arthralgia and non-specific gastrointestinal symptoms (nausea and vomiting). The symptoms increase in intensity over five days on average (range: 2–7), then subside as the pathogenic agent disappears from the blood. After a first remission, spirochetes reappear in the blood and symptoms recur. The relapse occurs over several days to weeks, but fewer than 10 relapses are usually observed among untreated patients [3].

Large outbreaks of louse-borne relapsing fever had occurred throughout the past century, during World War II that involved about 10 million cases and one million deaths [4]. According to different recent study results, LBRF is among the top 10 causes of hospital admission nowadays in developing countries such as Ethiopia, Sudan and Somalia (5, 6)

More recently the burden of infection is widely overshadowed by other infections such as malaria, which presents in a similar clinical way. Even though it becomes neglected, it remains the most common bacterial infection in some developing countries. The distribution of LBRF has changed.

Dramatically over recent years; with the decrease of this once worldwide infection interrelated directly with the diminished level of infestation with clothing lice [7].

Currently, epidemic relapsing fever is found only in Ethiopia and neighboring countries, although its occurrence among homeless people of industrialized European cities has been suspected but not confirmed. Famine, war, and the movement and groups of refugees often result in epidemics of louse born relapsing fever (8). The highlands region of Ethiopia may have hundreds to thousands of cases of LBRF annually [3]. The highest incidence in this region is during the rainy season when the poor gather together in shelters [3]. The burden of relapsing fever infections occurring in endemic regions is becoming undiagnosed or misdiagnosed as malaria [9].

Statements of the problem

LBRF cases declined significantly worldwide due to the highly-decreased incidence of body louse infestations after the 1940s. However still now it remains the most public health problem and a common cause of hospitalization and death in East African countries, particularly in Ethiopia [2]. B. recurrent is currently endemic in Ethiopia and Sudan. LBRF can be severe and death occurs in 10% - 40% of cases in the absence of appropriate treatment, and in 2% - 5% of treated patients (6). Because of its public health importance, it is among the disease under surveillance in Ethiopia, relapsing fever is one of weekly reportable disease. As different study shows LBRF is the most common type which is endemic in our country. there is different risk factor that favors the occurrence of epidemic RF such as crowdedness and very populated life in Addis Ababa in different parts of the city. Starting from the fourth week of January, 2017 some cases of Relapsing fever was reported to Akaki Kality Sub city from corresponding Health facilities. Since this sub city is located at high risk area in the city because of different factor, the transmission of Relapsing Fever is easy and many of the population can be affected secondary to living in overcrowded situation. Therefore, early investigation and intervention is highly important in this area and this investigation may lead concerned body to take control method and prevent further infection of Relapsing Fever by digging out the risk of being infected by the disease.

Significance of the study

In district six of Akaki Kality sub city, the case of Relapsing Fever become increasing markedly from the end of January, 2017. Since the socio-economic status and life style of the population living in woreda predisposes them for occurrence of Relapsing Fever outbreak, it needs further investigation and integrated intervention to shift the trend of Relapsing Fever in the town as a whole. Therefore, this investigation plays a great role to identify the major risk factors, potential to Relapsing Fever and successfully control the outbreak

LITERATURE REVIEW

Relapsing fever is a rapidly progressive and severe septic disease. The disease is divided into two forms, i.e., epidemic relapsing fever, caused by Borrelia recurrentis and transmitted by lice, and the endemic form caused by several Borrelia species, such as B. duttonii, and transmitted by soft-bodied ticks. The spirochetes enter the bloodstream by the vector bite and live persistently in plasma even after the development of specific antibodies [10].

LBRF was once a major epidemic disease in many parts of the world [5, 11]. Because the fact that it has no animal reservoir, except the infectious agent B. recurrent is transmission via the human body louse and the association of the latter with poor hygienic conditions during war and destitution LBRF has been rarely encountered in Europe since World War II. Interestingly, this almost neglected disease has reemerged in Europe in the context of the ongoing migration from East Africa such as Eritrea, Somalia, and Ethiopia [12, 13].

As study done in Senegal have suggested, relapsing fever borrelia are the cause of approximately 13% of fever presenting to health facilities, representing 11 to 25 cases per 100-person per years [14]. Mortality rates from relapsing fever vary with the infecting agent; Most of TBRF cases have less than 5% mortality. However, with the infection from the East African species, B. duttonii and its louse-borne variant, B. recurrentis mortality can be higher. From Tanzania where B. duttonii is endemic high perinatal mortality rates reaching 475 cases/1000 pregnant women have been reported. On the other hand, higher spirochaetal loads are reported among pregnant individuals compared to non-pregnant controls. There is no life-long post infection prophylaxis to prevent repeat infections being reported amongst individuals living in endemic regions [7].

In Ethiopia, as different reports show there were repeated and continuous LBRF out breaks in different regions. Among them in 2010 for instances, in Southern Ethiopia (Hosanna hospital), LBRF admissions accounts 27% of total admissions and 6% of mortality rate in South Western Ethiopia (Jimma hospital) [15]. In 2012 there were LBRF out breaks in Bahir Dar Amara region with overall attack ratios of 0.26 out of 1000 population with zero death rates. Unmatched community based case control and descriptive cross-sectional outbreak investigation was conducted in Bahir Dar and it shows Poor personal hygiene, overcrowding and lack of alternative clothes are the major risk factors of RF among the cases [2]. The study done in Mekele in 2016 also shows the likely hood of acquiring relapsing fever is higher among those sleep-in mass (>6 member), not wash their body at least weekly and not change their cloth at night (16).

OBJECTIVE

General Objective

- To investigate Relapsing Fever Outbreak in Woreda six, Akaki Kality sub city,2017

Specific objectives

- To verify the existence of louse born relapsing fever outbreak in the district
- To characterize the outbreak in terms of person, place and time
- To identify factors contributing to the occurrence of outbreak
- To implement the prevention and control interventions

METHODOLOGY

Study Area: This Relapsing Fever outbreak investigation was conducted in Akaki-Kality sub city woreda six; it is one of the 11 woreda in the sub city. It is located in northern direction of the sub city. The sub city has the distance of 12-35 Km from the center of Addis Ababa. The sub city has 11 districts. Out of those 3 are rural type and the rest 8 are Urban type. The total Population is 235,326 of which 48.5% male & 51.5% female. This relapsing fever outbreak was conducted at the woreda six district whose surrounded by Nifas silk lafto sub city to the north and west

woreda ten and nine respectively and bole sub city woreda two and Akaki Kality sub city woreda five to the north direction. The total population of the woreda is 35,167.

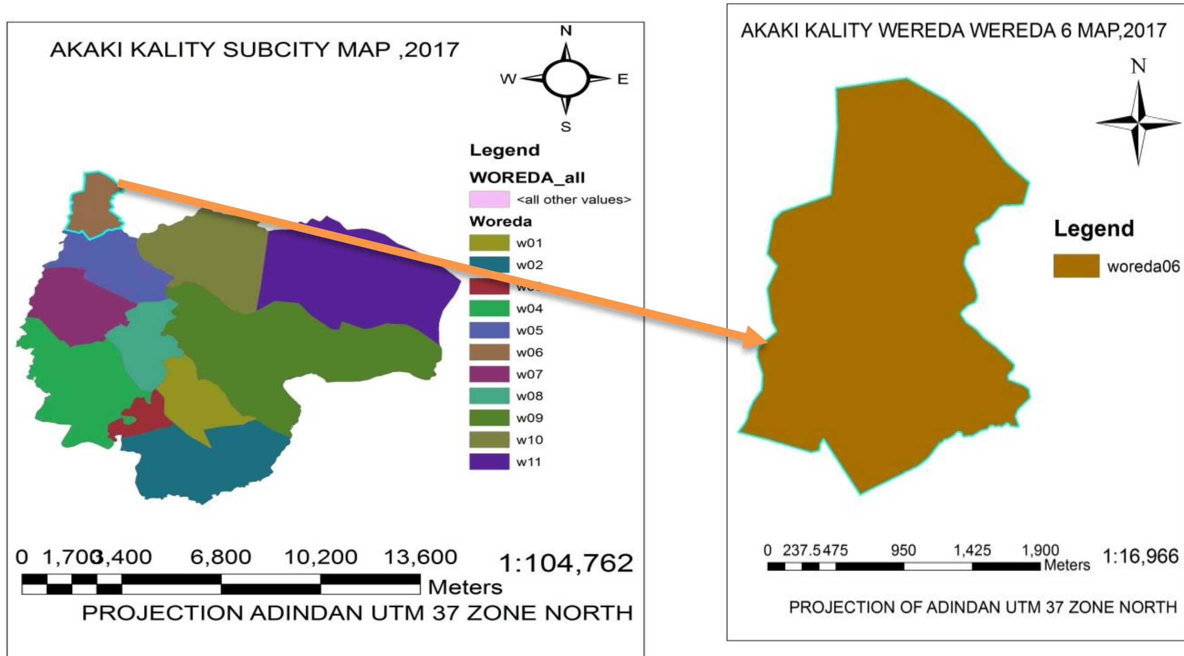

Figure: - 1. 6 *Map of the study area*

Study period: This study was conducted from First week of February, 2017 to June, 2017

Study Design: Unmatched health institution based case control study was conducted among 37 relapsing fever confirmed cases and 74 controls those have no contact with the cases and have no clinical features of Relapsing Fever on presentation. Both cases and controls were selected from the same Woreda.

Source Population: Population living in Akaki Kality sub city, Woreda Six.

Study population: All patients visit health facility in Woreda Six within study period

Study unit: The study units of this investigation were selected individual patients with louse born relapsing fever cases visited health facilities as a Cases group and those individuals who are living in the same Woreda six and visits health facilities for other medical care for control groups.

Sample size determination: In our study area since the cases were low, we proposed to enroll all Relapsing Fever cases those full fills our study inclusion criteria. Accordingly, by excluding patients visit health centers in this woreda with Relapsing fever illness from other neighboring/Adjacent woreda, patients those has no personal address (Phone) visited health facility at night and discharged before the arrival of data collector, all were selected for Case control study. Of 70 Relapsing Fever patients treated in this Woreda (Woreda Six), 12 cases were from Neighboring Woreda, 11 cases were treated before the initiation of our investigation, and 10 cases was seen at night. Finally, 37 RF cases were interviewed for investigation. For each case two controls were randomly collected among patients visited the health facility at same day with other health compliant.

Sampling Method: All relapsing Fever case presented at period of investigation was enrolled to study. Two controls (Individuals who were not complaining Relapsing fever clinical manifestation) were selected randomly for each selected cases at the same day in Health Facility.

Case Definition (EPHEM guide line)

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

Confirmed case: -suspected cases with demonstration of Borrelia recurrentis in peripheral blood film.

Epidemiologically linked case: -Is a suspected case, which has contacts (possibly got B. recurrent) with laboratory confirmed case.

Relapsing Fever Outbreak declaration criteria

As Ethiopian Public Health Emergency Management guide line recommends the thresh hold level for declaring an epidemic for Relapsing fever is: -

- Unusual increase of the case
- Doubling of Relapsing Fever cases on subsequent weeks

Accordingly, Relapsing fever outbreak was declared in Woreda Six, Akaki Kality Sub city sub city on January, 2017.

Selection of cases and controls

Inclusion criteria

- All Relapsing Fever cases came from Woreda six.

Exclusion criteria

- Relapsing fever patients presenting from neighboring woreda
- Relapsing Fever patients seen before the initiation of investigation

VARIABLES

Independent Variables

- Age
- Sex
- Religion
- Ethnic groups
- Residency Place
- Mass sleeping
- Knowledge about Relapsing Fever
- Monthly Income
- Personal hygiene
- Not changing cloth at night

Dependent Variables

- Relapsing Fever infection

Hypothesis

- H_o = Mass sleeping is associated with relapsing fever
- H_A = Mass sleeping is not associated with RF
- H_o = Poor personal hygiene is associated with RF outbreak
- H_A = Poor Personal hygiene is not associated with RF outbreak in Woreda six.

Data Collection Tools and Procedures

Since the outbreak was started one month before the beginning of Investigation, to get information, we reviewed patient's document (Card) from health facilities, OPD registration and laboratory log book retrospectively. Filled line lists were also used as an additional source of data for descriptive part. For analytical study, structured Questionnaire was prepared and Case and controls were interviewed face to face using standard questionnaire that includes; socio-

demographic data, Knowledge about the disease, exposure to risk factors etc. The questionnaires were adopted from different similar studies.

Data Quality Assurance

The questionnaire was checked for validity with sub city PHEM officers before starting data collection. Short description on data collection procedure was given for data collectors. To monitor and improve data collection system and quality, each completed questionnaire was daily reviewed by the principal investigators. Before analysis, data was also cleaned for any missing and logically inconsistent values.

Data processing and statistical analysis

Collected data were checked for completeness and inconsistencies. Then the data coded and entered to Epi Info Version 7.1.1 and Exported to excel. Some Variables were grouped and recoded using SPSS version 23 software. The entered data were cleaned and edited before subsequent analysis. Finally, analysis was done by using Epi info version7.1.1. Measures of central Locations (Mean, Median) and measures of dispersions (standard deviation, IQR) were calculated for cases and controls groups. Bivariate and multiple logistic regression analyses were done to identify the relationship between the independent variables and dependent variable. Independent variables that have p-value equals to or less than 0.2 in the bivariate logistic regression analysis were entered in multiple logistic regressions analysis. All statistical tests were two sided and significant associations were declared at p-value less than 0.05.

Ethical Consideration

A formal letter was written by Akaki Kality Sub city health office to woreda six administration health office and saris health center to get permission and facilitate the investigation process. Informed consent was taken from the study units and their families (if children) and any information related with personal identification was not used on the report. Confidentiality was kept through the process.

OPERATIONAL DEFINITION

- ***Mass sleeping***: - Sleeping in one place on one mat, card board on street, or Plastic sheet, as well small houses made of plastic by being more than 6 members.
- ***Homelessness:*** - A person who is living out of the home and sleep/ rest on the street
- **Knowledge**: - Participants those score points equal to or greater than the mean score (Mean= 3.17, SD=1.66) for the series of knowledge question were assigned to have good knowledge while those scores less than the mean point were assigned to have Poor knowledge about the disease transmission and prevention.

RESULT

Laboratory result

All registered relapsing fever cases starting from January 25, 2017 to June 30, a total of 70, were tested blood film at health center and confirmed to have Borrelia species.

Descriptive epidemiology

Descriptions of Relapsing fever cases by time

In Akaki Kality sub city Woreda six Relapsing Fever outbreak was reported in February, 2017. During the study period, 70 confirmed Relapsing Fever cases were reported with the overall attack rate of 16 out of 100,000 and CFR of Zero. In this Woreda, the cases reached the maximum level in May. The index case was reported from Woreda six in fourth week of January, 2017. The outbreak was reported to the sub city on the first March when there were six cases Visited health center with confirmed Relapsing Fever illness. The Relapsing Fever case report reaches the maximum at the 18th Epidemic week and ended in June (26th epidemic week) (Figure 1.7).

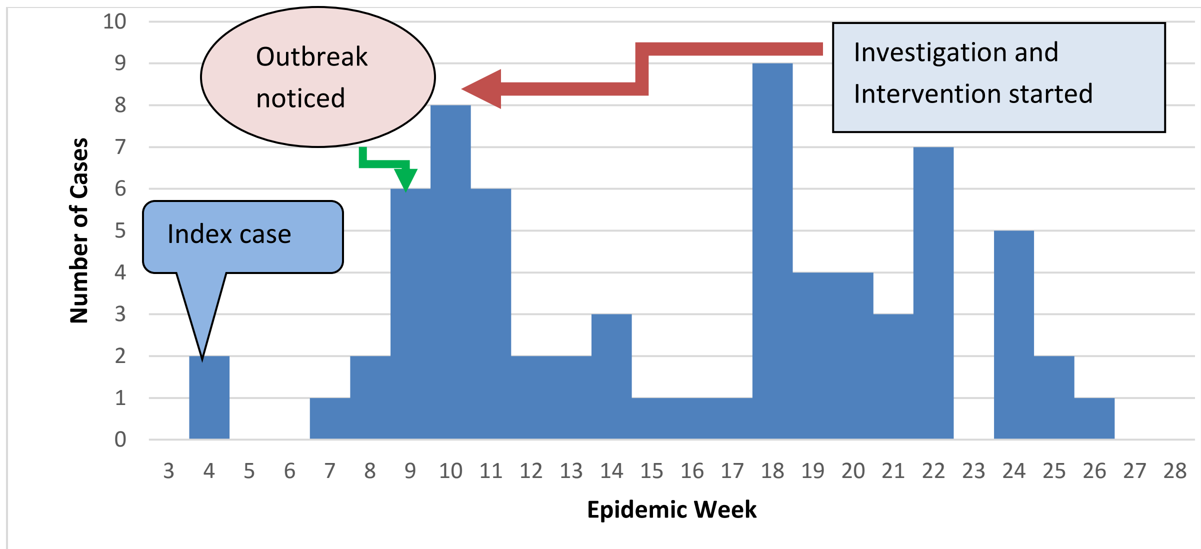

Figure: - 1. 7 Epi curve of Relapsing Fever outbreak in Woreda Six, Akaki Kality, Addis Ababa, Ethiopia,2017

Descriptions of Relapsing fever cases by person

Among 70 RF cases reported in 2017, from woreda 6 most of them, 62(89%) of them, was age group of 15yrs-34yrs. The age group of greater than 34yrs was less affected. The median age of affected group was 20 with IQR of 4 (Figure 1.8).

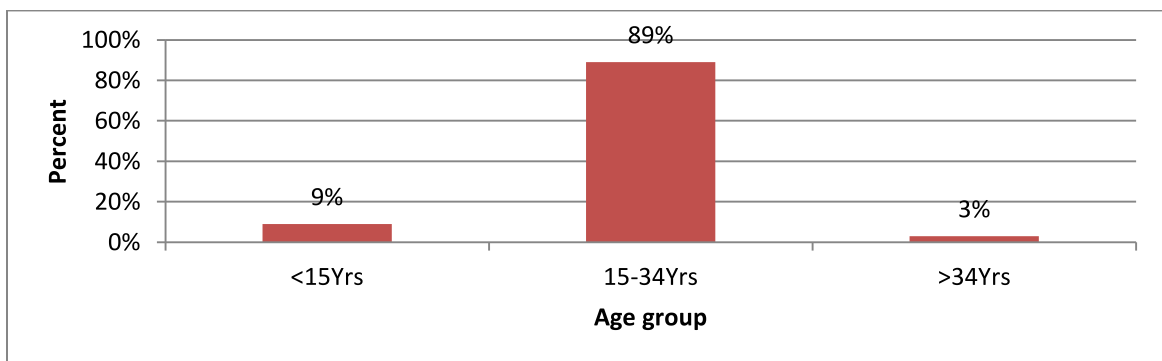

Figure: - 1. 8 Distribution of RF by age group 2017

From the woreda reports during the out breaks males were more affected than Females accounting about 33 cases per 10,000 populations (Figure 1.9).

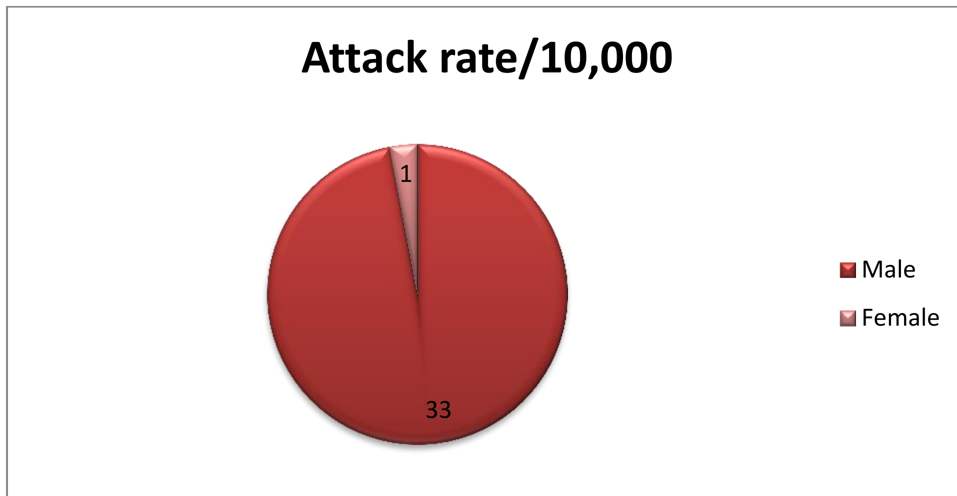

Figure: - 1. 9 Relapsing Fever distribution by sex, Woreda Six, Akaki Kality sub city, Addis Ababa, 2017

Descriptions of Relapsing fever cases by place

Among the total cases seen in woreda six health facility, about 12(17%) of them were came from the neighboring woreda (ten cases woreda 5 and two cases from woreda seven) (Figure 1.10).

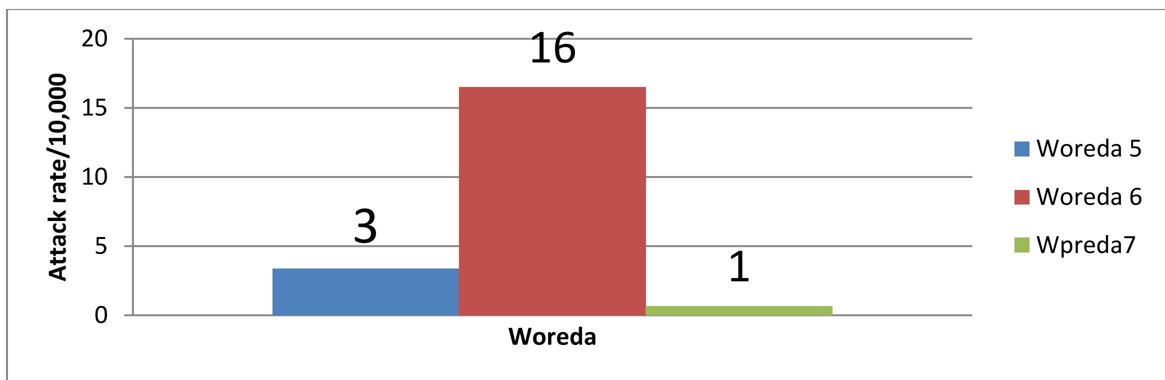

Figure: - 1. 10 Relapsing fever distribution by place, Woreda Six, Akaki Kality Sub City, Addis Ababa, 2017

Analytic epidemiology

A total of 37 LBRF confirmed cases and 74 controls were interviewed among which 28(76%) of cases and 36(49%) of controls were male. Most of the participants, 90(81%), were age group of 15-34yrs. The Median age of case and control was 18 (IQR = 6) and 25 (IQR=10) respectively.

The median monthly income of the participant was 900 Eth. birr with IQR of 1800 (ranges from 0-6000 birr). Of the respondents, 25(68%) cases and 14 (19%) controls were living on street (OR = 8.9, 95% CI [3.6, 21.9]. Significant association was observed among all socio demographic variables in bivariate analysis. (Table 1.4)

Table: - 1. 4 Bivariate analysis of Socio demographic Variables associated with RF outbreak, Woreda 6 Akaki Kality, 2017

Variables	Category	Case	Control	COR	P value
Age group	less than 15yrs	5(14%)	3(4%)	9.2(0.1,73.2)	0.026
	15-34yrs	30(81%)	60(81%)	2.8(0.6,13.2)	0.191
	Greater than 34	2(5%)	11(15%)	Reference	
Sex	Male	28(76%)	36(49%)	3.3(1.4,7.9)	0.0065
	Female	9(24%)	38(51%)	Reference	
Residency area	Street/Homeless	25(68%)	14(19%)	8.9(3.6,21.9)	0.00000
	Home	12(32%)	60(81%)	Reference	
Occupation	Employed	1(3%)	26(35%)	Reference	
	Daily laborer	26(70%)	19(26%)	35.694.4,285.6)	0.0000
	Student	4(11%)	22(30%)	4.7(0.5,45.5)	0.145
	No occupation	6(16%)	7(9%)	22.3(2.3,216.9)	0.0009
Monthly income	Greater than 2000	2(5%)	25(38%)	0.1(0.01,0.5)	0.0011
	1001-2000birr	10(27%)	15(20%)	0.9(0.3,2.3)	0.840
	Less than 1001	25(68%)	34(46%)	Reference	

Of the respondents, 29 (78%) of Cases and 17 (23%) of controls were sleeping together with a member of greater than six in one sleeping place (OR = 12.2, 95% CI [4.7-31.4]), 7(19%) of cases and 49 (66%) of controls were change cloths at night (OR = 0.12, 95% CI [0.04,0.3], and 9 (24%) cases and 2 (3%) controls had contact history with Relapsing fever ill person before (OR = 11.6, 95% CI [2.4,56.9]. Person those wash their cloths at least weakly was 99.98% less likely

to acquire Relapsing fever than those who wash their cloths monthly. In bivariate analysis Males are found to be 3.3 times more likely infected than Females (Table 1.5).

Table:-1. 5 ***Bivariate analysis of Personal and Environmental factors associated with RF outbreak Woreda six, 2017***

Variables	Category	Case	Control	COR	P value
Frequency of washing cloth	Once a week	4(11%)	56(76%)	0.02(0.01,0.08)	0.0000
	Every two weeks	10(27%)	7(9%)	0.5(0.1,0.7)	0.237
	Every three weeks	4(11%)	5(7%)	0.3(0.12,1.2)	0.082
	Once a month	19(51%)	6(8%)	Reference	
Changing cloth at night	Yes	7(19%)	49(66%)	0.12(0.04,0.3)	0.00000
	No	30(81%)	45(34%)	Reference	
Contact History	Yes	9(24%)	2(3%)	11.6(2.4,56.9)	0.0003
	No	28(76%)	72(97%)	Reference	
Knowledge	Good	14(38%)	36(49%)	0.6(0.3,1.4)	0.280
	Poor	23(62%)	38(51%)	Reference	
Mass sleeping	Yes	29(78 %)	17(23 %)	12.2(4.7-31.4)	0.00000
	No	8(22 %)	57(77 %)	Reference	
Frequency of body bath	At least once a week	3(8%)	50(68%)	0.01(0.003,0.07)	0.00000
	Every two to three weeks	11(30%)	18(24%)	0.1(0.04,0.5)	0.0017
	Monthly	5(14%)	2(3%)	0.6(0.1,3.9)	0.554
	Doesn't take at all	18(49%)	4(5%)	Reference	

Among factors those are suspected to be risk for the relapsing fever outbreak in Akaki Kality Woreda 6 in 2017 and cross tabulated with outcome variable, the variables those have a p value of 0.2 and less were entered into multivariate logistic regression to avoid possible confounders. In multivariate analysis the variables with a p value of less than 0.05 are considered to have significant association with relapsing fever illness. Accordingly, Multivariate analysis showed that the participant who was sleeping in mass (member of six and more people sleep together) was 5.5 times more affected than the counterpart (95% CI, 1.1, 28.0; P value 0.0379). Those individuals who take body bath at least weekly was 99.96% less likely to be affected Relapsing

Fever than those who do not take body both at all (AOR= 0.04(0.002,0.8). There was no difference observed among cases and control those take body bath monthly compared to not taking at all, monthly income, contact history, change cloth at night or not, washing clothes frequently or not, age groups and sex of the participant (Table 1.6).

Table: - 1. 6 Multivariate analysis of relapsing fever risk factors in Woreda six, Akaki Kality Sub City2017

Variables	Category	AOR	95% CI	P value
Age group	less than 15yrs	12.9	(0.2,10.7)	0.2582
	15-34yrs	2.5	(0.1,61.3	0.5745
	Greater than 34		1	
Sex	Male	5.4	(0.9,32.4	0.0644
	Female		1	
Residency area	**Street/Homeless**	0.9	0.1,8.1	0.8887
	Home		1	
Occupation	Employed		1	
	Daily laborer	5.4	0.01,24.5)	0.5912
	Student	12.0	0.03,48.5	0.4170
	No occupation	12.9	0.02,85.3)	0.4412
Frequency of washing cloth	Once a week	0.2	0.02,2.0	0.1674
	Every two weeks	1.6	0.1,21.9)	0.7260
	Every three weeks	0.2	0.01,4.7	0.3529
	Once a month		1	
Changing cloth at night	Yes	0.2	0.02,2.3)	0.2034
	No		1	
Contact History	Yes	51.8	0.6,76.2	0.0778
	No		1	
Monthly income	Greater than 2000	3.5	0.01,9.1	0.6614
	1001-2000birr	0.6	0.1,5.8	0.6838
	Less than 1001		1	
Mass sleeping	Yes	5.5	1.1,28.0)	0.0397*
	No		1	
Frequency of body bath	At least once a week	0.04	0.002,0.8	0.0362*
	Every two to three weeks	0.4	0.04,3.0)	0.3449
	Monthly	1.04	0.04,29.0)	0.9780
	Doesn't take at all		1	

*Key: *Variables significantly associated with RF outbreak*

1= Variables considered as reference in cross tabulation

INTERVANTION

- Akaki Kality sub city health office in collaborates with, woreda administration and AARHB, activates epidemic response task force to participate in active case detection & health educating to the community to prevent and control the outbreak.
- Action plan develop by task force.
- Contact tracing was done and house to house health education was given for contacts.
- The team engaged mass screening and conducted daily reporting cases to next level, Supportive, supervision in the case management & epidemiological linkage.
- Health education for all streets was given on how to prevent relapsing fever.
- Delousing (soaked their cloth with boiled water and shaves their scalp hair).
- Mass sleeping houses were identified and reported for Woreda to help them keep their personal hygiene and Environmental sanitation.

DISCUSSION

As EPHEM guide line recommends, unusual increase of relapsing cases or doubling of Relapsing Fever cases on subsequent weeks is considered as outbreak. Beginning from the fourth weeks of January 2017, RF cases was reported and up to the end of our investigation about 70 cases were registered in Woreda Six Health office which is from Saris Health Center. During our investigation, we reveal that the presence of Relapsing fever outbreak in Woreda Six Akaki Kality sub city.

In the study area Males (AR=33/10,000) were more affected than Females which is about 33 folds compared to female populations. This may be due to the probability that males are more prone to street life and mass sleeping. In the same manner age group of 15-34yrs population were more affected (89% of the total case) than the other age groups which is the same result with the case-control study done in Bahir- Dar, Amara region (97.1% were age group of 15-34yrs in Bahir Dar) [2]. This age group is a time when one person may be affected by peer pressure to go out of the family member and try to produce their own property. Due to this, most of the adolescent are prone to live on the street and most of them they prefer to sleep in a mass. Living on street were 3.6 folds (68%) among cases than control (19%) where mass sleeping and not changing cloth is common.

The death rate from relapsing fever in this Woreda was found to be 1.4% which was more than Bahir Dar in 2012 (Zero Death Rate) and the attack rate was 16 per 100,000 populations which was less than Bahir Dar as a case-control outbreak investigation study done in 2012 which shows attack rate of 26 out of 100,000 populations [2], and 2 folds than Mekele, Tigray which was 8/100,000 population in 2016 (16)

Mass sleeping and taking a bath at less than week were significantly associated with Relapsing Fever outbreak in our study area. The odds of acquiring relapsing fever for those sleep-in mass (more than six-member) (AOR=5.5, 95% CI [1.1-28.0]) was 5.5 times more than those sleep in less than six members. Similar finding was reported from the study done in Mekele, 2016 (AOR= 15.9, 95% CI [4.79-60.15]) (16). In addition, peoples those take body bath at least weekly (AOR = 0.04, 95% CI [0.02, 0.8]) was 99.6% less likely to be infected by Relapsing Fevers compared those take body bath more than week. This finding aligns with the study done in Bahir Dar in 2012 (AOR=8.01, 95% CI [3.5-18.29]) [2].

However, unlike the study done in Bahir Dar in 2012 (AOR= 13.23, 95% CI [5.51-31.75]) [2], Not washing closes at least weakly (AOR= 0.2, 95% C I [0.02, 2.0]) has no direct associated with louse born Relapsing Fever outbreaks in Woreda Six. The difference may be due to the sampling method which is Community based sampling method in Bahir Dar and hospital based in case of our study. It may also due to the possible difference between the life style of the study units. Similar to Bahir Dar study, no statistical difference was found on age, sex, ethnicity, changing cloths at night, Contact history and educational status compared both cases and control.

LIMITATIONS

- Representativeness Issue and possible bias (Hospital based sample selection)
- Some number of relapsing fever cases were not interviewed
- Controls were not screened by blood film as negative for relapsing fever

CONCLUSION

- There were RF outbreak in woreda six Akaki Kality sub city
- Males are more affected than Females
- Mass sleeping and poor Hygiene is associated risk factors for Relapsing fever

RECOMMENDATION

Woreda and sub city health office level

- Health education on Environmental sanitation and Personal Hygiene.
- Minimize mass sleeping and solutions for homeless people
- Close supportive supervision

Health center level

- Early case detection to initiate intervention early
- Continuous health education for community (cause, transmission, prevention)

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CHAPTER II: SURVEILLANCE DATA ANALYSIS

Surveillance data analysis of Epidemic Typhus in Akaki Kality Sub city, Addis Ababa, Ethiopia, 2012-2016

ABSTRACT

Back ground: - Epidemic typhus is caused by infection with Rickettsia prowazekii, which is carried and transmitted by body lice. Thus, it is a disease typically associated with war, famine, and other such events that cause personal hygiene to suffer and lice infestation to become prevalent. The aim of this data analysis to describe the epidemiology of epidemic typhus in Akaki Kality sub city, Addis Ababa, Ethiopia, 2012-2016.

Methodology: - Retrospective descriptive record review surveillance data analysis was done in five year trends of Epidemic typhus in Akaki Kality Sub city.

Result: - Totally within 5 years in Akaki Kality Sub city, about 49,940 cases of Epidemic Typhus were reported. The cases of epidemic typhus were become increasing year to year which is 6750 in the year of 2012 and 10,274 in the year of 2016. However, the highest number of cases was registered by the year of 2014 which accounts about 12,000 (24%).

Conclusion: In Akaki Kality sub city the prevalence of Epidemic Typhus was 3.33% in 2012, 3.53% in 2013, 5.63% in 2014, 4.30% in 2015, and 4.56% in 2016. In this Sub city the highest cases of epidemic typhus were reported in 2014. And among the eleven woreda administration, the highest number recorded in woreda seven administrations. In Akaki Kality sub city there were reporting gap between private health institutions which may lead to report discrepancy between real cases of Typhus in sub-city and report.

Recommendation: -The Akaki Kality Sub City Health Office PHEM case team has to aware the health institutions to report regularly genuine number to the respective site. The sub city health office advised to avoid data discrepancy between PHEM data and HMIS data. Well documented hard and soft copy is important for action measurement.

Key Words: Epidemiology of Typhus, Akaki Kality, Data analysis, 2012-2016

Word count: 291

2.1. INTRODUCTION

Epidemic typhus is caused by infection with Rickettsia prowazekii, which is carried and transmitted by body lice. Thus, it is a disease typically associated with war, famine, and other such events that cause personal hygiene to suffer and lice infestation to become prevalent. The disease is still responsible for outbreaks: it killed 100,000 people during the civil war in Burundi (1993-2005) (1).

Epidemic typhus is one of the most significant historical diseases of humans, is caused by Rickettsia prowazekii, a category B bioterrorism agent that can cause persistent human infection. Besides its notoriety as the agent of the recurrent chronic disease, trench fever, Bartonella Quintana can cause endocarditis and is a common infection among the homeless (2).

Typhus (Epidemic and Endemic)

Rickettsia is small intracellular bacteria that are spread to man by arthropod vectors, namely human body lice, fleas, ticks & larval mites. The rickettsioses are a zoonosis spread around various regions of the world, and the bacteria are transmitted by vectors such as mites, ticks, lice, and fleas. The organisms inhabit the gastrointestinal tract of these arthropods & spread to human host by the direct bite of the vector or the inoculation of the organism contained in the feces of the vector by bite induced body itching. These infections are characterized by persistence in the body, widespread vascuities (invading endothelial cells of small blood vessels) & multi-system involvement. Except in louse borne typhus humans are accidental hosts in most rickettsia diseases (3)

Epidemic Typhus (Louse born) is caused by ***R.prowazekii*** and transmitted by human body louse (Pediculus humanus corporis). Lice typically live in the seams of the host's clothing and infestations are associated with wearing the same clothing for prolonged periods of time without washing (*e.g*., wartime, natural disasters or poor personal hygiene). They acquire the rickettsia during a blood meal and the patient auto inoculates the organisms by scratching. It is commonly associated with poverty, cold weather, war and natural disasters. The disease is prevalent in mountainous areas of Africa, South America, and Asia.

Endemic Typhus (Flea born) / Murine Typhus: is cause by ***R. thypi*** which is transmitted by flea rikettsemic rats and carry the organism throughout the rest of their life span. Humans and

rats are infected when rickettsia –laden fleas are scratched in to pruritic bite lesions. Typhus remains an important public health problem in many developing countries. To reduce the incidence of typhus some control and prevention measures should be under taken like- Health education on personal hygiene and environmental sanitation,

Statement of the problem

Epidemiology and Characteristics of the disease: - Typhus is a febrile disease caused by Rickettsia prowazeki and characterized by various onset of clinical manifestation; often sudden and marked by headache, chills, prostration, and fever and generalized muscular pains. Pediculus humans corporis (body and head louse), which is peculiar to humans, is the only important vector of epidemic typhus. Cases of epidemic typhus now occur in significant numbers in Ethiopia and probably in highland areas of impoverished countries. Transmission: Human beings generally are infected when rickettsia laden louse feces are rubbed into the broken skin, scratching the louse bite facilities this process. Pathogenic rickettsias reside for a long period of time in patients with epidemic typhus

Particularly before modern sanitary practices and the availability of antimicrobial drugs and it spreads where conditions are crowded and unsanitary which is with its many areas of slums. Louse infestation, called pediculosis, is very contagious and easily transmitted by close body-to-body contact or contact with infested linen, brushes, or clothes, according to the species of louse. Louse-borne diseases are associated with a high prevalence of body louse infestation, and have recently re-emerged in jails and refugee camps in central and eastern Africa, in rural communities in the Peruvian Andes, in rural louse infested populations in Russia, and in homeless populations living in poor-hygiene conditions in developed countries (5).
Outbreaks of epidemic typhus have generally been associated with war, famine, refugee camps, cold weather, and gaps in public health management. No outbreaks of epidemic typhus have been recently identified in wealthy developed countries. Epidemic typhus remains a threat in the rural highlands of South America, Africa, and Asia. Areas of Russia, Burundi, Algeria, and Peru have all experienced typhus outbreaks in the past 20 years and are currently susceptible to outbreaks because of a high incidence of body lice, homelessness, or a large population of typhus survivors (5).

The permanent concentrations of the body louse occur in regions subject to cold weather, where inhabitants need to wear multiple layers of clothes, and in poverty-stricken communities whose inhabitants lack multiple sets of clothes. Such populations are most common in mountainous regions of countries in inter tropical zones, including Ethiopia, Epidemic typhus disease is recognized for its high mortality rate throughout human history, particularly before modern sanitary practices and the availability of antimicrobial drugs and it spreads where conditions are crowded and unsanitary which is with its many areas of slums. Louse infestation, called pediculosis, is very contagious and easily transmitted by close body-to-body contact or contact with infected linen, brushes, or clothes, according to the species of louse. Louse-borne diseases are associated with a high prevalence of body louse infestation,

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Significance of the study: -Analysis of surveillance data is important for detecting outbreaks and unexpected increases or decreases in disease occurrence, monitoring disease trends, and evaluating the effectiveness of disease control programs and policies. This information is also needed to determine the most appropriate and efficient allocation of public health resources and personnel. Analysis should be performed at regular intervals to identify changes in disease reporting. So in Akaki Kality Sub City there are Surveillance officers who are assigned to report immediately and weekly reportable diseases and to do trend analysis so I was try to pick the gap and comment to the concerned body. Therefore, this surveillance data analysis session helps to identify the sub city's incidence and trends of epidemic typhus disease of the past 5 years (2012-2016)

2.2.LITRATURE REVIEW

Magnitude: -Epidemic louse borne typhus has historically caused massive mortality in the era of war, famine, and great migrations. (1) In the four years from 1918 in Eastern Europe and Russia

there were up to 30 million cases, and three million deaths. In the recent past in Burundi typhus has infected prison inmates before spreading to the wider community. (2) It remains a risk among refugee populations in all parts of the world, despite its omission from a recent review of health care in refugee camps. (3) Tick borne typhus is a significant risk to human health, especially in the Eastern United States, Brazil, the Mediterranean basin, the Africa, India, and Australia. Endemic flea borne typhus occurs sporadically wherever rats and man live closely together. Scrub typhus is a hazard in many parts of South East Asia and beyond, and is the first of the rickettsia infections to show evidence of resistance to standard antibiotics (4). No useful vaccines are currently available for any of the rickettsia infections.

Pathogenesis The rickettsia cease are a family of obligate intracellular small Gram negative coccobacilli which infect humans chiefly through insect vectors, mostly from animal hosts, but some- times by trans ovarian transmission in the insects themselves.(5)The genus Rickettsia is divided into: (1) R prowazekii, the agent of classical epidemic typhus, transmitted by the human body (clothing) louse, Pediculus humans (but not by head lice) from active human cases or from healthy carriers or subclinical cases, so-called Brill-Zinsser disease.(6)Typical Circumstances were evident in the Burundi outbreak, (2) which started in a prison at N'Gozi in 1995 and spread to the malnourished inhabit- it ants of refugee camps in the central highlands (over 150m), causing over 50,000 cases with amorality of 2.6%.The infectious agent in the faeces of the body louse is usually inoculated by scratching of the site of the louse bite, but in epidemics in closed communities an aerosol of dried louse faeces may be inhaled. The genome of the organism has recently been sequenced, providing new evidence of an evolutionary relationship between rickettsia and intracellular mitochondria in general. (2, 7) R mooseri (R thypi), the causal agent of endemic typhus, is carried by the rat flea Xenopsylla cheopis, and typically infects man in markets, grain stores, breweries, and garbage depots. It is often a mild illness, but can become more aggressive in refugee camps, and a fatal case in the UK was infected in Spain (3, 8). The "spotted fever" group of rickettsia, which contains a large number of species transmitted from rodents, dogs, and wild animals by ticks. R rickettsia, the agent of Rocky Mountain spotted fever, so-called because of the area of its discovery, but now mainly occurring in the eastern Atlantic states of USA, especially in trekkers and hunters exposed to wild animal ticks, and with the potential for a severe haemorrhagic illness. (B) R conorii, the cause of tick typhus in the Mediterranean area and in India, which is transmitted by the brown dog tick Rhipicepha- lus

sanguineus-the tick is brown, the dog not necessarily so. A recent human case in Lille in northern France was caused by a tick from a dog imported from Marseille. (10) R Africa, which is found in the African veld, is transmitted in game park areas by ticks living on cattle, hippo, and rhino. (11) (D) R japonica, R Australia, and a variety of other similar organisms, which are widely distributed in Asia and Australia, (12, 13) and infect man through various species of animal ticks. (4) R tsutsugamushi, recently renamed as a new genus with only one species, Orientia tsutsugamushi,(14) the agent of scrub typhus, acquired from the bite of larval trombiculid mites living on the waist high Imperata grass growing in previously cleared jungle around villages and in plantations. The area of risk includes South East Asia, the Indian subcontinent- net, Sri Lanka, and other Indian Ocean islands, Papua New Guinea, and North Queensland. The rickettsia fevers are acute bacteraemia illnesses characterised by headache, mental confusion (and, in severe cases, meningo encephalitis), a macular rash, mainly on the trunk, with, in some types, a small black scar at the site of the insect bite, with local or general lymphadenopathy. Rickettsia proliferation on the endothelium of small blood vessels releases cytokines which damage endothelial integrity, with consequent. Based on outbreak investigation of epidemic typhus at Awi zone prison Awi Amara region state Ethiopia march 2012study death rates are zero but the attack rate is 23% [(12]) According to the study done on the sero prevalence of typhus fever at Kality prison, Addis Ababa, Ethiopia, prevalence of epidemic typhus is 26.3% [(11)]

2.3.OBJECTIVE

2.3.1. General objective

- To describe 5 years' trend of Epidemic typhus disease by time, person and place in Akaki Kality Sub City, Addis Ababa, Ethiopia, 2012-2016.

2.3.2. Specific objective

- To describe and interpret 5 years (2012-2016) epidemic typhus surveillance data by time, Person and Place.
- To show 5 years (2012-2016) epidemic typhus disease trend in Akaki Kality Sub City

2.4. METHODOLOGY

Study area: Akaki-Kality sub city is one of the10th sub city of A.A. The Sub city is found in south &south east direction of the city. The sub city has 11 district out of this 3 are rural type the rest 8 is Urban type. The total Population is 229,859 from this 48% male & 52% female. In the sub city there are one governmental hospital, one private Hospital, 07 governmental and 1 NGO health Center. Among seven governmental health centers seven of them are giving service and two other health centers are under construction; there are many private health institutions in urban woreda of the sub city (Figure 2.1).

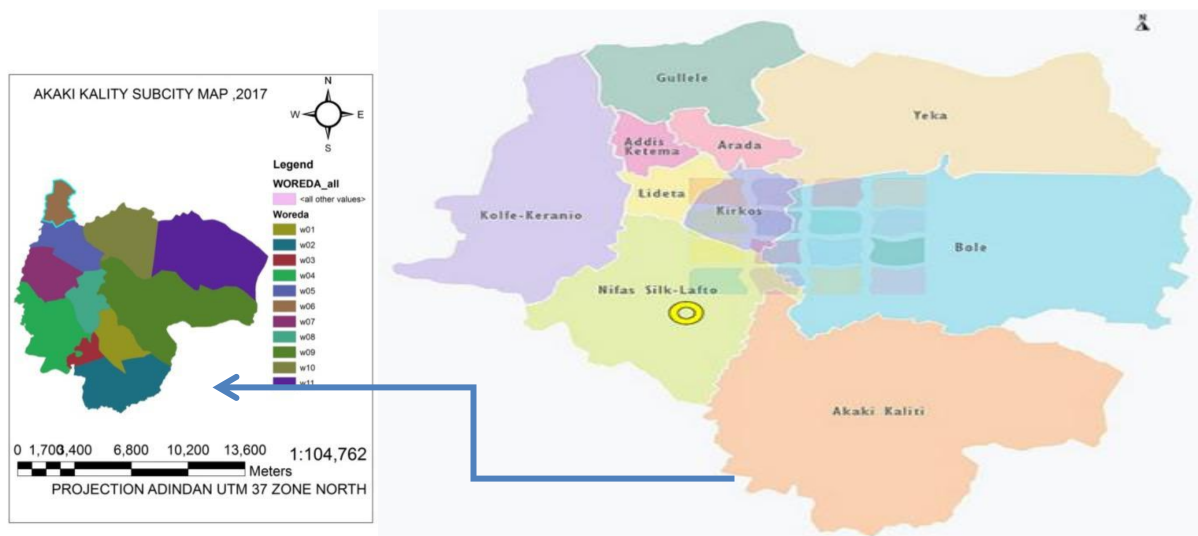


Figure: 2. 1 Akaki Kality Sub city Administrative map.

Study period: The last 5 years (2012-2016) epidemic typhus surveillance data were collected and analyzed in the time period from January 20/2017 to February 27/2017

Study design: Retrospective descriptive record review conducted to assess the last 5 years (2012-2016) surveillance data of epidemic typhus in Akaki Kality Sub City, Addis Ababa, Ethiopia.

Data source: The data were requested and obtained from Akaki Kality sub city pre documented information in PHEM office from weekly reports, Aggregated and annual report from all health center and private health institution that report to the sub city health office and monthly HMIS reports are used.

Sample size: No sample size is calculated because all reported cases are included

Numerator: All people who develop illness treated or died from Epidemic typhus in a year of study period.

Denominator: Total population at risk in the study period

Data entry and analysis: After data collected analyzed by using Excel 2007

Ethical issues: Ethical clearance was secured by writing formal letter from Addis Ababa university school of public health to Akaki Kality sub city health office and Official permission was obtained from concerned authorities of the health office.

INCLUSION AND EXCLUSION CRITERIA

Inclusion criteria: All last 5 years (2012-2016) epidemic typhus surveillance data of Akaki Kality Sub City was included in the analysis.

Exclusion criteria: Hospital and non-reporting private health facilities are excluded

VARIABLES

Dependent variables

- Outpatient cases of typhus,
- Inpatient cases of typhus and
- Deaths from typhus cases.

Independent variables

- Age
- Sex

Data collection: -secondary data were collected throw document review within 5 years (2012 to 2016) weekly PHEM and HMIS document reviewed by the principal investigator.

Operational Definitions of Terms

- **Epidemic Typhus (Louse born)**: is caused by ***R.prowazekii***and transmitted by human body louse (Pediculushumanuscorporis).
- **Endemic Typhus (Flea born) / Murine Typhus:** is caused by ***R. thyphi*** which is transmitted by fleas.

Dissemination of findings

The result of epidemic typhus surveillance data trend analysis is communicated to Akaki Kality sub city health office and Addis Ababa university school of public Health Field Epidemiology Training Program.

2.5. RESULT

Within 5 years back, in Akaki Kality Sub city, about 49,940 cases of Epidemic Typhus was reported from respective Health facilities with overall prevalence rate of 23% and Zero Case Fatality rate. The cases of epidemic typhus were become increasing year to year which is 6750 (Prevalence rate 3.3%) in the year of 2012 and 10,274 (Prevalence rate 4.6%) in the year of 2016. However, the highest number of cases was registered in the year of 2014 which accounts about 12,000 (24%) (Figure 2.2)

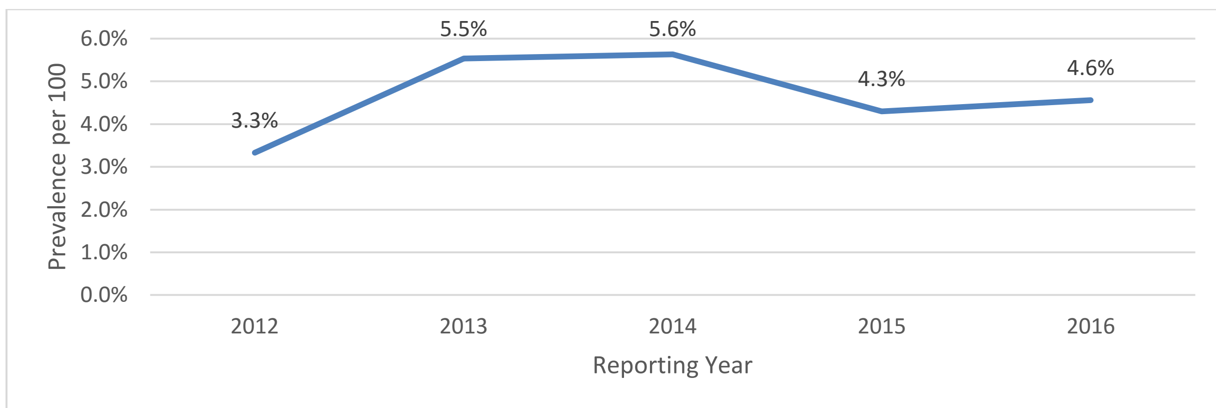
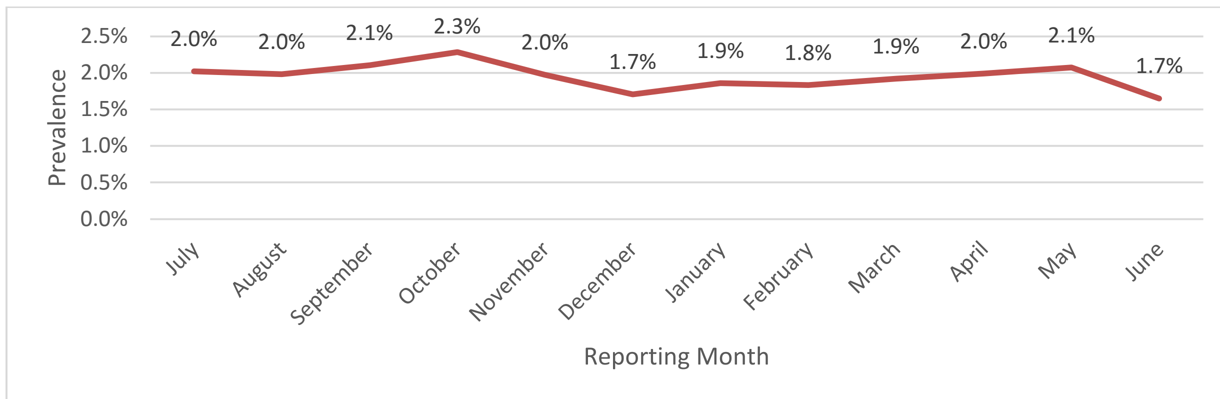


Figure: - 2. 2 ***Trend of Epidemic Typhus in Akaki Kality Sub city, Addis Ababa, Ethiopia, 2012-2016***

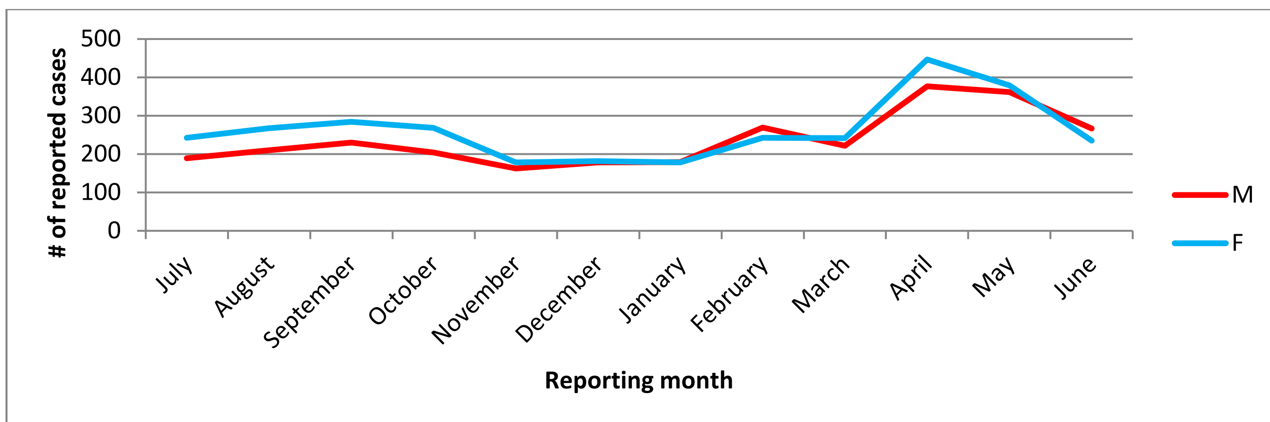
In terms of case reporting month, the highest number of Typhus was registered in the month of October which was 4877 (Prevalence rate of 2.3%) and the lowest cases were reported in June which accounts about 3524 cases (Prevalence rate of 1.7%) (Figure 2.3)



Source: -Akaki Kality sub city IDSR Report & PHEM office, 2012-2016

Figure: - 2. 3 Epidemic Typhus Prevalence by month in Akaki Kality, Addis Ababa, Ethiopia, 2012-2016

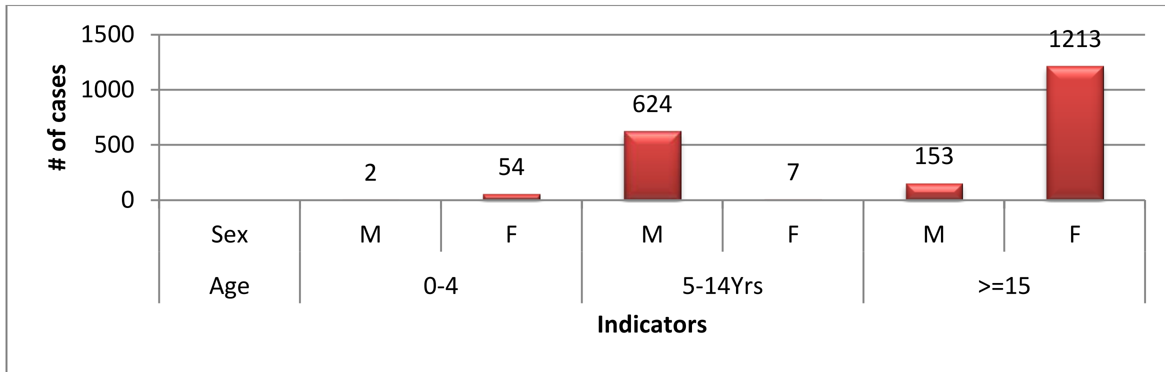
In 2016, the trends of Epidemic Typhus cases slightly increase from July to September and it decreases through October to March. Then from March to May it was increased. The following figure shows that females are more affected than males (Figure 2.4).



Source: -Akaki Kality sub city HMIS 2016.Report.

Figure: - 2. 4 Comparison of 2016 typhus patients by sex in Akaki Kality Sub city, Addis Ababa, 2016

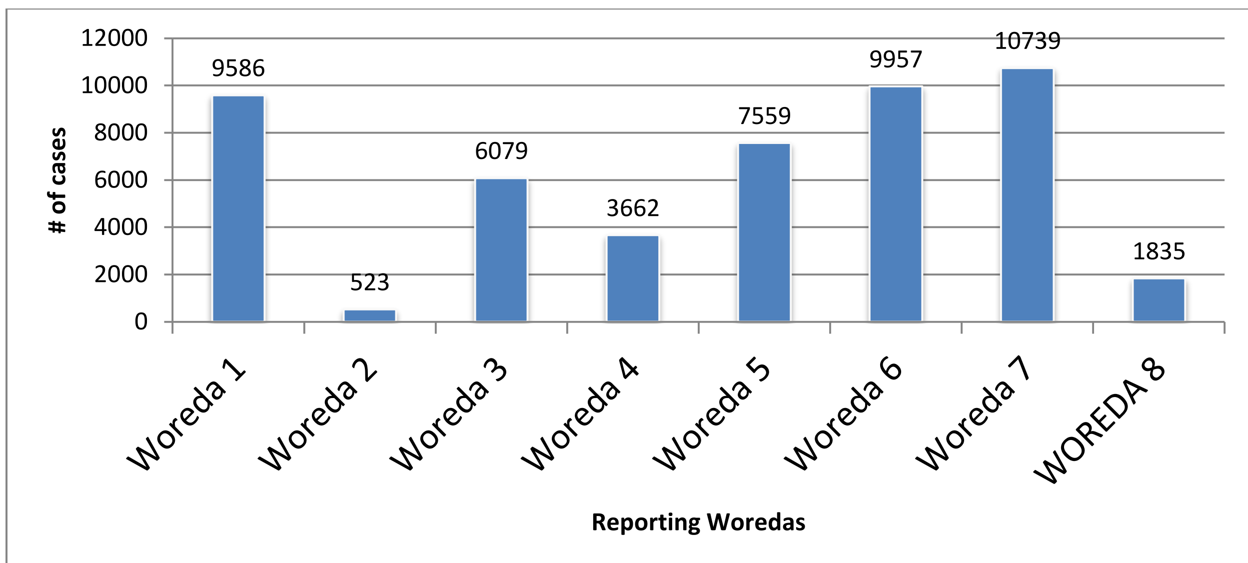
The PHEM weekly reporting format did not incorporate Sex and Age Variables. Because of this to see the distribution of Epidemic Typhus by sex and age, I tried to take some of information from HMIS data, data of 2012 and 2016 Accordingly, as this information shows Females are more affected than Males. In 2012 for example, Female age group of greater than 15 years are contribute 1213 while compared to male of the same year 153 and also by the year of 2012 female greater than 15 years old are contributed 2705 compared with same year and age 153. On the other hand, the least affected age groups are less than five-year-old which is 56 and 447 by the year of 2014 and 2016 respectively (Figure 2.5).



Source: Akaki Kality sub city HMIS 2016 report

Figure: - 2. 5 Akaki Kality sub city epidemic typhus distribution by Sex and Age in 2016

When we see the distribution of epidemic typhus in each woreda the result shows the highest number was reported from woreda 7 followed by woreda 6 while the least case reported from woreda 2 and 8 (Figure 2.6).



Source: - Akaki Kality sub city health office each 5-year report.

Figure: - 2.6 ***Typhus distribution by woreda in Akaki Kality Sub city, Addis Ababa, 2012-2016***

2.6. DISCUSSION

Epidemic typhus is one of the highly prevalent diseases in developing countries. It is considered primarily as a disease of war, and has made a significant contribution to human history. As this surveillance data analysis shows the Five years (2012 to 2016) trend of epidemic typhus cases at Akaki Kality sub city were increasing from Year to Year which needs the managerial discussion and decision to reduce the case.

The Prevalence of epidemic typhus cases in outpatient departments increased through a year. The cases increased from in 2012(6750) to 12000 (2014). The increment might be occurred because of the increasing of reporting health facilities, which was a total of 35 health facilities in 2012 increased to 65 health facilities in 2016.

The overall Typhus prevalence rate in Akaki Kality sub city within the last five years was 23% and the case fatality rate of the Akaki Kality sub city were 0% which is similar with the study report from Awi Zone, 2012 [(13)]. Death from typhus is expected to be increased after the age of 60yrs old ([12)], but my study doesn't Analyzed the data because of information shortage. Mortality of untreated patient ranges 0 to 70 % [(12)], but my study doesn't cover because of data limitation. Study shows 88% of cases are male [(12)], but my study proven that 70 % are female which opposes other study result. Epidemic typhus may lead to abortion [(12)], but the issue doesn't cover by my study because of data limitation.

Seasonality of the occurrence of epidemic typhus is not strongly evidenced with the surveillance data analysis. However, the incidence of epidemic typhus rises at October, September and July with all five years. Among the three months the incidence is higher on October. The admission rate of epidemic typhus at health center was almost zero cases. This is because health facilities and service expanded throughout the Eight Woreda of the sub city. These help the population to get treatment early.

In order to express the findings in terms of place, person and time, the weekly surveillance data can capture only outpatient, inpatient and deaths from epidemic typhus case. To compensate this problem, I have used HMIS two years 2012 and 2016 monthly report. Due to this there is data discrepancy between weekly surveillance data and HMIS monthly report data.

2.7.LIMITATION

- The sub city PHEM department data collection format is not well design that is not comprises age and sex.
- There may be Epidemic typhus cases those did not visit health facility
- Some of health facilities in the sub city don't report weekly.
- Poorly handled, incomplete and no well-organized hard and soft copy.

2.8.CONCLUSION

- In general, almost all of epidemic typhus cases were treated as outpatient.
- The highest number of epidemic typhus cases reported in 2016
- The highest cases were reported in the month of October
- The highest number case recorded from woreda seven administration
- There is data discrepancy between PHEM and HMIS

2.9.RECOMMENDATION

- Health education on personal hygiene for community at health center is Important.
- Close follow up of the trends at each woredas and Sub city level.
- Further study is needed to identify risk factors
- FMoH & EPHI are recommended that it is better to comprise all variable necessary for data analysis (age, sex, geographical distribution, admission and outpatient) in the Weekly and immediately reporting format.

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CHAPTER III SURVEILLANCE SYSTEM EVALUATION

Surveillance system evaluation of malaria in Akaki Kality sub city, Addis Ababa, 2017.

ABSTRACT

Background: - Public Health Surveillance is recognized as the cornerstone of public health decision-making and practice. public health surveillance system can be used to guide immediate action for cases of public health importance, measure and monitor the burden and trends of a disease, guide the planning, implementation, and evaluation of programs to prevent and control disease, prioritize the allocation of health resources, and others. The aim of this study was to assess the performance of core functions and attributes of surveillance system in Akaki Kality sub city of Addis Ababa region.

Method: - The study was conducted in Akaki Kality sub city from July 2017 up to septmber.2017. A descriptive document review evaluates surveillance system of malaria to four Governmental health facilities, four districts and one sub city health office also used the recommended update CDC guide line of surveillance system evaluation questioner.

Result: - In 2017 one year reported data 6593 suspected malaria cases was seen among them 1012 were confirmed cases (PF=249 and PV= 771). Over all Completeness and timeliness of the report was 100% and 90% respectively. Surveillance data were not analyzed regularly and there was no assigned budget for emergency PHEM activity.

Discussion: At all visited level facilities there was no regularly supportive super vision and written feedback. Over all report completeness and timeless are better than WHO standard (80%) registered (90%) and the core activity sum of achievement is 69% which is low and this may challenge the public health emergency management task. It is important to allocate Budget line for PHEM activity within sub-city, district and health center level. Plan and implement training for surveillance focal person,

Key Word: Surveillance, System Evaluation, Malaria, Akaki Kality, 2017

Word Count: 273

3.1.INTRODUCTION

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 [**1**]

Surveillance needs to be linked to timely dissemination of the data, so that effective action can be taken to prevent disease. Surveillance mechanisms include compulsory notification regarding specific diseases registries (population-based or hospital-based), and continuous or repeated population surveys [2, 4]

Data from a public health surveillance system can be used to guide immediate action for cases of public health importance, measure and monitor the burden and trends of a disease, guide the planning, implementation, and evaluation of programs to prevent and control disease, prioritize the allocation of health resources, and others. In addition, a surveillance system should be simple, flexible, acceptable, situation specific and should be established at the beginning of public health activities set up in response to an emergency [**3**]

In Africa, where infectious diseases continue to be a major health problem, many of the national surveillance systems ensure neither timely detection nor an effective response to them**.**

To address this issue, in 1998 the World Health Organization Regional Office for Africa approved the Integrated Disease Surveillance and Response (IDSR) strategy for strengthening infectious disease surveillance and response capacity among its 46 Member States and requested that Member States conduct assessments of their IDSR systems [**5**].

The findings of which would act as a baseline for reform plans. Integrated disease Surveillance and response is aimed to assist health workers to detect and respond to diseases of epidemic potential, of public health importance and those targeted for eradication and elimination. The information collected through this strategy will help district health teams to respond quickly to outbreaks, set priorities, plan interventions, and mobilize and allocate resources. The Integrated Disease Surveillance and Response strategy links community, health facility, district, regional and national levels with the overall objective of providing epidemiological evidence for use in making decisions and implementing public health interventions for the control and prevention of communicable diseases [6,**7].**

Surveillance is essential for the early detection of emerging (new) or re-emerging infectious diseases. In the absence of surveillance, disease may spread unrecognized by those responsible

for health care or public health agencies. By the time the outbreak is recognized, it may be too late for intervention measures. Continuous monitoring is essential for detecting the 'early signals' of outbreak of any epidemic of a new or resurgent disease. For disease surveillance to prevent emerging epidemics, the time taken for effective action should be short [**3**].

In 1996, as part of the response to the growing public health problem with communicable diseases, Ethiopia introduced an integrated disease surveillance and response (IDSR) strategy focusing on 17 priority diseases. Ethiopia adopted the world health organization's IDSR strategy in 1998, and in October 1999, the ministry of Health (MOH) of Ethiopia and its development partners assessed the country's surveillance system and used the results to adapt a five-year national plan [**8**]. The Study done at Nigeria by the year of 2017 the system provides information on malaria trends, morbidity and mortality. Case definitions are well understood by participants. All Malaria focal persons were willing to continue using the system. Standardized data collection tools are available in 91% of Health Facilities. The system was rated flexible by 91%. The system has an average timeliness of 37.7% and completeness of 59.4%, both parameters was below the Stated 80% world health organization target. About 91% malaria focal person had refresher training, while 78% malaria focal person received supportive supervision. Main challenges identified were lack of commodities in all health facility and inadequate mobile facilities in 70% of HFs (13).

Since 2009 Ethiopia has introduced a new approach i.e. the public health emergency management (PHEM) to guide the prevention and control of any public health emergency problems within the country. Public health surveillance is part of the public health emergency management that helps to provide advance information of an incoming threat in order to facilitate the adoption of measures to reduce its potential health impact. Before BPR implementation 23 priority diseases included under IDSR by categorizing it three major groups which are Epidemic-Prone Diseases, Diseases Targeted for Eradication and Elimination, and Other Diseases of Public Health Importance [10]. In BPR IDSR is included under PHEM core process. However, after redesigning those priority diseases modified in to 20 (13 are immediately report able whereas 7 are weekly report able). Those diseases are selected Based on: Diseases which have high epidemic potential, required internationally under IHR 2005, Diseases targeted for eradication or elimination, Diseases which have a significant public health

importance and Diseases that have available effective control and prevention measures for addressing the public health problem they pose [11].

Currently, the Federal ministry of health identified 21 diseases and health events to be reported immediately and Weekly **[9].**

Table: - 3. 1 ***List of Immediate and weekly reportable surveillance diseases in Ethiopia***

Immediate reportable diseases	**Weekly reportable diseases**
1. Acute Flaccid Paralysis (AFP) / Polio	**15. Dysentery**
2. Anthrax	**16. Malaria**
3. Avian Human Influenza	**17. Meningococcal Meningitis**
4. Cholera	**18. Relapsing fever**
5. Guinea worm	**19. Severe Malnutrition**
6. Measles	**20. Typhoid fever**
5. NNT	**21. Typhus**
8. Pandemic Influenza A	
9. Rabies	
10. Smallpox	
11. SARS	
12. VHF	
13. Yellow fever	
14. MDSR	

On the other hand, evaluation of public health surveillance system is used to ensure that problems of public health importance are being monitored efficiently and effectively.

Thus, Public health surveillance systems should be evaluated periodically, and the evaluation should include recommendations for improving quality, efficiency, and usefulness [5].

While evaluating surveillance system should include an assessment of usefulness of the system, system attributes, including simplicity, flexibility, data quality, acceptability, sensitivity, predictive value positive, representativeness, timeliness, and stability [5].

Statement of the problem

Malaria is a killer parasitic disease it causes more than 800,000 deaths and estimated 2.7 million cases annually; in Africa, malaria is the leading cause of morbidity and mortality; 88% of deaths and 83% of cases occur in Sub Saharan African countries. About 75% of the Ethiopia 's land is malarious and 68% of its population is at risk of malaria. Each year, health facilities report 5-10 million clinical cases of malaria and one million confirmed cases. Overall, according to the FMOH'2009/2010 report, malaria accounts for up to 14% of outpatient consultations (the leading cause of outpatient consultation) and 9% of health facility admissions. However, of these, only one million are reported at the national level, with 462,623 (55.84%) examined and 256,487 (23.68%) confirmed positive by a diagnostic test in 2009/2010. The completeness of this report, though, is questionable. According to FMOH reports, approximately 70,000 people die of malaria each year in Ethiopia. Compiling highly accurate malaria estimates is a challenge. In a country with a weak health information system, the few data which are available are often unreliable and likely to overstate malaria burden, as most cases are diagnosed solely on clinical grounds and only a small percentage of those with fever will have malaria [**12**].

Rational of the study

Malaria is the major surveillance diseases in the sub city reported with high frequency through the year and public Health concern but relatively delayed in detection and reporting. Malaria Outbreak is necessary to assess the surveillance strength in detecting it. Malaria is main indicator of the surveillance system of the sub-.city. The purpose of evaluating public health surveillance systems is to ensure that problems of public health importance are being monitored efficiently and effectively. Public health surveillance systems should be evaluated periodically, and the evaluation should include recommendations for improving quality, efficiency, and usefulness. Evaluation of a public health surveillance system focuses on how well the system operates to meet its purpose and objectives.

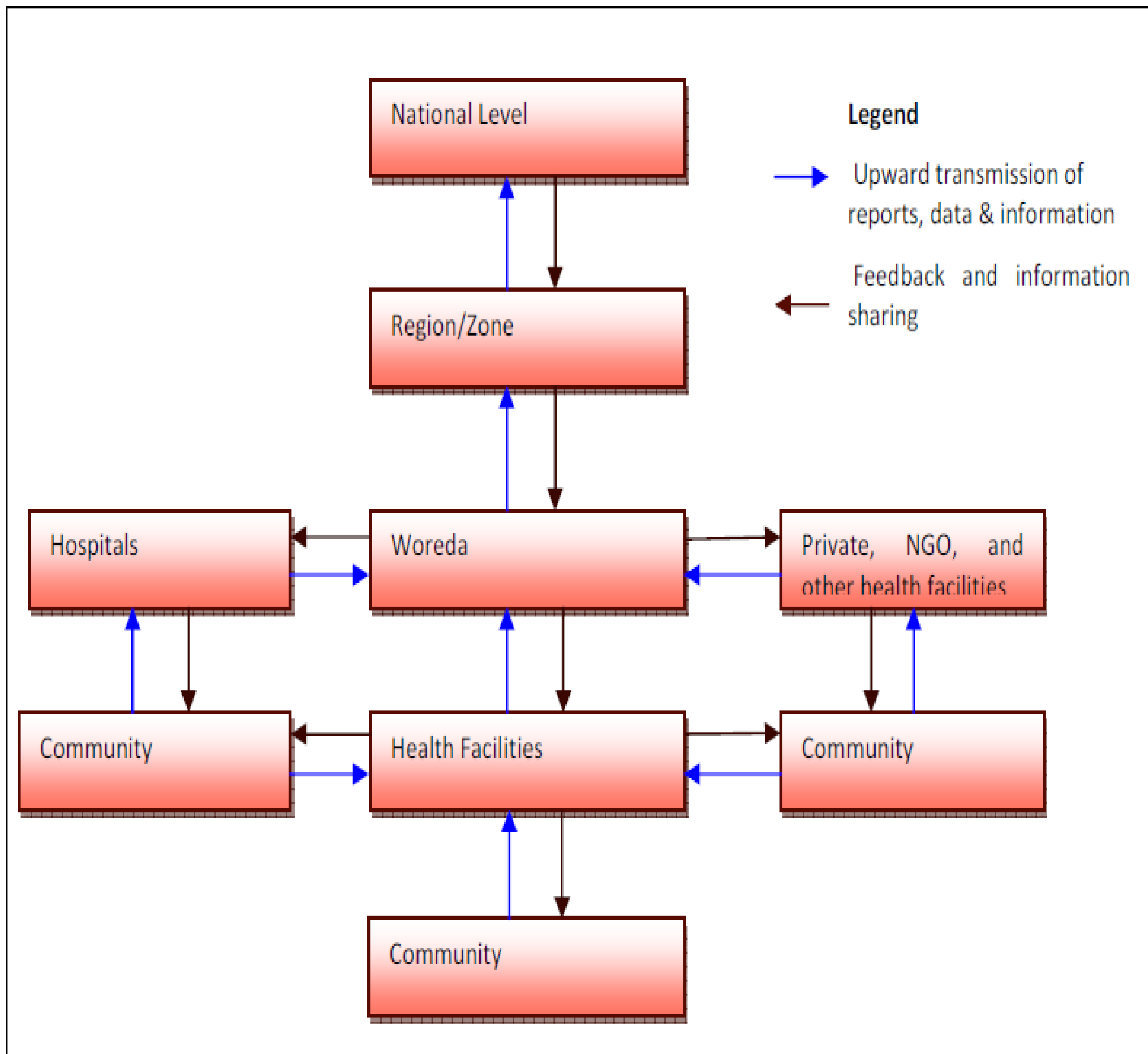

Figure: - 3. 1 illustrating the formal flow of surveillance data and information throughout a health system in Ethiopia

3.2. OBJECTIVES

3.2.1. General objective:

- ❖ To describe the performance of existing surveillance system for malaria and evaluate the key system attributes of surveillance in Akaki Kality from June 11/2017 to September 10/2017

3.2.2. Specific objectives:

- ❖ To evaluate the key attributes of surveillance system (Accuracy, completeness, Accessibility, Flexibility, PPV, simplicity, Time lines, and validity)
- ❖ To assess the core activities (case detection, reporting, data analysis and response) of the surveillance system.
- ❖ To describe constraints and challenges faced in the process of implementing the surveillance system.

3.3. METHOD AND MATERIAL

Study area: Akaki-Kality sub city is one of the 10 sub city of Addis Ababa. It is located in southern direction of the city. The sub city has the distance of 12-35 Km from the center of Addis Ababa. The sub city has 11 districts. Out of those 3 are rural type and the rest 8 are Urban type. The total Population is 229,859 of which 48.5% male & 51.5% female. The sub cities have one governmental, one private Hospital, Nine governments and one NGO health center. There are 101 private clinics in urban woreda of the sub city. All hospitals are reporting to regional health bureau and 95 health facility report to zonal health office.

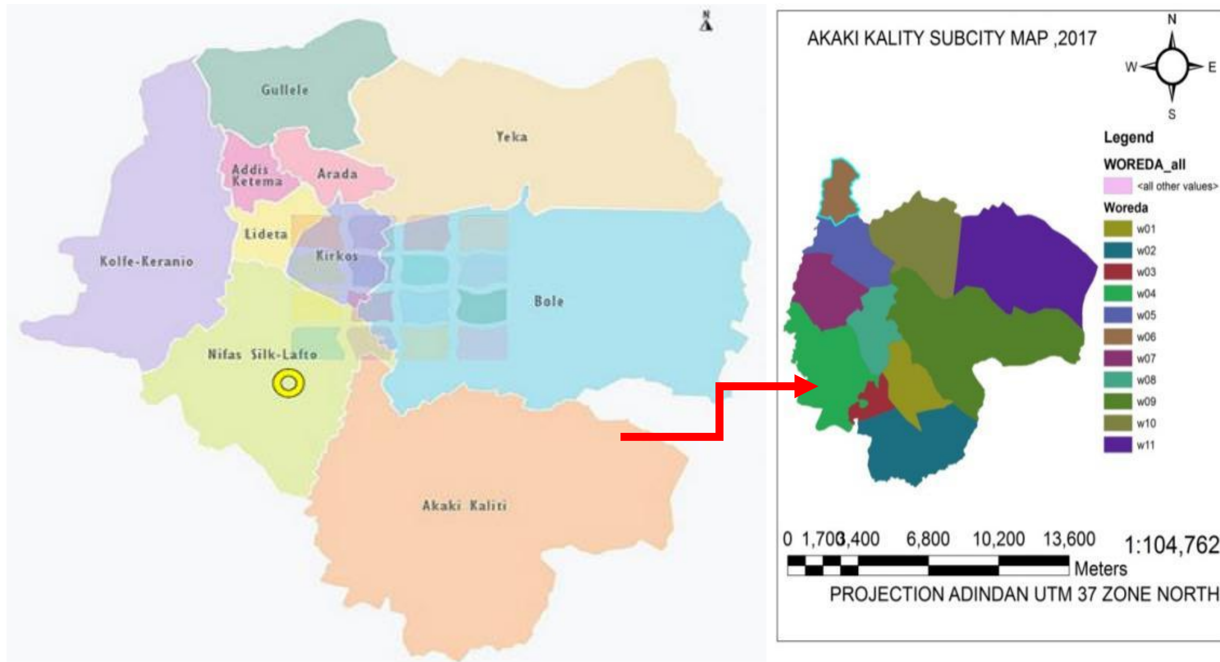

Figure: - 3. 2 Akaki Kality Sub city administrative Map

Study period: The study was conducted from June 11/2017 to September 10/2017

Study Design: Descriptive cross sectional study design was used.

Study population: All Health facilities in the Akaki Kality sub city

Sample size and Sampling technique: The sub city has 11 districts and from 11 districts, 4 districts (woreda3, Woreda Seven, Woreda 11, and woreda 05) with their corresponding health centers (Fire selam health center, Kality health center, catholic health center and saris health center) were selected by using simple random sampling method.

Data collection tools and methods: Data collection was done by face to face interview using WHO standard questionnaire/checklists. The core functions of the surveillance system (case detection and registration, data reporting, data analysis, outbreak investigation, epidemic preparedness and response; existence and functionality of RRT and the surveillance feedbacks were evaluated. The respondents were PHEM officers and /or the head of the institution. In addition to interview the data were checked by observing some tools for surveillance by the principal investigator. Record review was also one part of the data collection system. The data was entering in to computer and analyze with Microsoft excel.

Standard case Definition

Suspected: - Any person with fever, headache, rigor, back pain, chills, sweats, muscular, pain, nausea, and vomiting diagnosed clinically as malaria

Confirmed: - A suspected case confirmed by microscopy or RDT for plasmodium parasites

Data quality and control: Data was collected by interview at four health facility and five health office checked with documents available at that level of the surveillance unit and also completeness of the information after each interview were checked and rechecked the document.

Dissemination of the result: Written reports both hard and soft copies are prepared and share to Addis Ababa university school of public health Field Epidemiology Training Program and Akaki Kality sub city health office.

Ethical consideration: Before conducting the surveillance system evaluation, supportive letter was obtaining from the sub city health office and submitted to all those site data and information was collected.

Operational definition

Acceptability: -Willingness of persons and organizations to participate in the surveillance system. And it was measured quantitatively through the reviewing completeness of report forms for the past three months and timeliness of information coverage.

Accuracy: - Degree to which a measurement or an appraisal based on measurements represents the genuine value of the attribute that is being evaluated.

Completeness: - Proportion of all expected data reports that were actually submitted to the public health surveillance scheme.

Data Quality: - Data quality reflects the completeness and robustness of the data entered into the public health surveillance scheme.

Flexibility: - A flexible public health surveillance system can conform to changing data needs or operating conditions with little extra time, staff office, or allocated funds. Flexible systems can accommodate, for instance, new health-associated effects, changes in case definitions or technology, and variations in funding or reporting sources. In accession, organizations that

utilize standard data formats (e.g., in electronic data interchange) can be well mixed with other arrangements and therefore might be considered flexible.

Positive Predictive Value (PVP): - PVP is the proportion of reported cases that actually have the health-related event under surveillance.

Representatives: - A public health surveillance system that is represented accurately describes the occurrence of a health-related event over time and its distribution in the population by place and person

Simplicity: - The simplicity of a public health surveillance system refers to both its structure and operation easy to understandable Surveillance systems should be as simple as possible while still meeting their objectives.

Sensitivity: - sensitivity refers to the ability to detect outbreaks, including the ability to monitor changes in the number of cases over time.

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.

Timeliness: - Interval between the occurrence of an adverse health event and make an action.

(i) The report of the event to the appropriate health agency,

(ii) The identification of that agency of trends or outbreaks, or

(iii) The implementation of control measures

Usefulness: - How helpful the system is to public health staff in taking actions as a result of interpreting and analyzing its data.

Validity: - Degree to which statistical information correctly describes the phenomena it was designed to ensure

3.4.RESULT

3.4.1. Disease Trend

The surveillance system of Akaki Kality sub city was assessed. In this assessment a total of 9 sites five health office and four health center were participated. In the last one year (2016/2017) about 6,593 malaria suspected cases was reported among which 1,012 were confirmed (PF=241 and PV= 771).

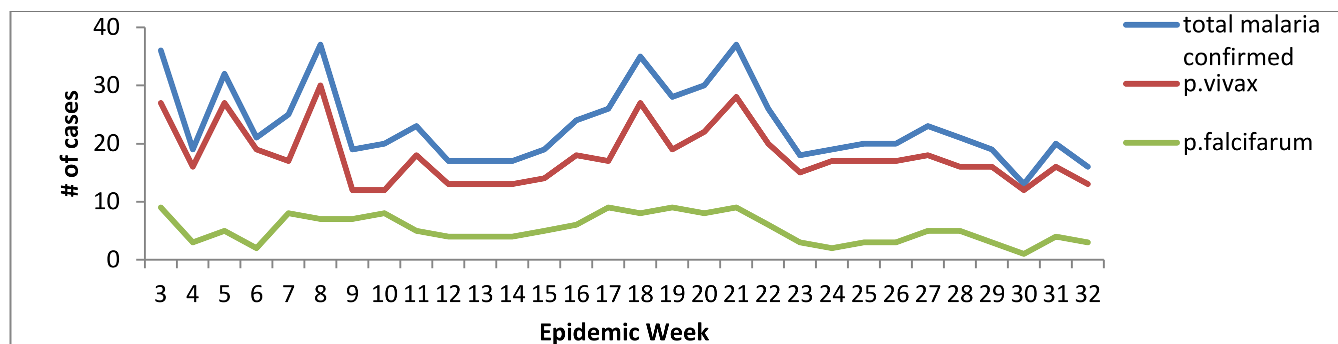

Figure: - 3. 3 Confirmed Malaria Cases trends in Akaki Kality the sub city, Addis Ababa, Ethiopia, 2016/2017

The above one year confirmed malaria trend shows high pick of cases reported during July to September and there were high plasmodium vivax cases than plasmodium falciparum.

3.4.2. CORE FUNCTIONS OF THE SURVEILLANCE SYSTEM

Availability of national surveillance manual

From Nine visited health facility/office seven of them have the national surveillance guide line.

Table:-3.2 Availability of case definition, register, format, guideline, protocol, in visited health institutions/health office at Akaki Kality sub city 2016/2017

S. NO	VARIABLE	Sub city health office n=1	%	Health center (n=4)	%	Districts (n=4)	%	SUM (n=9)	%
1	Availability of case definition of Malaria	1	100	4	100	2	50	7	78
2	Availability of clinical register	N/A	-	4	100	NA	-	4	100
3	Availability of report format	1	100	4	100	1	25	6	67
4	PHEM guideline	1	100	3	75	3	75	7	78
5	Malaria guide Lines 2012	1	100	3	75	1	25	6	67
6	Posted Malaria management protocol	1	100	0	0	0	0	1	11
7	Data reporting	1	100	4	100	4	100	16	76
8	Data analysis	1	100	0	0	0	0	1	11
9	Epidemic preparedness	1	100	4	100	1	100	9	100
10	Response to epidemics	1	100	4	100	4	100	9	100
	TOTAL AVEREGE	-	100	-	75	-	47.5	-	68.8

Case definitions, Case Detection and Registration

Standard case definitions for all prioritized diseases are available in 4 health facilities, one sub city and two districts. Mentioned above in their surveillance manual which is (78%) from 9 health facilities/health office. All the visited health facilities prepared log books for rumor and clinical registration. But some of them were not clear and complete which makes difficult to collecting data and cross checking the reported cases.

Data reporting formats and communication

During the last six months, there was shortage of weekly PHEM reporting formats in sub-city as well as in visited health facilities. But the gap filled by copying the format. All the health facilities weekly and immediately surveillance activities reported to district level used by telephone. The districts/ Woreda report to the sub city by telephone and hard copy. The sub city was send report regularly by telephone to A.A regional health bureau; sometimes they did report with email & manually but now it is interrupt due to shortage of weekly surveillance format.

Reporting Timeliness & completeness

Timely report of surveillance data is important for early public health interventions. Timeliness is a speed between steps in a public health surveillance system as per standard of National PHEM. The expected level of report timeliness is 80% and above. In Assessed Woreda the average timeliness was 90%. And all zonal cumulative timelines including non-assessed health facilities from sub city secondary data are 88%. Completeness of reporting from assessed institution was 100% but all over health facilities in the sub city completeness are 95%.

Table: - 3. 3 Completeness & Timelines of visited health facilities within three months (January to March 2017)

Weeks	Expected HF	Total Reported	Completeness	Reported on time	Timeliness
1st	9	9	100%	8	89%
2nd	9	9	100%	7	78%
3rd	9	9	100%	7	78%
4th	9	9	100%	8	89%
5th	9	9	100%	8	89%
6th	9	9	100%	8	89%
7th	9	9	100%	9	100%
8th	9	9	100%	9	89%
9th	9	9	100%	8	89%
10th	9	9	100%	8	89%
11th	9	9	100%	9	100%
12th	9	9	100%	9	100%
TOTAL	108	108	100%	98	90%
Overall health facility	96*12=1152	1092	95	1018	88%

Key: HF= Health Facility

Data Analysis

In all visited health facilities and Woreda health office the trend of malaria cases analysis was not done in the last one year except one Woreda and Sub city which is performed irregularly. This accounts about 2%.

Existence of Action Threshold Levels

Action threshold level was available at all assessed health facilities and sub city level but only 56% of them has posted the thresh hold level for priority disease. However, in all assessed District health office there was no posted thresh hold level.

Outbreak investigation

In the past one year, the sub city had reported two outbreaks, AWD which was covers five Woreda of the sub city (Woreda1, 4, 5, 7, & 8) in 2016/ 2017 and relapsing fever from two

Woreda (6 and 8). All the visited health facilities/offices were highly participated in outbreak investigation and responding to them.

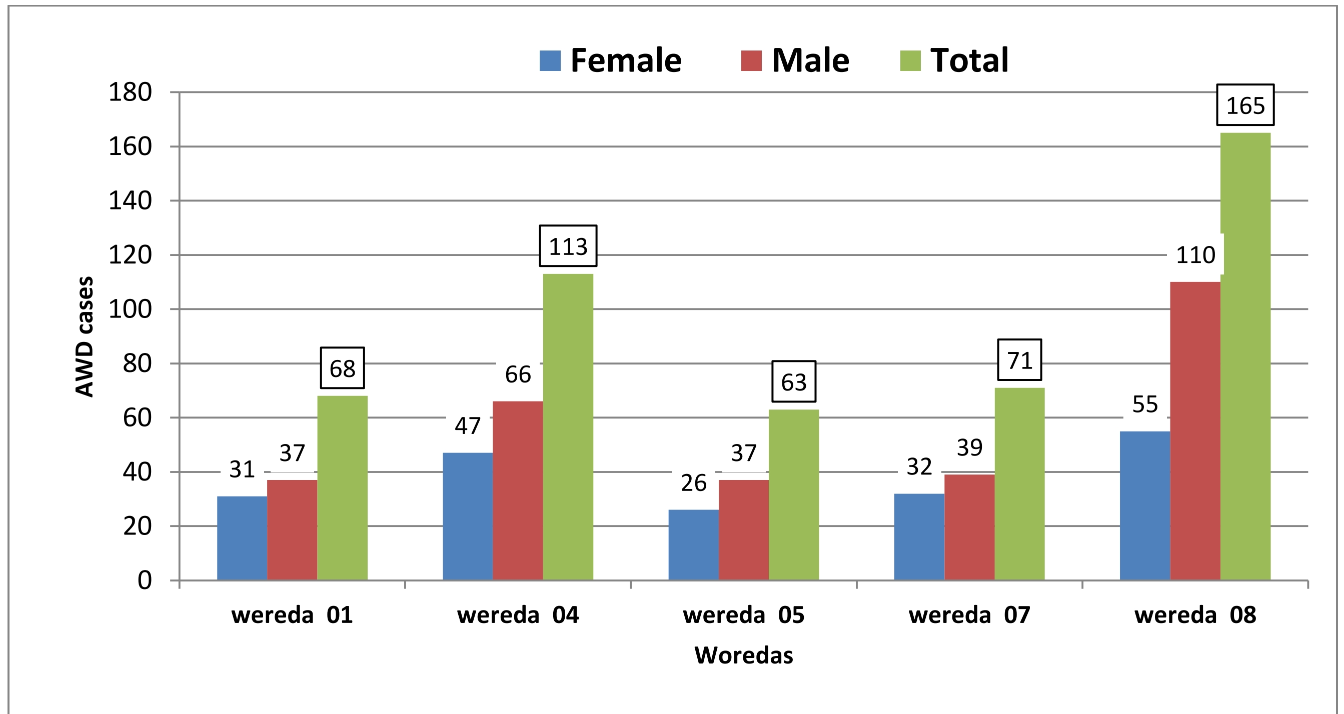

Figure: - 3. 4 AWD out-breaks in 5 Woreda of Akaki Kality sub city, Addis Ababa, Ethiopia, 2016

Epidemic Preparedness & Response

There was written epidemic preparedness and response plan at sub city level and 4 health centers but the assessed districts have not. Regarding rapid response team there was established in three governments & one NGO health center including sub city. But no regular meeting was done and didn't establish of epidemic management committee in all visited health facility and Rapid Response Team were not established at district level but avail at health center and sub city even if there is no regular meeting (Table 3.4).

Table:-3.4 Availability of epidemic preparedness and response in all visited health facilities/offices

S.NO	VARIABLE	Health center (n=4)	%	Districts (n=4)	%	Sub city (n=1)	%	Total % (n=9)
1	Availability of Rapid Response Team (RRT)	4	100	0	0	1	100	56
2	Epidemic preparedness (relevant for epidemic prone diseases)	2	50	0	0	1	100	33
3	Response to epidemics	4	100	4	100	1	100	100
4	Availability of Emergency stock of drugs and supplies	0	0	0	0	0	0	0
5	Availability Outbreak investigation check list	3	75	0	0	1	100	45
6	Availability of budget for epidemics/ emergency	0	0	0	0	0	0	0
7	epidemics responded within 72 hours	4	100	0	0	1	100	56
8	Average	17/28	61	4/28	14	5/7	71	41

Laboratory

In Akaki Kality health office the commonest under surveillance disease are AWD, Malaria, measles, Relapsing fever, Typhoid fever, Epidemic Typhus and Dysentery. Of these, measles and AWD laboratory test were not being done at health center level and the sample was transported to National Laboratory (EPHI). Other diseases like polio and meningitis also could not performed at health center even there is no material for sample collection at health center level. The rest tests are being performed at health center level. In average malaria test result took 30 up to 45 minutes to conform. Ethiopia Public Health Institute is responsible to the test of the

specimen those transported to EPHI and inform the result based on the standard time on the national guideline to the national Public Health Emergency Management (PHEM).

3.4.3. Supportive Functions of Surveillance System

Feed back

From 9 visited health facilities/offices eight of them were received the written feedback from sub city health office (only 50% of the plan) but the Woreda didn't make feed back to the lower level.

Supportive Supervision

During the past six months, the sub city health office conducted supportive supervision only two times on surveillance activities with other integration activities. This is 50% of the plan as well the districts make supervision regularly with none of written document to their private and governmental health facility due to shortage of vehicle, budget and logistics.

Training

Training is one of the mechanisms to build the capacity of health workers and strengthening the surveillance system. Generally, the sub city PHEM officers and all four health center focal person are trained on basic surveillance system as well got refreshment course about surveillance within two years. But the district PHEM officer was not trained on surveillance except three days' refreshment training.

Resources and communication

Most of the visited health facilities/offices lack electricity, Computer, printer, photocopy and generator. They used private phone for reporting surveillance disease and other communication and they have not PHEM unit separately in each health facilities except sub city health offices (Table 3.5).

Table: - 3. 5 Availability of resources for PHEM activates in visited sites

S.NO	VARIABLE	Health center (n=4)	%	Districts (n=4)	%	Sub city (n=1)	%	Total (n=9)	%
1	Telephone	4	100	4	100	1	100	**9**	**100**
2	Electricity's	4	100	3	75	1	100	**8**	**89**
3	Bicycles	0	0	0	0	0	0	**0**	**0**
4	motorcycles	3	75	0	0	0	0	**3**	**33**
5	Vehicles	2	50	0	0	1	100	**3**	**33**
6	Computer	4	100	1	40	1	100	**6**	**67**
7	Fax	0	0	0	0	0	0	**0**	**0**
8	Printer	4	100	0	0	1	100	**5**	**56**
9	Internet	0	0	0	0	0	0	**0**	**0**
10	Photocopy	4	100	0	0	1	100	**5**	**56**
11	Budget for Emergency response	0	0	0	0	0	0	**0**	**0**
12	**Total**	25/44	57	8/44	20	6/11	55	**39/99**	**39**

Budget for Surveillance Activities

At all health facilities and health office have no separate budget allocated for surveillance activates.

3.4.4. Attributes of the Surveillance System

Usefulness

Collecting surveillance data through case based and weekly basis is very important but not sufficient by itself to improve the public health problems through preventing and controlling the impact of priority diseases. Data must be analyzed, interpreted, and used for taking action accordingly. In each visited sites there was surveillance focal person but data was not analyzed in most of the visited facilities and districts except one Woreda and Sub city health offices in which they perform irregularly. The main reasons they reported for not analyzing data were lack of technical skills and had limited time for the surveillance system, due to work overload. The population under surveillance is around 229,859. In all assessed health facilities and health office they replied the existing surveillance system enables them to capture any disease under surveillance easily.

Simplicity

Reporting formats used were simple and can take, on average, only 10-15 minute to fill and all health professionals can easily fill the format.

Flexibility

The flexibility of the surveillance system in this evaluation indicated that 6 (67%) of the study participants reported that the current reporting formats could be used for other newly occurring health event (disease) without any difficulty and 2(33%) of respondents said that any change in the existing procedure of case detection and reporting formats made it difficult to implement.

Data Quality

Reporting formats of weekly and immediately reportable diseases are well understood at health center, districts, and sub city levels. But the format didn't fill appropriately and a lot of blanks are observed almost all observed facilities.

Acceptability

Health workers expressed they are satisfied with their work related to surveillance and believe that surveillance system is helpful and important for public health. Among participants 67% of them replied they are satisfied by the current surveillance system and un satisfied employee

complains that they have no updated training, basic surveillance training, and regular super vision. All private and governmental health facilities those providing health service are accepted the existing surveillance system and are participating in reporting epidemic prone disease as per national guide line.

Representativeness:

Representativeness shows how far the routine surveillance report is covered by the health service delivery system and how many facilities are reporting to the offices. The representativeness of the surveillance system was assessed by health service coverage and by health care seeking behavior of the community. According to the sub city health office, in assessed area health center and private clinics coverage is 100%. The population has good health seeking behavior for the disease. Geographical representativeness and health service physical accessibility in the district is particularly greater important in an early warning system to ensure detection of outbreaks nationally notify-able diseases. In visited districts the surveillance activities being done not only in health facilities but also health extension workers are also reporting any health events they observe in house to house survey. However, holy water place, Traditional healers, other religious organizations were not well integrated to the system. This may affect the representative of system.

Sensitivity

Sensitivity is the proportion of cases of a disease (or other health-related event) detected by the surveillance system. It was difficult to evaluate sensitivity of the system without knowing false negatives and positives that identified by the system. Even though there are false positives those are confirmed as negative by Gold Test/Microscope/, there are no false negatives identified by system and later confirmed by Gold test as true negative. Due to this reason, it was difficult to measure sensitivity of the system at each level.

Predictive Value Positive (PVP)

The gold standard test for malaria is Blood film. But in our study area all malaria suspected cases was tested only by RDT and to calculate PVP we have no numerator (Blood film test result)

Stability

As we stated above in all assed Woreda there were no allocated budgets for surveillance system. Due to lack of accessibility of computer and other supporting materials the health offices didn't perform disease trend analysis which has great impact on the early disease outbreak identification. However other than lack of budget, the surveillance system did not affect by other restructuring process in all assessed Woreda.

3.5. DISCUSSION

Disease surveillance provides a means of monitoring disease incidence over time and, depending on the nature of the system, may be an appropriate instrument for detecting unusual patterns among incidence data. However, a properly designed system should bring forward significantly the chances of intervention disease control if the system is evaluated regularly.

In Akaki Kality there was a surveillance focal person in all the visited sites but the focal persons had work overload and lack of capacity to do data analysis. Due to work over loads the focal person are not performing the expected data analysis which is very crucial for early detection of disease outbreak. There was a poor practice data handling systems, interpretation and utilization of surveillance data at all facility and Health office that is only 22% this might be due to lack of Knowledge and skill to handle the data. The entire visited health center was participated in response of epidemic including sub city and they have RRT. This is one strengthen of surveillance intervention practice. On the other hand, lack of budget for surveillance system support, epidemic preparedness plan, surveillance manual, malaria guide line and management protocol which was observed in assessed woreda have a negative impact on surveillance systems strengthening. Lack of Feedback and supervision, training of staff, refunding of transport and telephone expenditures and per diem are affecting the timeliness, completeness, data quality and the overall performance of the surveillance system.

Compared to other study done at Nigeria by the year of 2016, the timelines and completeness of Akaki Kality sub city was better which is 90% and 100% in Akaki and 38% and 59% in Nigeria respectively. But the supportive super vision, availability of the commodity, and the flexibility of surveillance system is less than that Nigeria which is 50%, 39%, 67% in Akaki and 78%, 70%, 91% in Nigeria respectively. Over all main function and supportive function as well attributes of

the surveillance system in Akaki Kality needs careful attention to go through the system and early handling epidemic prone diseases.

3.6.LIMITATION

- This surveillance system evaluation analysis doesn't include Hospitals.
- No internet access to the district and zonal health office which interrupts the reporting system and affects report completeness and timeliness.

3.7.CONCLUSIONS

- There was limitation of data reporting and trend analysis in assessed woreda.
- The surveillance system is being affected by lack of budget, training, and other logistic issues.
- The completeness and timeliness of assessed woreda is relatively better
- There were no emergency drugs and epidemic preparedness plan which affects early epidemic response.
- The existing surveillance system lacks representativeness due to non-participation holly water and traditional healers in disease report.

3.8.RECOMMENDATIONS

- It is important to allocate Budget line for PHEM activity within sub-city, district and health center level.
- It is highly recommended for the Sub city to develop time schedule for weekly data analysis and distribute the result to all health facilities and district health offices.
- The zonal health office, district health office and health centers, are recommended to Create awareness for all health professionals in all levels about the use of surveillance system.
- 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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13. Baffa S. Ibrahim*2, Aisha A. Abubakar1, Ummulkhulthum A. BAJOGA2 and Patrick M. Nguku

CHAPTER IV: HEALTH PROFILE DESCRIPTION

Health profile description report in Akaki Kality sub city, woreda 6 administration, 2016

ABSTRACT

Background: - Health profile description is important to identify and prioritize major problems at any level of health system to make decision for action and to prepare plan. It includes scanning of health system, problem identification, prioritization and identified problems by using prioritization criteria; public health importance, magnitude of the problem, severity of the problem, community and political concern and feasibility of the interventions. We aimed to describe Akaki Kality sub city woreda 6 Administration health related profile

Methods: - This Health profile assessment done at Akaki Kality sub city Woreda 6 Administration from 28/02/ 2017 up to 29/03/2017 descriptive cross-sectional study design conducted. Secondary data used and collected through document review. And edited, coded and cleaned before it enters to a computer

Result: - Woreda six administrations have a total estimated population of 33530 with 16094 males and 17436 females. All vaccine coverage was >100% except polio 0 and Vitamin A supplementation 90% and 87% of achievement from the plan. URTI and Non Bloody diarrhea were the first and the second cause of Morbidity among Adult and under five children. Trauma for adult and pneumonia for less than 5 age of are the 3rd cause of illness. The environmental sanitation is poor over all solid and liquid management; safe water supply and latrine coverage have clear limitation.

Conclusion: - The performance of Family planning and delivery was low but in EPI, TB and trauma is crucial public health concern that registered By far over the plan. All over there is data limitation to each woreda sector office. Latrine coverage of the woreda has been improved and avoids open defecation practice. Solid and liquid waste management including factory sewerage system advised to be improved. Data handling and registration have to give great attention by woreda health office.

Key Word: Health profile, Woreda Six, Akaki Kality, 2016

Word count: 297

4.1. INTRODUCTION

According to WHO, Health is defined as the wellbeing of human beings socially, mentally, physically as well as economically but not merely the absence of diseases. Based on this definition heath is multi-dimensional approach that encompasses different sectors rather than health sector. Health profile is collected and summarized compiled data and discussion of health related issue. According to the result obtained from the assessment, discussion is made with concerned bodies in the woreda who are responsible for each sector. Health profile Assessment is vital for prioritizing prominent health and health related problems of the community. It is basic for planning and for appropriate intervention; and is an entry point for operational research. Stakeholders of health and health related issues will have access to evidence-based information from well compiled health profile.

A community health profile includes both previously identified health issues and the identification of new issues. A comprehensive community health profile includes: a narrative description of the given community, community strengths and challenges, demographic and economic data, health status data, community resources, including services, coalitions, and systems and interpretation of data presented, from both the perspective of the health council and the broader community. However, in low income countries like Ethiopia such information especially at district level is usually not complete and comprehensive.

It is very true that Addis Ababa is the capital city of Ethiopia and also possible to say Africa. But in terms of health related information, it has so many critical challenges especially in clean water supply, environmental hygiene and there was no organized and well documented community health profile information in most of the sectors. Different health and health related data were available at different health organizations but most of the information is disorganized and incomplete in such a way that no one can access and use them at the right time and place for action. This document is a comprehensive health and health related issues for Addis Ababa Akaki Kality sub city woreda 6 administration community. This document is prepared so as to enable health sectors and other health partners of the Woreda to clearly understand the challenges of the community for their health needs. So, having this document will contribute to governmental and non-governmental health stakeholders to work for the community based on

evidence and information for prioritizing and institutionalized approach for appropriate public health interventions.

Significance of the study

Describing the health profile of the woreda is helpful to address the current challenge of community health, for stakeholder's priority setting, and it is important to understand the overall activates of the woreda such as demographic, socio-economic status, MMR, ,UFMR,NMR ten top disease of the woreda ,electric and water supply, political structure and population pyramid and other findings from the health profile description is Crucial point and this help to manage the administration and other stakeholders for public health decision making.

Describing health profile is helpful to understand the current health of population and many aspects of the community's life that influence it. Health profile description is important to identify and prioritize major problems at any level of health system to make decision for action and to prepare plan. Health profile description include scanning of health system, problem identification, prioritization of identified problems by using prioritization criteria; public health importance, magnitude of the problem, severity of the problem, community and political concern and feasibility of the interventions.

The appropriate attention to the prevention of disease and injury, along with the provision of high quality health care are crucial for accessible and affordable health care service. Therefore, this health profile description is help to increase understanding of the current health care service quality. The health status description or profiling will provide a better understanding about population health characteristics and will contribute to Public Health planning and decision making.

4.2. OBJECTIVE

4.2.1. General objective

- To describe and compile Health and health related profile of Akaki Kality sub city woreda 6 Administration,2016/2017

4.2.2. Specific objective

- To describe health care coverage and distribution for relevant public concern
- To describe solid and liquid management of the woreda
- To identify priority heath problem of the woreda
- To describe demographic characteristics
- To describe health delivery infrastructures

4.3. METHODS AND MATERIALS

Study Area: Woreda six administrations is one of the 11 districts in Akaki Kality sub city of A.A. The woreda is found in north &north east direction of the sub city. Its Boundaries are east: - Nifas silk sub city woreda 9 administrative, South: - Akaki Kality sub city _woreda five administration North, - Nifas silk Lafto sub city woreda nine and ten administration West: - Nifas silk lafto sub city woreda 10 and12 administration The district distance is 12-15 Km from the Akaki Kality sub city office. The total Population is 33,530 from this 16094 is male & 17436 is female. The woreda have 1 private Hospital & 1 Governmental Health center, 11 private clinics. All of them are functional. The Altitude of the woreda is-2050mt, and the average rain fall is 1180.4mm as well as the annual temperature is 10.6-22.8 degree centigrade.

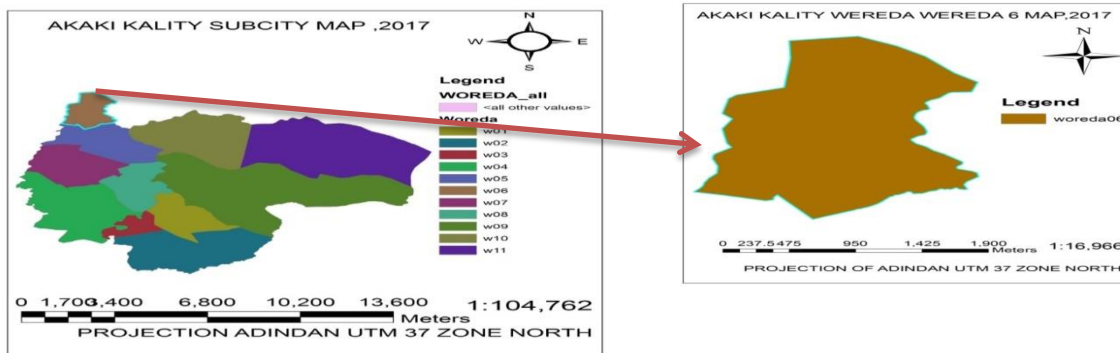

Figure: - 4. 1 Administrative Map of Akaki Kality woreda six.

Study Period: This study was done from 28/02/ 2017 up to 29/03/2017

Study design: -A descriptive cross-sectional study was conducted to describe the health profile of the Woreda 6 administration in 2017 at Akaki Kality Sub City, Addis Ababa, Ethiopia.

Data source: All available secondary data (documents) that have relevant information for health profile were used the last 2016

Method of data collection: The secondary data is collected through document review. The principal investigator collected additional information through interviewing the responsible authority and key informants using semi structured questionnaire and observation was used as required.

The principal investigator checked the collected data for completeness, accuracy, clarity and consistency throughout the data collection period in order to maintain the quality of the data. The questionnaire/checklist is developed in English version prior to the actual data collection.

Method of Data Analysis: The data was collected through document review edited, coded and cleaned before it enters to a computer. Questionnaires are organized or analyzed using frequency distribution table, graphs and excel.

Ethical clearance: Ethical clearance was secured by writing formal letter from Akaki sub city health office to woreda 6 administrations.

Dissemination of findings: The result of Health profile data analysis is communicated to Akaki Kality sub city woreda six administration and Addis Ababa university school of public Health Field Epidemiology Training Program.

4.4. RESULT

Geography and Climate

Woreda six administrations is one of the 11 districts in Akaki Kality sub city of A.A. The woreda is found in north &north east direction of the sub city. The total Population is 33,530 from this 16094 is male & 17436 is female. The woreda have 1 private Hospital & 1 Governmental Health center, 11 private clinics. All of them are functional. The Altitude of the woreda is-2050mt, and the average rain fall is

1180.4 mm as well as the annual temperature is 10.6-22.8 degree centigrade. All the administration is 100% land body.

Administrative and political structure

Woreda six administrations have 9 Ketena, 81sefer and 8178 house hold. For administrative purpose all sector offices concentrated in one building. All the sector offices are under Akaki Kality sub city.

Table: - 4. 1 Population size of Akaki Kality sub city woreda 6 Administration by "Ketena", 2016

S,no	Name of " ketena"	Male	Female	Total
1	Ketna one	2808	2592	5400
2	Ketena two	384	416	800
3	Ketena three	288	312	600
4	Ketena four	2400	2600	5000
5	Ketena five	3120	3380	6500
6	Ketena six	600	650	1250
7	Ketena seven	360	390	750
8	Ketena eight	3000	3250	6250
9	Ketena nine	3350	3630	6980
	TOTAL	16310	17220	33530

Demographic Information

Woreda-six administration has total estimated population of 33,530 with 16,094 males and 17,436 females. Male to female sex ratio is 0.9:1. From the total population under one years old children constitutes (2.4%), under five (7.16%), less than 15 years old (31%), women of child bearing age

(34.64%) and pregnant women are (2.3%). The annual growth rate is considered to be 2.1% per annum, average fertility rate was 2.8% children per women in life during her reproductive ages and average house hold size was 4.1% and age group above 65 years old were 5%. In terms of religion distribution Orthodox accounts 43.5%, Muslim 33.9%, Protestant 18.5%, Catholic 2.7% and others was 1.4%.

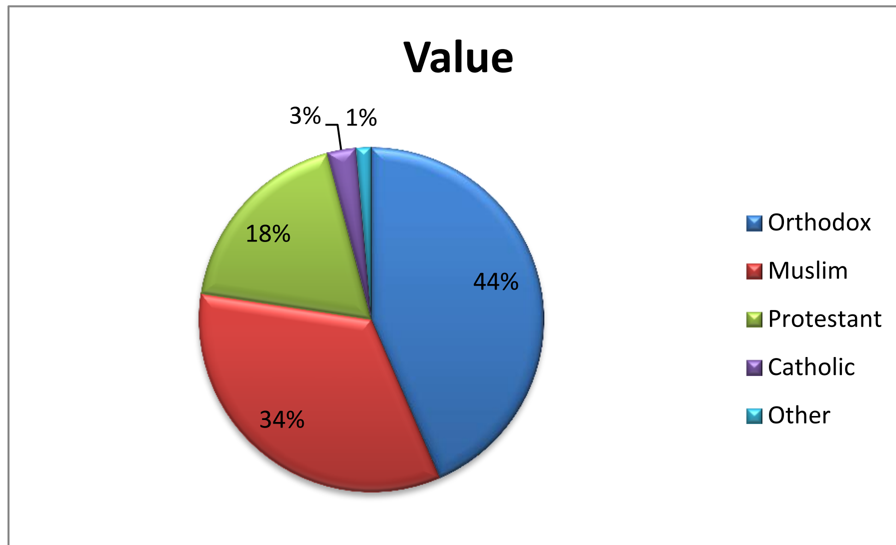

Figure: -4. 2 Religion Description of Population in Akaki Kality Sub city woreda Six 2016.

Productivity and income

There is no well-organized data about the income of the population from any sector in the woreda but the researcher got some information that is most of the community in that woreda is a merchant, factory worker and governmental employee.

Education

Akaki Kality sub city woreda six Administration district has a total 15 schools, of this 3are kindergarten, 9are primary 2are secondary schools and one college. Females are account 53% of the total students enrolled. Totally 283 teachers are worked in the schools and females are account 65 %. All schools have access to protected and safe water supply. The latrine coverage is 100% but there was not a standard latrine, poor quality, poor sanitation & utilization. All the school has Anti HIV/ADIS club.

Table: - 4. 2 Education Coverage and School distribution in Woreda 6 Akaki Kality Sub City, 2016

S/No	Type of School	Number School	Number of teachers	Male Students.	Female students.	Total student
1	Primary	9	130	1444	1433	2877
2	Secondary	2	113	1054	1337	2391
3	Tertiary	0	0	0	0	0
4	College	1	18	218	325	543
5	Kindergarten	3	22	175	185	360
	Total	15	2065	2891	3280	6171

Health status

The woreda administration have its Owen aged one governmental health center it gives service to the woreda community and surrounding population the health center gives different types of service such as OPD (outpatient department), Admission, Delivery, Abortion, ANC, IMNCI, TB/HIV, Minor surgery, FP, Pharmacy, 24 hrs. Emergency services are utilized by the community. To better achievement the health center structured by one medical director two core process and two other supportive work process with different case team.

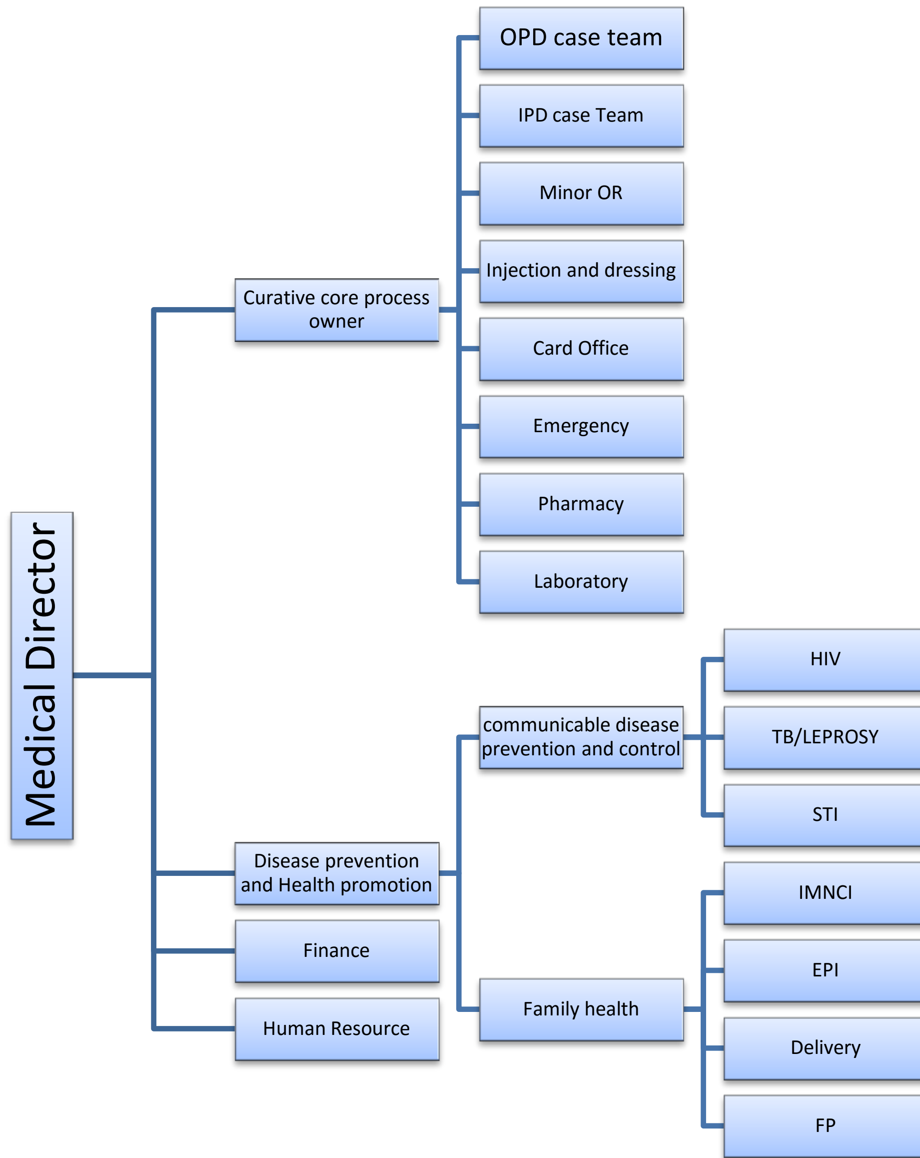

Figure: - 4. 3 Organizational structure of health service in Woreda, Akaki Kality Sub city 2016

Man power of woreda health office and health Center in 2016

In the woreda six Administration Saris Health center has a total of 137 employees. Of this 14 are Health extension workers 57 are supportive stuff and the remaining 66 are health professionals who have different filed of health study from this the highest number is nurses followed by health officer there is no physician in the Health center.

Table: - 4. 3 Woreda 6 Health center human resource, Akaki Kality Sub city Addis Ababa. 2016

S/no	Type	Number	Ratio
1	Physicians	0	0
2	Health officer	17	1:1972
3	Laboratory technician/technologist	7	1:4790
4	Pharmacy technician/pharmacist	8	1:4192
5	Nurse	25	1:1341
6	Midwife	8	1:4191
7	X-ray	0	0
8	Sanitarian	1	1:33530
9	Hews	14	1:2395
10	Supportive staff	57	1:588
	Total	137	1:245

Woreda six all health facility coverage

In the woreda in addition to governmental health center there are private health institutions those who have permission from the woreda regulatory and sub city regulatory their status is from medium clinic to General Hospital from this total of 8.7% are governmental and 91.3% are private.

Table: - 4. 4 **Number of health facilities in woreda six Akaki Kality Sub City, Addis Ababa, Ethiopia.**

S/no	Type of Health facilities	Gov.	Private	Total
1	Hospital	0	1	1
2	Health center	1	0	1
3	Medium clinic	0	7	7
4	Pharmacy	1	2	3
5	Specialty clinic	0	0	0
6	Drug store	0	2	2
7	Diagnostic laboratories	0	0	0
8	Factory clinic	0	8	8
9	Dental clinic	0	1	1
	Total	2	21	23

National health delivery system

Ethiopia health delivery system is three titer systems that inter related to one health institution to the other by formal referral system with their status. That is primary, secondary and Tertiary each level organized by the capacity of health institution based on resource and man power. One health center assign to give service to 40,000 populations (primary Health institution), secondary (primary Hospital) for 1-1.5millon population and tertiary (specialized Hospital) expected to give service 3.5-5 million populations.

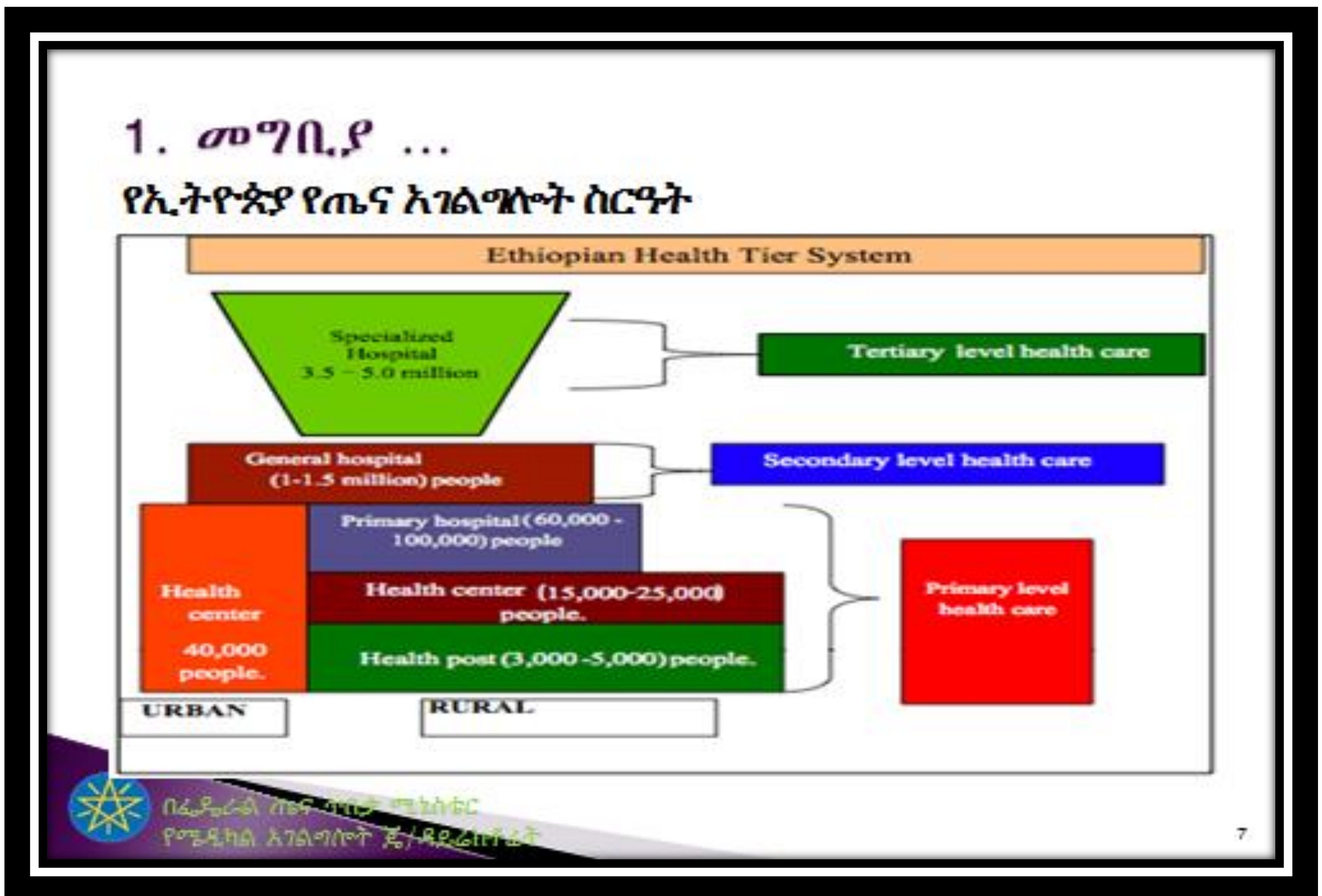

Figure: - 4. 4 ***Service provision structure of national standard health facility to population ratio***

Leading cause of morbidity in the woreda six administration

At Akaki Kality sub city woreda six administration health center there are only one death secondary to pulmonary tuberculosis and from total of 2016 pediatric (under 5) and adult for both AURTI and non-bloody diarrhea are the primary and secondary cause of illness respectively trauma for adult and pneumonia for under 5 are the 3rd cause of illness in the health center.

Table: - 4. 5 *Top ten leading causes of OPD visit (morbidity) Akaki Kality woreda six 2016*

S/N	Adult cases, in 2016/1017.	Number	%	Under 5 years old cases	Number	%
1	Acute upper respiratory infection	6918	12.31	AURTI	2171	19.76
2	Diarrhea non bloody	3639	11.61	Diarrhea(Non-bloody)	1042	19.7
3	Trauma	2566	11.42	Pneumonia	794	15.01
4	AFI	2554	9.07	Infection of the Skin & subcutaneous Tissue	276	5.22
5	Dyspepsia	1585	8.55	Other or Unspecified Disease of the Eye	225	4.25
6	UTI	1784	7.13	Intestinal parasite	167	3.16
7	Helmenthiasis	1618	6.82	MAMN	166	3.14
8	Pneumonia	1287	4.86	Diarrhea with dehydration	159	3.01
9	Typhoid fever	1058	4.19	Trauma	159	3.01
10	Dyspepsia	89	0.4%	Other un specified disease of skin and subcutaneous tissue	131	2.48
	Total	23098	100%	Total	5290	100%

Maternal and Child Health

In the woreda six Saris health center 6105 children under five were sick and treated for different illness this number high comparing with the plan that is 255 %. MAM is the least 17% of the plan 514 children are affected by non-bloody diarrhea which is 92% of the plan. On the other hand the health center family planning achievement is very low 45% from the plan even though its achievement is very low long term method is better than short term 61and 31% respectively.

Child Health

Table: - 4. 6 Child health in Akaki Kality woreda 6, 2016/2017

S/no	Description.	Plan	Achievement	% coverage
1	Sick baby	2392	6105	100%
2	Growth monitoring	2392	6105	100%
3	MAM	677	118	17%
4	SAM	33	49	100%
5	Nutritional supplement	710	167	24%
6	Deworming	1485	1382	93%
7	Pneumonia	480	592	100%
8	Diarrhea	558	514	92%
9	Total family planning	7009	3169	45%
10	Short term	3505	1078	31%
11	Total long term	3503	2177	62%
12	IUCD	1752	447	26%
13	*Implanol*	1752	1827	100%

Ante Natal Care

Totally 1151 pregnant mothers have visited the health center for ANC1 which is 148%of the health center annual plan but this number decreased to 647 by antenatal 4 mean that 83% of the plan. All pregnant mothers were tested for VDRL and supplied iron foliate. 1013 pregnant mothers performed PICT, 26 of them was positive for HIV, meaning that the prevalence of HIV on pregnant mothers is 2.6%. All 26 mothers started taking HAART (Table 4.8).

Table: - 4. 7 Ante natal service coverage in Woreda 6, 2016/2017

S/No	Description	Plan	achievement	%
1	ANC1	779	1151	100%
2	ANC4	779	647	83
3	PICT	779	1013	100%
4	Iron supplement	779	1151	100%
5	PMTCT	24	26	100%
6	Pregnant Women on ART	34	29	85
7	Partner test	779	205	26
8	Referral	120	115	96
9	VDRL	779	1151	100%

Expended Immunization Program

At Akaki Kality sub city woreda 6 administration saris health center, BCG, POLIO, PENTA, PCV, ROTA, MEASLE, VITAMIN A and TT were administering to Under one infants and pregnant mothers. All vaccine coverage is >100% except polio 0 and Vitamin A supplementation 90 and 87% of achievement respectively from the plan (Figure 4.7)

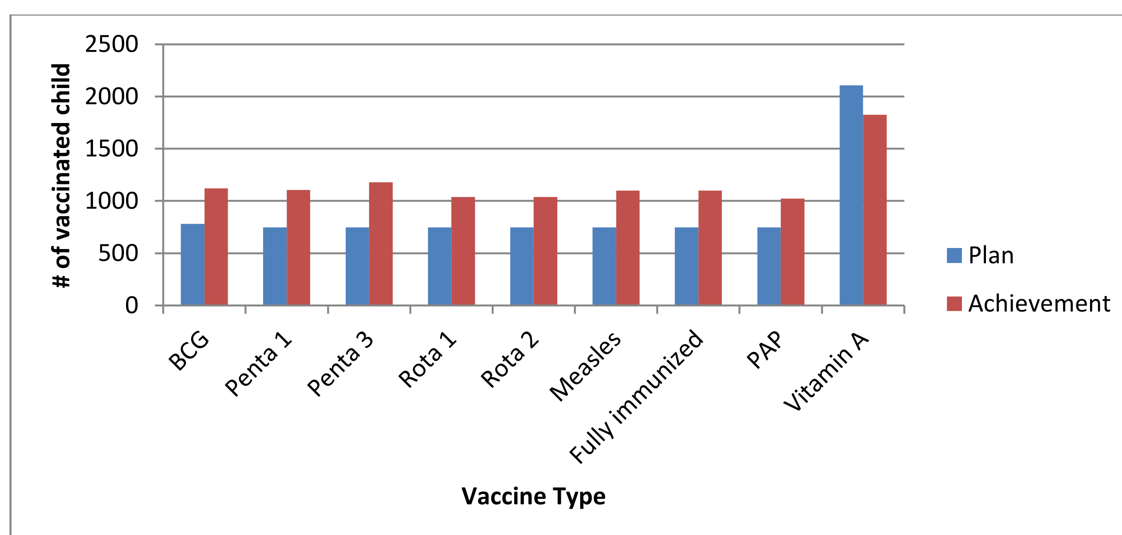

Figure: -4. 5 Immunization coverage in Akaki Kality Sub city Woreda 6, 2016/2017

Table: - 4. 8 EPI coverage in Woreda 6, Akaki Kality Sub city, Addis Ababa, Ethiopia, 2016/2017

S/No	Description	Plan	Achievement	%
1	BCG	779	1119	>100%
2	Polio 0	779	698	90
3	Polio 1	747	1028	>100%
4	Polio 3	747	1125	>100%
5	Penta 1	747	1106	>100%
6	Penta 3	747	1179	>100%
7	PCV 1	747	1106	>100%
8	PCV 3	747	1173	>100%
9	Rota 1	747	1039	>100%
10	Rota 2	747	1039	>100%
11	Measles	747	1098	>100%
12	Fully immunized	747	1098	>100%
13	PAP	747	1023	>100%
14	Vitamin A	2105	1824	87
15	TT2	779	1151	>100%

Delivery Attended by skilled attendants

In Akaki Kality Woreda 6 administration, 556 mothers were given birth at health center in 2016. This accounts 71 % of the annual plan. Number of laboring mother referred to the higher health institutions were about 248 which is very high, greater than two folds of annual plan (221%) and total PNC is very low 440/779 mean that 56% of the annual plan.

Table: - 4. 9 Skilled Birth attendant, PICT, and Partner test coverage in Woreda 6, Akaki Kality, 2016/2017

S/No	Description	Plane	Achievement	%
1	Skilled delivery	779	556	71
2	PICT	779	26	3.33
3	Partner test	779	12	1.54
4	Referral	112	248	100%
5	PNC1	779	64	8.21
6	Total PNC	779	440	56.48
7	CAC	80	83	100%

ENDEMIC AND EPIDEMIC DISEASES

Tuberculosis/leprosy

Totally 157 TB case were registered in 2016/2017 in Akaki Kality Sub city Woreda 6, among which 93 (59%) were pulmonary TB and of this 37 (40%) were smear positive TB. Case detection rate in Woreda 6 was above 100% (Estimated cases from total population was 64 and 157 cases were detected in this year). Cure rate 86 % & treatment success rate was 91%. And death rate was 0.64%. All TB patients were screened for HIV; out of those 19 were positive 12 % from the test. No leprosy cases were found among the diagnosed customers in the respective year.

Table: -4. 10 TB cases in woreda 6, Akaki Kality Sub city, Addis Ababa, 2016/17

S/No	Description		Case Counts	Population No. (%)
1	Prevalence of TB		157	0.47%
2	Pulmonary TB -	Smear positive	37	23.5%
		Smear negative	56	35.6%
3	Extra PTB		64	40.7
4	TB detection rate		157	100%
5	TB Rx completion rate		142	93%
6	TB cure rate		135	86%
7	TB Rx success rate		143	91%
8	TB defaulter rate		1	0.6%
9	Death rate on TB Rx		1	0.6%
10	Total TB patients screened for HIV		157	100%
11	HIV prevalence rate among TB cases		19	12%
12	Prevalence of Leprosy		0	0

HIV/AIDS

In 2016/2017 a total of 1244 clients were screened for HIV among those females was 1039 (83.5%) and males were 205(16.5%). From a total screened the prevalence is 0.1% and 0.086, 0.015% for female and male respectively. A total of 1484 clients are PLWHIV among which 1298 are on ART (577 males and 721 females) and about 120 clients are on pre ART. In 2016/2017 health education were given for 2919 clients and 7020 condoms were distributed to consumer.

Table: - 4. 11 HIV/AIDS screening, testing and prevalence in Woreda 6, Akaki Kality Sub city, 2016/2017

S/no	Activities	Male	Female	Total
1	Total people screened for HIV	205	1,039	1,244
2	VCT	0	0	0
3	PICT	205	1,039	1,218
4	Tested HIV positive	5	29	34
5	PMTCT	0	26	26
6	HIV Prevalence	0.015	0.086	0.1
7	**Total PLWHIV**	**622**	**796**	**1,418**
8	On ART	577	721	1,298
9	ON PRE-ART	45	75	120
10	Condom Distribution	68,970	1,230	70,200
11	Health education coverage	1,269	1,650	2,919

AWD (acute watery diarrhea):-The woreda was affected by acute watery diarrhea by the month of June 2016/2017 to September 2016/2017. Through this period a total of 52 cases are seen. Out this, 28 are male and 24 are female, no death, all was treated accordingly, the suspected source of the infection was vegetables, raw meat and holly water. More adults are affected than other age group (Figure 4.8).

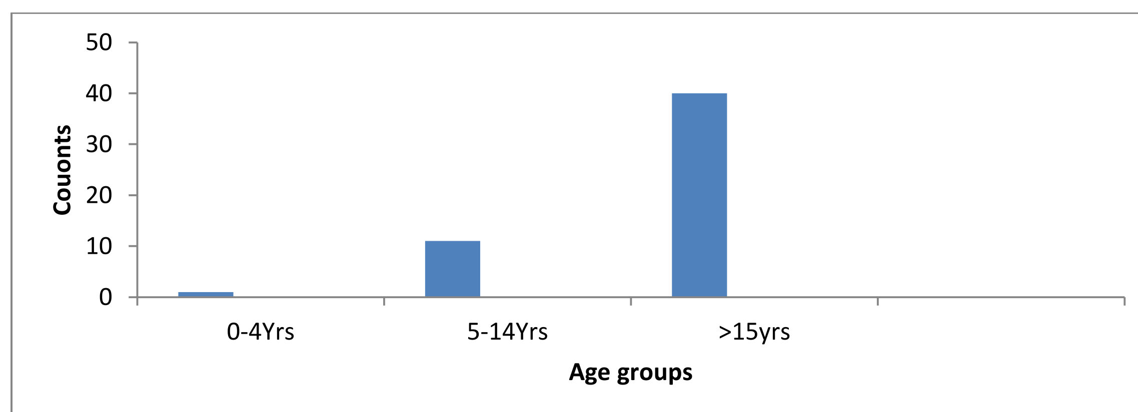

Figure: - 4. 6 AWD cases by age group in Woreda 6, Akaki Kality Sub city, 2016/2017

Trauma

In 2016/2017 about 2,571 trauma cases were reported from Woreda Six among which 1,848 (72%) was male. The main cause of trauma was fighting accident, road traffic accident, falling down accident and machine injury. Overall prevalence of trauma in Akaki Kality Woreda 6 was 7.7%.

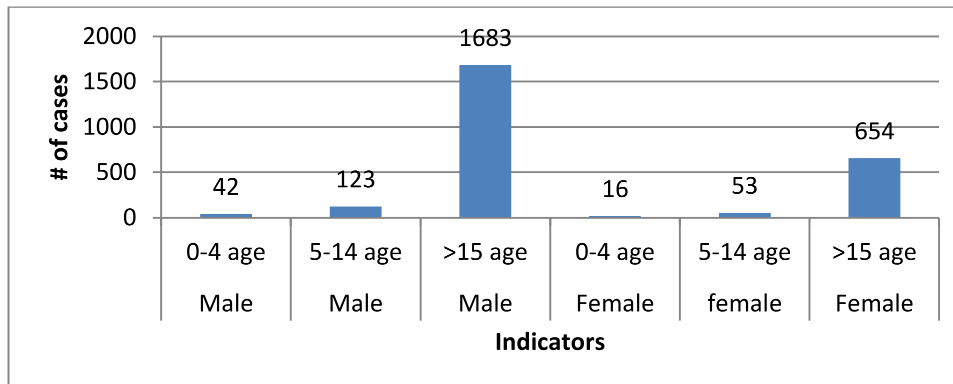

Figure: - 4. 7 Trauma Patient by Age and Sex Category in Saris health center 2016/2017

Disease under surveillance

As nation there 21 immediately and weekly reportable diseases from this seven were seen at Akaki Kality saris health center with different distribution the rest of 14 were not report in the health center from reported disease Dysentery and Typhoid fever were the leading one 1265 and 1050 Respectively but the least one was relapsing fever (2) and measles (3).

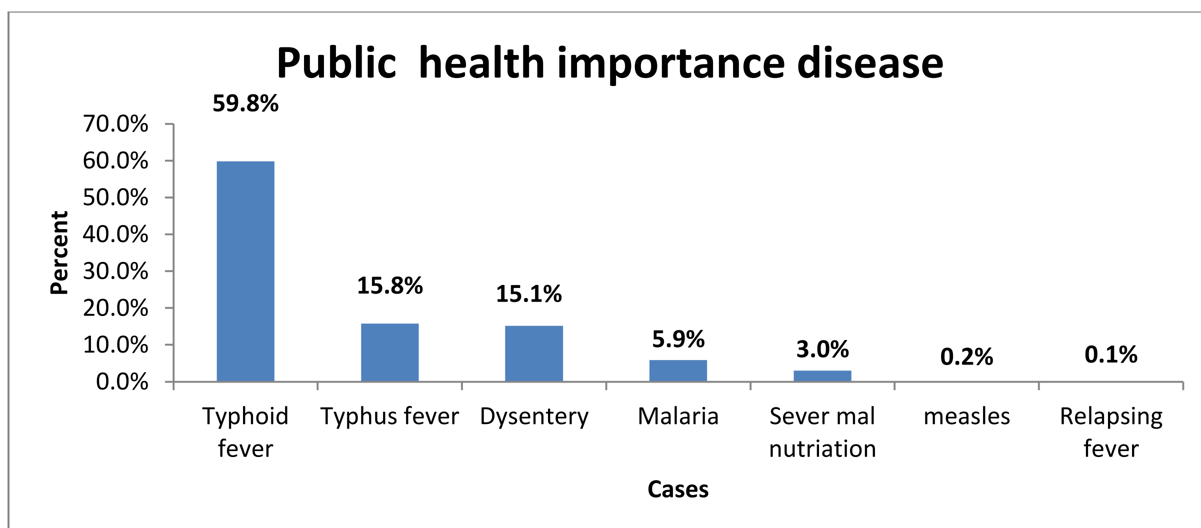

Figure: - 4. 8 Disease under surveillance at Akaki Kality sub city woreda six administratio.2016/2017

Environmental sanitation and availability of safe Water in 2016/2017

Since launching of urban health extension program in Addis Ababa, about 15 health extension professionals were employed at Woreda 6 administration and they are providing disease prevention and health promotion activities i.e. promotion of healthful living and healthy environment; prevention of major infectious diseases; mobilizing and empowering the community in health matter.

There is no well summarized data about the coverage of safe water supply and latrine coverage in the woreda but I have get an information from health extension workers and community most of Ketena 9 and Ketena 8 community are use open defecation and river water for drinking and personal hygiene. The health extension workers are not sufficient to the woreda population covers only 75%. This may lead to poor environmental sanitation. Over all solid and liquid management, safe water supply and latrine coverage have clear limitation.

Table:-4. 12 Environmental sanitation and availability of safe Water in Woreda Six, Akaki Kality, 2016/2017

S/no	Description	Number	%
1	Total house hold	8178	
2	Number of latrine	6548	80
	Number of house hold without latrine	1630	20
3	Number of house hold use open defecation	142	2
4	Number ketena access to safe water supply	9	100
5	Number of house hold access to safe water supply	8018	98
6	Number of house hold use water from river or spring	160	2
7	Total factory in the woreda	22	-
8	Sewerage system of the factory	15 are good and 7 are bad	
9	Coverage HEW in the woreda	12	75
10	Solid and liquid waste management system	No strong data	no strong data

Agriculture

Of course it is not possible to measure the amount of lands that is used to farming and the amount of harvesting vegetables in the woreda, all Ketena produce different types of vegetable. The major amount produced in the Ketena 8 and 9 is by the help of river water. The main vegetables being produced are garlic, carrot, salad, endive, pepper, cabbage and onion. These are produced by 125-140 households. Most of these productions are used to commercial and source of income for the community. In addition to vegetable production, the community also applies veterinary urban agriculture basically milk and milk product, Hen and hen product and ox for abattoirs.

Communication and utilities

In Provision of requisite infrastructure in woreda 6 district, all Ketena has electricity, even though the power was on & off. Regarding transportation, it is difficult to know the number of km because of data limitation. Many parts of the Ketena are covered by cobblestone and 3km by train road. 12-14 km is covered by asphalt. Almost all of the Ketena had access to wireless telephone communication but sometimes it becomes nonfunctional. Also mobile service is introduced even though its network access is not regular, users have to travel some distance apart from their residential area in searching of network. Computers, postal, internet, fax, bank service exists and is sufficient for community.

Health service expenditure and financing in woreda 6 administrations

Table: - 4. 13 Akaki Kality Woreda six Health budget 2016/2017

SOURCE	Birr	%
TOTAL BUDGET OF THE WOREDA	13676818.00	100
ALLOCATED TO THE HEALTH CEN	4199860.00	31

Zoonotic disease of the woreda

In the woreda even though the number of cases was not clearly registered, Dog bite was common and 6-10 individuals were bitten by dog by the last 2016/2017

Priority setting of the identified problem

Akaki Kality sub city woreda six administration health profile assessment selected problems based on their magnitude and feasibility is shown in the following table. Totally about four priority problem was selected and was evaluated from 21 marks (three scores for each indicator) and ranked accordingly.

Table: - 4. 14 Priority setting of the identified problems 2016/2017

Sr.no	Identified Problems	Magnitude	Availability of Information	Feasibility	Urgency	Gov't Concern	Ethical acceptability	Applicability	Total	Rank
1.	Poor liquid & solid waste management System	3	2	3	3	3	3	2	19	1
2.	Latrine coverage	2	2	3	3	3	3	2	18	2
3.	Low family planning (CAR) Service utilization	2	2	3	2	3	2	3	17	3
4.	Factory sewerage system	3	2	2	3	2	2	1	15	4

4.5. DISCUSSION

Akaki Kality sub city Woreda six administration has a total estimated population of 33530 of which 48% are male and 52% are female. Based on Ethiopian 2015 survey and Wikipedia, this result varies from the nationwide and worldwide sex ratios which are 50.08% female, 49.92% male and 49.7% female and 50.3% male respectively.

In terms of religion distribution in the Woreda, Orthodox accounts 43.5%, Muslim 33.9%, Protestant 18.5%, Catholic 2.7% and others 1.4%. Based on the world fact book, national religion distribution is 43.5% orthodox, 33.9% Muslim, 12.6% protestant and 2.6% traditional. This result shows orthodox and Muslim is similarly distributed with Akaki Kality woreda six but protestant and others vary a little bit.

In the woreda six administration saris Health center has a total of 137 employees. Of these 14 (10%) are HEW, 57 are supportive stuff and the remaining 66 are health professionals who have different field of health study. From this the highest number is nurses followed by health officer. There is no physician (0%) in the Health center. This result shows a slight variation from the standard recommended by the Addis Ababa City administration structural organization which requires 2 physicians for each Health Center. On the other hand, the health Extension Worker Coverage in This Woreda was found to be 75% which is lower than the minimum recommendation of Addis Ababa City Administration Health Bureau which is 100% coverage. This leads to poor environmental sanitation especially in ketene eight and Ketena nine. All solid and liquid management, safe water supply and latrine coverage have clear limitation in Akaki Kality sub city woreda six administration health center there was only one death secondary to pulmonary tuberculosis, pediatric (under 5) and adult from both AURTI and non-bloody diarrhea were the primary and secondary cause of illness respectively during 2016/2017. Trauma for adult and pneumonia for under 5-years were the 3rdcause of illness in the health center. This result varies when compared with the whole of Akaki Kality sub city which shows the leading causes of morbidity for adult were AURTI followed by typhoid fever and for pediatrics, it was almost similar with our findings AURTI followed by non-bloody diarrhea. In woreda six Saris health center, under-five children were sick and treated for different illness. This can be quantified in number comparing with their plan that is 255 %. When considering MAM, it is small relative to their plan which is 17%. 514 children were affected by non-bloody diarrhea which is 92% of the plan. On the other hand; the health center family planning achievement is 45% which is very low in contrast to their plan. Even though its achievement is very low, the performance in long term method is better than short term method with 61%and 31% respectively. This result shows better achievement comparing to Addis Ababa health bureau 2016 /2017annual report (38% of their plan). A total of 157 TB case were registered in 2016/2017 in Akaki Kality Sub city Woreda 6 health center among which 93 (59%) were pulmonary TB and 37 (40%) were smear positive TB. Case detection rate in Woreda 6 was above 100% (Estimated cases from total population was 64 and 157 cases were detected in that year). Cure rate 86 % & treatment success rate was 91%. And death rate was 0. 64%. All TB patients (157) were screened for HIV and 19 (12%) of them were positive. Whereas when we consider nationally, the TB case detection rate was 53.7% in 2013/14, below the detection rate of 58.9% in 2012/13. TB treatment success and cure rates

reached 92.1% and 69.1% respectively in 2016. This description shows the prevalence of Tb cases increase by 14% compared to the national 2016/2017 report and the prevalence of Tb/HIV also increase by 1% from national report (11% nationally). A total of 1244 clients were screened for HIV during that period and females were 1039 (83.5%) and males were 205(16.5%). From the total screened, the HIV prevalence was 1.5% and this result is a bit higher than the national HIV prevalence (1.3%).

Akaki Kality sub city EPI coverage was almost 100% compared to their plan. This result compared to 2015 FDREMH annual report for immunization coverage (86.5-91.1% national) was better.

4.6. **LIMITATION**

- There was no complete data in different sectors offices of the woreda

4.7. CONCLUSION

The district main problem was poor solid and liquid management. The performance of Family planning and delivery was low but the performance EPI. TB and trauma are crucial public health concern that registered by far over the plan. All over there is data limitation about the community health each woreda sector office. Even though there was only one death, the highest disease in the woreda for both adult and pediatric were AURTI and diarrhea, both directly related to personal hygiene and environmental sanitation. Under public health importance diseases Typhoid fever is the leading one registered in the woreda

4.8. RECOMMENDATIONS

- The health center recommends that to avail logistics like HIV kit and long term and short term family planning resources to increase number of clients.
- Increasing the number of Health extension Workers according to National Guide lines is important (Sub city)
- The woreda health office recommended to increase Latrine coverage of the woreda

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CHAPTER V-SCIENTIFIC MANUSCRIPT FOR PEER REVIEW

Surveillance Data analysis of Epidemic Typhus in Akaki Kality Sub city, Addis Ababa, Ethiopia, 2012-2016

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ABSTRACT

Back ground: - Epidemic typhus is caused by infection with Rickettsia prowazekii, which is carried and transmitted by body lice. It is a category B bioterrorism agent that can cause persistent human infection. In Ethiopian, Typhus outbreak was reported from Hawi Zone Amhara region with attack rate of 23% and in Akaki Kality 26.3% was reported in 2012. The aim of our study was to describe the last 5 years' surveillance data of epidemic typhus disease distribution in Akaki Kality sub city, Addis Ababa, Ethiopia.

Methodology: - we reviewed five years (2012-2016) surveillance data from health facilities and sub city health office. We considered all Weil flex tests Positive as cases. Data was collected from January21 -February 27, 2017. We used Microsoft Excel to analysis data.

Result: Forty-nine thousand nine hundred forty cases of Epidemic Typhus were reported in the last five years. The incidence of Epidemic typhus in Akaki Kality was 33 in 2012, 55 in 2013, 56 in 2014, 43 in 2015 and 45 in 2016 out of 1000 population. 21.5 % of reported cases were from woreda seven and 20% were from woreda six while 19% were from woreda one.

Conclusion: High number of typhus cases was reported in the study area in last five years. All reported cases were tested positive for typhus in reporting health Facilities. The incidence of Epidemic typhus was increasing from 2012 to 2016. The highest number was reported from woreda seven administrations. We recommended that continuous health education for community to prevent Epidemic typhus especially for those in high risk area.[1]

We recommended that continuous health education for community to prevent Epidemic typhus especially for those in high risk area.

Key Word:- [1] ***Surveillance data Analysis, Epidemic Typhus, Akaki Kality, Addis Ababa, Ethiopia, 2004-2008***

Word Count: 293

5.1. INTRODUCTION

Epidemic Typhus is a febrile disease caused by Rickettsia prowazeki and characterized by various onset of clinical manifestation; often sudden and marked by headache, chills, prostration, and fever and generalized muscular pains. Pediculus humans corporis (body and head louse), which is peculiar to humans, is the only important vector of epidemic typhus. It is a disease typically associated with war, famine, and other such events that cause personal hygiene to suffer and lice infestation to become prevalent. The disease is still responsible for modern outbreaks. It is the category B bioterrorism agent that can cause persistent human infection. Rickettsia is small intracellular bacteria that are spread to man by arthropod vectors, namely human body lice, fleas, ticks & larval mites. The rickettsioses are a zoonosis spread around various regions of the world.

The disease is prevalent in mountainous areas of Africa, South America, and Asia. Typhus remains an important public health problem in many developing countries. Outbreaks of epidemic typhus have generally been associated with war, famine, refugee camps, cold weather, and gaps in public health management. No outbreaks of epidemic typhus have been recently identified in wealthy developed countries. Epidemic typhus remains a threat in the rural highlands of South America, Africa, and Asia. Areas of Russia, Burundi, Algeria, and Peru have all experienced typhus outbreaks in the past 20 years and are currently susceptible to outbreaks because of a high incidence of body lice, homelessness, or a large population of typhus survivors.

Cases of epidemic typhus now occur in significant numbers in Ethiopia and probably in highland areas of impoverished countries; particularly before modern sanitary practices and the availability of antimicrobial drugs. Based on outbreak investigation of epidemic typhus at Awi zone prison Amara region in 2012 the attack rate was 23 with zero death rate [(12]) and the study done on the sero prevalence of typhus fever at Kality prison, Addis Ababa, shows the prevalence of epidemic typhus is 26.3% [(11)]. We conducted this surveillance data analysis to describe five years' surveillance data in terms of time, place and person.

5.2.METHODOLOGY

The total Population of Akaki Kality is 229,859 among which 52% female. In the sub city there are two hospitals, nine health center and 92 private health institution are render service to the community. We collected five-year surveillance data of epidemic typhus in the time period of

January 20/2017 to February 27/2017. We reviewed records from Health Facilities and Sub City Health office. We use weekly reports, Aggregated and annual report from all health center and private health institution that reported to the sub city health office and monthly HMIS reports as secondary data source. We defined confirmed Cases as all Weil flex tests Positive and suspected cases as sudden and marked headache, chills, prostration, fever and generalized muscular pains. All cases tested positive for Weil flex test was included. The principal investigator checked the collected data for completeness, accuracy, clarity and consistency throughout the data collection period in order to maintain the quality of data. The data collected through document review were edited, coded and cleaned before it entered into a computer analysis was done by using Microsoft Excel 2016. We secured the Ethical clearance by obtaining writing formal letter from Addis Ababa university school of public health to Akaki Kality health office and Official permission was obtained from concerned authorities of the health office.

5.3.RESULT

About 49,940 cases of Epidemic Typhus were reported from respective Health facilities in the past five years. The cases of epidemic typhus were become increasing year to year which was 6750 (prevalence rate of 3.3%) in the year of 2012 and 10274 (Prevalence arte of 4.6%) in the year of 2016. However, the highest number of cases was registered by the year of 2014 which accounts about 12,000.

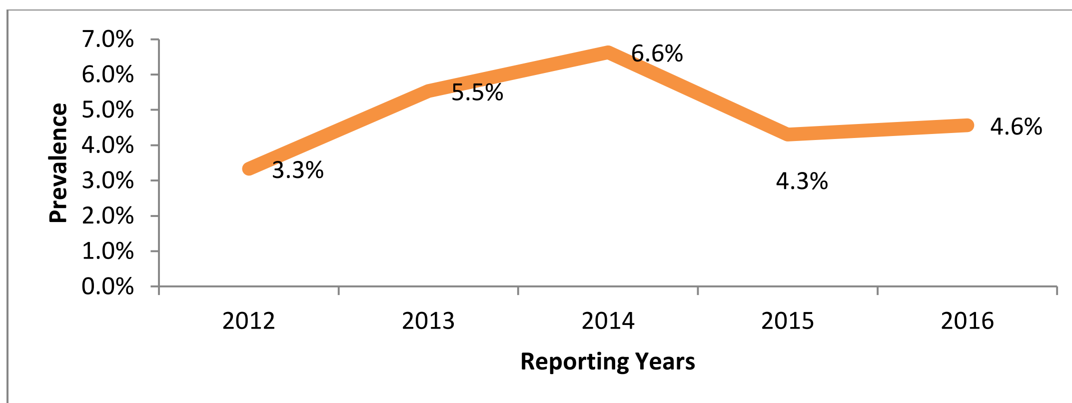


Figure: - 5. 1 Prevalence of s year's epidemic Typhus Akaki Kality sub city2012-2016

The prevalence of Epidemic Typhus in Akaki Kality sub city was 3.33% in 2012. Which is the lowest in the past five years, and the highest prevalence rate in the past five years was in 2014 which was 5.63%. The overall prevalence was 23% (Figure 5.2).

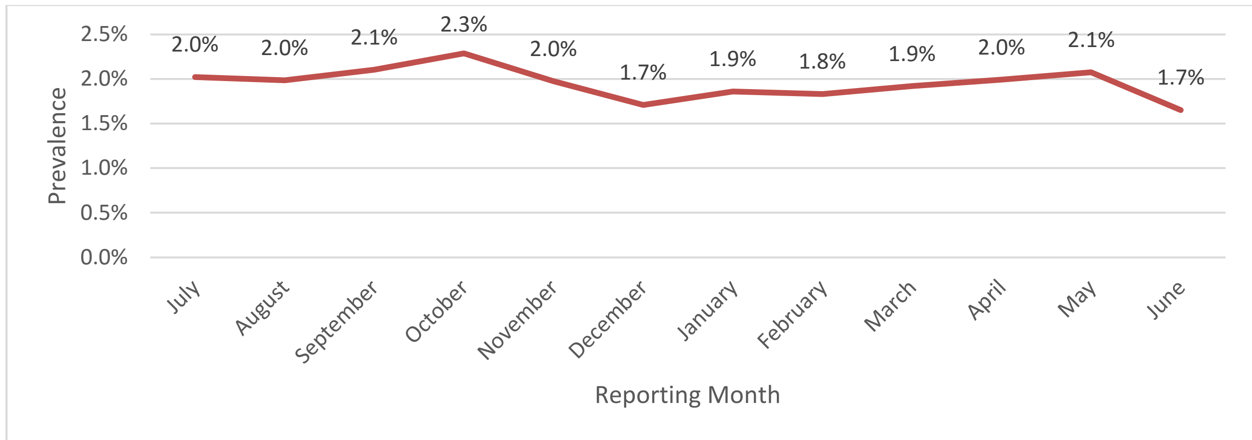


Figure: - 5. 2 Typhus data by month at Akaki Kality sub city, Addis Ababa, Ethiopia, 2012-2016

The reporting health institution are basically seven woreda health center and one NGO health institution and the highest case was reported from woreda **seven,** woreda six and woreda one which is 10739, 9957, and 9586 respectively while the least number of typhus Five-year typhus data by month at Akaki Kality sub city (Figure 5.3).

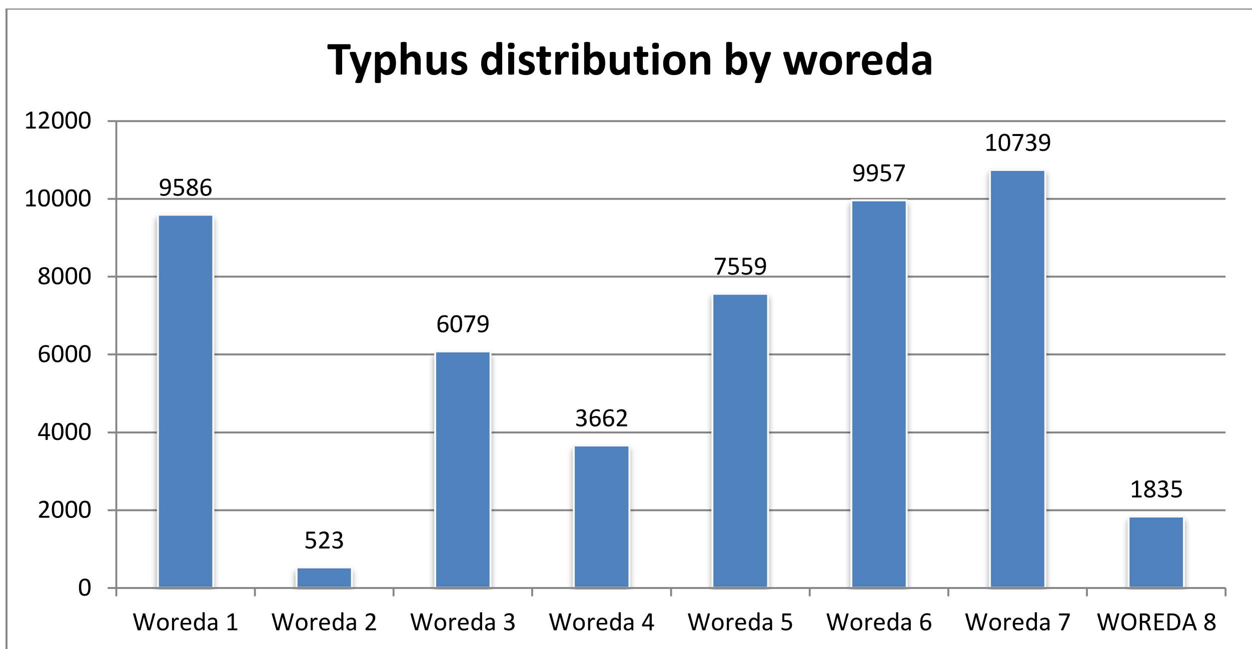
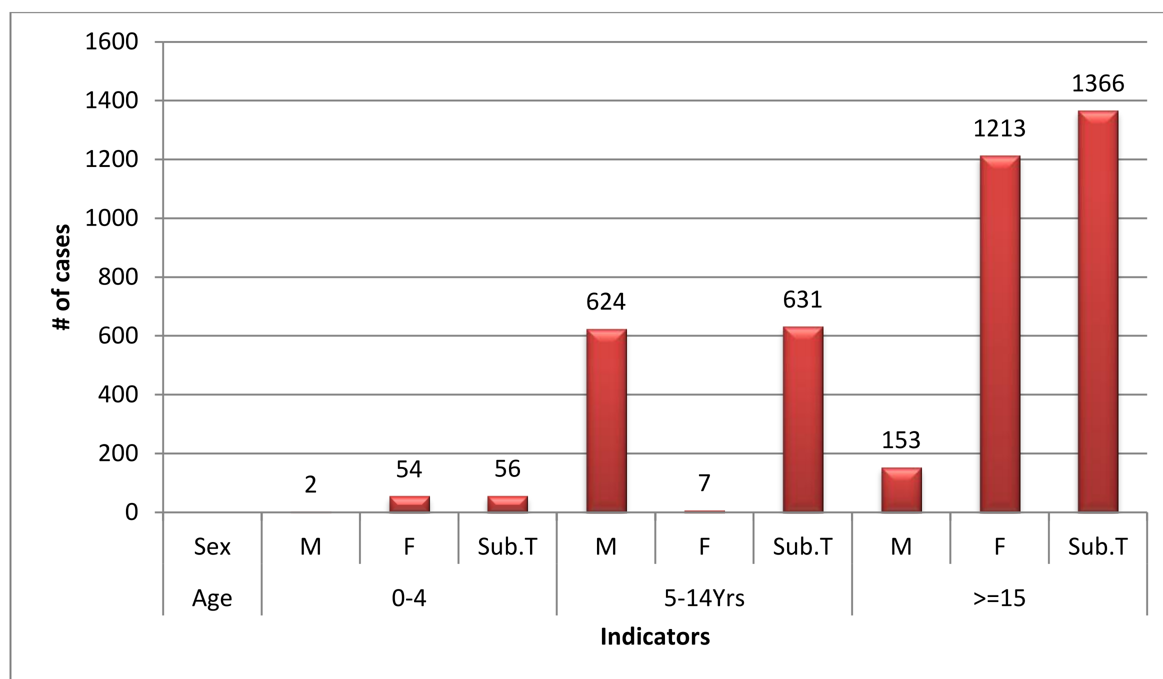


Figure: - 5. 3 Epidemic Typhus Distribution in Akaki Kality Sub city, Addis Ababa, Ethiopia, 2012-2016

The PHEM weekly reporting format did not incorporate Sex and Age Variables. Because of this to see the distribution of Epidemic Typhus by sex and age, I tried to take some of information from HMIS data, data of 2012 and 2016 Accordingly, as this information shows Females are

more affected than Males. In 2012 for example, Female age group of greater than 15 years are contribute 1213 while compared to male of the same year 153 and also by the year of 2012 female greater than 15 years old are contributed 2705 compared with same year and age 153. On the other hand, the least affected age groups are less than five-year-old which is 56 and 447 by the year of 2004 and 2016 respectively (Figure 5.4).



Source*: Akaki Kality sub city HMIS 2016. Report*

Figure: - 5. 4 Age and sex distribution of epidemic typhus Akaki Kality sub city 2016

5.4. DISCUSSION

In Akaki Kality Sub city the prevalence of Epidemic Typhus was increased from 3.33% in 2012 to 4.56% in 2016. The increment might be occurred because of the increasing of reporting health facilities, which was a total of 18 health facilities in 2012 increased to 35 health facilities in 2016.

The overall prevalence of Epidemic Typhus is found to be 23% which is less than previous study done on the sero prevalence of typhus fever at Kality prison in 2012 which was 26.3%. This finding is similar with the study done in Amara region Hawi Zone in 2012. The case fatality rate of Epidemic typhus was 0%.

Mortality of untreated patient ranges 0 to 70 % [12], but our finding there were no death which indicates early treatment of cases in the area.

Seasonality of the occurrence of epidemic typhus is not strongly evidenced with the surveillance data analysis. However, the incidence of epidemic typhus rises at July to October. The admission rate of epidemic typhus at health center was almost zero cases. This is because health facilities and service expanded throughout the eight woreda of the sub city which contributes in early detection and treatment. The sub city PHEM department data collection format is not well design and not comprises age and sex which hinders us from describing the typhus cases in terms of Sex and age. Some of health facility in the sub city doesn't report weekly typhus report on time and the number of Epidemic typhus may exceed what we have presented.

5.5. CONCLUSION/RECOMMENDATION

Over all we observed in crescent of the Epidemic typhus despite some private health facilities were not incorporate into surveillance system. The highest number of Epidemic Typhus was reported following Ethiopian Rainy Season. From this we recommended that the Sub City Health Office have to give health education to the community on personal hygiene, the federal ministry of Health recommended incorporating the Data collection format to handle the important variable like sex and age.

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CHAPTER VI -ABSTRACT

6.1. Epidemic Typhus cases surveillance data analysis report in Akaki Kality Sub city, Addis Ababa, Ethiopia 2012-2016

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ABSTRACT

Back ground: - Epidemic typhus is caused by infection with Rickettsia prowazekii, which is carried and transmitted by body lice. It is a category B bioterrorism agent that can cause persistent human infection. In Ethiopian, Typhus outbreak was reported from Hawi Zone Amhara region with attack rate of 23% and in Akaki Kality 26.3% was reported in 2012. The aim of our study was to describe the last 5 years' surveillance data of epidemic typhus disease distribution in Akaki Kality sub city, Addis Ababa, Ethiopia.

Methodology: - we reviewed five years (2012-2016) surveillance data from health facilities and sub city health office. We considered all Weil flex tests Positive as cases. Data was collected from January21 -February 27, 2017. We used Microsoft Excel to analysis data.

Result: Forty-nine thousand nine hundred forty cases of Epidemic Typhus were reported in the last five years. The incidence of Epidemic typhus in Akaki Kality was 33 in 2012, 55 in 2013, 56 in 2014, 43 in 2015 and 45 in 2016 out of 1000 population. 21.5 % of reported cases were from woreda seven and 20% were from woreda six while 19% were from woreda one.

Conclusion: High number of typhus cases was reported in the study area in last five year. All reported cases were tested positive for typhus in reporting health Facilities. The incidence of Epidemic typhus was increasing from 2012 to 2016. The highest number was reported from woreda seven administrations. We recommended that continuous health education for community to prevent Epidemic typhus especially for those in high risk area.[2] We recommended that continuous health education for community to prevent Epidemic typhus especially for those in high risk area.

Key Word:- [2] Surveillance data Analysis, Epidemic Typhus, Akaki Kality, Addis Ababa, Ethiopia, 2004-2008

Word Count: 296

6.2. Relapsing fever outbreak investigation report in woreda six, Akaki Kality sub-city, Addis Ababa, Ethiopia, 2017

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ABSTRACT

Background: -Louse born Relapsing Fever is endemic in the mountains of Ethiopia and it accounts 27% of hospital admission. Most of the times, it occurs in the form of outbreak. In February 2017, a rise of louse-born Relapsing Fever cases was reported to Akaki Kality sub city from Akaki Kality woreda six districts. The aim of this investigation was to identify the source of infection, risk factors and recommend preventive measures to challenge the problem.

Methods: - We defined suspected cases as abrupt onset of rigors with remittent fever, headache, arthralgia and myalgia and compared each of them to two unmatched Controls randomly selected from health facilities based on screening result. A total of 37 cases and 74 Controls (screened negative for Relapsing Fever clinically and by the laboratory) were interviewed. We run a Bivariate and Multivariate test to identify risk factors. We assessed the residency place, living condition, environmental sanitation and personal hygiene of the participants.

Results: -We identified 70 total cases and interviewed 37 cases. The median age of cases was 20 (IQR=4). The attack rate was 16/100,000 population. Participant who was slept with greater six persons were 5.5 times more likely to develop relapsing fever than control (95% CI, 1.1, 28.0; P value 0.0379). Those individuals bathed at least weekly were 96% less likely to be affected, than those who do not take body both at all (AOR= 0.04(0.002, 0.8). No significant association was observed with monthly income, contact history, change cloth at night or not, washing clothes frequently or not, age groups and sex of the respondent. We verified the existence of Relapsing fever outbreaks in Akaki Kality Sub city Woreda six which was significantly associated with mass sleeping and poor Hygiene. Close follow up of disease trend is recommended to minimize the impact.

***Key Word**: - Out break investigation, Case control, LBRF, Akaki Kality woreda six, 2017*

Word Count: 297

CHAPTER VII-VISITED DISASTER REPORT

Loss and damage from Akaki River over flow flooding in Akaki Kality sub city Addis Ababa, Ethiopia, 2017

ABSTRACT

Back ground: - Disaster is any event, typically occurring suddenly, that causes damage, ecological disruption, loss of human life, deterioration of health and health services, and which exceeds the capacity of the affected community on a scale sufficient to require outside assistance. The Akaki River over flow affected community and their economy in September, seven 2017 at night, 9:00pm [7]. The aim of this report is to describe response challenge and magnitude of flood in terms of person, place and time in Akaki Kality sub city.

Method: - Flooding affect two districts (three and eight). The assessment was started from the time of disaster, 7th September and continued up to the displaced community resettled to their place, 6th October, 2017.

Result: - In Woreda three about 227 *Households* a total population of 1022 was displaced. Out of them 510(49.9%) were male while 512(50.1%) were Female. And in Woreda eight about 15 households in one Ketena with a population of 79 were affected and displaced by the flooding. Out of displaced population 39 were Male and 40 Female. Several houses got inundated and house properties were severely or partially damaged. Due to the flooding a total of 242 households with a total population 1101 were displaced from their residency for a month. Affected households received assistance from government and neighboring community. One school and Youth center was given for temporary shelter. The community provides daily foods for displaced population at their shelter along with the woreda. Clothing, Hygiene materials (Soup, Omo, Bleach, Tissue Paper, Water guard and Aqua tabs) was issued to each house hold

CNCLUSION: - Akaki River over flow Flooding resulted from the manual spilling of Lega Dadi Dam was affected the populations settled on the basin of the river. Many populations were displaced from their house for one month

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Key words: Flooding, River over flow, Legedadi dam, Akaki River

Word count: 300

7.1. INTRODUCTION

Disaster is any event, typically occurring suddenly, that causes damage, ecological disruption, loss of human life, deterioration of health and health services, and which exceeds the capacity of the affected community on a scale sufficient to require outside assistance. Due to the combination of different damages in disaster situation Deaths, injuries, illness, and property damage cannot be effectively managed with routine procedures or resources. The cause disasters could be natural or manmade (technological). Flooding is one of Natural cause of disaster [1].

River floods pose a serious threat to millions of people living in river basins worldwide. At the national level, extreme floods may bring back development by some years and threaten national food security [2]. At the household level, a flood may leave people without shelter, limit possibilities to get involved in economic activities, and may increase the burden of diseases [3]. The severity of flood impacts may further increase in the future due to climate change. In many places, climate change will not only manifest itself as a gradual change in average conditions, but also as a change in the frequency and intensity of extreme events, such as heavy rainfall or drought, or periods of extreme heat or cold [4].

In different parts of Ethiopia, due to heavy rain and River over flow, flood hits vulnerable areas in different time. The 2006 flooding affected Dire Dawa is the most memorable in the recent history of flood disaster in Ethiopia. It has inflicted severe direct and indirect damages on social; infrastructure and Economic sectors of Dire Dawa. It caused the death of 256 people, 244 missing and 15,000 people displaced from their dwellings. Number of fatalities was large because floods hit the city in the middle of the night while people were in deep sleep and absence of early warning system that alerts the residents before the flood hit the city. Of the total fatalities, the proportions of women fatalities were 134 as compared to 83 men fatalities; and the remaining 39 fatalities were children. Flood in 2006 also severely damaged infrastructure and housing sector. In the housing section, a total of 1628 houses were totally and partially damaged with a total value of 10.23 million USD[5].

The National Disaster Risk Management Commission (NDRMC) reported flash flooding in communities within the Awash River basin and of the potential for additional flooding in areas that lie downstream. As of 14 September, over 20,000 people in Oromia Region are reported to be affected by floods. Some areas in Gambella region have also reported flooding affecting about

13,000 people. According the NDRMC, more flooding is expected in Amhara Region alongside Lake Tana where Tana- Beles hydro-electric power dam is located and in Somali Region where the Wabe Shebelle River has reportedly surpassed its maximum threshold [6].

On 8 September, the overflow of Awash and Asabera rivers caused massive flooding in Aysaita *woreda* (district) in Zone 1 and Buremoditu *woreda* in Zone 3 of Afar Region affecting over 4,500 people - with others displaced and over 500 hectares of agricultural land inundated. The displaced are currently living in temporary shelters on elevated ground. Flooding was also reported in Kalafo town of Shabelle Zone, Somali Region on the evening of 14 September, affecting 16 *Kebeles* (neighborhoods) along the Wabe Shebelle River. Assessments by regional authorities are ongoing and any humanitarian needs which cannot be met at the regional level will be requested to the NDRMC [6].

There are 12 river basins in Addis Ababa; the capital city has many rivers which may cause flood disaster with different magnitude. These rivers are the tributes of main Akaki River. The tributaries of the Akaki River include Kabana, BancheYeketu, Kortame, Bulbula, LequSoramba, kotebe and Fincha Rivers etc. Akaki river consists of two main branches, the confluence of which at the Aba-Samuel reservoir. Little Akaki flows through the western part of the city, rises north-west of Addis Ababa on the flanks of Wechacha Mountain and flows for 40 km before it reaches the reservoir and the Big Akaki river flows through the eastern part of the city which rises from north-east part of Addis Ababa (Entoto Kidane Miheret) area and flows into Aba-Samuel reservoir after 53 km. The main water resources that provide the city by man-made water reservoirs in a wash basin are Legedadi, Gefersa, Dire and Aba Samuel. The Akaki River over flow affected community and their economy in September, 2017 at night, 9:00pm [7].

7.2. OBJECTIVE

7.2.1. General objective

- To assess the impact of River overflow flooding in Akaki Kality sub city, 2017

7.2.2. Specific objective

- To identify the cause flooding.
- To describe the flood by person, Place, Time
- To describe the loss secondary to flooding

7.3.MATERIAL AND METHOD

Study area and period

Akaki-Kality sub city is one of the 10 sub city of Addis Ababa. It is located in southern direction of the city. The sub city has the distance of 12-35 Km from the center of Addis Ababa. The total Population of the sub city is 229,859 of which 48.5% male & 51.5% female. The sub city has 11 districts. Out of those 3 are rural type and the rest 8 are Urban type. Flooding affect two districts (three and eight). The assessment was started from the time of disaster, 7th September and continued up to the displaced community resettled to their place, 6th October, 2017.

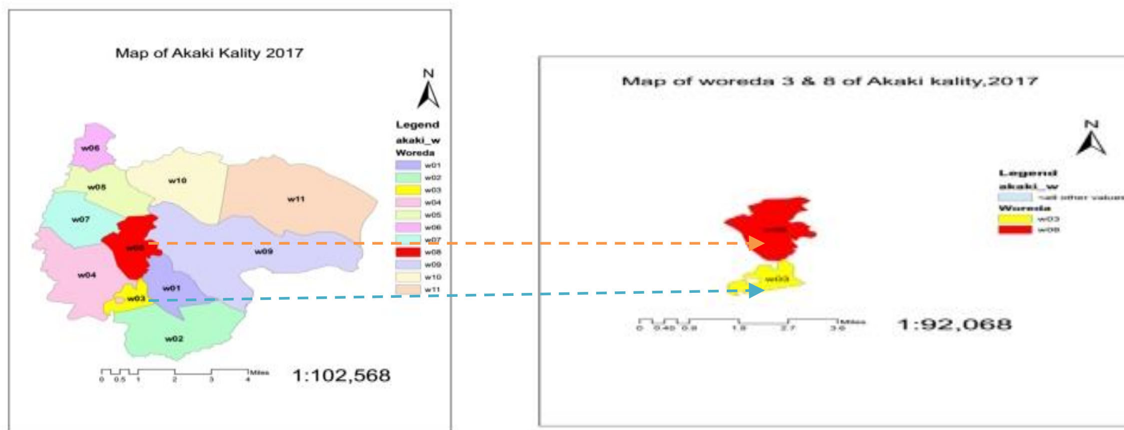

Figure: - 7. 1 Woreda three and woreda eight map in Akaki Kality 2017

Figure 7. 2 Map of Akaki river catchments.

Study Design

Descriptive record review and physical observation was used.

Study population

Population live in woreda three and eight in Akaki Kality sub city

Data collection tools and method

The data was collected using Check lists developed by sub-city. All affected population was interviewed to know damaged properties and for their health status.

Dissemination of the result

Written reports were prepared and shared to Addis Ababa university school of public health Field Epidemiology Training Program and Akaki Kality sub city health office.

Ethical consideration

Before conducting the flood report, supportive letter was obtaining from the sub city health office and submitted to those entire site data and information was collected.

7.4. SITUATIONAL DISCREPTION

Livelihood activities of Affected District

During Akaki Kality River overflow flooding two woreda (Woreda three and eight) are affected. In the affected area, most people are involved in more than one economic activity. The main activities are crop cultivation and livestock keeping. In the floodplains, farmers mainly grow Crops like Teff and Vegetables like Cabbage, Carrots, Potato, and Tomato especially in Woreda three. They cultivate by using both rain-fed cultivation (May to August) and Irrigation from Akaki river in dry season. In addition, some of households' income is from livestock, Trade, and daily laborer.

Cause of Flooding

The main water resources that provide the Addis Ababa city by man-made water reservoirs in a wash basin are Legedadi, Gefersa, Dire and Aba Samuel. Among them, has a great probability to Legedadi is found on south east direction of Addis Ababa in Oromia region near to Sendafa. It located at an elevation of 2376 meter above the sea level. In rainy season the Lega Dadi Dam become filled and cause over flow which drains to Akaki Kality after long distance due to its topographic locations from Akaki River. In august 7, 2017 because of overfilling of the Dam, Addis Ababa Water authority spills the dam manually. Along with the rain fall at the time this causes the over flow of Akaki River which cause damages to human and human property.

Flood impact

Socio- Economic Impact

In Akaki Kality from flooding during September 2017, two woreda were affected (Woreda Three and Woreda Eight). In Woreda three about 227 Households in three Ketena with a total population of 1022 were displaced. Out of them 510(49.9%) were male while 512(50.1%) were Female.

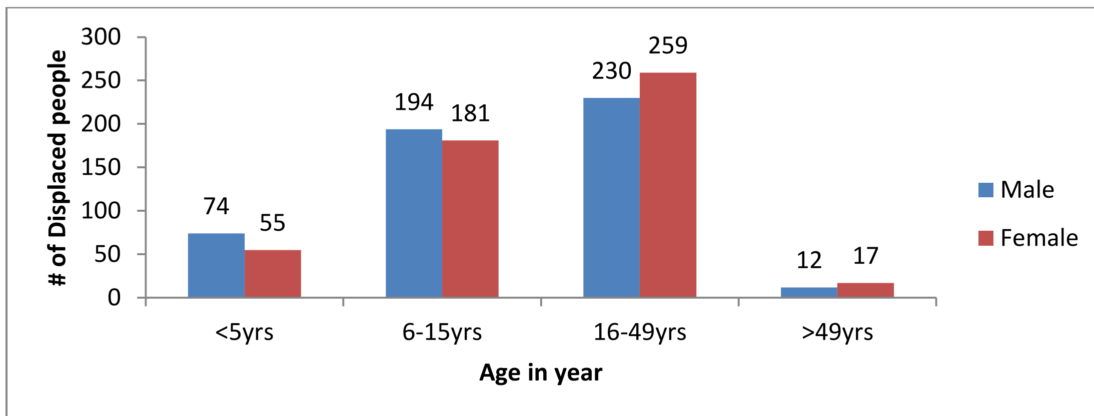

Figure :-7. 3 *Number of populations affected/displaced by flooding from Akaki River in Woreda three, 2017*

In Woreda eight about 15 households in one Ketena with a population of 79 were affected and displaced by the flooding. Out of displaced population 39 were Male and 40 Female.

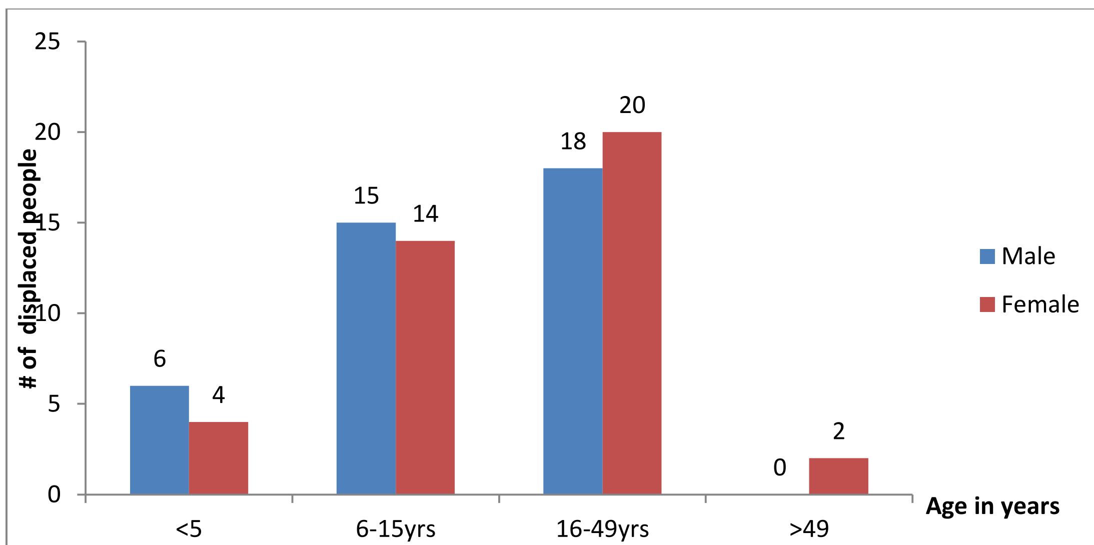

Figure:- 7. 4*Number of population affected/displaced by flooding from Akaki River in Woreda Eight, 2017*

Many of the houses in the affected area are built from wood and mud walls, which are easy to be damaged. These building materials are not strong enough to withstand an extreme flood. About 242 Households (227 from Woreda three and 15 in Woreda 8) was affected among which 10 (4%) were severely damaged by the 2017 flooding (Table 2). Several houses got inundated and house properties were severely or partially damaged. Due to the flooding a total of 242 households with a total population 1101 were displaced from their residency for month (Table 7.1).

Table: - 7. 1 Properties affected by flooding of Akaki River, Akaki Kality sub city, Addis Ababa, Ethiopia, 2017

	Property damaged/ passed away	Number	Total price	Remark
	Sheep	20	42,850	
	Teff	4kg	7200	
	Generator	6	58000	
	Chaff (Galba)	2 heap (kimer)	25000	
	Refrigerator	2	21200	
	Fertilizer	1250 kg	14400	
	water pump	27	162000	
	House	10	400000	Damaged
	Calf/TIJA	4	12000	
	Plough plow and Yolk	102	15300	
	Crop Germinal(Yersha bukaya)	62 hectare	2,480,000	
Total cost			3,237,950	

Figure:- 7. 5Impact of flooding in woreda eight, Akaki Kality, Addis Ababa, 2017

7.5. RESPONSE ACTIVITIES AFTER FLOODING

Immediately after the flooding, affected households received assistance from government and neighboring community. This assistance was mostly in the form of food and material aid. One school and Youth center was given for temporary shelter. The community provides daily foods for displaced population at their shelter along with the woreda. Clothing, Hygiene materials (Soup, Omo, Bleach, Tissue Paper, Water guard and Aqua tabs) was distributed for each house hold. The sub city establishes temporary clinic to solve possible health problem following the flooding.

In general, the support given for the affected population from sub city was:

- Sub city Establish temporary clinic and service render 24 hrs.
- Assign one ambulance from Salam free health center
- The woreda health extension worker give health education to refuges
- All displaced assign temporary refuges school and youth center.
- Food and water supplied to the displaced refuges for 28 days (300,000 birr)
- Destroyed Houses were reconstructed and maintenance for partially damaged houses and other properties was done by community and sub city.

Table:-7. 2 Supply distributed to displaced population, Akaki Kality Sub city, 2017

Properties	Number distributed	Price
Mattress	319 pcs	12760
Linen	319 pcs	79750
Blanket	319 pcs	133980
Soap for cloth wash	2500 pcs	25000
soap/body	1305 pcs	15660
Tissue paper(Soft)	512 pcs	5120
Tuta	46 pcs	5980
Wuha agar(Water guard)	3855 bottles	42405
aqua tab	85 tabs	510
Bleach	1200 Liter	4320
Omo	144pcs	1584
Modes	500pcs	4500
Total		**331,569**

7.6.RESPONSE CHALLENGES

- No well-functioning Rapid response team (RRT)
- No external supports for affected community
- Transportation problem to provide supports immediately for displaced community
- No integration between concerned sectors in the sub.city
- There is no planed budget for any emergency activates in the sub city as well as in the district level.
- Non displaced population came to the shelter to be counted as of displaced for interest of support.

7.7.CONCLUSION

- Akaki River over flow Flooding resulted from the manual spilling of Lega Dadi Dam was affected the populations settled on the basin of the river
- A property costs about 3,237,950 Ethiopia birr was destroyed
- Many population was displaced from their house for one month
- No out breaks and significant health problem was resulted from the flooding
- Important interventions were done by Sub city and neighboring community

7.8.RECOMMENDATION

- The sub city has to work on Early warning for community on the possible occurrence of river over flow flowing rainy season
- The Addis Ababa Water authority has to announce the community when the Dam will be spill.
- The sub city has to arrange and plan enough response budget for possible disaster
- Proper functioning of RRT both sub city and woreda level and integrating work with `other responsible sectors is crucial for successful control of any Health related events.
- The sub city highly recommended that all population advised to be settled far from Akaki river basin.

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CHAPTER VIII-EPIDEMIOLOGICAL RESEARCH PROJECT

8.1. Malaria vector control (ITN/IRS) owner ship, utilization and affecting factors

EXECUTIVE SUMMARY

Background: -Malaria constitutes a major public health problem and hindrance to socioeconomic development in Ethiopia. About 75% of landmass of the country is malaria-endemic, and 65% (58.5million) of the population is estimated to be at risk of malaria infection. According to the national strategy for malaria control, areas lower than 2,000 meters in altitude were considered malaria-endemic, and targeted to receive key malaria control interventions including long-lasting insecticidal nets (LLINs), indoor residual spraying (IRS), and prompt diagnosis and effective case management. Therefore, this study aims to assess the Coverage, utilization of ITN/IRS and factors affecting it in Akaki Kality sub city, Addis Ababa, Ethiopia 2018.

Methodology: - This study will be conducted from February to May 2018. Cross sectional study design will be conducted from among 409 households. Simple random sampling followed by systematic sampling method will be used to select participants. Proportion of LLINs coverage of Oromia region in 2015, Awareness of malaria preventability in Gambella region 2016, Family size in Gambella region 2016, ITN owner ship in Oromia region in 2015 and other factors are used in sample size calculation. To collect information semi structured questionnaire will be used which is adopted from different literature. Proportion of households with at least one insecticide treated net (ITN), indoor residual spreading (IRS), ITN utilization, and barriers to utilization of these vector control method will be studied. To accomplish this study 30,877 Eth birr will require.

Key Words: Malaria, Vector Control, Akaki Kality, 2018

Word count: 235

8.1.INTRODUCTION

Malaria is the highly prevalent tropical disease with high morbidity and mortality as well as high economic and social impact. Even though it has no vaccination, it is an absolutely preventable and treatable vector-borne illness which is caused by protozoa parasite of the genus *Plasmodium*. People with malaria often experience fever, chills, and flu-like illness. Left untreated, they may develop severe complications and die [1].

According to WHO report, in 2016, an estimated 216 million cases of malaria occurred worldwide in which 90% was from African Region followed by South-East Asia Region (7%) and the Eastern Mediterranean Region (2%). Of the 91 countries that had an indigenous malaria case in 2016, a decrease in malaria cases of more than 20% compared with 2015 was estimated in 16 countries, while an increase of a similar magnitude was estimated in 25 countries. The WHO regions of the Americas and Africa accounted for nearly 70% of the countries that had increases of more than 20% in 2016 compared with 2015. It was estimated that 445 000 deaths due to malaria had occurred globally, of which 407 000 deaths (approximately 91%) were in the WHO African Region in 2016 [2].

In combating the high prevalence of Malaria through the world WHO and every country formulates different strategies in vector controls. The most commonly used methods to prevent mosquito bites are sleeping under an ITN and spraying the inside walls of a dwelling with an insecticide – an intervention known as IRS. Use of ITNs has been shown to reduce malaria case incidence rates by 50% in a range of settings, and to reduce malaria mortality rates by 55% in children aged less than 5 years in sub-Saharan Africa. Between 2014 and 2016, a total of 582 million insecticide-treated mosquito nets (ITNs) were reported as having been delivered globally, of which almost 505 million ITNs (87%) were delivered to countries in sub-Saharan Africa [2].

In sub-Saharan Africa, 16 countries accounted for more than 80% of deliveries in the period 2014–2016. These countries were Nigeria (78.0 million), Democratic Republic of the Congo (61.2 million), Uganda (35.6 million), and Ethiopia (33.0 million) [2].

In Ethiopia malaria constitutes a major public health problem and impediment to socioeconomic development where, about 75% of landmass of the country is malaria-endemic and 65% (58.5million) of the population is estimated to be at risk of malaria infection [3].

According to the national strategy for malaria control, areas lower than 2,000 meters in altitude were considered malaria-endemic, and targeted to receive key malaria control interventions

including long-lasting insecticidal nets (LLINs), indoor residual spraying (IRS), and prompt diagnosis and effective case management. The strategy outlined an ambitious national goal of 100% household LLIN coverage in malaria-endemic areas, with a mean of two LLINs per household [4]. Akaki Kality sub city is one of the ten sub city in Addis Ababa city Administration where there is many malaria risk factors found and as information received from different woreda of the sub city shows, in different time, the distribution of ITN and IRS was done. But, the transmission of malaria stays as endemic and epidemic with in recent five years differently from other sub city.

Statement of the problem

Worldwide, Malaria remains a challenging infectious disease resulting in death and economic crisis. To combat this, WHO has developed ***Global Technical Strategy for Malaria 2016-2030*** (GTS). The Strategy was adopted by the World Health Assembly in May 2015. It provides a technical framework for all endemic countries as they work towards malaria control and elimination. This Strategy sets ambitious but attainable goals for 2030, with milestones along the way to track progress. The milestones for 2020 include [5]:

1. Reducing malaria case incidence by at least 40%;
2. Reducing malaria mortality rates by at least 40%;
3. Eliminating malaria in at least 10 countries;
4. Preventing a resurgence of malaria in all countries that are malaria-free.

To achieve this goal, Vector control using Insecticide- treated mosquito nets (ITNs) and indoor residual spraying (IRS)) are the main way to prevent and reduce malaria transmission. As per the National Malaria Control Strategic Plan 2014-2020, the FMOH conducted a mass campaign in 2015, distributing 29.6 million long-lasting insecticidal nets (LLINs) to protect all Ethiopians living in areas with ongoing malaria transmission, representing 60% of the total population [5]. Among Ethiopian malarias area, Akaki Kality is the one, but ignored area. As the sub city report in 2016/2017, 1,012 laboratories confirmed malaria case were reported with a prevalence of 4.4 per 1000 population which indicates high burden of malaria in the sub city. Therefore, assessing the ITN coverage, utilization and influencing factors in the sub city may provide important information for concerned stake holders to prevent malaria transmission in the sub city.

Significance of the study

The main objective of malaria program is to stop local transmission of malaria, and proper use of vector control methods is very important. In different time national, or regional government in collaboration with different non-governmental stakeholder, distributes ITN/IRS for population at risk. But still now in different part of the Ethiopian region malaria transmission is continued and many populations are being affected by malaria. So, this study is important to identify the gap of vector control measures utilization in community and what factors affect the utilization of ITN/IRS. Furthermore the result of our study may help to show the area of intervention to control malaria transmission in Akaki Kality sub city and will use as standing point for in tested researcher.

8.2. LITERATURE REVIEW

Worldwide, about 104 countries and territories are considered malaria endemic [3]. Malaria is an entirely preventable and treatable mosquito-borne illness. However, it remains a huge public health problem throughout the world. According to the annual global report of 2014, 97 countries and territories had ongoing malaria transmission with an estimated 3.2 billion people at risk of malaria and 1.2 billion are at high risk [6].

Malaria occurs mostly in tropical and subtropical areas of the world. In many of the countries affected by malaria, it is a leading cause of illness and death. The most vulnerable people for malaria are persons with no or little immunity against the disease. These are young children who have not yet developed partial immunity to malaria, pregnant women whose immunity is decreased by pregnancy especially during the first and second pregnancies and travelers or migrants coming from areas with little or no malaria transmission who lack immunity [7, 8].

The problem of malaria is very severe in Ethiopia where it has been the major cause of illness and death for many years. In Ethiopia malaria transmission are unstable. Because of it, malaria epidemic is serious public health emergencies. According to records from the Ethiopian Federal Ministry of Health, 75% of the country is malarias with about 52 million people (68%) of the total population living in areas at risk of malaria [9]. The epidemiology of malaria in Ethiopia contrasts with that of many other countries in Africa with high malaria transmission where malaria morbidity and mortality mainly affect young children. The 2015 HMIS data indicated

that parasite prevalence in Ethiopia was 0.5% by microscopy and 1.2% by RDTs for areas below 2,000 meters and less than 0.1% prevalence above 2,000 meters [9].

In Ethiopia there are about 835 districts with different levels of malaria risk with an estimated at-risk population of 50.5 million people as per the new stratification. However, the estimates of at risk population from the official projected population size for the year 2016 are 55.3 million. The best available proxy for local malaria transmission risk in Ethiopia is household altitude below 2,000 meters (above sea level), since malaria is rarely transmitted at higher elevations (unless there are weather abnormalities and widespread epidemics). Hence, those districts with malaria high risk needs proper vector control interventions to tackle malaria transmission [5].

Among the most malaria epidemic-prone countries in Africa, Ethiopia is the one of the few African countries that has a history of malaria control strategies for more than 40 years. To combat the burden of Malaria, globally as well in Ethiopia, different strategies were developed. Among these the two major malaria prevention services implemented in Ethiopia are targeted IRS with insecticides and distribution of LLINs for universal coverage. Other vector control activities, mainly larval control through environmental management and chemical larviciding, are also practiced in areas where such interventions are appropriate and expected to have significant impact [10].

Moreover, ITNs are the cornerstone of malaria prevention efforts, particularly in sub-Saharan Africa. Over the last 5 years, the use of treated nets in the region has increased significantly: in 2015, an estimated 53% of the population at risk slept under a treated net compared to 30% in 2010. Indoor residual spraying of insecticides (IRS) is used by national malaria programs in targeted areas. In 2015, 106 million people globally were protected by IRS, including 49 million people in Africa. The proportion of the population at risk of malaria protected by IRS declined from a peak of 5.7% globally in 2010 to 3.1% in 2015 [11].

Even though the national target is to sustain 100% LLINs coverage in malaria risk areas, as Ethiopian national malaria survey report of 2015 shows, the percentage of households in malarious areas owning at least one LLIN in EMIS 2015 was 64% in Ethiopia, while it was about 58.5% in Oromia region. On the other hand, the coverage of Indoor residual spraying (IRS) in 2015 was about 28.8% of Households in Ethiopia and 29.8 in Oromia region [10].

However, the presence of ITN in House hold does not guarantee the prevention of malaria vectors because proper utilization is crucial. As different study showed the utilization of ITN may be affected by different personal, social and environmental barriers. Education level of the HH, awareness about ITNs, number of sleeping rooms in the HH, individual ITN-color preference, presence of children aged under 5 years in the HH, IRS status of the HH, awareness of malaria prevention, family size of the HH, and occupational status of the HH head are reported as affecting factors in different previous study [12,13,14]. Moreover, the study supported by President's malaria initiative and conducted in five districts of Jima Zone in 2015 shows, the shape of ITN, low risk perception due to seasonality of malaria, saving nets for future use, decreased awareness, negligence and perceived low efficacy of LLITN are the major barriers. Again, the study conducted in Gambella also shows, sleeping in a member of more than three is more likely to use bed nets [15].

8.3.OBJECTIVE

8.3.1. General Objective:

- To assess malaria vector control (ITN/IRS) owner ship, utilization and affecting factors in Akaki Kality sub city, Addis Ababa, 2017

8.3.2. Specific Objectives

- To Identify ITN/IRS coverage at house hold level in Akaki Kality sub city.
- To describe ITN/IRS utilization in Akaki Kality sub city
- To identify factors affecting utilization of ITN/IRS

8.4.METHODS AND MATERIALS

Study area and period

Akaki-Kality sub city is one of the 10 sub city of Addis Ababa. It is located in southern direction of the city. The sub city has the distance of 12-35 Km from the center of Addis Ababa. The sub city has 11 districts. Out of those 3 are rural type and the rest 8 are Urban type. The total Population is 235,326 within 56,000 house hold of which 48.5% male & 51.5% female. The sub cities have one governmental, one private Hospital, Nine governments and one NGO health center. There are 101 private clinics in urban woreda of the sub city. The Altitude of the sub city is 1500-2050mt, and the average rain fall is 1180.4mm as well as the annual temperature is 10.6-

22.8 degree centigrade. Due to this topographic location, Akaki Kality is the leading malarias area among Addis Ababa city administration. The study will be conducted from April 28/2018-June 15/ 2018

Study design

Cross-sectional study design will be employed to assess malaria vector control (ITN/IRS) owner ship and affecting factors.

Source Population

The source population will be all households which are found in Akaki Kality sub city

Study population

Akaki Kality sub city population (households) will be used as our study population

Study units

Our study unit will be randomly selected Households from each Woreda of the sub city. Number of households will determine based on the total population of the woreda proportionally.

Sample size calculation

The sample size will be calculated based on population proportion formula

$$N = \frac{(Za)^2 [p*q]}{d^2}$$

P: The prevalence of the condition/ health state

q: When p is in percentage terms: (100-p)

d: The precision of the estimate. This could be either the relative precision, or the absolute precision 95%.

Za [Z alpha]: The value of z from the probability tables. If the values are normally distributed, then 95% of the values will fall within 2 standard errors of the mean. The value of z corresponding to this is 1.96 (from the standard normal variate tables). Then we get:

Table: - 8. 1 Epidemiological project sample size determination.

S/n	Study finding Variables	P	Q	Z	D	population proportion formula	size	(10%)	size [(a*b)+c]
1	Not Aware of malaria preventability (Gambella region 2015)	0.39	0.61	1.96	0.05	$n=Z^2(p\times q)/w^2$	366	37	**403**
2	LLINs Utilization (in Oromia region 2015)	0.41	0.59	1.96	0.05	$n=Z^2(p\times q)/w^2$	372	37	**409**
3	IRS coverage (in Oromia region 2015)	0.298	0.702	1.96	0.05	$n=Z^2(p\times q)/w^2$	321	32	**353**
4	Bed shared by 3-5 HH member (Gambella region 2015)	0.81	0.19	1.96	0.05	$n=Z^2(p\times q)/w^3$	236	24	**260**
5	Bed shared by more than HH member (Gambella region 2015))	0.86	0.14	1.96	0.05	$n=Z^2(p\times q)/w^4$	185	19	**204**
6	ITN coverage (Oromia,2015)	0.59	0.41	1.96	0.05	$n=Z^2(p\times q)/w^4$	372	37	**409**

Among the six indicators, to address all variables, we will use the variables with larger sample size which is 409. Since the total Household of the study area is more than 10,000 no need of adjusting of sample size and the final sample size will be 409 households including 10% non-responder rate.

Sampling technique

The first study units will be identified by Simple random sampling technique from all districts followed by systematic sampling. Households from each District will be calculated proportionally according to their population size. After the first House hold is identified randomly the next house hold will be every 9th house.

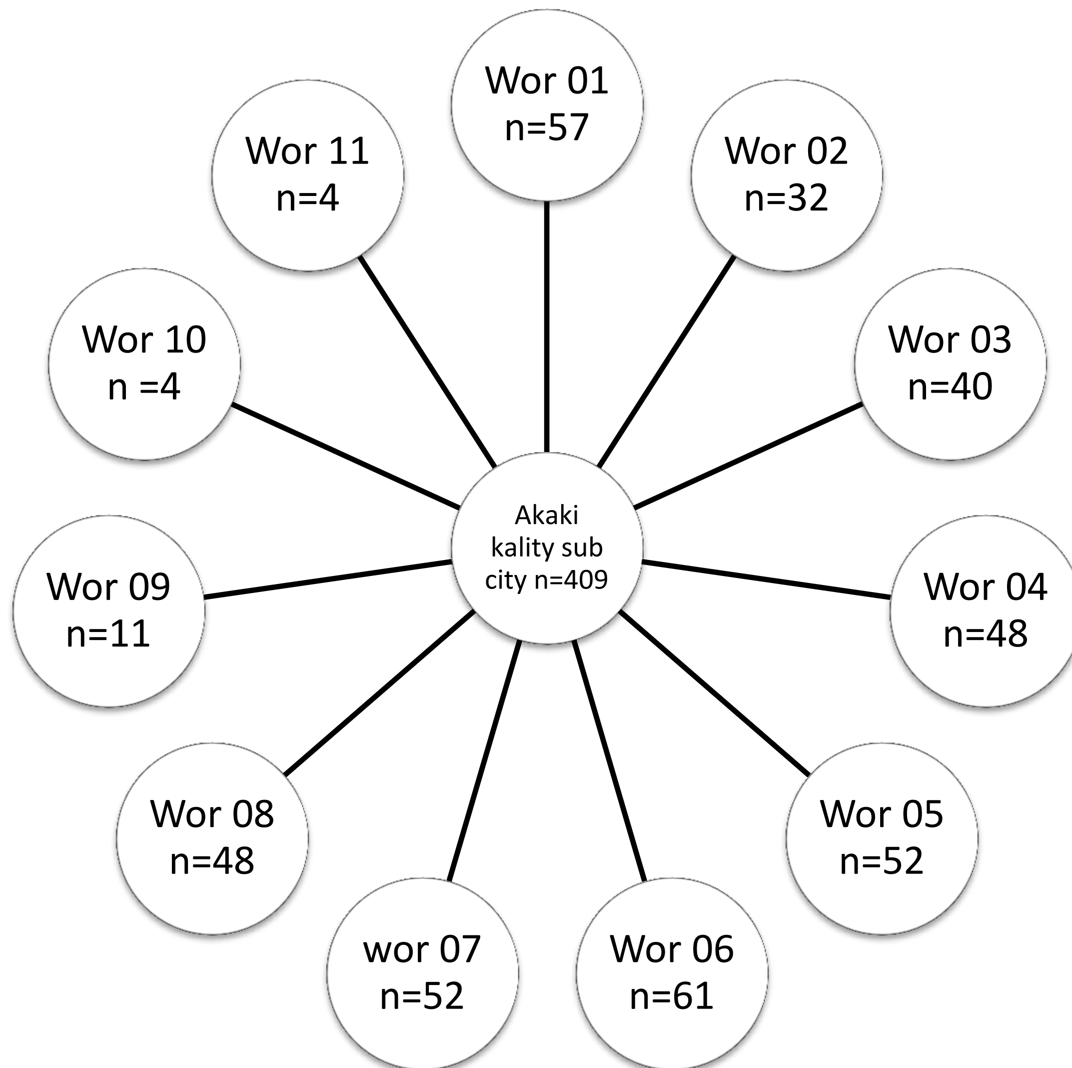

Figure: - 8. 1 diagrammatic representation of sampling technique and sample size from each woreda

Data collection procedure

Data will be collected using structured questionnaire and pretested. Data collectors will be trained and collect data house to house. Family head or any family members of age greater than 18 yrs will be selected for interview. The following findings will be obtained; Proportion of households who own at least one insecticide treated net (ITN) and utilized, dwellings in geographic areas targeted for indoor residual spreading (IRS) which have sprayed and factors hinders ITN/IRS utilization. Data will be analyzed using Epi Info version 7.1.2 after data cleaning done thoroughly.

Variables

Independent Variables

- Age
- Sex
- Religious
- Monthly income
- Knowledge
- Occupation
- Family Sleeping pattern
- ITN owner ship
- Sleeping under ITN
- Dwelling sprayed with IRS

Dependent

- ITN/IRS utilization
- Coverage/Owner ship

Exclusion and Inclusion Criteria

Inclusion criteria

- All households within the sub city will included

Exclusion criteria

- Closed houses at the time of survey
- House where there is no respondent in the house hold/where there is no above 18 years old family member.

Ethical consideration

Ethical clearance will be obtained from Addis Ababa University School of public health confidentiality of every responder will kept through our study by obtaining informed consent.

Project outcome

This study will provide important information on the status of malaria vector control IRS/ITN Owner ship, utilizations and what factors affecting the utilization of ITN/IRS in the district. The result will contribute for district, regional and national malaria vector control strategy improvement.

Result Dissemination Plan

The study result will be submitted to the Addis Ababa University School of public health and Akaki Kality sub city health office by May second week 2018.

WORK PLAN

Table:- 8. 2 Thesis work plan for malaria vector control Akaki Kality sub city, 2018.

Sr. No	**Activity**	**Responsible body**	May	June				July				August	
			Week	Week				Week				Week	
			4	1	2	3	4	1	2	3	4	1	2
1	Title selection	Investigator											
2	Proposal writing	Investigator											
3	Proposal Submission to advisor	Investigator											
4	Budget rise	AAU											
5	Pretest	Investigator, collectors											
6	Data collection	Investigator, collectors											
7	Data analysis	Investigator											
8	Writing first draft narration	Investigator											
9	Submission of first draft narration	Investigator											
10	Writing final Narration	Investigator											
11	Submission of final result	Investigator											

BUDGET BREAK DOWN

Table:-8. 3 Budget break down for malaria vector control Akaki Kality sub city 2018.

Titles	Required number	Each Rate by Birr	Date of duration	Required birr
Data collectors	11	300	5	11*300*5=16,500
Supervisor	2	400	5	2*400*5=4,000
Principal investigator	1	500	5	1*500*5=2,500
Sub total				**23,000**
Stationery				
Pen	15	5		15x5=75
Pencil	15	3	-	15*3=45
Eraser	15	5	-	15*5= 75
A4 size papers	6 pack	150	-	6*150 = 900
Copy	3500	1	-	3500
Subtotal				**4,595**
Communication				
Mobile card	11*25+1*100 +50*2		-	**475**
Contingency 10%				**2,8007**
Grand total				**30,877**

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CHAPTER IX-OTHER ADDITIONAL OUT PUT

9.1. Report of training on PHEM activities in Akaki Kality sub city Addis Ababa, Ethiopia 2018

9.1. INTRODUCTION

Training is playing an important role in the effectiveness of organizations and to the experiences of people in work. Training has implications for productivity, health and safety at work and personal development. All organizations employing people need to train and develop their staff. Most organizations are cognizant of this requirement and invest effort and other resources in training and development. Such investment can take the form of employing specialist training and development staff and paying salaries to staff undergoing training and development.

The purpose of training and management development programs is to improve employee capabilities and organizational capabilities. When the organization invests in improving the knowledge and skills of its employees, the investment is returned in the form of more productive and effective employees. Training and development programs may be focused on individual performance or team performance. The creation and implementation of training and management

In Ethiopia there are 21 weekly and immediately reportable diseases from these in Addis Ababa Akaki Kality sub city Dysentery, Malaria, Typhoid fever, Relapsing fever, Typhus fever and Measles are commonly reportable disease on other hand the timelines and completeness of reportable diseases are 90% and 92% respectively. Increase knowledge of health professionals are very important to understand the case definition of reportable disease and complete on time reporting system.

Akaki Kality health office is one of the Addis Ababa regional states in the country with a population of nearly 3 hundred thousand. The diseases of interest that the public health emergency management core process at Akaki Kality sub city at present has planned to train health professionals on acute watery diarrhea, malaria, measles, Dysentery, malnutrition, AFP and MDSR. The regional health bureau usually used to give basic trainings on all public health emergencies at Woreda and Health center level.

9.2. OBJECTIVES

9.2.1. General objective

- ❖ To strengthen the capacity of PHEM focal persons on general PHEM activities

9.2.2. Specific objective

- ❖ To improve the recording, reporting and case managing abilities of Health center and woreda focal persons.
- ❖ To enable participants to develop the skills necessary to support the lower level on surveillance systems and outbreak investigation.
- ❖ To improve the health workers' ability case definition of epidemic prone Diseases
- ❖ To strength core and supportive function of surveillance system.
- ❖ **METHODS AND MATERIALS**
- ❖ PPT presentation, LCD, flip chart and computer were used to conduct
- ❖ Prior to the presentations pre-test was administered to identify the level of their awareness of the participants about public health emergencies prone diseases the training.
- ❖ Group work
- ❖ General discussion
- ❖ Evaluating their level of awareness at the end of the training through administration of Post-test
- ❖ Weekly bulletin preparation and Figure (table) practical presentation were employed
- ❖ Challenge and threat were discussed to each organization

9.3. ACTIVITIES ACCOMPLISHED BEFORE THE TRAINING

Prior to the training gap was identified (need assessment was conducted). Based on the assessment result this training is prepared. A selection criterion was also prepared such as the trainee must be PHEM focal person and related employee who are permanently working at woreda health office, health center and zonal health office. Invitation letter was written to Woreda health office and health center to call trainees. And other administration issues also managed

A total of 33 different categories of health professionals who have been working at zonal, woreda and health center PHEM focal person was selected and wrote letter to join the training. The training was held at Akaki Kality sub city health office hall from January 6 to January 9, 2018. The participants were from 11 woreda PHEM focal person, nine health center PHEM focal person and Woreda disease prevention and health promotion responsible body and two Akaki Kality sub city disease prevention and health promotion staff. Three presenters were selected by the Sub city those are Mr,Girma Demessie from Akaki Kality Sub city PHEM department, Mr,Getiye Getaneh From St Pawlos millennium medical college and Mr. Debalke Abate from Addis Ababa university school of public health. All presenters were engaged for four days training

All reportable disease case definition, Data analysis and presentation, supervision feedback, Timelines and completeness of report, outbreak investigation and intervention, supportive and core function of surveillance activities as we as strengthening of community surveillance were topics cover under the training

9.4. OUTCOME OF THE TRAINING

A Total of 31 participants were participated on this training. Of these, 8(26%) was male and 23(74%) were female. From a total participant the majority, 20 (65%) were from woreda health office, two (6%) were from sub city health office and nine (29%) were from health center.

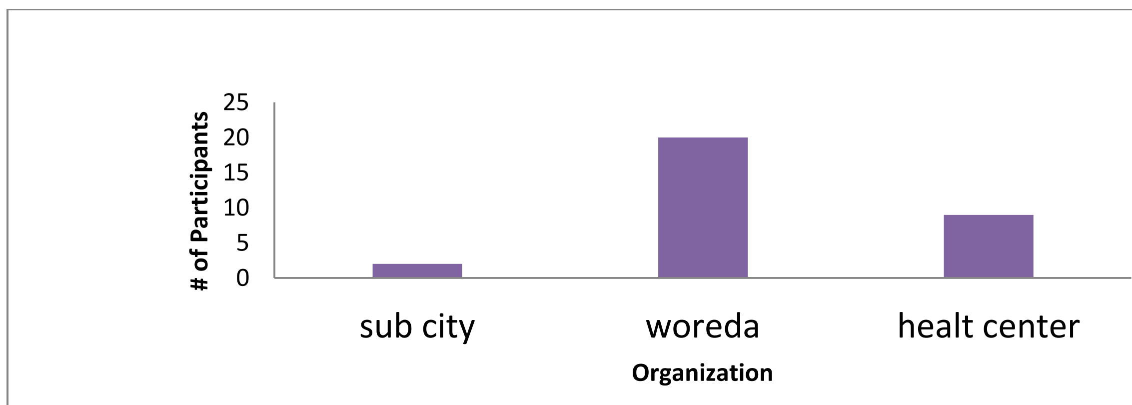

Figure: - 9. 1 PHEM training participant organization in Akaki Kality sub city, 2018

Prior to the training to assess the knowledge of the participants, pretest was prepared and given for each trainee. In addition to evaluate the training objectives, Post assessment is mandatory and the trainee were also taken posttest Exam. Accordingly, the minimum result of the pretest was

36% and the maximum result was 84% and the posttest minimum and maximum result was 48%and96% respectively. The average mean of pretest and posttest is 53% and 73% respectively. The standard deviation of posttest and pretest is 18.5% and 25.3 respectively.

Table: - 9. 1 PHEM Training in Akaki Kality Sub city, trainees' pre and post test result, 2018

Code	Pretest %	Post Test%
1	46	74
2	80	88
3	38	66
4	76	88
5	56	60
6	64	0
7	60	72
8	84	88
9	60	80
10	84	96
11	68	88
12	52	70
13	66	86
14	68	72
15	80	92

Code	Pretest%	Post Test %
16	50	70
17	76	74
18	44	76
19	76	92
20	60	72
21	54	92
22	38	68
23	64	72
24	38	54
25	40	68
26	80	92
27	36	54
28	0	65
29	0	74
30	0	85
31	0	48

9.5. CHALLENGE

- The training hall was not convenient.
- Punctuality Issue (most participant are late comer)
- Five participants were not take pre or posttest assessment

9.6. CONCLUSION AND RECOMMENDATION

A total of 31 participants were conducting the training. The training was effective and had influence on the trainees in increasing knowledge and skill on PHEM activities and core components. After the training the trainees gained and shared good experience from the training. Addis Ababa health bureau and Akaki Kality sub city health office advised to maintain and update knowledge and skills of PHEM focal person about PHEM and outbreak investigation at zonal and woreda level.

9.2. PHEM Weekly bulletin in Akaki Kality sub city Addis Ababa, Ethiopia

❖ **Highlights of the Week 01 (1/1/2018–7/1//2018.**

❖ Akaki Kality Surveillance report completeness and timeliness rates in week 01 for health facilities under the sub city were 95%.

❖ There were no new SAM/MAM cases reported in the first week of 2018.

❖ Number of total malaria cases was 10.

❖ Number of typhoid cases were 370

❖ Number of epidemic typhus was. 311.

❖ The number of dysentery cases in the week was 17.

❖ The number of Measles case were 2

❖ There were no AWD cases detected in this week.

❖ No maternal death was reported in this week.

I. Introduction

This Epidemiological Weekly Bulletin serves to provide key information on public health emergency management activities, and summarizes surveillance data and performance on epidemic prone diseases and other public health emergencies. The bullet mainly includes surveillance data of week 01 of 2018 received through SMS, phone call and line list reports. It highlights the surveillance completeness and timeliness across all woreda, trends of diseases under surveillance, cluster of cases and events, ongoing outbreaks and responses undertaken at all levels in the sub city.

II. Completeness and Timeliness

- In this week the sub city average surveillance completeness was 95%. Which is not aligned with the WHO expectation (100%)?

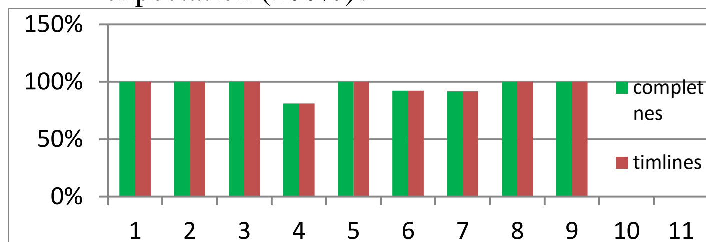

Figure: - 9. 2 ***Timelines and completeness of facility report in week 01 by woreda, Akaki Kality sub city, 2018.***

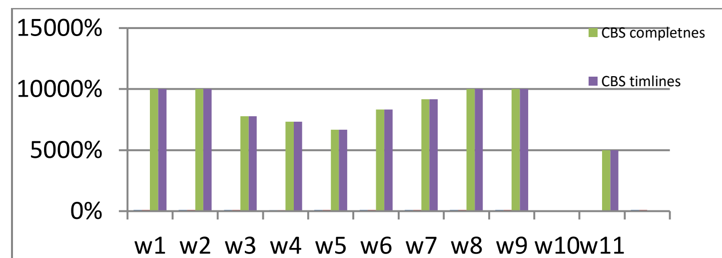

Figure:- 9. 3 ***Timelines and completeness of community report by woreda in 1st week, Akaki Kality sub city, 2018.***

Typhoid

A total of 403typhoid cases with no death were reported in this week. The number of Cases was increased as compared to the previous week (which was 373).

Dysentery

A total of 15 dysentery cases were reported during week 47. The number of Cases was nearly the similar as compared to the previous week report (which was 19).

Relapsing fever

There was no RF case reported in this weak

Measles

There was two measles case reported from woreda 7 private school in this week.

Other immediately reportable disease

All immediately reportable disease (AWD, AFP, NNT, SARS, Rabies, Cholera, Anthrax, Guinea worm, VHF, Yellow fever, MD and other were reported zero in week 01.2018

Recommendations

There is a potential risk for relapsing fever due to cold weather in the morning so it is recommended to give continues community awareness and risk assessment.

Contacts:

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9.3. Research conducted and Abstract Submitted

- Proposal for malaria mini grant was sent for FMOH and accepted. It was funded by CDC and we conducted study entitled "assessment of malaria vector control measures (ITNs/IRS) and affecting factors in Adama District, 2017)". The result is waiting for opportunity to be presented on National or International conference.
- Abstracts entitled "Epidemic Typhus cases surveillance data analysis report in Akaki Kality Sub city, Addis Ababa, Ethiopia 2012-2016" was sent for Scientific conference in response to call from:
    - 2018 EIS CONFERENCE MIS, FETP International Night 2018 which will be held on April 16–19, 2018 in Atlanta, Georgia.
    - The 7th AFENET Scientific Conference which will be held at the Joachim Chissano Conference Center in Maputo, Mozambique during the week of November 11-16, 2018.

9.4. Conference attended

The first EFELTP annual conference was held in June, 2017 at EPHI, Addis Ababa for three days and all EFELTP residencies were invited to submit abstract and to attend the conference. On this conference different scientific writing was presented by residents. Training on Scientific Writing, Arc GIS, etc. Was given for residents by invited guests and I attended the session of scientific writing and presentations.

In addition, other scientific conference was held in February 26-28, 2018 at UNCC, Addis Ababa by EPHA for three days. There were very interesting scientific presentations on this conference and I attended and captured good experiences from this conference.

DATA COLLECTION TOOLS

ANNEX I: Data collection tools for case control study on AWD.

This survey is conducted by Addis Ababa university school of public health and Ethiopian Public Health Institute as part of the ongoing response to the Acute Watery Diarrhea (AWD) outbreak in Benishangul Gumuz region Metekel zone Dangur woreda. All personal information collected through this survey will be handled confidentially and your name is not required.

The Survey is being conducted to improve prevention, control measures against AWD, and stop further spread. You may wish to withdraw at any stage of the interview.

Part A: General information

1. Serial No/code-------------
2. Participant category Case ☐ Control ☐
3. Age (in years): --------------------
4. Sex: Male ☐ Female ☐
5. Occupation________________
6. Residential Address----------
7. Residency zone------------
8. Residency woreda------------------
9. Telephone Number----------------------[3]

Clinical Information (for cases)

10. Date of onset (dd/mm/yyy) ---------------------------
11. Presenting symptoms

Watery Diarrhea ☐ Vomiting ☐ Dehydration ☐ Others (specify) ________________________ ☐

12. Hospitalized? Yes No

13. Date of hospitalization (dd/mm/yyyy) ----------------------

Part B: Exposures

Water

14. What is your regular source of water for domestic use in the last 5days?

Household Tap water Communal tap water River
Well

Borehole Spring Street vended water

Tanker water (Roto) Bottled water others
(specify)________________________

15. What is your regular source of drinking water within the last five days?

Household Tap water Communal tap water River
Well

Borehole Spring Street vended water

Tanker water (Roto) Bottled water

Others (specify)________________________

16. Did you treat the water before drinking? Yes No

17. If yes, how did you treat it? Filter Boiling Aqua tab

Water guard Bishangare Pure

Other(specify)____________________________

18. Did you drink water from a holy water site in the last five days? Yes
No

19. If yes, what is the source of the holy water site? Spring Piped water
Well others (specify)_____________________

Food and Beverages

20. Did you eat any of the following in the last 5 days?

Vegetable salad ☐ Fruits ☐ Raw meat ☐ Partially roasted meat ☐ Fish ☐ Milk ☐ others (specify) ---------

21. Where did you get (or buy) food for your household?

Local market ☐ Private garden/farm ☐ Street shops ☐ Supermarkets ☐ Others (specify)_-------------------

22. Did you eat food outside your home in the last 5days? Yes ☐ No ☐

23. If yes, where? Sold by street vendors ☐ Hotel ☐ Restaurant ☐

At a gathering ☐ School/work cafeteria ☐

24. Others (specify)________________________

25. Did you eat any cold left-over food in the last 5days? Yes ☐ No ☐

26. If Yes, where is the source of the food? Home ☐ Hotel ☐ Restaurant ☐ University ☐ Others (specify)____________________________

27. Did you drink any of the following locally-made beverages in the last 5days?A. Yes B. No

28. If yes which one? Shameta ☐ Borde ☐ Besso ☐ Others (specify)_____________

Hygiene and sanitation

29. Do you systematically wash your hands with soap before eating? Yes ☐ No ☐

30. Is there a latrine in your home? Yes ☐ No ☐

31. If yes, Communal or private? Communal ☐ ivate ☐

32. If No to Q.15, where do you discharge human waste (faeces)?

Open defecation ☐ in the river ☐ bury in the soil ☐

Others (specify) ________________________

33. Did you wash your hands every time with soap after defecation? Yes ☐ No ☐

34. Where do you dispose of your refuse? Open dumping ☐

Open pit ☐ In the river ☐ Bury ☐ Burn ☐

Others (specify)____________

Other exposures

35. In the last one week, did anyone in your household have diarrhea or vomiting? Yes ☐ no ☐

36. Did you visit anyone having diarrhea or vomiting Yes ☐ No ☐

37. Did you attend a funeral within the last five days? Yes ☐ ☐

38. Did you travel to a place affected with diarrhea and vomiting illness?

Yes ☐ No ☐

39. If Yes, where? ________________________ (Name of Kebele/Ketena, Woredas,)

ANNEX II: Data collection tools for case control study on relapsing fever

Consent form

My name is-----------------------------------. I am first year field epidemiology resident in Addis Ababa University School of public health and I interested to investigate relapsing Fever outbreak in Akaki Kality woreda six by identifying predisposing factors. This study, after investigation, will provide recommendation on the place of control method and concerned body will intervene to control further infection. Therefore, your participation has a great role for the success of controlling Relapsing Fever.

While collecting data no one will be wanted to specify her name on the questionnaire paper and no one will be forced to participate in the study. Through all process the confidentiality of interviewee is highly kept. Hence no one can enforce to answer the questioners & you can stop at anywhere even after answering some of questions.

Do you agree?

- ○ Yes
- ○ No

If yes proceed to the question on the next page. Since your answer has great value on my study, while answering the question, please, answer as per your feeling.

Thank you for your willingness!!!!!

Principal investigators Name Debalke Abate Phone Number: 0911693736.

Questionnaire for Louse Born Relapsing Fever Outbreak Investigation in Akaki Kality woreda six Saris health center, 2017

Code --------------------------Date of data collection -----------------------MRN -------------------

Data collector name -----------------------------Signature -----------------

Name of principal investigator-------------------------------------

Data collection Place (Name of HF) ------------------ Location of Woreda HF -----------

S/n	Questions	Multiple choice	Skip
	Part I Socio-demographic data		
1.	Age	-------------------------------	
2.	Sex	1 Male 2 Female	
3.	Former address		
4.	Woreda(Current)		
5.	Kebele(ketena) - specific name		
6.	Residency	1 Home 2 Homeless(street) 3 Bed room(daily) 4 Shelter	
7.	House N^{o} (if any)	-------------------	Skip if homeless
8.	Phone number	--------------------------	Optional
9.	How long you live in your current address?	----------------------------------	
10.	If you are living on street, Mention the specific area	----------------------------------	
S/n	**Questions**	**Multiple choice**	**Skip**
11.	Religion	1. Orthodox 2. Muslim 3. Protestant 4. Catholic 5. Others	

12.	Ethnic group	1 Amhara 2 Oromo 3 Tigray 4 SNNP 5 Other(specify)------	
13.	Respondent's educational status	1. Illiterate 2. Elementary 3. Secondary 4. Preparatory 5. Higher education	
14.	Respondent's occupation	1. Employed 2. Private owner 3. Daily laborer 4. House wife 5. Student 6. No Occupation	If Student or No occupation skip Q 15 & 16
15.	Working place	----------------------	
16.	Respondent's monthly in come	-----------------------	
17.	Respondent category	1 Case 2 Control	
Part II Participant status and clinical description			
18.	Referral information	1. Self-referral 2. Private Hospital/clinic 3. Government Health facility	

S/n	Questions	Multiple choice	Skip
19.	Patients status at arrival	1. Walking by him/her self 2. Supported by others 3. By Ambulance/ any car	
20.	Patient first seen in	1. Emergency OPD 2. OPD (normal OPD)	
21.	Date of Onset of illness	-----------------------------------	
22.	Date visit Health facility	---------------------------	
23.	Duration of illness	----------------------	
24.	Was the patient admitted (treated as IP)?	1. YES 2. NO	If No Skip to Q Nº 29
25.	If YES, which hospital (HF)?	--------------------------------	
26.	Date of admission:	-----------------------------------	
27.	Date of discharge	-------------------------------------	
28.	Discharge diagnosis	1. No improvement 2. Recovered 3. Died 4. Referred	
29.	Does the patient deloused before discharge	1. Yes 2. No	NA for Controls
30.	What is the symptoms that the patient experiencing? (History + PE) **(Circle all that applies)**	1. Fever 2. Chills 3. Headache 4. Nausea or Vomiting 5. Malaise Myalgia 6. Joint Pain 7. Nosebleeds	

31.		1. 2.	
32.	Describe the rash	-----------------	
	Part III Laboratory test and Treatment		
33.	Did the Patient tested for blood film	1. Yes 2. No	If No Skip to Q no 37
34.	If yes, Date of specimen taken	-----------------------	
35.	What was the result?	1. No hemo parasite seen 2. Borrella species seen	
36.	Laboratory Name	-----------------------	
37.	Did the patient got medication?	1. Yes 2. No	If no go to Q. Nº 39
38.	Types of Drug given for the patient	----------------------------	
Part IV Knowledge questions			
39.	Do you know RF?	1. Yes 2. No	
40.	How RF can be transmitted?	1. Through body louse 2. Sleeping with RF ill person 3. Sleeping in overcrowded house(place) 4. Other(specify)______ 5. I don't know	
41.	How RF can be prevented	1. Keeping personal hygiene 2. Keeping environment clean 3. I don't know 4. Other ___	
S/n	**Questions**	**Multiple choice**	**Skip**

42.	Where did you go first when you get ill?	1. Health facility 2. Traditional healer 3. Holy water 4. stays at home 5. Other(Specify)___________	
43.	Which method do you think is best for RF treatment?	1. Modern medicine 2. Traditional medicine 3. Holly water 4. Nutritious food 5. Stays indoor 6. Delousing	
Part V EXPOSURE: - Risk or exposure of louse born relapsing fever			
44.	How many peoples sleep together?	-------------------------	
45.	How frequent do you groom your hair?	1. Every two week 2. Every month 3. Every two to three month 4. More than three month	
46.	How frequent do you take body bath?	1. At least once a week 2. Twice a week 3. Every two to three weeks 4. Other ---------	
47.	How frequent you wash your clothes	1. Once a week 2. Every two week 3. Every three week 4. Once a month 5. Not wash at all	
48.	Do you change your cloths at night?	1. Yes 2. No	
49.	Have you Contact with LBRF ill person	1. Yes 2. No	

ANNEX III: data collection tool for malaria on surveillance system evaluation

Facility/organization -

Date __/___/_____ Zone _________________

Sub City ______________ Interviewer___________________

Respondent Name ________________

General

I. **Availability of a National Surveillance Manual;**

1. Is there a national manual for surveillance? a. Yes b. No c. Unknown

If yes, describe (last update, diseases included, case definitions, surveillance and control, integrated or different for each disease): ____

____

II. **Case Detection and Registration;**

2. Do you have standard case definitions for malaria?

a. Yes b. No c. Unknown d. Not applicable

If yes, observe the standard case definition for those diseases ____________________

III. **Data reporting:**

3. Who is responsible for providing you reporting formats of surveillance?

A. Federa Ministry of Health PHEM unit.

B. NGOs

C. RHB

D. Other___________________

4. Have you encountered shortage of appropriate surveillance forms at any time during the Last 6 months?

a. Yes b. No c. Unknown

5. What are the reporting entities for the surveillance system?

A. Public health facilities

B. NGO health facilities

C. Military health facilities

D. Private health facilities

E.Others__________________

6. Number of districts has reported weekly and immediately report in the last 3 months compared

to expected number? ___________________________________

7. Number, Health centers, Hospitals, NGO health facility, others (private) sent weekly report in the last three months? ___________________________________

Weekly: ____

Immediately: ____

8. **on time (use national deadlines)**

Number of districts has sent weekly reports on time in the last 3months: ___________

9. Was there any report of the immediately reportable diseases in the past 1 month?

a. Yes b. No

If yes, with in what time is the report received after detection of the case/ diseases?

A. Less than 1 hour B. 2-24 hour C. 1- 2 days D. 3- 7 days E. After 1 week

10. How do you report to the next level?

A. Mai B. Fax C. Telephone D. Radio E. Electronic F. Other_____________

IV. **Data analysis**

11. Do you describe data by person (case based, outbreaks, and sentinel)?

A. yes B. no C. don't know

If yes, observe analyzed data by person: ______________________________

12. Do you describe data by place?

a. yes b. no c. don't know

If yes, Observe description of data by district (tables, maps) _________________________

13. Do you describe data by time? a. yes b. no c. don't know

If yes, observe description of data by time: __________________________________

14. Do you perform trend analysis?

a. yes b. no c. don't know

If yes, observe line graph of cases by time _________________________________

List disease(s) for which line graph is observed_________________________________

____

V. **Availability of defined threshold;**

15. Do you have defined threshold level for Malaria?

a. yes b. no c. don't know

If yes, observe for some diseases ____

16. Who is responsible for the analysis of the collected data? ___________________________

17. How often do you analyze the collected data? A. Daily B. Weekly C. Every 2 week

D. Monthly E. Quarterly F. As needed…

18. Have you an appropriate denominator?

a. Yes b. No c. don't know

If yes, observe presence of demographic data (E.g. population by district and hard to reach groups) ____

VI. **Outbreak Investigation**

19. Number of outbreaks suspected in the past year:___________________________

20. List the diseases: ____

21. Of those suspected/detected, how many of them were investigated? ______________

(Observe reports and take copies if possible) ___________________________________

22. Number and percentage of outbreaks in which risk factors were looked for: _______________

23. Number and percentage of outbreaks in which findings were used for action: ______________

[Observe report]____

24. Number of districts that looked for risk factors [observe in reports]: _____________________

25. Number of districts that used the data for action [observe in final report]: _________________

VII. Epidemic preparedness (relevant for epidemic prone diseases)

26. is there Zonal plan for epidemic preparedness and response?

a. Yes b. No c. Unknown

If yes, observe a written plan of epidemic preparedness and response: _______________________

27. Has the zone had emergency stocks of drugs, vaccines, and supplies at all times in past 1 year?

a. Yes b. No c. Unknown

28. Has the zone experienced shortage of drugs, vaccines or supplies during the most recent epidemic (or outbreak)?

a. Yes b. No c. Unknown

29. Are there standard case management protocols for Malaria?

a. Yes b. No c. Unknown

If yes, list the exists protocols, ____

Observe the existence of a written case management protocol for at least 1 priority disease _____

VIII. Presence of a budget line for epidemic response;

30. Is there a budget line for epidemic response?

a. Yes b. No c. Unknown

If yes, describe total budget allocated and utilized in the past last year _________________

IX. Existence of zonal epidemic management committee;

31. Is there established zonal epidemic management committee?

a. Yes b. No c. Unknown

If yes, observe minutes (or report) of meetings of epidemic management committee __________

32. Has epidemic management committee evaluated its preparedness and response activities during the past year?

a. yes b. no c. don't know

If yes, observe written report to confirm _____________________________________

X .Zonal rapid response team for epidemics;

33. Does the zone have a rapid response team for epidemic? a. Yes b. No c. Unknown

34. Is there any notification of recently reported outbreak to which you had response within? 48hrs? a. Yes b. No c. Unknown

If yes, observe that the zone responded within 48 hours of notification of most recently reported outbreak (from written reports with trend and intervention)

XI. Feedback:

35. How many feedback bulletin or reports has the regional level produced in the last year?

____

Observe the presence of a report or bulletin that is regularly produced to disseminate surveillance data ____

XII.Supervision:

36. How many supervisory visits have you made in the last 6 months compared to expect? _____________(%)

37. If supervision was not made during the past 6 months, please mention the reasons,

____

____

____

XIII.Training on surveillance activities;

38. What percent of your subordinate personnel have been trained in surveillance? ___________

39. On what topics have you gave training in the last 6 months?

____

____

____

40. What are your stakeholders those supporting you in giving training? ____________________

____

41. Major challenges during and after training activities __________________________________

____

____

42. Strengths during and after training ____

____

____

XIV. Resources

Do you have? :

43. **Data management equipment**

Computer_________

Printer ___________

Photocopier _______

Data manager ______

Statistical package _____

Stationary________

44. **Communications:**

Telephone service _______

Fax _______

Radio call ________

Mobile phone _______

Computers that have modems _______

45. **Budget line (from donors)** ______

XV.Surveillance Networking

46. Do you have functional computerized surveillance network at this level?

a. Yes b. No c. Unknown

XVI. **Budget for surveillance**

47. Is there a budget allocated for surveillance activities from the Regional Health Bureau budget (governmental source)?

a. Yes b. No c. Unknown

If yes, what is the proportion of this budget from total allocated budget for other activities?

____(%)

48. How could surveillance be improved? ____________________________________

____

____

____

XVII.Surveillance Co-ordination

49. Is there a focal unit for surveillance at this level?

a. Yes b. No c. Unknown

If yes, observe organogram of the zone to confirm: ____________________________________

50. What opportunities are there for integration of surveillance activities and functions (core activities, training, supervision, guidelines, resources etc.)? ______________________________

____

____

____

Questionnaire for Attributes and level of Usefulness:

A. Total population under surveillance_____________

B. in 20009 E.C, what is the incidence / Prevalence of:

□Malaria incidence ________ prevalence __________Deaths_________

I. Level of Usefulness of the Surveillance System for these selected priority diseases

Does the surveillance system help?

A. To detect outbreaks of these selected priority diseases early? Yes/ No

B. To estimate the magnitude of morbidity and mortality of these diseases, including identification of factors associated with these diseases? Yes/ No

C. Permit assessment of the effect of prevention and control programs? Yes/ No

Observe (confirmation):

Interventions and diseases trends analyzed ________________________

____

II.Description of Each System Attributes:

i. Simplicity:

1. Is the case definition malaria easy for case detection by all level health professionals?

a. Yes b. No c. Unknown

2. What are the organizations which need to receive reports of the surveillance data?

____

3. Do you feel that additional data collected on cases are time consuming?

a. Yes b. No c. don't know

4. How long it takes to fill the reporting format?

a. <5 minutes b. 10-15 minutes c. >15 minutes

Overall comments of on the above point's _________________________________

____

____

ii.Flexibility

1. Can the current reporting formats be used for other newly occurring health event (disease) without much difficulty? a. Yes b. No c. don't know
2. Do you think that any change in the existing procedure of case detection, case definition, allocating funds, report forms, and formats will make difficult to implement?

a. Yes b. No c. don't know

Overall comments on the above points: ____

____

____

____

iii.Data Quality: (Completeness of the reporting forms/and validity of the recordeddata)

1. Are the data collection formats for these priority diseases clear and easy to fill for all the data collectors/ reporting sites? a. Yes b. No
2. Have you ever given training for data collectors on data quality management?

a. yes b. no. c. don't know

3. Are the reporting site and data collectors supervised regularly? a. Yes b. No
4. **Observe:** Review the last month report of selected 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 ____
____

iv. Acceptability

1. Do you think all the reporting agents accept and well engaged to the surveillance activities? a. Yes b. No

If yes, how many are active participants (of the expected)?_____________

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 theircontribution; i.e. no dissemination of the analysis data back to reportingfacilities
C. Reporting formats are difficult to understand
D. Report formats are time consuming
E. Cost of data reporting
F. Other:____
____

2. Are all stakeholders are fully participate in surveillance system strengthening?

a. yes b. no c. don't know

If no, what are the reasons make them discomfort?______________________
____

V.Representativeness:

1. What is the health service coverage of the zone? _________%
2. Do you think that the populations under surveillance have good health seeking behavior for these diseases? Yes / No
3. Whom do you think is well represented by the surveillance data?

a. the urban b. the rural c. equal

VI. Timeliness:

1. Do you think that the existing surveillance system is timely detecting the outbreak?

a. yes b. no c. don't know

Comment ____
____

2. During the most recent outbreak of malaria within how many days these outbreaks were reported to the region after the first case/index case/_______________________________
3. Is enough information is available for control of selected diseases during outbreak?

a. yes b. no c. don't know

Comment____

____

4. How long does it take to have laboratory confirmation of Malaria?_____________

Vii. Stability:

1. Was there lack of resources that interrupt the surveillance system? Yes/No
2. Was the new BPR restructuring affected the procedure and activities of the surveillance of these diseases? A. Yes/ B. No

ANNEX IV: Data collection tools FOR HEALTH PROFILE Assessment

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 ____________________degree centigrade

Land body________________________________

- Water bodies __________________________

3. **Demographic information**

- Total Population size ______________
- Male _____________
- Female ___________-
- Urban________________
- Rural ____________
- Sex ratio ___________
- Age structure: - percentage of children < 1yrs____<5yrs___< 15 yrs ____
- Percentage of old people >65 years ____________
- Women child bearing age ____________
- Percentage of pregnant women ____________
- Dependency ratio ____________

Population size by religion

- Orthodox _________
- Catholic ________
- Protestant _______

- Muslim ________
- Others ________

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

No	Ketene	population	%	Remark

5. **Administrative setup**

Total no. of Ketena rural ____ Urban_____

Woreda Boundaries east:- ___________________________________

South:- _____________________________________

North:- _____________________________________

West:-_______________________________________

6. **Health status**

6. **Number of health facilities**

S/no	Type of Health facilities	Gov.	Private	Ratio

7. **Man power of woreda health office and health Center in 2008**

S/no	Type	Number	Ratio

8. Top ten morbidity and mortality adult and pediatrics

S/no	Adult	number	%	Pediatrics	Number	%

9 Vital statistics 2008 E.C

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

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

Crude Birth Rate_________

Crude Death Rate__________ (total deaths)

Maternal Mortality Rate ______ (total maternal deaths)

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

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

Percentage of deliveries attended by skilled birth attendant ____________

5. MCH and EPI coverage

S/no	Description.	Plan	Coverage	%
Under 5 children				

6. environmental sanitation and availability of safe drinking Water

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	

Factory sewerage system

No	**Total factory**	**Sewerage system**	**Remark**
1			

7. 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	

8. **HIV/AIDS**;

S/no	Activities	Male	Female	Total	Remark
1	Total people screened for HIV				
2	VCT				
3	PICT				
4	PMTCT				
5	HIV Prevalence				
6	Total PLWHIV				
7	On ART				

8	ON PRE-ART				
9	Condom Distribution				
10	Health education coverage				

9. TRAUMA PATIENT BY AGE AND SEX CATEGORY 2008 E.C SARIS HC

Male	Male	Male	Female	female	Female	Total prevalence
0-4 age	5-14 age	>15 age	0-4 age	5-14 age	>15 age	

15. 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

Is there any recent disease outbreak/other public health emergency?

Yes (specify) yes___________________________________

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 addressed problems?

21. Discussion of the highlights 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?

Annex: V- Data collection tools for epidemiological project on malaria vector control (ITN/IRS) owner ship, utilization and affecting factor

Hello, I am __________________________ I am Field epidemiologist from federal ministry of health. Also Introduce yourself that, you came from woreda /Zonal health office. Then explain the purpose of the study for the respondent by saying that "the reason why I came here is to ask you some questions related to malaria. The purpose of this interview is to have your opinion on the coverahe, bed nets and IRS. This in turn will help to design the intervention to tackle the transmission of malaria." After the explanation, identify the presence of any household member whose age is greater than 18 years old and above.

16. II. Informed consent

Read the following paragraph for the selected person." To conduct our study, I would like to ask you some questions. I kindly request you to give me your sincere and truthful answer. All the information that you are going to give me will remain confidential and you don't need to mention your name." For any un clear doubt you can contact the investigator Mr,Debalke Abate by 0911693736.

Are you willing to participate in the interview?

Yes________(continue the interview). No________ (Thank you and stop)

Signature of Data collector_______________________ Date___________________

Signature of the supervisor ________________Date______________________

A. Socio-demographic Characteristics

No	Question	Response
01	Sex of the HH head	1. Male 2. Female
02	Age of the HH head	………….
03	Marital status HH head	1. Married 3. Divorced 2. Single 4. Widowed
04	Educational status HH head	1. Illiterate 3. Secondary 2. Primary 4. Higher level
05	Religion HH head	1. Orthodox 2. Protestant 3. Muslim 4. Catholic 5. Others (specify……)
06	Source of income	1. Farming 2. Monthly salary 3. Daily laborer 4. Trade 5. No income
07	Monthly income (Eth birr)	………………...birr
08	Family size (constantly who shares the same house)	…….

B. Factors associated with ITN & IRS utilization

No	Question	Response
09	Does the HH member have habits of sharing one bed/sleeping area?	1. Yes 2. No
10	Persons sharing one bed	1. Two and less people share one bed 2. 3-5 people share one bed 3. More than 5 people share one bed

No	Question	Response
11	How many Sleeping rooms are there?	1. One 2. Two 3. Three and above
No	**Question**	**Response**
12	How many Beds/sleeping area available in the HH?	1. One 2. Two 3. Three and above
13	Sleeping pattern of children <5 years old	1. All children under 5years together 2. They sleep with both parents 3. They sleep with other family member
14	Sleeping pattern of children 5–10 years old	1. Everybody sleeps alone 2. All males together or all females together 3. All males and females together
15	Sleeping pattern of adolescents	1. Everybody sleeps alone 2. All males together or all females together 3. Both males and females together
16	Bed Room status	1. Separate from other room 2. Shared with other room

C. Knowledge Level of the respondent

No	Question	Response
18.	Do you believe malaria is preventable?	1. Yes 2. No
19.	How can we prevent malaria transmission	1. DDT spray 2. Source reduction 3. Drugs(prophylaxis) 4. ITN s utilization 5. Not known
20.	Does sleeping under bed net cause any problem?	1. Yes 2. No

21.	If YES, to Q 20 above, what are the major problems?	1. No comfort 2. Cause heat 3. Air hanger 4. If other, specify
22.	Do you think DDT spray cause any problem?	1. Yes 2. No
23.	If yes what is the problem?	1. Bad odor 2. Food contamination 3. House suffocation 4. Other …….
No	**Question**	**Response**
24.	Who are at high risk of malaria in the household? (Multiple answer is possible)	1. Under five children 2. Pregnant women 3. Adults 4. Old age 5. I don't know
25.	Who should be given priority in malaria infection in the household? (Multiple answer is possible)	1. Under five children 2. Pregnant women 3. Adults 4. Old age 5. If other, specify
26.	How frequent and when should one use ITN?	1. Every night 2. Seasonally 3. When Mosquito seen in the house 4. I don't know
27.	Who should have to uses the ITNs? (Multiple answer possible)	1. Children only 2. Mother only 3. Father only 4. Father and mother only 5. The whole family 6. Children and mother

D. ITN ownership and Utilization

No	Question	Response
28.	**Have you any type of ITN**	**1. Yes** **2. No**
29.	If yes Who provide ITN for you?	1. Bought/gift from relatives 2. Kebele/health bureau 3. NGO
30.	If yes for Q 28,When you get/bought	1. One years ago 2. Two years ago 3. Three years ago 4. Four and above years ago
31.	How many ITN (any types) are there in the house hold?	1. One 2. Two 3. Three and above
32.	Number of beds /places of sleep observed with bed nets	1. One 2. Two 3. Three and above
33.	The type of bed net that household owned	1. Re treatable 2. Permanently treated
	If no why?	1. No K-O tab 2. Lack of information 3. Forgotten 4. Other
34.	Is the bed net hanged (placed) properly over the bed or sleeping area?	1. Yes 2. No
35.	Is there any hole (throne) in the bed net?	1. Yes 2. No
36.	Shape of Bed net	1. Conical 2. Rectangular
37.	Was the house sprayed with insecticide (IRS) in the last one year?	1. Yes 2. No

38.	Is there <5 child in the household?	1. Yes 2. No
39.	If **YES**, did he/she sleep under bed net previous night? (For those who own)	1. Yes 2. No
40.	Is there a pregnant woman in the house hold?	1. Yes 2. No
41.	Did she slept under bed net the previous night? (For those who own bed net)	1. Yes 2. No

E. Family history of Malaria illness

No	Question	Response
42.	Did any of family members diagnosed of Malaria in this year?	1. Yes 2. No
43.	Who was he/she?	1. Father 2. Mother 3. < 5ys child 4. 5-10yr children 5. Adult children(>10yr)
44.	What was its outcome?	1. Improved 2. Died 3. Unknown

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.

Name: **Debalke Abate Chekol**

Signature: _______________________________

Place: Addis Ababa City Administration Regional Health Bureau

Date of Submission: May, 2018

The thesis has been submitted for examination with my approval as a university advisor.

Name of advisor

Dr. Adamu Addissie (MD, MPH, PHD)	**Mr. Wondimu Ayele (MPH, PHD Fellow)**
Signature: _____________________	Signature: _____________________
Date: _________________________	Date: _________________________

RESIDENT CURRICULUM VITAE

1. PERSONAL INFORMATION

Name --------Debalke Abate Chekol

Sex ------------------------ M Date of birth -------December 19, 1974

Place of birth------------- East gojam

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E-mail: --------- kakeabate@gmail.com

Nationality---------------- Ethiopian

2. WORK EXPERIENCE

2.1. Dates (from - to) May 23, 2000 – September, 2012

a) Name and address of employer: Blue Nile construction Share Company, Nifas silk lafto Sub city, Addis Ababa.

b) Type of organization: Governmental Health Facility

c) Pharmacy, injection and dressing room, outpatient department.

d) Clinic Head

2.3. Dates (from - to) July 2012 to, August 2015

a) Name and address of employer Bole sub city health office, Addis Ababa, Ethiopia

b) Type of organization: Governmental Health Facility

c) Occupation or position held: Medical director of semit health center

2.3. Dates (from - to), August 2015 to September, 2016

a. Name and address of employer: Nifas silk lafto sub city, Addis Ababa, Ethiopia

b. Type of business or sector: Governmental Health Facility

c. Occupation or position held- Medical director of woreda one health center

3. Educational Background

3.1. Dates (from - to) 2006-2008

a) Name and type of organization: Medico bio medical college

b) Title of qualification awarded: Diploma in clinical nurse

c) Level in national classification: Diploma in clinical nurse

3.2. Dates (from - to) 2006-2008
a) Name and type of organization: Keiamed University

b) Title of qualification awarded: First degree in public health

c) Level in national classification: Senior public health professional

2. Dates (From-to) October, 2016 to June, 2018

a. Name and type of organization: Addis Ababa University, Health Sciences College, School of Public Health

b. Principal subjects/ occupational skills: MPH in Field Epidemiology

c. Title of qualification awarded: Degree of masters

d. Level in national classification: 2nd Degree

4. **LANGUAGE SKILLS**

Language	Listening	Speaking	Reading	Writing
English	**Excellent**	**Very good**	**Excellent**	**Excellent**
Amharic	**Excellent**	**Excellent**	**Excellent**	**Excellent**

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