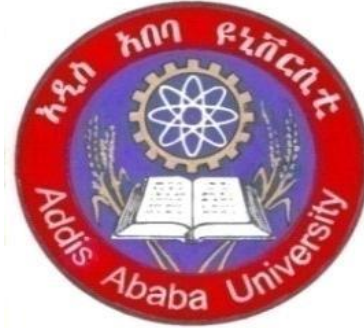


**ADDIS ABABA UNIVERSITY, COLLEGE OF HEALTH SCIENCE,  
SCHOOL OF PUBLIC HEALTH**



**Ethiopia Field Epidemiology Training Program (EFETP)**

**Compiled Body of Works in Field Epidemiology**

**By**

**Zerihun Taye Bekele**

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

**June, 2018**

**Addis Ababa**

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**Advisors**

**Dr. Girma Taye**

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## List of abbreviation and acronyms

AFI	-----	Acute Febrile Illness
AFP	-----	Acute flaccid paralysis
AIDS	-----	Acquire Immunodeficiency Syndrome
ANC	-----	Antenatal Care
AOR	-----	Adjust Odd Ratio
AWD	-----	Acute watery diarrhea
ART	-----	Anti-Retroviral Therapy
BCG	-----	Bacilli Chalmette Guerin
BPR	-----	Business process re-engineering
COR	-----	Crude Odd Ratio
CFR	-----	Crude Fatality Rate
DALYS	-----	Disability Adjusted Life Year
EDHS	-----	Ethiopian Demographic Health Survey
EPI	-----	Expanded Program on Immunization
FP	-----	Family Planning
FMOH	-----	Federal Minister of Health
GDP	-----	Growth domestic product
HCW	-----	Health Care Workers
HCPs	-----	Health Care Professionals
HIV	-----	Human Immunodeficiency Virus
HMIS	-----	Health management information system
IDSR	-----	Integrated Disease Surveillance and Response
LBRF	-----	Louse born Relapsing Fever
MCH	-----	Maternal and Child Health
MoC	-----	Mission of Charity
NGO	-----	Non-Governmental Organization
NNT	-----	Neonatal tetanus
OPD	-----	Outpatient department

OPV-----Oral Polio Vaccine  
ORS ----- Oral Re hydration Salt  
PAB ----- Protective at Birth  
PHEM ----- Public Health Emergency and Management  
PITC----- Provider Initiated Testing and Counseling  
PLWHA -----People living with HIV AIDS  
PMTCT-----Preventing Mather to Child Transmission  
PNC -----Post-natal Care  
PTB-----Pulmonary Tuberculosis  
RDT -----Rapid Diagnostic Test  
RRT -----Rapid respond team  
RF-----Relapsing Fever  
RTA-----Road Traffic Accident  
RTC-----Road Traffic Collision  
SIA-----Supplementary immunization Activity  
TB-----Tuberculosis  
TF -----Typhoid Fever  
VCT-----Voluntary Counseling and Testing  
WHO -----World Health Organization

## **Executive Summary**

Ethiopia has been giving special attention to the control of epidemic prone diseases, of international concern and diseases on eradication and elimination programs, through surveillance activities. The role of public health practitioners includes ensuring effective health promotion, disease prevention and control activities, conducting surveillance on emerging public health threats and providing pertinent information to policy makers and public health officials. The Ethiopian field epidemiology and training program is a two years competency based program which 25% is class and 75% is field based work (residency).

From October, 2016 to end of May, 2018 I have stayed in Field Epidemiology Training Program, School of Public Health-AAU and at Addis Ketema sub city health office field base. During residency, we carried out two outbreak investigations, one surveillance data analysis, one evaluation of surveillance system, one woreda health profile description, two abstracts for scientific conference, one scientific manuscript for Peer review journal, epidemiological research proposal and other activity done during resident like development of weekly bulletin on priority disease.

**Chapter One:** I have conducted two outbreak investigations we conducted using case control study design on relapsing fever outbreak in Arada sub city. And descriptive cross-sectional study design on measles outbreak in Arada sub city, woreda 2. investigation report contains abstract, introduction, methods, discussions, conclusion, recommendations, acknowledgement and references separately.

**Chapter Two:** Contains report of surveillance data analysis which was conducted on Analysis of Typhoid fever Surveillance in Addis ketema sub city. Five-year data was used in the analysis. The objective of this study was to describe typhoid fever distribution by place, person and time and recommend possible solutions.

**Chapter Three:** To assess key attributes of surveillance system evaluation of Typhoid fever and Cholera Performance of the system in line with set objectives and operations of the system to generate evidence-based information for the better improvement of the surveillance system. The surveillance attributes: simplicity, flexibility, stability, acceptability, representativeness, timeliness, data quality, were also assessed in the chapter.

**Chapter Four:** descriptive woreda Health Profile were conducted from 13/2/2017-15/3/2017 in Addis ketema sub city, Woreda 7Administrative in 2017. The aim was over view of the social, economic, demographic and geographic health status of woreda. It is basic for planning and undertaking appropriate public health interventions; and is doorway point for operational public health researches. Stakeholders of health and health related issues will access evidence-based information from this chapter.

**Chapter Five:** Epidemiological research proposal on magnitude of road traffic accident and factor association in Addis Ababa was prepared.

**Chapter Six:** Scientific Manuscripts for Peer reviewed Journals. The manuscripts were prepared according to Ethiopian journal of health development author's guideline in relapsing fever outbreak investigation in Arada sub city.

**Chapter Seven:** we prepared two Abstracts for scientific conference on relapsing fever outbreak investigation in Arada subcity and surveillance data analysis in Addis ketema sub city.

**Chapter Eight:** Prepared weekly bulletin on PHEM reported of Addis Ketema sub city health office for epidemiological week 52, 2017.



# **Chapter -I**

## **Outbreak**

### **Investigation**

## **1.1 Relapsing fever outbreak investigation in Arada sub city, Addis Ababa, Ethiopia, 2018.**

### **Abstract**

**Introduction:** Ethiopia is the main endemic focus of louse borne relapsing fever. *Borrelia recurrentis* is the etiologic agent for louse-borne relapsing fever and occurs as epidemic under conditions of poor socioeconomic status, overcrowding, poverty, draught and famine. Therefore, the aim of investigation was to investigate the occurrence outbreak of relapsing fever, identify the risk factors and suggest practical control measures to alleviate the disease burden of the community.

**Methods:** We conducted facility based unmatched case control study to investigate the outbreak. All patients from 3 January to 29 January 2018 were included. fifty patients un matched with hundred controls that had no previous history of relapsing fever and admitted to for other case in the facility. Study was conducted in on a daily basis and data was analyzed using Microsoft Excel and Epi-Info version 7.2.0.1.

**Results:** Among all confirmed patients 100% (50), was male. There was no death during the outbreak. Mean age of case and control was 26,31 years respectively and their median age was 24,32 years respectively. Statistically significant associations were Mass sleeping (AOR = 6.2, 95% CI [2.02-19.06]), who did not change cloth at night (AOR = 8.8, 95%CI [1.5-50.8]) and residency status at street (AOR = 26.4, 95%CI [4.79-145.5]) and residency status at daily bed room (AOR=48.2,95%CI [7.5-83] showed a statistically significant association. Those Not changing cloth at night was about eight times, Mass sleeping was six times, residency status on street was about twenty-six times and residency status on daily bed room was about forty-eight times likely hood of acquiring relapsing fever compare to those who change cloth at night, who did not sleep in mass and not sleeping in street and daily bed room.

**Conclusion:** Among all case mass sleeping in street, daily bed room and lack of alternative clothes change at night were source and risk factor for the outbreak. Education on the transmission of Relapsing Fever was given to homeless and daily laborer people. The outbreak was contained due to prompt interventions taken and strong preventive measures were recommended to prevent emergence of future outbreak of relapsing fever.

## **1.1.1 Introduction**

### **1.1.2 Background**

Relapsing fever is a recurrent febrile infection caused by various *Borrelia* spirochetes transmitted either by lice (epidemic relapsing fever) or by ticks (endemic relapsing fever). It is transmitted from human to human by the body louse, *Pediculus humanus*. The pathogen multiplies in the gut of the louse and is transmitted when an infected louse is crushed or scratched while feeding in the human host [2].

Relapsing fever (RF) was once a disease of global epidemic importance. *Borrelia recurrentis* is the etiologic agent for louse-borne relapsing fever and humans are the only known reservoirs. It occurs as epidemic under conditions of overcrowding, poverty, draught and famine. Homeless people in crowded shelters are also at risk of louse-borne relapsing fever [3], [4].

Large outbreaks of louse-borne relapsing fever had occurred throughout the past century. These outbreaks usually occur following man-made breakdowns in public health, as typified by the epidemic following World War II that involved about 10 million cases and one million deaths during this epidemic [3].

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-borne relapsing fever [5], [6].

Ethiopia is the main endemic focus of louse-borne relapsing fever. It was reported as seventh of the top ten leading causes of admission and death among adults in the country, in 2002/03. More than 9000 cases were reported to the ministry of health in the same year. However, lack of diagnostic facilities in rural health set up and incomplete reporting make it difficult to estimate the total number of cases [3], [7].

Several large epidemics were recorded in the country, usually following war and famine. Localized epidemics continue to occur when circumstances become favorable. The latest epidemic occurred in 1991/92, at the end of the civil war in Ethiopia. It occurred among military recruits returning to their residence areas, and later spread to different sections of the

community, including schools. Among 389 patients from Arsi, southern Ethiopia, during this epidemic, the case fatality rate was 3.5 % [3].

Therefore, the aim of investigation was to investigate the occurrence outbreak of relapsing fever, identify the risk factors and suggest practical control measures to alleviate the disease burden of the community in mission of charity, Arada sub city.

## **1.1.2 Objective**

### **1.1.2.1 General objective**

- To describe magnitude of relapsing fever outbreak and identify factors associated with this outbreak in Arada sub city, Addis Ababa city, Ethiopia 2018

### **1.1.2.2 Specific objectives**

- To verify existence of relapsing fever outbreak in Arada sub city
- To describe the magnitude of the outbreak by time, place and person.
- To identify risk factors for relapsing fever
- To propose recommendation to ward relapsing fever control and prevention

## 1.1.3 Methods and Materials

### 1.1.3.1 Study area

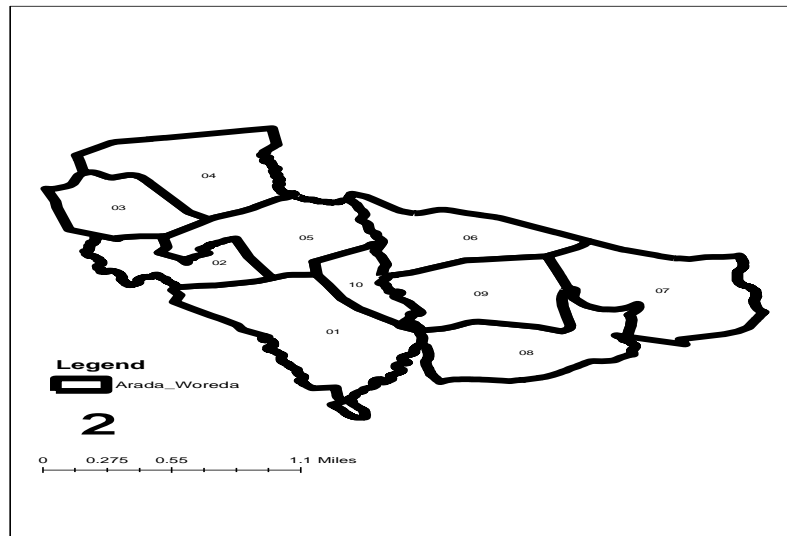


Figure 1.1.1 Map of Arada sub city by woreda in 2018

Arada sub city administration divided in to 10 woreda with Area of 9.9 sq.km. according to 2017/2018 population projections was 272,356 of which 130,730(48%) are male and 141,625 (52%) are female. and the population density per sq.m:22, 805. It is located in the central part of Addis Ababa city administration It is bordered on the south by Kirkos, on the West by Lideta and Addis Ketema, on the North by Gullele and East by Yeka. There are 2 Governmental hospital, 10 health centers,14 private medical clinic,3 private hospital and 2 NGO clinics.

### 1.1.3.2 Study period

Study was undertaken 50 cases and 100 controls from 3 January to 29 January 2018 in Arada sub city, Mission of charity clinic Addis Ababa, Ethiopia.

### 1.1.3.3 Study design

We conducted facility based unmatched case control study to investigate the out break

### 1.1.3.4 Study population

Was conducted in Fifty cases matched with one hundred controls that had negative for relapsing fever and admitted to by other case. Line list of cases was taken and followed daily within the study period, cases and controls interviewed using semi-structured questionnaire Arada sub city, Mission of charity clinic Addis Ababa, Ethiopia.

### 1.1.3.2 Standard case definition

#### **Suspected**

Any person presented with an abrupt onset of rigors with fever, usually remittent, headache, arthralgia and myalgia, dry cough, epistaxis

#### **Confirmed**

A suspected case with positive of *Borrelia* in peripheral blood film.

#### Operational definition

#### **Mass sleeping: -**

- *Mass sleeping*: - Sleeping in one place by being more than 6 members
- *Homelessness*: - A person who is living out of the home and sleep on the street

#### **Knowledge: -**

- ✓ Very good Knowledge about Relapsing fever-----Among Respondents those scores 80% and above
- ✓ Good Knowledge about Relapsing Fever-----Among respondents those scores 60%-79%
- ✓ Poor knowledge about Relapsing Fever-----Among respondents those scores less than 60%

### **1.1.3.3 Inclusion and Exclusion criteria**

#### **1.1.3.3.1 Inclusion Criteria**

**Cases:** Any one with suspected case with positive of Borrelia in peripheral blood film

**Controls:** Any one with suspected case with negative for Borrelia in peripheral blood film

#### **1.1.3.3.2 Exclusion criteria**

**Cases:** Any one with positive of Borrelia in peripheral blood film or those who refused to participate or un consciousness.

**Controls:** Any one with suspected case with negative for Borrelia in peripheral blood film those who refused to participate.

#### **1.1.3.3.3 Variables**

##### **1.1.3.3.4 Independent Variables**

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

##### **1.1.3.3.5 Dependent Variables**

- Relapsing Fever infection

### **1.13.3.6 Sampling**

The sample size was calculated using Stat calc. function of Epi-info version 7.2.0.1, the confidence level of 95%, power of 80%, and with 1:2 cases to controls a total of 50 cases and 100 controls.

### **1.1.3.3.7 Data collection**

**Descriptive:** Line list collected from registration and patient cards in the health facilities and descriptive analysis was conducted. Discussions were conducted with health workers and authorities structured questionnaire was used in order to collect basic epidemiological information: symptoms, date of onset of disease, medical care, and age group affected.

**Analytical study:** unmatched case control study (1:2) done. Cases were based on standard case definition and 50 positives for relapsing fever from MoC clinic. 100 Controls were patients admitted to by other case and negative for relapsing fever. Data were collected with structured questionnaire that addresses possible risks. Oral consent from the study subjects was asked. We interviewed 50 cases and compared with 100 controls.

### **1.1.3.3.8 Data analysis and clearance**

Data was entered, summarized and analyzed by using Epi-info version 7.2.0.1 and Microsoft office Excel 2016 software's. Results were presented using graph and table Additionally, estimated odds ratio, P value<0.05 and 95% confidence interval for risk factors were determined through bi-variate and multivariate analysis.

### **1.1.3.3.9 Data Dissemination**

Findings of this investigation in both soft and hard copy was communicated with Arada sub city health office and All document sent to Addis Ababa University Field epidemiology training program Mentors.

### 1.1.3.3.10 Ethical issues

Support letter to conduct the study were obtained from Arada subcity health office. Moreover, objective of the study was briefly mentioned and Oral informed consent was obtained from the study participants or their parents to participate in the study. Confidentiality was assured and no personal details was recorded or produced on this documentation.

## 1.1.4 Result

### 1.1.4.1 Descriptive Analysis

A total of 50 cases confirmed relapsing fever case (AR: 1.8/10000 Pop) with no deaths were reported during the investigation. The index case was reported from mission of charity clinic on 1 January 2018 who had daily laborer and residency at daily bed room in mass on Addis ketema sub city at gojamberenda. Of the total reported cases 50(100%) were from mission of charity clinic in different sub city and woreda.

Among all identified cases 50(100%) were male and 84% (42) were within age range of 10-68 years. Age group between 15-44 years were 44(88%) most affected, Age group were 5 (10%) were between 5-14years, and 3(6%) was +44years were less affected compared to 15-44 years populations. The overall attack rate was 1.8 per 10,000 population with a CFR of zero. Age group 15-44years was the most affected with an AR was 2.5 per 10,000 population. Followed 0.8/10,000 population in 5-14 years old and 0.7/10,000age above 44 years old. (Table 1).

Table 1.1.1 Relapsing fever case distribution place and person in mission of charity clinic, Arada sub city, Addis Ababa, Ethiopia 2018.

Variable		Population	Number of case	Percentage	Attack rate per 10000	Case fatality ratio %
Age group	5-14yrs	65,284	5	10	0.8	0
	15-44yrs	165,838	44	88	2.5	0
	44+ yrs.	41,234	3	6	0.7	0
Sex	Male	130,760	50	100	3.8	0
	Female	141,625	0	0	0	0
Total		272356	50	100	1.8	0

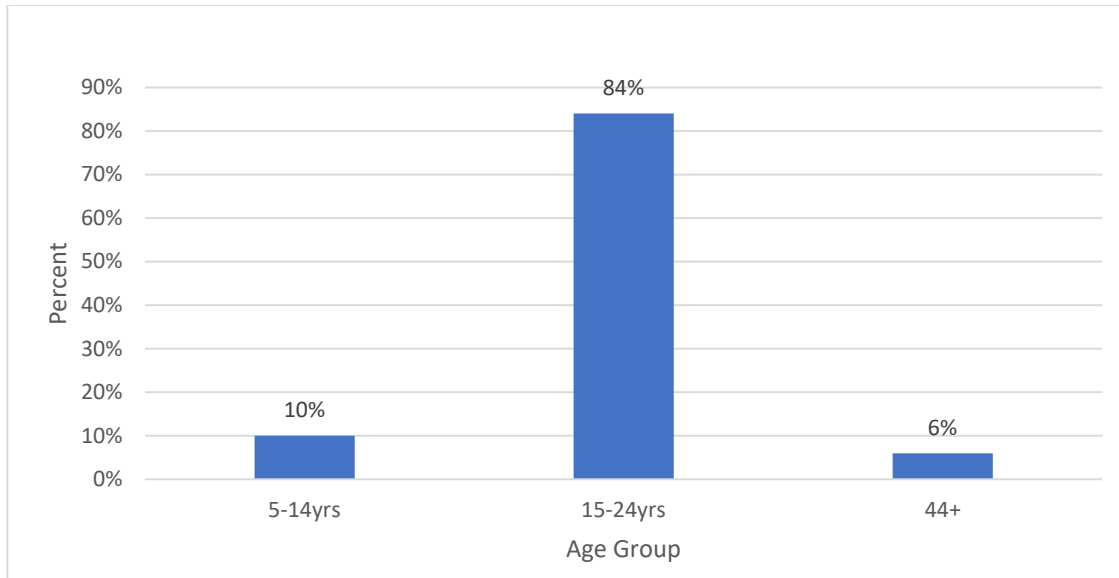


Figure1.1. 2 distribution of relapsing fever by Age group in mission of charity clinic, Arada sub city, Addis Ababa, Ethiopia 2018.

As we see the epi curve index case had onset of symptoms on 12/25/2017. The case was a 17-year-old male and interventions (treatment of cases, delousing, health information by health professional health worker about the outbreak was provided however investigation was started on the 1/5/2018 almost a two week after the outbreak onset. The outbreak lasted for two weeks this was due to late notification of outbreak by health facility to next level (Fig 1.1.3).

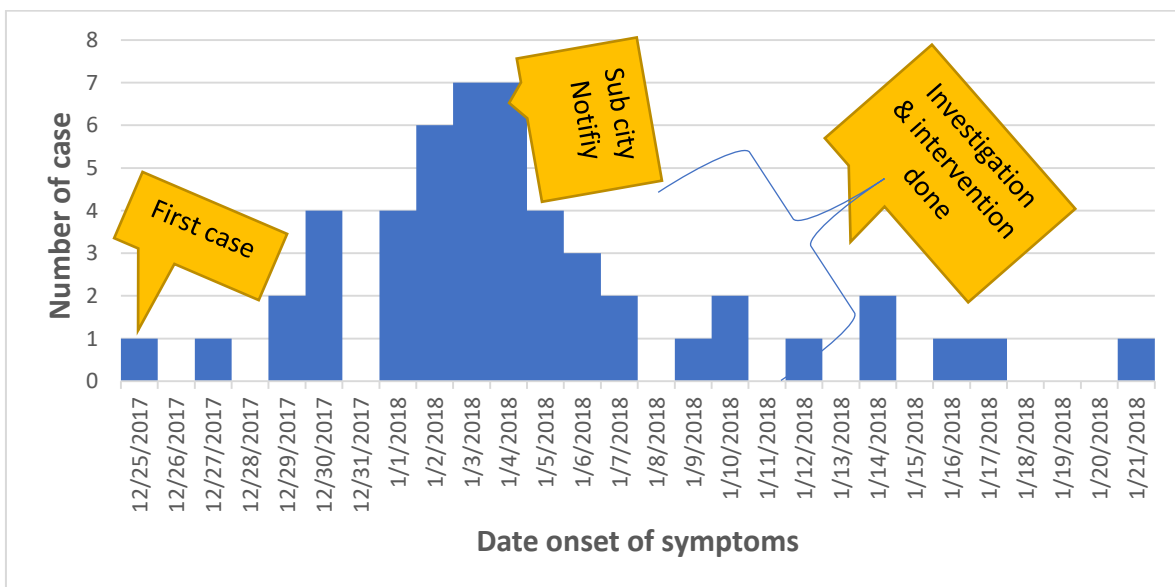


Figure1.1.3 Relapsing fever Cases by Date of Onset, Mission of charity clinic, Arada sub city, Addis Ababa, Ethiopia 2018

### 1.1.4.2 Analysis

During this case-control study, 50 relapsing fever case-patients and 100 controls were selected and interviewed patient to admitted by other case in mission of charity clinic. Selected controls were unmatched by age but by sex matched with case-patients. With regards to age distribution 42(84%) of the cases and 86(86%) of the controls were 15-44years. The mean and media age of case were 26 and 24years respectively. for control the mean and media was 31 and 32years respectively. Regarding sex, 50(100%) of the cases and 100(100%) of the controls were male. In education 39(78%) of cases and 85(85%) of controls were primary school attended. On the knowledge level 19(38 %) case and 39 (39 %) control was good and 31(62%)case and 61(61 %) were poor. Of the interviewed cases 25(50%) and 75(75%) were daily laborers. (Table 2).

Table1.1.2 Socio Demographic Distribution, in mission of charity clinic, Arada sub city, Addis Ababa, Ethiopia 2018

Variables	Category	Case (n=50)	Control(n=100)	P Value
Age groups	5-14yrs	3(6%)	1(1%)	Reference
	15-44yrs	44(88%)	86(86%)	0.039
	44+ yrs.	3(6%)	13(13%)	0.028
Educational status	Illiterate	9(18%)	14(14%)	Reference
	Primary	39(78%)	85(85%)	0.470
	Secondary	2(4%)	1(1%)	0.363
Residency status	Home	10(20%)	51(51%)	Reference
	Street	32(64%)	36(36%)	0.0002
	Bed room	8(16%)	13(13%)	0.038

During bi variate analysis six independent variables were associated with the occurrence of Relapsing fever outbreak. therefore from respondents of the study 50% (25) case and 30% (30) controls mass sleeping (COR = 2.3 95%CI [1.2-4.7]and p-value 0.016) , 39% (78) case and 48% (48) controls were not changing cloth at night COR = 3.8, [1.7-8.3] and p-value 0.0004,64%(32)case and36%(36) control were residence status on street (COR = 4.5, [2.0-10.4] and p-value 0.0002),16%(8) case and13%(13%) control were residence status daily mass bed room (COR = 3.1,[1.0-9.5] and p-value 0.038), 3(6%) case and 43(43%)body bath habits at list once a week (COR=0.1[0.01,0.2]and p-value 0.00000), 2(4%) case and 47(47%) control were

frequency of washing clothes At least once per two weeks (COR= 0.02[0.003,0.09] p-value 0.00000) and 26(52%) case and 38(38%)control were frequency of washing cloths Once a month (COR= 0.2[0.1,0.8]and p-value 0.022) all of the above result of crude odds ratio P-value below 0.05 were statistically significant associations for relapsing fever outbreak.(table 3)

Table1.1.3 Bi variate Independent Predictors of Relapsing fever in mission of charity, Arada sub city, Addis Ababa, Ethiopia 2018

Variables	Category	Case (n=50)	Control(n=100)	COR	P Value
Mass sleeping	Yes	25(50%)	30(30%)	2.3 (1.2,4.7)	0.016
	No	25(50%)	70(70%)		
Body bath habits	Above Three weeks	27 (54%)	22(22%)	Reference	
	At least once a week	3(6%)	43(43%)	0.1(0.01,0.2)	0.00000
Frequency of washing cloths	Not wash at all	11(22%)	4(4%)	Reference	
	At least once per two weeks	2(4%)	47(47%)	0.02(0.003,0.09)	0.00000
	Once a month	26(52%)	38(38%)	0.2(0.1,0.8)	0.022
Not Changing cloth at night	Yes	39(78%)	48(48%)	3.8(1.7,8.3)	0.0004
	No	11(22%)	52(52%)	Reference	
Residency status	Home	10(20%)	51(51%)	Reference	
	Street	32(64%)	36(36%)	4.5(2.0,10.4)	0.0002
	Bed room	8(16%)	13(13%)	3.1(1.0,9.5)	0.038

During multivariate analysis three independent variables were associated with the occurrence of relapsing fever outbreak. factors that remained independently associated with contracting relapsing fever outbreak in mission of charity were, mass sleeping, Residency status and not changing cloth at night. Case from of mass sleeping (AOR = 6.2, 95% CI [2.02-19.06]), not changing cloth at night (AOR = 8.8, 95%CI [1.5-50.8]) and residency status at street (AOR = 26.4, 95%CI [4.79-145.5]) and residency status at daily bed room (AOR=48.2,95%CI [7.5-83])

showed a statistically significant association. The likelihood of acquiring relapsing fever for those Not changing cloth at night was about eight times, Mass sleeping was six times, residency status on street was about twenty-six times and residency status on daily bed room was about forty-eight times higher compared to control. (Table1.1.4).

Table1.1.4 Multivariate independent Predictors of Relapsing fever in mission of charity, Arada sub city, Addis Ababa, Ethiopia 2018

Variables	Category	Case (n=50)	Control (n=100)	COR	AOR	P Value
Mass sleeping	Yes	25(50%)	30(30%)	2.3 (1.2,4.7)	<u>6.2(2.02,19.06)</u>	<u>0.0014</u>
	No	25(50%)	70(70%)	Reference		
Residency status	Home	10(20%)	51(51%)	Reference		
	Street	32(64%)	36(36%)	4.5(2.0,10.4)	<u>26.4(4.79,145.5)</u>	<u>0.0002</u>
	Bed room	8(16%)	13(13%)	3.1(1.0,9.5)	<u>48.2(7.5,83)</u>	<u>0.0000</u>
Not Changing cloth at night	Yes	39(78%)	48(48%)	3.8(1.7,8.3)	<u>8.8(1.5,50.8)</u>	<u>0.0157</u>
	No	11(22%)	52(52%)	Reference		

### 1.1.5 Public health intervention

Treat and manage the patient at clinic early. Additionally, all patient was delousing and clean and change close in the admission time. Mission of charity clinic health professionals was conducted health education to all come to clinic about relapsing fever transmission, prevention and control measures.

### **1.1.6 Discussion**

The onset date of the first case was on 25 of December 2018 in Mission of charity clinic reported. But the study was conducted from 1 January to 29 January 29. Among all cases 100% (50) were males and 88% (44) were within age group of 15 -44 years. The age ranges from 10 to 68years.

The reason for rapid spread of outbreak might be due to mass sleeping, lack of alternative clothes at night, poor personal hygiene. The number of cases was two times more than the previous year (2017) cases (only 24cases) reported to the sub city health office in the same period. The evidence showed that all daily laborers who live in mass sleeping, daily bed room and Not changing cloth at night condition were at risk of the outbreak.

The death rate from relapsing fever in this sub city was zero and the attack rate was 1.8 out of 10,000 populations which are less than Bahir Dar as a case-control outbreak investigation study done in 2012 which shows attack rate of 2.6 out of 10,000 populations and two times higher than Mekele, Tigray which was 8/100,000 population in 2016. On the other hand, our study shows the likelihood of acquiring relapsing fever for those sleep-in mass (more than six-member) and not changing clothes at night was six times and eight times higher compared to those not sleep in mass (sleeping in a member of less than six) and changing clothes at night respectively. And people who are commonly living on street and in Bed Room are 26 times and 48 times more affected than those who were living in their House respectively. This finding aligns with the study done in Mekele, Tigray in 2016. Those people who are commonly living on street and in Bed Room are 14 times and 16.5 times more affected than those who were living in their House respectively.

### **1.1.7 Limitation**

- Relapsing fever line-list was not properly filled by clinic.
- Specific place of patient not identified.

### **1.1.8 Conclusion**

Among all case daily laborers, mass sleeping, street, daily bed room in mass and lack of alternative clothes change at night might contribute to increase the magnitude of the outbreak.

Exchanging information between different levels and providing prompt response in reducing undesirable disease outcomes, increasing daily laborer's awareness, solution to interrupt the occurrence and distribution of the relapsing fever out-break requires more effort from lower level health facility to woreda, sub city health office and stake-holders. This finding suggests that relapsing fever was a threat to daily laborers.

### **1.1.9 Recommendation**

- Strengthen active surveillance activities of the sub city for early detection of the outbreak.
- All stake holder to discuss the way how to minimize mass sleeping on daily bed room houses and solutions for daily laborers
- Awareness creation through continuous health education facility level and community for daily laborer's.

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## **1.2 Measles Outbreak Investigation in Woreda 2 of Arada sub city, Addis Ababa, Ethiopia, May 2018**

### **Abstract**

#### **Introduction: -**

Measles is a highly contagious viral disease caused by Paramyxovirus, of the genus *Morbillivirus*. A measles outbreak was detected in woreda 2, Arada sub city on the 29/1-4/3/2018. An outbreak investigation was carried out.

#### **Methods:**

We conducted un matched case and control study. We recruited a total of 12 case. Data was collected from 29/1-4/3/2018. using structured questionnaire to solicit information from cases. Verbal consent from all participants and confidentiality were in place. Permission to carry out the study was obtained from Arada sub city health office, Addis Ababa. Epi Info was used to calculate frequencies, odds ratios and 95% confidence interval finally SPSS software used to perform logistic regression to identify risk factors for measles.

#### **Results: -**

A total of 12 suspected measles outbreak cases with no death were reported. The index case was male with five years of age. Majority case were from ketena 4. Age specific attack rate was higher in age groups of <5 year (3.8/1000person). The overall attack rate was 0.4/1000person. Case management, active case searching and health education was conducted during the suspected outbreak.

**Conclusion:** Factors associated with the occurrence of measles outbreak were, it may be last year immunization coverage below fifty. we recommend the awareness of immunization in the community, strengthening routine vaccination for all children before enrolling into schools, and Active case surveillance of febrile-rash illness have to be enhanced.

### **1.2.1 Introduction**

Measles is an acute, highly contagious viral disease caused by measles virus. This virus is transmitted primarily by respiratory droplets or airborne spray to mucous membranes in the upper respiratory tract or the conjunctiva [1]. Measles virus is diseases known to man and often occurs in explosive epidemics. It usually does not kill children directly; however, as a result of its associated immune suppression, measles can lead to lethal complications, such as pneumonia, croup, and diarrhea. Measles can also lead to lifelong disabilities, including blindness, brain damage, and deafness [2].

Measles virus is paramyxovirus of single serological type. The disease is highly communicable with an incubation period of about 10 days (with a range of 7 to 18 days). The disease is characterized by prodromal fever, conjunctivitis, coryza, cough and presence of koplik spot. A characteristics Maculopapular rash appears on the third to seventh day beginning on the face and become more generalized. Man is the only host factor for the measles virus (5).

Global progress in the past decade against measles has resulted in the reduction of cases by 71 percent from an estimated 548,000 in 2000 to 158,000 in 2011 [6]. However more than 40,000 laboratory confirmed cases of measles were reported globally in 2011 (3).

Ethiopia introduced measles vaccination as part of the Expanded Program on Immunization (EPI) in 1980; one dose of measles vaccine was recommended at 9 months of age and started SIA on 1998 targeting children 6 months - 14 years and follow up /SIAs have been conducted every year targeting different geographic areas since 2005 (1).

The WHO-UNICEF coverage estimates for measles vaccination in Ethiopia indicate an increase from 37% in 2000 to 66% in 2012. However, measles outbreaks continue to occur throughout the regions of Ethiopia (4). Measles vaccine coverage of the, woreda2, Arada sub city was 42% in 2017.

After the report of the measles outbreak from Arada sub city woreda 2, team was deployed for investigation. The main aim of this outbreak investigation was to assess the magnitude and risk factor of measles infection in woreda 2 Arada sub city, from 29/1/2018-4/3/2018 and make recommendations of the future.

## **1.2.2 Objectives**

### **1.2.2.1 General objective**

To verify and determine the magnitude of outbreak in woreda 2, Arada sub city, Addis Ababa from 29/1/-4/3/2018.

### **1.2.2.2 Specific objectives**

- To confirm the existence of measles outbreak
- To describe the distribution of measles out break
- To re command prevention and control measure

## 1.2.3 Materials and Methods

### 1.2.3.1 Study Area: -

Woreda 2 is one of the 10 woredas of Arada sub city, Addis Ababa city Administrative. Administratively the woreda is divided in to 7 ketena. The woreda has a total population of 29344. It is located at a distance of 2-3 K.M from the Arada sub city health office. The woreda shares boundaries with woreda 3 in south, woreda 4 in east in Arada sub city, woreda 1 south and woreda 7 in west in Addis ketema sub city. The woreda has 1 health center, 3 private clinics currently on service. The physical health service coverage of the woreda is 100% by health center.

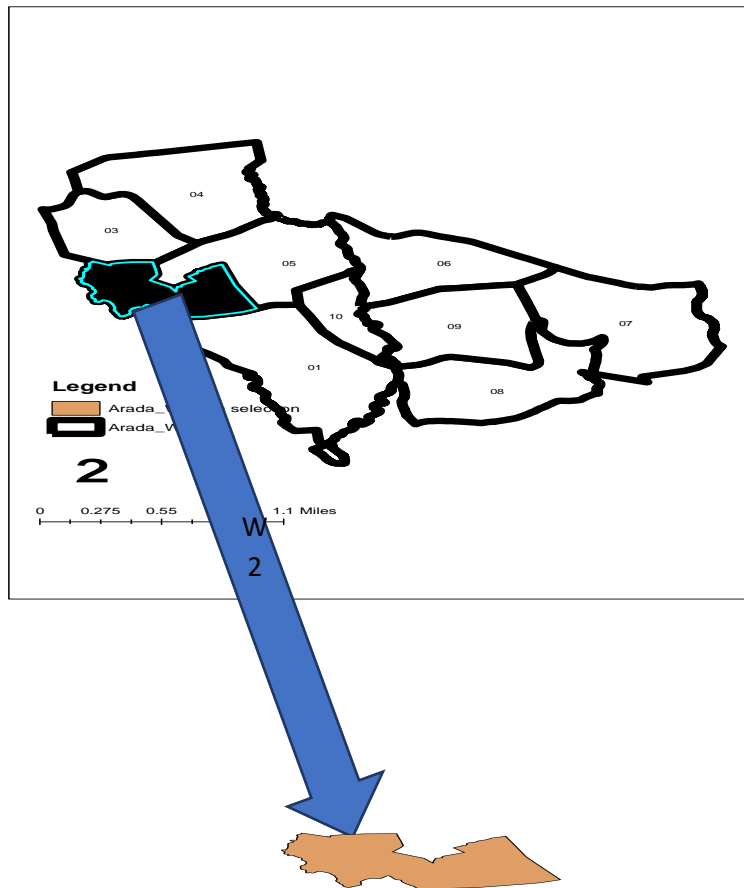


Figure 4 Figure Map of Arada sub city and woreda 2 Addis Ababa Ethiopia, 2018.

### **1.2.3.2 Study population: -**

During this outbreak all suspected measles case in woreda 2, Arada sub city.

### **1.2.3.3 Study design: -**

Descriptive Cross-sectional investigation was conducted

### **1.2.3.4 Study period: -**

The study was conducted from 29 January 2018 to 4 March 2018 in woreda.

### **1.2.3.5 Data Processing and Analyzing: -**

Reviewing of records & developing of line list. Also, we interviewed patients, Health workers managing cases at health center. We defined a suspected measles case as any person with fever, rash, cough, and coryza in woreda from 29/1/2018 to 4/3/2018. The collected data were entered excel and analyzed Microsoft Excel.

### **1.2.3.6 Ethical Consideration: -**

Support letter was written from sub city health office. We obtained support and willingness to conduct the study from woreda health office. Objective of the investigation was told to study participants briefly. Then after, their oral consent and support was asked to participate in this study. Their confidentiality was assured

### **1.2.3.7 Data dissemination: -**

Findings of this investigation in both soft and hard copy was shared to Addis Ababa University School of Public Health Resident mentors, Arada sub city health office PHEM officer.

## **1.2.4 Operational definition**

### **1.2.4.1 Standard case definition: -**

- Any person with fever and maculopapular (nonvesicular) generalized rash, and cough, coryza or conjunctivitis (red eyes) or any person in whom a clinician suspects measles.
- A suspected measles case that is investigated, including the collection of an adequate blood specimen (5ml), and has serological confirmation of recent measles virus infection (IgM positive).

### **1.2.4.2 Community case definition of measles: -**

- Any person with fever and rash starts from face.

#### **1.2.4.1.1 Suspected measles case: -**

Defined as occurrence of five or more reported suspected cases in one month in a defined geographic area, like, kebele, woreda or health facility catchment area.

#### **1.2.4.1.2 Confirmed case definition: -**

Defined as occurrence of three or more laboratory confirmed cases in one month in a defined geographic area, like, kebele, woreda or health facility catchment area.

**Index case:** The case that is first reported to public health authorities (8).

#### **1.2.4.3 Epidemiologically linked case: -**

suspected case, which has contacts (possibly got the virus) with laboratory confirmed case or another epidemiologically confirmed case.

## 2.1 Inclusion and Exclusion criteria

### Inclusion Criteria

- **Cases:** Any person with generalized maculopapular rash lasting  $\geq 3$  days; and temperature  $\geq 101^\circ\text{F}$  or  $38.3^\circ\text{C}$ ; and cough, coryza, or conjunctivitis (12 cases) during the study period from 29/1/2018 to 4/3/2018 and who agreed to participate in the study were included.
- **Controls:** Any resident of woreda 2 during the study period who was a neighbor to a case and who did not develop signs and symptoms of measles and agreed to participate were included.

### Exclusion criteria

- **Cases:** Those who refused to participate were excluded
- **Controls:** When more than one eligible in the family found the elder were excluded and also who were not willing to participate in the study,

**Laboratory investigation:** Prior to the investigation period Woreda 2, health center surveillance focal collected 12 blood serum samples and sent to EPHI. As part of the investigation the result of laboratory analysis were positive for measles IgM.

## 1.2.5 Results

From January 29 to March, 2018, a total of 12-suspected measles cases with no deaths were reported from health facilities in woreda 2. The overall attack rate was 0.4/1000.

### 1.2.5.1 Laboratory

All suspected case blood samples were collected and sent to Central Laboratory for IgM confirmatory test.

### 1.2.5.2 Descriptive Epidemiology

A total of 12 suspected measles cases with no deaths were reported from 29/1/2018 to 4/3/2018 from woreda 2. The overall attack rate of the disease per 1000 population was 0.4 and the CFR was 0% in this woreda. Out of 12 cases, 1 (8%) of them were admitted with measles complications such as pneumonia and feeding problem. The index case was male with five years of age who has vaccinated.

#### 1.2.5.2.1 Description of measles cases by time

The duration of measles outbreak was one month with intermittent interventions across the ketena where the cases were occurred.

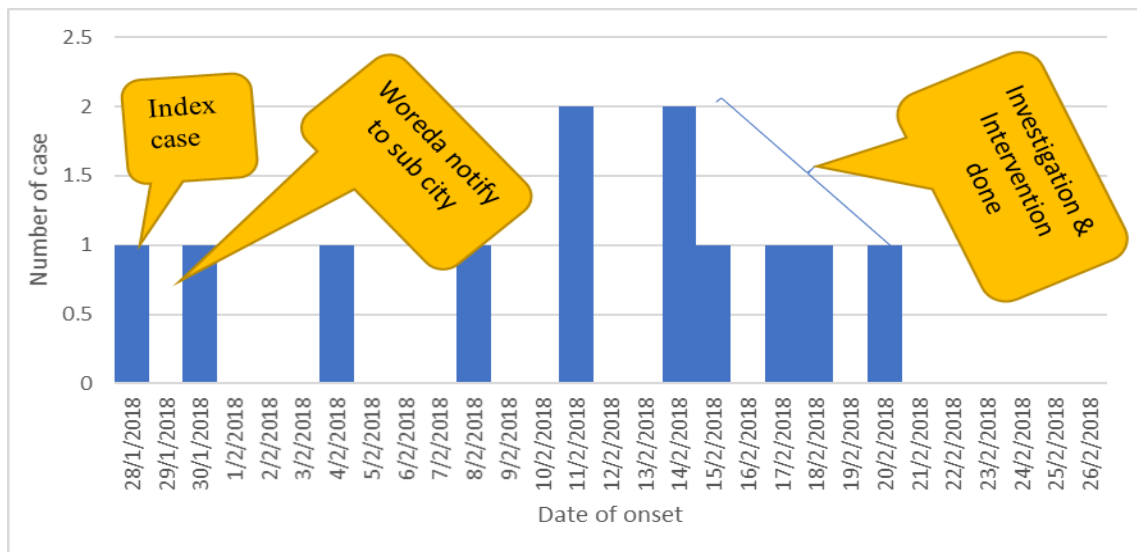


Figure 5 The date of onset of measles outbreak in Woreda 2, Arada sub city, Addis Ababa, Ethiopia from 28/1/-26/2/2018.

### 1.2.5.2.2 Description of measles cases by place

Between 29 January 2018 and 4 March 2018, we detected a period Incidence of 5.8/1000(12) measles case. Majority of the cases were from Ketena 4 6(50%) followed by ketena 6, ketena 7, ketena 5, ketena 3 and ketena 2(17%), 1(8%),1(8%), 1(8%) and1(8%) respectively.

### 1.2.5.2.3 Description of measles case by person

In this outbreak 4(33%) of the cases were males while females constituted 8(67%).

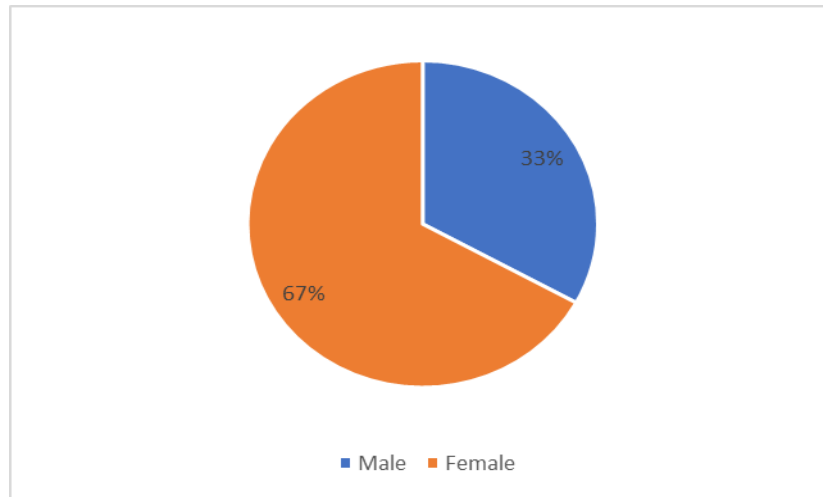


Figure 6 Distribution of measles case by sex in woreda2, Arada subcity, Addis Ababa, Ethiopia 2018.

During the outbreak, highly affected were that age group <5 years, followed by 5-8 years while no cases were reported from those >15 years.

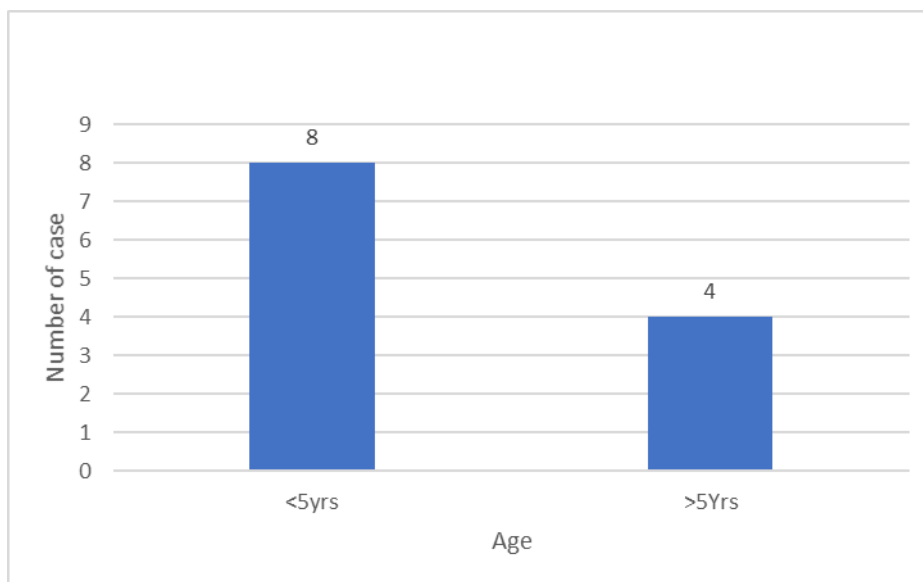


Figure 7 Distribution of suspected measles case by Age group in woreda2, Arada sub city, Addis Ababa, Ethiopia 2018.

Table 5 Distribution of suspected measles case by Age and sex with attack rate in woreda2, Arada sub city, Addis Ababa Ethiopia 2018.

Variable	Population	# case	# Death	Attack Rate per 1000	Case Fatality Ratio	
Age	<5yrs	2101	8	0	3.8%	0
	5-15yrs	4933	4	0	0.8%	0
Sex	Male	14085	4	0	0.3%	0
	Female	15258	8	0	0.5%	0
Total	29344	12	0	0.4%	0	

#### 1.2.5.2.4 Suspected cases by Vaccination Status

When we see the distribution of suspected cases by vaccination status, majority 12(100%) of the cases were vaccinated.

### **1.2.6 Public health intervention**

- ❖ Prompt case management: cases were managed by supportive treatments (Antibiotics, tetracycline ointment, oral re hydrating Salt, and Vitamin A, and anti-pyretic).
- ❖ We delivered Health Education in social gathering areas like school, health facility to create awareness about measles modes of transmission, control mechanisms and to make them report cases as soon as possible to the nearby health institution.
- ❖ Orientation was given to Woreda Health Office & Health Center Workers on the following topics: active surveillance and contact tracing, complicated cases to be managed at Health center. Vitamin A supplementation to all contacts under 15 years of age.

### **1.2.7 Discussion**

Many factors may contribute for the occurrence of measles outbreak in this woreda. Measles outbreak is expected and could frequently occurred in area with low measles immunization coverage and poor cold chain management even with high vaccination coverage. From the woreda measles vaccination coverage of the last year's 42% 2017. This shows that low vaccination coverage in the woreda resulted from poor community mobilization activity was attributed for the occurrence of the outbreak.

The overall attack rate and case fatality rate was 0.4/1000 and 0%, respectively. In current outbreak, there was high fatality compared with the National the measles guideline in which (1-3%) is accepted while it is within Current estimates of CFRs used by WHO in endemic countries range between 0.05% - 6%(7). The higher fatality can be explained by late coming of patients to health facilities and this may contribute to developing of complications, which result in deaths (8).

The mostly affected in suspected outbreak age group and sex were among age group < 5 8(3.8%) and female 4(0.5%). The suspected outbreak was distributed to majority of woreda. The cases propagated to most of the ketena. About 100% of cases were detected by health professional in health center only and this may show the strengthen active case search as the community may keep cases at home rather than bringing to Health facility, the population do not go to health

facilities for case management timely due to the belief of the community that no treatment exists for measles.

### **1.2.8 Limitation**

- ❖ Laboratory result should not come early

### **1.2.9 Conclusion and recommendation**

When we see suspected measles outbreak in woreda2 affected mainly under five children and last year measles vaccine coverage below fifty, so improve the community awareness on uses of immunization, and measles prevention and control mechanisms, strengthening routine immunization & Active case surveillance of febrile-rash illness have to be enhanced and continued in the community.

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# **Chapter- II**

## **Surveillance data**

### **Analysis**

## **2.1 Typhoid fever Data Analysis in Addis ketema sub city, Addis Ababa, Ethiopia 2012- 2016**

### **Abstract**

**BACKGROUND:** - 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.

Typhoid fever is acute and often life-threatening febrile illnesses caused by systemic infection with the bacterium *Salmonella enteric sero type typhi* and paratyphoid, respectively. The most recent global burden of disease estimates for typhoid and paratyphoid fever reported that in 2010, there were 22 million new cases. Typhoid fever a significant health burden, especially in low- and middle-income countries. there for surveillance data analysis will carry out to describe the disease burden and trend.

**METHODS:** - A 5-year retrospective cross-sectional study on typhoid fever was conducted from January 6/2012 to April 8/2016. with the objective of describing the epidemiology of the disease, determining the burden, describing the disease in time, Person and place. data analyzed by using MS-Excel.

**RESULT:** -In year 2012 to 2016 reportable surveillance disease 53446 typhoid fever incidence cases were reported but there was no death in related to the case. Among these reported cases the highest incidence reported in 2015 ,11968(23%) and woreda 1with amount of 13765(26%) The disease mostly occurred during dry season or month of May with these 7279(14%) reported during the period.

**CONCLUSION:** -All Typhoid fever cases were treated at outpatient's department. The highest number of typhoid fever cases were reported during dry season on May during the reported period also the highest incidence reported by woreda one during the reported period. All governmental, non-governmental and NGO institutions should emphasis on hygiene and sanitation activity of the community. Training should be given on data analysis, documentation and reporting for PHEM officer of woreda and health facility.

## **2.1.1 Background**

### **2.1.2 Introduction**

Reports that estimate the global burden of typhoid fever indicate the disease is still a public health issue. WHO reported, in its 2000 global typhoid and paratyphoid fever estimate, that there were around 22 million typhoid fever cases and 5 million paratyphoid fever cases [10,11].

Ongoing 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.

Analyses should be performed at regular intervals to identify changes in disease reporting. These analyses can be performed using standard approaches. Findings of analyses should be reviewed regularly and provided as feedback to medical providers and others in the community who are asked to report cases. Often additional analyses are needed to answer specific questions that arise; these analyses may require additional customized approaches beyond what are routinely performed. Analysis of surveillance data begins with characterizing the pattern of disease reports by person, place, and time (1).

In Ethiopia, as in other developing countries, it is difficult to evaluate the burden of salmonellosis because of the limited scope of studies and lack of coordinated epidemiological surveillance systems. In addition, under-reporting of cases and the presence of other diseases considered to be of high priority may have overshadowed the problem of salmonellosis (2).

The epidemiology of salmonellosis in Ethiopia has not been well investigated and that funding is needed for continuous surveillance both nationally and locally in order to develop guidelines for antibiotic treatment (3).

Typhoid fever remains a significant health burden, especially in low- and middle-income countries. Despite the availability of more recent data on both enteric fevers, additional research is needed in many regions, particularly Africa, Latin America and other developing countries.

Typhoid and paratyphoid fever remain important public health problems globally and major causes of morbidity in the developing world (4).

Classical symptoms include gradual onset of sustained fever, chills, hepatosplenomegaly and abdominal pain. In some cases, patients experience rash, nausea, anorexia, diarrhea or constipation, headache, relative bradycardia and reduced level of consciousness (5).

The most recent global burden of disease estimates for typhoid and paratyphoid fever reported that in 2000, there were 22 million new cases of typhoid fever, 210 000 typhoid fever-related deaths, and 5.4 million cases of paratyphoid fever [6].

Ethiopia has suffered several social, political and humanitarian crises that have distributed the health infrastructure, putting the health of the country's most vulnerable population at risk. mostly preventable diseases such as malaria infectious diarrhea, epidemic prone disease etc. To meet this challenge in 1999, Ethiopia introduced an IDSR strategy focusing on 17 priority diseases among the disease that are included in the IDSR reporting system is typhoid fever. Typhoid is a systemic bacterial disease characterized by insidious onset of sustained fever, severe headaches, malaise, anorexia, a non-productive cough in the early stage of the illness, a relative bradycardia, splenomegaly and abdominal discomfort a transient, macular rash of rose-colored spots can occasionally be seen on the trunk. In adults, constipation is more often seen than diarrhea [7].

### **2.1.3 Statement of the problem**

Typhoid fever was a major cause of morbidity and mortality in developing countries (8).

In Ethiopia, typhoid fever is among the major widespread diseases affecting both young children and young adults as a result of many interrelated factors such as inadequate facilities for processing human wastes and indiscriminate use of antibiotics. Morbidity associated with illness due to typhoid continues to be on the increase, in some cases resulting in death. In 2012, 24,030,746 patients visited health facilities to get treatment or medication. Of these cases, 665,220 (3%) were acute febrile illness patients and it was in the top ten lists of morbidity and from 15008 of total death 336 (2%) deaths caused by typhoid fever account [9].

It is difficult to evaluate typhoid fever burden because of the very limited scope of studies, and lack of coordinated epidemiological surveillance systems at all levels of government (city administration, sub city and woreda), and the presence of other diseases considered to be of higher priority. These situations have undermined reported cases of waterborne infections,

particularly typhoid fever. This study initiated with a view to generate information through a coordinated epidemiological surveillance study from which typhoid fever burden in Addis ketema sub city could be assessed.

Therefore, assessing and analyzing the surveillance data of typhoid fever in the sub city is useful to give evidence-based information for prioritizing and instituting appropriate public health interventions in the sub city. To the best of my knowledge, this is the first report of a sub city population-based cross-sectional study on laboratory-confirmed Salmonella infections in recent years in Addis ketema sub city, Addis Ababa

#### **2.1.4 Significance of the study**

Ethiopia, as one of the countries with high burden of the disease experienced recurrent epidemic of communicable disease for many years. Since typhoid fever is among the major widespread diseases affecting both young children and young adults as a result of many interrelated factors such as inadequate facilities for processing human wastes and water, sanitation. Morbidity associated with illness due to typhoid continues to be on the increase. It is difficult to evaluate typhoid fever burden because of the very limited scope of studies the lack of coordinated epidemiological surveillance systems at all levels of government. Ongoing 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. There for surveillance data analysis will carry out to describe the disease burden and trend retrospectively from 2012 to 2016, to improve public health actions against the disease and focus on the study on the disease in the study area.

### **2.1.5 Literature review**

A recent publication that revised typhoid fever incidence data indicated that, in 2010, there were an estimated 27 million typhoid fever episodes globally; and a systematic analysis for Global Burden of Disease Study confirms that, in 2010, there were about 190,000 deaths due to typhoid fever [12,13].

Asia is the top-ranking part of the world where the prevalence of typhoid fever is high compared to the other parts of the world. A prospective population-based surveillance conducted by WHO in five Asian countries result was consistent with previous reviews and showed higher incidences of typhoid fever in India, Indonesia and Pakistan, and relatively lower incidences in Vietnam and China [14].

On the other hand, in Europe, North America, Australia and New Zealand, the incidence of new enteric fever cases has significantly decreased mostly due to the improved water quality and sanitation [15,16,17].

In Sub-Saharan Africa, the epidemiology of typhoid fever is still not clearly understood. A recent review on the issue of typhoid fever in Sub-Saharan Africa stated that epidemiological study is important to have a clear image on the real prevalence of enteric fever [18].

Ethiopia is among the countries in Sub-Saharan Africa where the disease burden is not clearly known. A recent review on this issue has indicated that, even if the epidemiology of [19]

salmonellosis has not been well investigated in the country, there is widespread distribution of *Salmonella* isolates in the community [20].

Enteric fever is a systemic infection caused by the human adapted pathogens *Salmonella* enteric serotype Typhi (*S. Typhi*) and *S. Paratyphoid* A, B, and C. These organisms are important causes of febrile illness among crowded and impoverished populations with inadequate sanitation who are exposed to unsafe water and food, and also pose a risk to travelers visiting endemic countries [21].

A chronic carrier state can be expected to develop in about 3 percent of cases. Faecal carriers are more frequent than urinary carriers. A chronic carrier may excrete bacilli for several years either

continuously or intermittently. It is a disease which is amenable to control through modern public health measures [22].

In Ethiopia, several factors including under and mal-nutrition, HIV-AIDS, the unhygienic living circumstances and the close relations between humans and animals may substantially contribute to the occurrence of Salmonellosis. Although surveillance and monitoring systems are not in place and its epidemiology is not described, qualitative and quantitative syntheses of previous studies could shed light on the occurrence of the disease and the major serotypes that frequently cause infections. The objectives of this study were to systematically review and estimate the prevalence of human Salmonellosis in Ethiopia by using meta-analytical methods. The outcomes of interests were the proportions of Salmonella isolated from diarrheal patients, febrile patients, apparently normal subjects and the dominant serogroups and serotypes [23].

Total of 5029 patients were serologically diagnosed for typhoid fever between January 2007 to December 2011 in the international clinical laboratory. Greater proportion of the patient in Addis Ababa and surrounding community. Young adult represented the largest number of patients and mean age was  $33.89 \pm 14.72$  years [95% CL] [24].

## **2.1.6 Objective**

### **2.1.6.1 General objective**

- To assess the epidemiology of typhoid fever case in Addis ketema sub city 2012 to 2016.

### **2.2.6.2 Specific objective**

- To describe the burden of typhoid fever case in terms of time, place and person.
- To recommend public health action.

## **2.1.7 Materials and Methods**

### **2.1.7.1 Study area**

Addis ketema sub city administration is one of the 10 sub cities of Addis Ababa city administration with total population of 319,138 in 2017 and with total area of 7.41 sq.km in 10 woreda. It borders with the districts of Gullele sub city in the north, Arada sub city in the east, Lideta subcity in the south and kolfe keranio in the west. The data in the sub city shows that out of the total population 156378 are male and 162760 are female. The day to day activities of residents' sub cities are more or less Trade and Commercial business and also have the big market place in the city of Addis Ababa.

### **2.1.7.2 Study period**

We collected analyzed and interpreted secondary data on Typhoid fever case for the past three years (2012-2016) conducted from 6/1/2017-8/4/2017.

### **2.1.7.3 Study Design**

Cross-sectional study was used to analyze the five-year data of typhoid fever in Addis ketema sub city appropriate person, time, and place.

### **2.1.7.4 Data collection methods**

Secondary data of typhoid fever for the last consecutive three years (2012-2016) were reviewed and collected from sub city PHEM department.

### **2.1.7.5 Data analysis**

The three years of data were analyzed by using Microsoft Office Excel 2016.

### **2.1.7.6 Dissemination of result**

Report or result of this Typhoid Fever surveillance data analysis will be submitted timely to Addis Ababa university Department of Public health, and Addis ketema sub city Health Office by hard and soft copy.

### **2.1.7.7 Inclusion criteria**

Health center and private clinic that are in surveillance system.

### **2.1.7.8 Exclusion criteria**

Private clinic that are out of surveillance system.

### **2.1.7.9 Sample size**

5 years' surveillance data (2012 to 2016) from Addis ketema sub city of all government health center and private clinic and hospital was used.

### **2.1.8 Case definition**

Any person comes with gradual onset of remittent fever (rising in step ladder fashion) in the 1st week, headache, arthralgia, anorexia, constipation and abdominal pain.

### **2.1.9 Ethical consideration**

Official letter was obtained from Addis Ababa university, college of health science, school of public health to practice ongoing to work two outputs like health profile and surveillance analysis in Addis ketema sub city health office. so, to collect 5-year Sub city base surveillance data analysis collect to accepted. The purpose and objective of the analysis which the data required was briefly explained to the respected official based on their level on responsibility and they were asked for oral consent to conduct the study.

### 2.1.10 Result

During the last five years (2012-2016) 53446 total typhoid fever case reported in Addis ketema sub city. Among these reported cases the highest incidence reported in 2015 with amount of 11968(23%). the least incidence reported in 2012 with the amount of 8962(17%) during the periods.

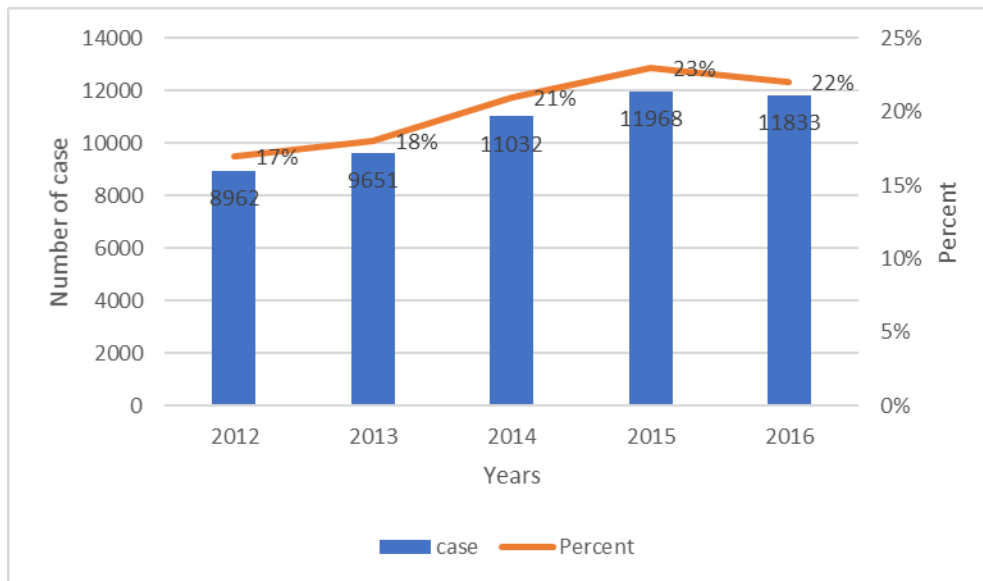


Figure2.1.8 distribution of Typhoid fever case by years in Addis ketema sub city, Addis Ababa **Error! Reference source not found.**6

From a total typhoid fever case reported during five years period with the amount of 53446 in all month were reported. among those in 2012 month of May with amount of 2100(4%) the highest reported. The least reported in 2012 by month of January with amount of 380(0.7%) in subcity.

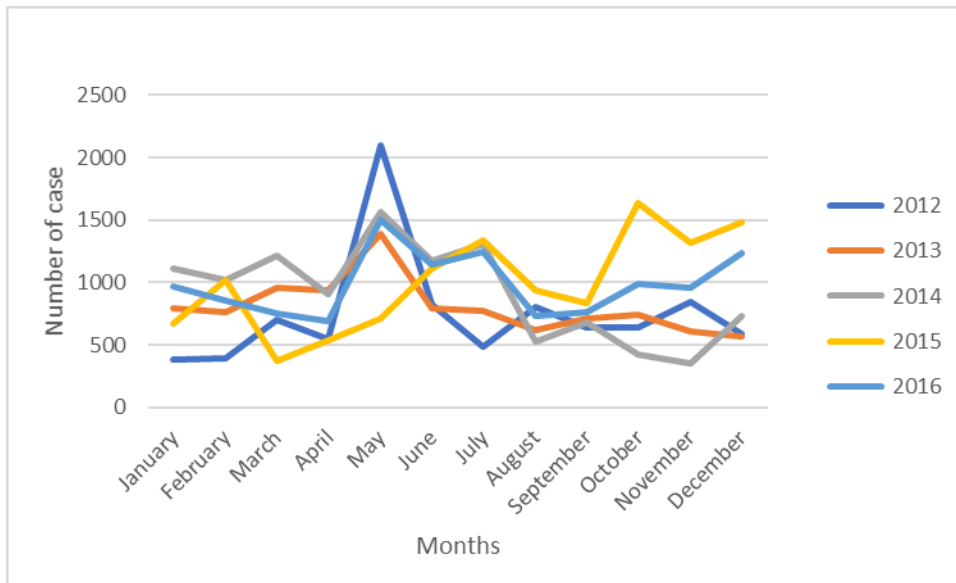


Figure2.1.9 Yearly trend of typhoid fever case by month in Addis ketema sub city, Addis Ababa 2012-2016

From a total five years of 53446 typhoid fever case reported all woredas. among these in 2016 woreda 1 the highest case reported with the amount of 3266 (6%). the least reported case was by woreda 4 with the amount of 185(0.4%) in 2013 in subcity.

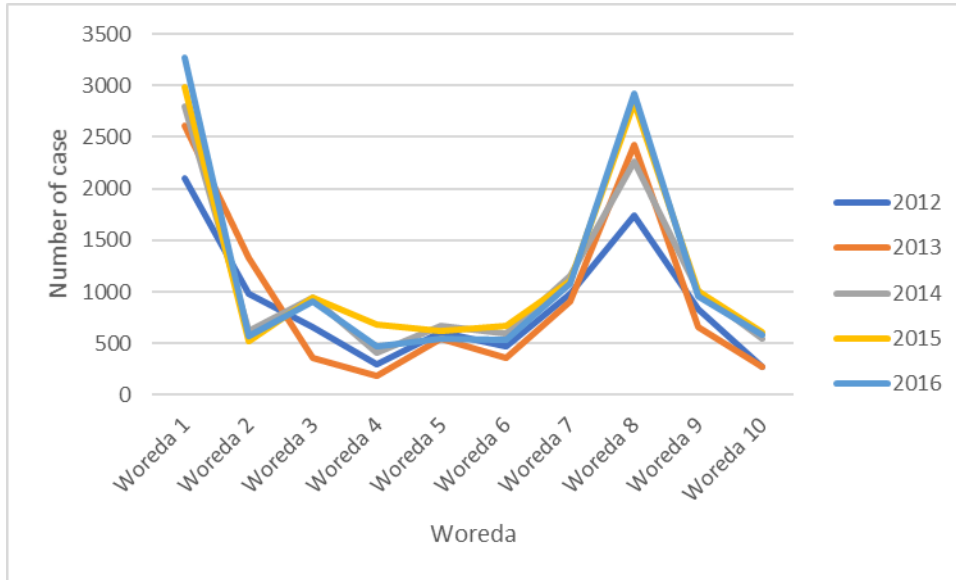


Figure2.1.10 Yearly trend of typhoid fever case by woreda in Addis ketema sub city, Addis ababa,2012-2016.

### 2.1.11 Discussion

From total five years typhoid fever case on May 14% higher incidence of cases reported. The least incidence of case reported in April 7%.

All woredas were reported during the period among those woredas, 26% woreda one highest incidence case reported. The least incidence of case reported 4% woreda 4.

In Ethiopia, Morbidity associated with illness due to typhoid continues to be on increase, in 2012, patients visited health facilities to get treatment or medication. Of these (2%) by typhoid fever account [9].

### **2.1.12 Limitation**

- The existing Surveillance report format did not include sex and age, as a result it was difficult to analyze the data by age and sex.
- Weak and un integrated electronic surveillance system e-PHEM at all level.
- In adequate documentation of surveillance data at all level.

### **2.1.13 Conclusion**

- Typhoid fever is major public health problem in country and in Addis ketema sub city the last 5 year increased typhoid fever incidence were reported. all Typhoid fever cases were treated at outpatient's department. The highest incidence of typhoid fever cases was reported in May. In addition, when the reported cases were viewed by year and woreda, the highest incidence of typhoid fever cases were reported in 2015 years and woreda one also the highest incidence reported.

### **2.1.14 Recommendation**

- The existing surveillance reporting format will be including age and sex
- Woreda and health facility level Implement of electronic surveillance system e - PHEM.
- Training should be given on data analysis, documentation and reporting for PHEM officer at all level.
- Strengthen regular supportive supervision for lower level.

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# **Chapter-III**

## **Evaluation of public health surveillance system**

## **3.1 Evaluation of public health surveillance system in Addis ketema sub city, Addis Ababa, Ethiopia, 2017.**

### **3.1.1 Introduction**

Cholera is: An acute intestinal disease characterized by sudden onset, profuse watery ("rice water") stools; occasional vomiting, rapid dehydration, and circulatory collapse. Mild cases with only diarrhea are common, especially in children. Asymptomatic infection is more frequent than clinical illness. In severe, untreated cases, death may occur within a few hours of onset. Diagnosis: Confirmed by culturing *V. cholerae* serogroup O1 or O139 from feces, rectal swabs, or vomitus, Incubation: Few hours to 5 days, usually 2-3 days. Transmission: Ingestion of food or water contaminated with feces or vomitus of cases, and occasionally feces of carriers. Consumption of raw or improperly cooked seafood, and other foods contaminated with seawater. Low person-to-person transmission risk [1].

Typhoid And paratyphoid fever are acute and often life-threatening febrile illnesses caused by systemic infection with the bacterium *Salmonella enteric* serotype typhi and paratyphoid, respectively. Classical symptoms include gradual onset of sustained fever, chills, hepatosplenomegaly and abdominal pain. In some cases, patients experience rash, nausea, anorexia, diarrhea or constipation, headache, relative bradycardia and reduced level of consciousness [1].

The global typhoid fever case burden estimate of 21,650,974, the case fatality rate yield 216,510 death annually [2].

Federal Ministry of Health had prioritized 21 notifiable diseases which are prone for epidemic, had international concern. These diseases are categorized as immediate and weekly reportable diseases. Of selected diseases in this study, Typhoid fever are classified under weekly reportable diseases whereas Cholera is categorized as immediately reportable disease.

Public health surveillance is an ongoing systematic collection analysis, interpretation and dissemination of data regarding a health-related event for use in public health action to reduce morbidity, mortality and to improve health. Data disseminated by a public health surveillance

system can be used for immediate public health action, program planning and evaluation, and formulating research hypotheses [3].

Therefore, the Evaluation of this Cholera and Typhoid fever surveillance system was needed to check the effectiveness and efficiency of the system to achieve the stated objectives/goals for in the sub city of Addis ketema, assess of resources from Health center to sub city level, and examine quality of surveillance, multiple use of data collection tools and timely utilization of the data at woreda level for action, and epidemic preparedness and response. Especially, with the implementation of the new structure for surveillance system (PHEM) in the sector, the change in the quality of information needs to be assessed [4].

The evaluation of surveillance systems should promote the best use of public health resources by ensuring that only important problems are under surveillance and that surveillance systems operate efficiently [5].

Every disease surveillance system should be analyzed and re-evaluated periodically to ensure that it address the current priority disease within the sub city in which it operates and to improve performance where necessary [6].

Therefore, the Evaluation of this Typhoid fever and Cholera surveillance system was needed to check the effectiveness and efficiency of the system to achieve the stated objectives for in the sub city, assess of resources from Health center to sub city, and examine quality of surveillance, multiple use of data collection tools and timely utilization of the data at woreda level for action, and epidemic preparedness and response. Especially, with the implementation of the new structure for surveillance system (PHEM) in the sector, the change in the quality of information needs to be assessed.

The health sector needs timely and reliable information for planning and evaluating interventions, Well-functioning surveillance systems are crucial for effective disease control programs.

The overall objectives of the surveillance system are; serve as an early warning system for impending public health emergencies, document the impact of an intervention, or track progress towards specified goals and monitor and clarify the epidemiology of health problems, to allow

priorities to be set and to inform public health policy and strategies. Data and information of surveillance flow is clearly stated in the system, which comprises from community level to international agencies. In the same manner, tasks in surveillance system is starts from reporting occurrence of health-related events and ends with feedback and dissemination of information for public health action.

### **3.1.2 Statement of problem**

Ethiopia, as one of the countries with high burden of the disease experienced recurrent epidemic of communicable disease for many years. Since typhoid fever and Cholera are among the major widespread diseases affecting both young children and young adults as a result of many interrelated factors such as inadequate facilities for processing human wastes and water, sanitation. Morbidity associated with illness due to typhoid and cholera continues. It is difficult to evaluate typhoid fever burden because of the very limited scope of studies the lack of coordinated epidemiological surveillance systems at all levels of government. Ongoing 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. There for surveillance data evaluation will carry out to describe the disease burden and trend retrospectively, to improve public health actions against the disease and focus on the study on the disease in the study area.

In Addis ketema sub city, these diseases have been major public health problems. In 2016 there was Cholera outbreak in sub city affected all woreda and kebeles. During this year, a total 869 confirmed case by Culture and RDT and 0 deaths were reported from the sub city. Similarly, there were 4190 suspected and confirmed Typhoid fever cases reported in the sub city. In this study, purposes and attributes of surveillance system at Addis ketema sub city were described in detail. The purpose of evaluating surveillance of this disease is to monitor their trends and trigger public health action as they are shown increased.

### **3.1.3 Rationale of the Study**

PHEM is designed to ensure rapid detection of any public health threats, preparedness related to logistic and fund administration, and prompt response to and recovery from various public health emergencies, which range from recurrent epidemics, emerging infections, nutritional emergencies, chemical spills, and bioterrorism. The activities under this core process are to be implemented by appropriately trained and capable professionals. This core process is comprised of four sub-processes, which are Public Health Emergency Preparedness, Early Warning, Response, and Recovery [3].

Surveillance system evaluation is an important tool to assess the capacity of the system to meet its purpose and objectives; to improve its operation and to optimize the available resources (2). Enhancing surveillance system of these diseases is also crucial for reducing their magnitude.

Surveillance system evaluation is a tool for monitoring surveillance activities; disseminate feedbacks and inputs for improvement of intervention programs. Enhancing this evaluation is very important to control communicable diseases mainly those has public health importance. Typhoid fever and Cholera is one of communicable disease, which is under surveillance activities and poses major public health problem in the sub city. Additionally, findings of this evaluation may lead decisions and use as an input for strengthening public health surveillance activities.

### **3.1.4 Objectives**

#### **3.1.4.1 General objective**

- To assess the performance of the Typhoid fever and cholera(AWD) surveillance system and forward practical recommendation to support and improve the surveillance system of Addis ketema sub city.

#### **3.1.4.2 Specific Objectives**

- To assess the core activities such as case detection, reporting, analysis and response of surveillance system.
- To evaluate the attributes of the surveillance system of the selected diseases
- To assess support function such as standard guidelines, supervision and resources for Surveillance.
- To identify gaps and opportunities in performing the core and support functions of surveillance and asses the resources available.

### 3.1.5 Methods and Materials

#### 3.1.5.1 Study Area and period

Study area Addis ketema sub city health office and study period will be conducted from 15/6/2017-30/8/2017

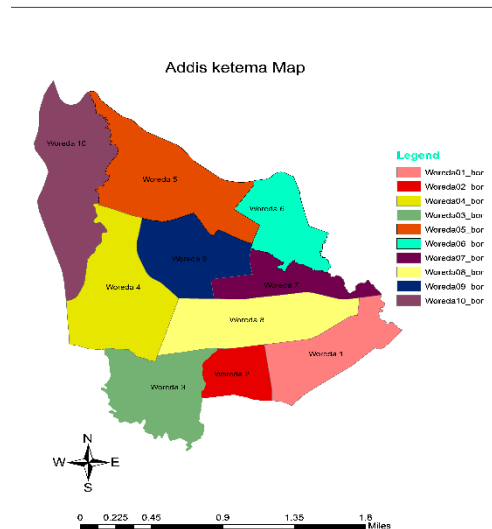


Figure3.1.11 Addis ketema sub city by woreda map

#### 3.1.5.2 Study Design

Cross-sectional descriptive study is conduct during this evaluation in Addis ketema sub city. Data on attributes of the surveillance system (usefulness of the surveillance system, simplicity of the system, flexibility, quality of the data, acceptability, Representative, timeliness, and stability of the surveillance system) at different level is collect during the assessment.

#### 3.1.5.3 Study Unit

Sub city health office, 10 woreda health office and 10 Health centers include in this assessment of Addis ketema sub city.

#### 3.1.5.4 Data Collection Tools and Procedures

Semi-structured questionnaire adopted from WHO and CDC standard questionnaire for surveillance system evaluation is used during data collection at all levels. Sub city, woreda, and Health Facility PHEM focal persons and other responsible bodies are interview with this

questionnaire. To confirm responses and ensure quality of the data, observation of documents is done at all levels. Similarly, data at different levels are compared for their consistency.

### **3.1.5.5 Data Analysis**

Data was analyzed using Microsoft office Excel 2016.

### **3.1.5.6 Data Dissemination**

The report is prepared in both hard and soft copies to submit for Addis Ababa University School of Public Health, Addis ketema sub city health office disease prevention and promotion core process and 10 visited woreda, health center.

### **3.1.5.7 Ethical issue**

From Addis ketema sub city health office obtains formal letter for all woreda health office and health center to perform surveillance system evaluation from June 20 up to July 20 2017.

### **3.1.6 Operational definitions**

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

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

**Outbreak confirmation:** refers to the epidemiological and laboratory capacity for confirmation.

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

**Epidemic preparedness:** refers to the existing level of preparedness for potential epidemics

**Stake holders:** individuals or organizations that generate or use surveillance data for promotion of health and for prevention or control of diseases.

**Usefulness:** Usefulness of the surveillance system is reflected by documented changes in policies and procedures as a result of information generated by the system.

**Flexibility:** is the ability of the system to adapt to changing needs with little additional time, persons or allocated funds. A flexible public health surveillance system can adapt to changing

information needs or operating conditions with little additional time, personnel, or allocated funds. Flexible systems can be easily integrated with other systems.

**Data Quality:** Data quality reflects the completeness and validity of the data recorded in the public health surveillance system.

**Timeliness:** is the ability of the system to trigger appropriate action in time. The surveillance system must provide information in time to control communicable diseases.

**Representative:** is the ability of the system to describe health events accurately in terms of time, place and person. A public health surveillance system that is representative 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 ease of operation. Surveillance systems should be as simple as possible while still meeting their objectives.

**Acceptability:** reflects the willingness of persons and organizations to participate in the surveillance system.

**Sensitivity:** is of a surveillance system can be considered on two levels. First, at the level of case reporting, sensitivity refers to the proportion of cases of a disease (or other health related event) detected by the surveillance system. Second, sensitivity can refer to the ability to detect outbreaks, including the ability to monitor changes in the number of cases over time.

**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.

## **3.1.7 Results**

### **3.1.7.1 Structure of surveillance system**

#### **3.1.7.2 Meeting with stakeholders**

Before data collected or surveillance evaluation meeting with responsible person in subcity, woreda PHEM officer and health center surveillance focal person and head of institution before assessing the objective and importance of surveillance system evaluation after assessment highlight information at all level. This meeting was also will help for assessment of recommendations and betterment of the surveillance and response of the major priority diseases of the evaluated sub city, woreda and health center.

#### **3.1.7.3 Description of the surveillance system (Systems in place)**

In Ethiopia, the health information system for surveillance of communicable and noncommunicable diseases are organized in two main categories, the surveillance system under Public Health Emergency Management core process (PHEM) and the Health Information Management System (HMIS). These systems are set at the central level Ministry of Health and extending down to the regions, sub city and woreda health office levels including all governmental, non-governmental and some private health facilities.

Public Health Emergency Management (PHEM) is defined as the process of anticipating, preventing, preparing for responding to and recovering from the impact of epidemics and health consequences of natural and man-made disasters. This surveillance focuses on diseases which have epidemic potential, diseases under eradication and elimination, diseases of international concern, and malnutrition. Whereas the HMIS collects all the general health related data from the health facilities including those disease under surveillance (4).

#### **3.1.7.4 List of reportable surveillance disease**

Currently, there are 21 reportable priority diseases in Ethiopia, which are included in the surveillance system. These 21 priority diseases are further classified into two. 14 Immediately reportable disease and 7 Weekly reportable diseases (4).

The evaluation assessed the surveillance system of one immediately reportable (Cholera) and one weekly reportable disease (Typhoid fever). They are important public health problems of the sub city that caused significant amount of morbidity and mortality.

Table3.1.6 List of surveillance reportable diseases/ conditions in Ethiopia

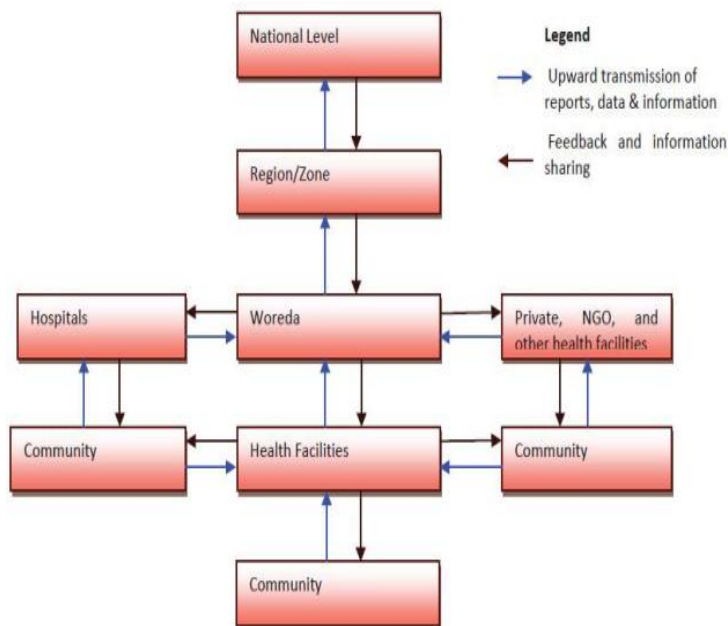
No	Immediately disease	Weekly Disease
1	Acute flaccid paralysis (AFP)	Dysentery
2	Anthrax	Malaria
3	Avian human influenza	Malnutrition
4	Cholera	Meningitis
5	Dracunculiasis/Guinea worm disease/	Relapsing fever
6	Measles	Typhoid fever
7	Neonatal tetanus	Typhus
8	Pandemic influenza A(H1N1)	
9	Rabies	
10	Severe acute respiratory syndrome (SARS)	
11	Smallpox	
12	Viral hemorrhagic fever (VHF)	
13	Yellow fever	
14	Maternal Death (MDSR)	

Source: Ethiopian National PHEM Guideline2012 edition

### 3.1.7.5 Operation and reporting of surveillance system

In Ethiopia surveillance systems, information is collected at a local level and sent to regional and national health authorities that then compile and analyze the data. The results of the data analyses are then summarized in reports that are provided to national and perhaps local health authorities (4). In the Addis Ababa Region, the same strategic follow therefore woreda and health facilities at the lowest level. Particularly hospital, Health center and private health facility are the main source of information about the occurrence of health-related event. Data collected from this site

is compiled in reporting forms, then analyzed and forwarded to the woreda health office. Woreda health office compiles, analyzes and sends the data to the Sub city level by using a standard form. Similarly, the sub city level compiles and analyzes the report and sends the compiled data to the regional health bureau by using a standard form. Regional health bureau data compile, analyze then send to federal ministry of health. Health facility and woreda usually send report to the next level by hard copy and phone. similarly sub city and regional levels send the report to the next level by Hard copy, phone and email.



Source: Ethiopian National PHEM Guideline 2012 edition

Figure3.1.12 Data and information flow chart of surveillance system indicating varying cycles at various levels

### 3.1.7.6 Immediately reporting

Currently 14 diseases are identified to be reported immediately to the next reporting level. A single occurrence of these diseases needs to be reported from the Health facility to woreda health office within 30 minutes, from the woreda health office to sub city health office level within 30 minutes, similarly from sub city health office to region health bureau with in another 30 minutes,

then from the regional health bureau to the federal ministry of health within another 30 minutes and finally from federal ministry of health to the WHO within 24 hours. The information can be reported by means of available convenient methods; like telephone, email, fax or mobile SMS (4).

#### **3.1.7.7 Weekly reporting**

Currently seven diseases and health conditions are identified to be reported weekly to the next reporting level. The total number of cases and deaths occurred within the week (Monday to Sunday) needs to be reported; from the health facilities to woreda health office every Monday till mid-day, from the woreda health office to subcity level every Tuesday till mid-day, from Sub city health office to region health bureau every Wednesday till midday, then from the regional health bureau to federal ministry of health every Thursday and finally from the FMOH to stakeholders every Friday (4).

#### **3.1.7.8 Purpose of the surveillance system**

In Ethiopia, Public Health Emergency Management (PHEM) is one of the core processes identified by Ethiopian Federal Ministry of Health's (FMOH) following the 2008 health sector reform and restructuring based on business reengineering process (BPR) to ensure rapid and prompt response to and recovery from various public health emergencies, which range from recurrent epidemics, emerging infections, nutritional emergencies, chemical spills, and bioterrorism. The overall purpose of surveillance of these priority diseases is to monitor their trends against the pre-seated tolerance limits and pick any deviation from the limit at the earliest point in time and have prompt response (4). In addition, as early warning system, it guides prevention, control and risk aversion actions like immunization, vector control and so on.

#### **3.1.8 Objectives surveillance system**

The overall objective of the surveillance system is to improve the ability of health workers to detect early and respond to priority communicable diseases, effective and timely decision making based on evidence, increases efficient utilization of available resources for preventing and controlling communicable diseases and improving the health status of the population under surveillance (14).

### 3.1.9 Description of (Typhoid fever and Cholera) in Surveillance System Evaluation

In Addis ketema sub city, two selected disease are important public health problems of the sub city that caused significant amount of morbidity. In 2016 there was Cholera outbreak occurred in subcity it affected all woreda. During the year, a total 869 cases were reported from the sub city.

During Assessment Typhoid fever case from week 17 up to week 31, the first priority disease reported all Assessed woreda health office on reported health facility and health center totally 4934 Typhoid fever cases reported.

Table3.1.7 Typhoid fever data from all woreda by epidemiological week from week 17-31 2017.

Number	Epidemiological week	Number of Typhoid fever case reported	Remark
1	Week 17	320	
2	Week 18	323	
3	Week 19	414	
4	Week 20	425	
5	Week 21	470	
6	Week 22	313	
7	Week 23	420	
8	Week 24	371	
9	Week 25	323	
10	Week 26	124	
11	Week 27	282	
12	Week 28	79	
13	Week 29	282	
14	Week 30	320	
15	Week 31	320	
Total		4934	

### **3.1.10 Case definitions**

According to the PHEM guideline, there are two case definitions; standard case definitions and community case definitions:

#### **3.1.10.1 Standard case definitions of selected disease**

**Typhoid fever:** An illness characterized by fever, headache, malaise, cough, bradycardia, splenomegaly or rose spot on the trunk with or without gastrointestinal symptoms.

**Cholera:** An illness that is characterized by acute painless watery diarrhea with or without vomiting.

#### **3.1.10.2 Community case definitions of selected disease**

**Typhoid fever:** Any person with fever, constipation or diarrhea, confusion (delirium) and with the body in a passively prone position (prostration)

**Cholera:** Any person aged 5 years or older with lots of acute watery diarrhea

**AWD:** Any child having loose stools within the last 24 hours, or showing danger signs of loss of fluid from the body (dehydration)

### **3.1.11 Addis ketema sub city Population under surveillance and Health facility**

The Ethiopian Ministry of Health targeted all the population of the country to be under surveillance for all 21-public health important health events. The same as all populations of Addis ketema sub city were under surveillance for the 21 reportable health events. The population of Addis ketema sub city is estimated to be about 319,138 population in 2017. Addis ketema sub city is divided into 10 woreda Administrative. In the sub city, there are 10 health center, 62 private health clinic, 2 private hospital that have been participating in the surveillance system. During the evaluation of the sub city surveillance system we have assessed sub city health office, ten woreda health offices, ten health centers.

Table3.1.8 Population and health facility by woreda 2017

No	Name of woreda	Total population	Number of health facility
1	Woreda 1	38506	7
2	Woreda 2	39959	2
3	Woreda 3	34338	4
4	Woreda 4	40229	5
5	Woreda 5	31312	6
6	Woreda 6	29073	4
7	Woreda 7	35272	9
8	Woreda 8	22939	22
9	Woreda 9	33196	12
10	Woreda 10	19473	5
Total		319138	77

### 3.1.12 Core activities of surveillance system

#### 3.1.12.1 Case detection and confirmation

During the assessment period observed standard case definitions & posted on OPD only for four reportable diseases Cholera, Acute Flaccid Paralysis (AFP), Measles and (NNT) in the Health centers. But all health center didn't have the Standard case definition for Typhoid fever. but all health personnel were well understood case definitions and all health center (100%) have national PHEM guidelines. when come to recording & register all health center correctly used clinical register and recorded reportable diseases. Among the assessed health center 10(100%) of have the capacity to collect specimen, Handling and Transporting for Cholera, AFP, Measles, Polio for immediately reportable disease. But still no laboratory result or feedback from National laboratory (EPHI) come early.

### **3.1.12.2 Reporting**

The national public health emergency management and its partners are responsible for preparing and distributing different reporting form to regional health bureaus to be used for reporting by all levels of the surveillance system. At the time of the assessment all health center has no shortage of reporting format. All Health center, woreda health office and sub city health office are reported to next level by Hard copy and Mobile (SMS). The periodicity of the report we have observed that all woreda health office, health center follows the data collected date (Monday to Sunday). Health center compile data Monday early morning then send to woreda health office the same day Monday till 12 AM. Woreda health office compiled and send to sub city health office Tuesday till 12AM. Subcity health office compiled and send to regional health bureau Wednesday till 12 AM follow according to the PHEM guide line. Data collection and filling was not time taking which took 15-20 minutes on average.

### **3.1.12.3 Data Analysis**

In all visited health offices and health facilities, there was a responsible person for surveillance data analysis, in subcity and woreda health office were PHEM officer and health center level surveillance focal person. however, observed data analysis at sub city and woreda health office was a variable for the priority disease on Typhoid fever, Typhus, Dysentery. The data was analyzed at weekly bases in subcity and woreda health office on Bulletin form, 100% of sub city health office analyzed by time and place and 75% of woreda health office analyzed the data by time & place and 30% of health center level data analyzed by time. On action thresh hold for typhoid fever and Cholera 100% sub city health office, 90% woreda health office and 70% health centers level established an action thresh hold. When come to denominator all visited health office and health center were denominators for surveillance data analysis but they didn't use to surveillance data analysis compare the incidence with the previous experience at the woreda and health facility, except at sub city level. There is in subcity level surveillance data base e-PHEM and they use XLs software but in woreda health office there is no data base on e-PHEM but uses XL software. But in health center not use data base and XLs software.

### 3.1.12.4 Epidemic Preparedness and Response

Public health services needing to be well prepared to outbreaks, and adequately react if an outbreak occurs. Out of all visited health office and health center experience Cholera(AWD) outbreak in the last Years. During assessment, all woreda and health center including sub city have establish rapid response team(RRT). but this committee were actively engaged only if outbreak occurred at all level. On the other hand, 4(40%) woreda health office and 1(10%)health center has written plan for Epidemic preparedness and response. all Woreda and health center have no implemented prevention and control measures based on local data for Cholera & Typhoid fever in this year. 100% of woreda and 70 % health center have documents or meeting minutes at the time of the evaluation that shows the existence and activities of RRT. Sub city, woreda health office and health center have no specific budget line for emergency management and response. During assessed 9(90%) health center of them have emergency stock of drugs and supplies at all time in the last year. But all Woreda and health center including sub city have no experienced shortage of drugs, Vaccines or supplies during the most recent outbreak.

Table3.1.9 Number of woreda, health center and sub city their emergency preparedness status in Addis ketema subcity 2017.

No	Variables	Sub city		woreda		Health centers	
			%		%		%
1	Established Rapid Response Team (RRT)	1	100%	10	100%	10	100%
2	Availability of Written emergency preparedness plan	1	100	4	40%	1	10%
3	Observed epidemic management (RRT) meetings minutes	1	100%	10	100%	8	80%
4	Availability of emergency stocks of drugs and supplies	1	100%	9	100%	9	90%
5	Experienced shortage of drugs during in the past year out break	1	100%	10	100%	10	100%
6	Presence of budget line for epidemic response	0	0%	0	0	0	0

### **3.1.12.5 Outbreak investigation**

Outbreak investigating and managing appropriately is essential to minimize morbidity and mortality by aborting the outbreak early before it spreads in the area. The sub city, woreda health office and health center there is no outbreak investigation on typhoid fever and cholera in this year.

### **3.1.13 Attributes of surveillance system**

#### **3.1.13.1 Usefulness**

A surveillance system is useful if it contributes to the prevention and control of adverse health events, including an improved understanding of the public health implications of such events. All assessed subcity, woreda health office and health center were responded that the surveillance system is useful for early detection of outbreaks of diseases and health events under surveillance. In addition, they responded that it helps to determine the burden of morbidity and mortality of the reportable health events and to determine the risk factors related to those diseases and to permit assessment of the effect of the prevention and control program.

#### **3.1.13.2 Simplicity**

The simplicity of a surveillance system refers to both its structure and ease of operation. system that is simple in design is one whose case definition is easy to apply and in which the person identifying the case will also be the one analyzing and using the information. During assesse all woreda health office, health center and subcity health office 100% of respondent were familiar or understand standard or community case definition for selected priority disease (AFP, Cholera, Measles, NNT, Polio). All respondents agreed that the case definition for Cholera (AWD) is simple & easy to understand and applied by all health professionals and community health worker. In addition, all participants of the evaluation responded that surveillance reporting formats are also clear and simple except two (20%) health center surveillance focal. Among the assessed subcity, woreda health office and health center were an average 15-20 minute to fill weekly reporting format. But, to confirm the Cholera cases it needs high level of laboratory or culture identification at all level.

### **3.1.13.3 Flexibility**

A flexible surveillance system can adapt to changing information needs or operating conditions adding small amount of time, personnel, and funds. At sub city health office, woreda health office and health center respondents were system easy to integrate with other systems and not be difficult to existing procedure of case detection, and report forms. As the current reporting format contains additional spaces named (others) at the end of immediately reportable diseases format, it can make it flexible to accommodate newly occurring health events/disease to fill on without any difficulty but in weekly reporting form no additional space or others at the end of format there for not flexible.

### **3.1.13.4 Acceptability**

Willingness to continue the acceptability of the surveillance system assessed based on the engagement of the reporting agents and active participation in the case detection and reporting. During assessment, all respondents from sub city to health center were active participant in the system. the reporting agents accept and well engaged uses case definition, case detection and reporting specially community health worker (health extension worker).

### **3.1.13.5 Sensitivity**

Sensitivity of surveillance system refers to the ability of the system that can detect actual cases in a population and notify through the system. During the evaluation sensitivity was described at all level mostly clinical units ‘and community worker case identifies by standard case definition and community-based case definition and also surveillance system is not including positive and negative in the reporting format because of this difficult to evaluate sensitivity of the typhoid fever quantitatively.

### **3.1.13.6 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 routine surveillance system covers in the sub city were 10 woreda health office, 10 health center and 64 private health facilities. Typhoid fever case top one priority at all woreda health office collected in a surveillance system should be representative of the cases that occur in the catchment population covered by the surveillance system.

### **3.1.13.7 Stability**

Stability of surveillance system is the reliability and availability (ability to be operational when needed) of the surveillance system without interruption. During assessment available of PHEM officer at sub city, woreda health office and surveillance focal person at all Health center level is a good opportunity for running surveillance system. All assessed sub city, woreda health office and health center don't interrupted surveillance activities last six months.

### **3.1.13.8 Timeliness and Completeness**

Completeness of reporting sites refers to the proportion of reporting sites that submitted the surveillance report irrespective of the time when the report was submitted and Timeliness of the surveillance is usually considered that time interval between the onset of health-related event and the reporting of the event within the time period. During assessment woreda health office reported to sub city health office completeness and timeliness was an average 100% last one month. And health facility reported to woreda health office 93% was completeness and timeliness was an average 85.5%. The minimum expected reporting timeliness and completeness is 80% as per recommendation of the national PHEM guideline. Both timeliness and completeness was above minimum requirement.

Table3.1.10 Woreda health office by completeness and timeliness for last one month from week 23-31/2017

No	Name of woreda	Number of expected HF	Number of Reported HF	Completeness by %	Timeliness by %
1	Woreda 1	7	6	89	90
2	Woreda 2	2	2	100	100
3	Woreda 3	4	4	100	100
4	Woreda 4	5	5	100	100
5	Woreda 5	6	6	97	100
6	Woreda 6	5	4	84	80
7	Woreda 7	9	8	89	55
8	Woreda 8	22	20	91	68
9	Woreda 9	12	10	82	75
10	Woreda 10	5	5	100	90
Total		77	70	93	85.5

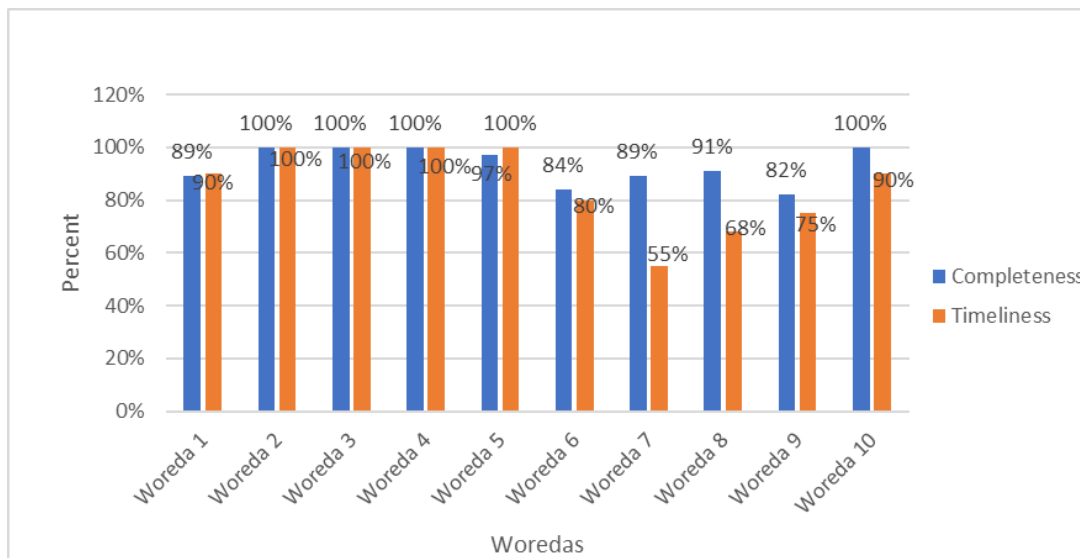


Figure3.1.13 By woreda Completeness and timeliness form week 23-31, 2017

### 3.1.14 Supportive surveillance system

#### 3.1.14.1 Availability of Budget and Resources for Surveillance Activities

For implementing and operating a surveillance system activities availability resources and budget is important for executing surveillance activities and epidemic preparedness effectively and efficiently. During assessment, there is no specific allocated budget for public health emergency activities at sub city, woreda and health center level. however, sub city, woreda health office and health center level there is no shortage of reporting format and clinical registration book was available at OPD level in the last six months. In the sub city level computer and e-PHEM have available but there is no internet access by this time. 2(20%) woreda health office have computer it is functional and 1(10%) of woreda health office have internet access but 2(20%) of health center have computer and internet access and its functional. All reports were sent to the next level subcity, woreda and health center through mobile (SMS), telephone, and by manually written (hard copy).

Table 3.1.11 Availability of resource needed for surveillance activities, in Addis ketema sub city 2017.

No	Item	Sub city	%	Woreda	%	Health center	%
1	Computer	1	100%	0	0	0	0
2	Printer	1	100%	10	100%	10	100%
3	Stationary	1	100%	10	100%	10	100%
4	Fax	0	0	0	0	0	0
5	Internet	1	100%	0	0	2	20%
6	Telephone	1	100%	10	100%	9	90%
7	Vehicle	0	0	0	0	0	0

### 3.1.14.2 Training

Availability of trained staff on surveillance activities is an important key for improvement of weekly reporting system, early detection and reporting of outbreaks and for meeting the objectives and purpose of the surveillance system. According to sub city health office response there are 25 trained focal persons engaged on surveillance activities in the sub city. Among the assessed woreda health office ten (100%) PHEM officer, 8 (80%) health center surveillance focal person and in the sub city health office two of them are trained on basic surveillance system or PHEM. The other 96 (100%) health extension worker trained on community surveillance for 3day at sub city level.

Table3.1.12 List of selected health center and their number of staff trained on basic surveillance system in Addis ketema sub city 2017 E.C.

No	Name of woreda	Number	Name of health center	Number	Name of sub city	Number
1	Woreda 1	1	Ginbote 20	2	Addis ketema	2
2	Woreda 2	1	Abyssinia	0		
3	Woreda 3	1	Woreda 3	1		
4	Woreda 4	1	Addis ketema	3		
5	Woreda 5	1	Abebe Bikila	2		
6	Woreda 6	1	Felegmeles	2		
7	Woreda 7	1	Addis Raye	1		
8	Woreda 8	1	Millennium	0		
9	Woreda 9	1	Kwasmeda	2		
10	Woreda 10	1	Efoyta	1		
	Total	10	10	14	1	2

### **3.1.14.3 Supportive Supervision**

On the Last 12-month sub city health office conducted 4 integrated supportive supervision on surveillance activities for 10 woreda health office, 10 health centers and 74 health facility worked on active search as priority level. But in woreda health office has not conducted supportive supervision but worked on active search as priority level their respective health facility. For supportive supervision and active search sub city and woreda health office have checklist & used. This helped in improving the communication between the health professional working in the health facility to sub city health office. In addition, it helps in solving problem and improving surveillance activity on time.

### **3.1.14.4 Feedback**

Feedback is an important function of all surveillance systems and the way of encouraging, an individual or staffs working in the surveillance system. The sub city health office has provided written and oral feedback on surveillance activities to woreda health office and health facility during active search as priority level and integrated supportive supervision every quarter last year. Therefore, woreda health office oral feed back to their respective reporting health facility during active search as priority level for last year.

### 3.1.15 Discussion

Surveillance system evaluation is a periodic assessment of effectiveness and efficiency program toward its purposes and objectives. During assessment, 10 woreda health office reported to sub city health office timeliness and completeness was an average 100% last one month. And the same to health facility reported to woreda health office timeliness 85.5% and completeness was an average 93.8%. This is above WHO the minimum expected reporting timeliness and completeness is 80%.

Computers are important data management tools for PHEM officer as they can be used for data entry and analysis .100% of woreda health office was not have computers available for data management but at subcity level have computer available for data management. Although internet facilities available at the sub city level. But 20%, of woreda health office and health center have internet access.

Use of standard case definitions and community case definition is very important as it allows for standardization and consistency of reporting across subcity from woreda & all health facilities there for all health center and woreda health extension worker use standard and community case definition. 40% of the health facilities were data analysis and interpretation where as 90% of woreda health office were surveillance data analysis and interpret. Analysis and interpretation of data at the health centers and woreda health offices level is important and is one of the determinants of PHEM implementation. all of the health facilities have a reporting system in place for reporting to the woreda health offices. Reports are sent to next level by hard copy and mobile SMS. This may be connected to the unavailability of internet facilities at all levels. Although 10% of woreda health offices have internet access but still, reporting to the sub city level was by hard copy and mobile phones (SMS) The 30% of health center not receiving any feedback from the woreda health office level where as 10% of woreda health office not receive feedback from sub city. Lack of feedback from higher levels discourages staffs especially focal persons as they may not see the results of reporting and may lead to a poor performance in the future.

### **3.1.16 Conclusions**

Generally, the surveillance system was successful working from sub city, woreda health office and health center level. At all woreda health office assign PHEM officers and almost all of them have attended the basic PHEM training. In addition, the system was successful in working and community-based surveillance system in all woreda health office by health extension worker. According to the finding of this assessment, in order to strengthen Typhoid fever and Cholera surveillance and response in the health center and woreda health office surveillance core activities-case detection, analysis and reporting of surveillance data for action is very crucial. Typhoid fever and Cholera were a major public health problem of in the subcity. in which typhoid fever were the first priority reported from all woreda health office and health center which means for community high burden social and economic problems.

Last year Cholera (AWD) outbreak occurred in all woreda now days main threats of outbreak to the community. Therefore, an effective and well-functioning surveillance system is crucial for timely detection of cases and will help in the timely response which reduce the expansion and impact of the outbreak; this will improve the satisfaction of the activities involved in the surveillance system.

### **3.1.17 Limitation of the study**

- Some focal person and PHEM officer not present during assessment
- I haven't get last year cholera line list data from sub city
- lack of available materials (stationary)
- Absence of transportation(budget) from woreda to woreda and health center.

### **3.1.18 Recommendations**

- Regularly priority surveillance disease should be analyzing and interoperate on woreda PHEM officer.
- Completeness and timeliness of the surveillance data by regular monitoring in woreda health office level.
- Strengthen integrated supportive supervision at health center and health facility by woreda health office level.
- Strengthen training health personnel on data management at the health facilities and woreda PHEM officer.
- Strengthen appropriate documentation, reporting format should be checked at regular basis at woreda and health center levels.
- For all woreda health office avail computer for PHEM officer

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# **Chapter-IV**

## **Health Profile Description**

## **4.1. Health Profile Description of woreda 7, Addis Ketema Sub City, Addis Ababa, Ethiopia,2017**

### **ABSTRACT**

**BACKGROUND:** - Health Profile assessment is a systematic collection, organization and documentation of health and health related data of specific area. It provides a lively, scientifically based account of health in woreda; it can identify target for the future and monitoring progress and also set out strategy and program of the intervention to improve health in community.

**METHODS:** - Descriptive cross-sectional study design conducted from 13/2/2017-15/3/2017 with the objective of describing the health and health related profile.

**RESULTS:** - Total of 95 new TB cases were reported in woreda of those 33(35%) were smear positive pulmonary TB, 24 (25%) were smear negative pulmonary TB, 38(40%) were extra pulmonary TB. 162 were people living with HIV/AIDS in woreda. Of which 80 peoples are currently on ART and 82 are on pre-ART. Family planning service 376(10.2%) are accepted modern contraceptive methods. Of which short terms contraceptive method is 304(8.3%) and long-term contraceptive method are 72(2%). immunization coverage 351(44%) were vaccinated for BCG, 365(46%) were Penta-3, 377(48%) were OPV3, 348(44%) were measles, 346(44%) fully immunize and 345(44%) PAB vaccinated in woreda.

**CONCLUSION:** - Acute upper respiratory infection, acute febrile illness, non-bloody diarrhea and pneumonia is a top leading cause of outpatient morbidity in adults and pediatrics. So woreda health office priority to these diseases and give more attention.

Regarding tuberculosis, the cure rate, completion rate of the woreda was below the recommendation of WHO. There for woreda has to work more on outcome. On the maternal health activity, Family planning, Skilled delivery, postnatal service was low coverage in the woreda compare to last year performance also gives more attention to educate community by using health extension worker

**Recommendation:** - TB program should have to be strengthen in health center and more efforts have to be done on the TB case detection rate, cure rate, completion rate. Awareness creation by health extension workers to improved family planning utilization coverage in woreda.

### **4.1.1 Introduction**

Health Profile assessment is a systematic collection, organization and documentation of health and health related data of specific area. Health profile of a district is a comprehensive document that contains information about the history and location of the district, its accessibility, its cultural value, political and administrative setup, demographic characteristics of its population, general health status, health indicator, education and socioeconomic status.

Historical development of modern medicine in Ethiopia as organized by government began to be practiced at the beginning of 20<sup>th</sup> century. However, it was introduced and practiced in a fragmentary situation starting from 16<sup>th</sup> century by different groups of people ranging from religious and diplomatic missions to travelers, traders, invaders and warriors. The government was not fully responsible for the operating of modern health service system until the start of 20<sup>th</sup> century. Prior this time, even though the services existed they were limited to few private individuals, religious missions, diplomats and member of the royal family. The first government sponsored health facilities were established in Harar and Addis Ababa by Ras Makonen an Emperor Menelik-II in 1909 respectively (1). The first health legislation that formally delegates the government with the responsibility of ensuring public health was promulgated in 1947. Following this legislation, a separate Ministry of health was established in 1948. However, the health service provided were majorly centered in main cities to the ruling and wealthy class (2).

Following the 1974 revolution, the country's health policies were reformulated to emphasize disease prevention and control, decentralization and rural health services, self-reliance and community involvement. Ethiopia signed the Alma Ata charter in 1978 to implement primary health care (PHC) and adapted the 1979 declaration of "Health for all by the year 2020" using PHC strategies (3). The basic principles of PHC were community participation, intersectoral collaboration, utilizing technology in health care activities, focus on prevention and ensuring the equitable distribution of health care resources across rural/urban and wealthy/poor population group (4).

This summarized and comprehensive public health data of the woreda is important for public health officials and stakeholders to use it for policy development, planning, implementation and

evaluation of public health programs. More over Describing health profile of a particular woreda is vital to describe and communicate health status and determine diseases burden in a simple way and can also be used as an entry point for operational research. Hence collecting, compiling and documenting of health profile of a woreda is critically important for countries like Ethiopia where data management and information system is poor, especially at woreda level. Hence this data will be a valuable asset for the health offices that found in this sub city.

## **4.1.2 Objective**

### **4.1.2.1 General objective**

- To assess and describe health and health related data and to identify problems for priority setting of Addis ketema sub city, Woreda, 2017

### **4.1.2.2 Specific objectives**

- To summarize health and health related data of Woreda7
- To identify health service status of the woreda in 2017
- To understand basic infrastructures of the woreda
- To identify major health problems of Woreda7

## 4.1.3 Methods

### 4.1.3.1 Study area

Health Profile Description was conducted in Addis ketema subcity, Woreda 7, 2017.

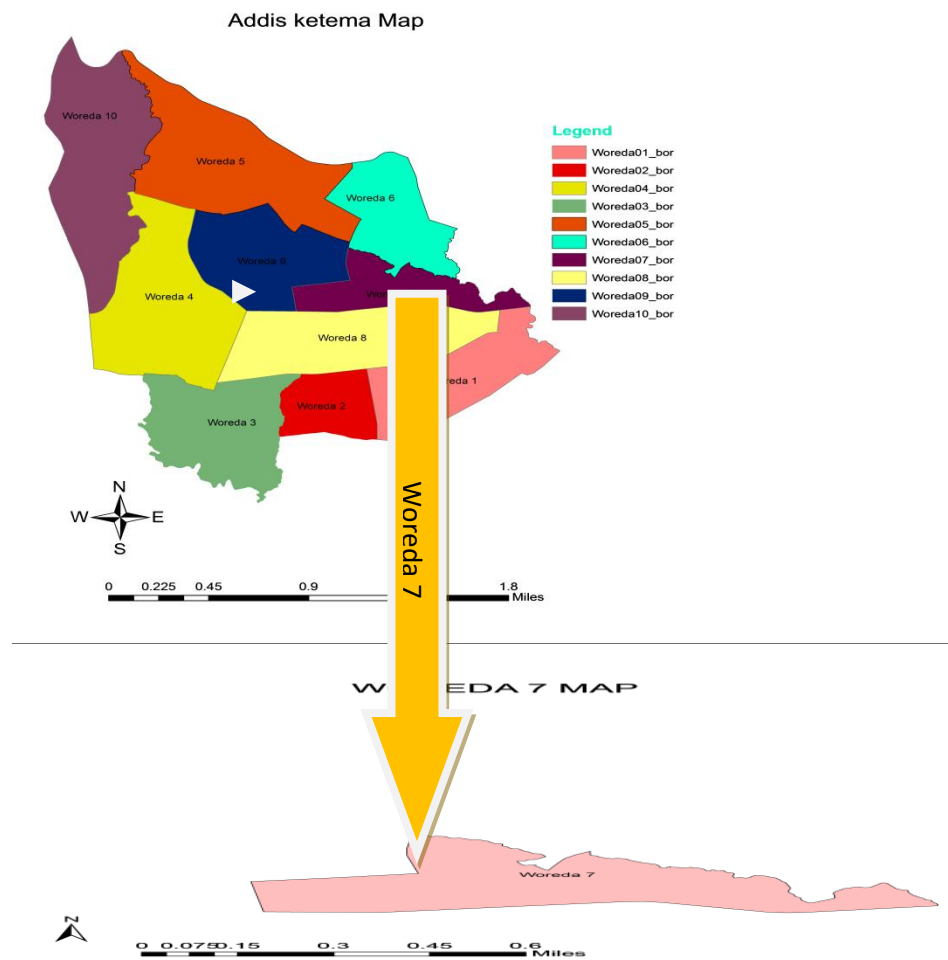


Figure4.1.14: Map of woreda 7, Addis ketema subcity,2017

#### **4.1.3.2 Study period**

All required data of (2017 G.C) were collected, analyzed and interpreted from 13/2/2017-15/3/2017

#### **4.1.3.3 Study design**

Descriptive cross-sectional study was conducted using standard questionnaire. Hard copy and soft copy were reviewed to generate different data. In addition, interviewing and discussion with concerned body will also be conducted.

#### **4.1.3.4 Study units**

The main sources of data used for the preparation of the document are Addis ketema sub city, woreda 7 administration, Health office, health center, Educational, culture and tourism, and Finance office and other relevant sectors.

#### **4.1.3.5 Data collection method**

Structured questioner was developed and used to collect primary and secondary data. Interview was conducted with relevant person of the based on the data in woreda.

#### **4.1.3.6 Data analysis**

Data was compiled and analyzed using Microsoft Excel.

#### **4.1.3.7 Ethical clearance**

Official letter was obtained from Addis ketema sub city health office to assess data of woreda 7 health office, health center and other relevant office to accept legality of the study. The purpose and objective of gathering data which the data required was briefly explained to the respected official based on their level on responsibility and they were asked for oral consent to conducted.

## **4.1.4 Result**

### **4.1.4.1 Historical background**

Woreda 7 administrative is one of ten woreda of Addis ketema sub city in Addis Ababa city. Historically previous name of woreda is kebele. Its established in 2011. there are no documented data how and why the name is changed.

### **4.1.4.2 Geography and climate**

Woreda 7 is found at 1 Kilometer near to Addis Ababa largest market place (Mercato). The area of the woreda is 49 hectares. It is composed of 4 kebeles & located in the west part of Addis ketema subcity. The Woreda is surrounded by four woreda in the sub city and woreda 2 in Arada sub city. In the south woreda 1, in the West by woreda 5, in the North by woreda 6 and in the East by woreda 9. The altitude of the woreda is 2400 Meters above the sea level. Annual temperature is estimated to be between 16.3c. Annual range of rainfall is 1143 mm. The climatic condition of a woreda is warm and temperate. In the summer, much rainy than in winter

### **4.1.4.3 Demographic information**

From the projection of 2007 census, the total population of woreda is estimated to be 35,272 of which 17,252(47.99%) is male and 18,020(52.1%) is female in 2017. male to female ratio 0.957. under 1-years children are 798, less than 5-years 2,525 and less than 15-years 8,455 of the total population. Child bearing women (15-49years of age) are accounted for 34.64% (12218) of a population. Amhara, Gurage and Sillte are the dominant ethnics in the woreda. Regarding religion distribution, most woreda population are followers Orthodox and Muslim.

Table4.1.13 Population demography by age and sex in woreda 7, Addis ketema subcity 2016/17.

S/N	Description	Percentage	Population	Remark
1	Total Population	100.0%	35272	
2	Male	47.99%	17252	
3	Female	52.1%	18020	
4	Population growth rate	2.1%		
5	Population under one year	2.24%	790	
6	Population Under five years	7.16%	2525	
7	Population <15 years	23.97%	8455	
8	Population 15-24 years	28.91%	10197	
9	Population 25-59 years	70.89%	25004	
10	Women 15-49 years	34.64%	12218	
11	Average house hold size	9.3%	3785	

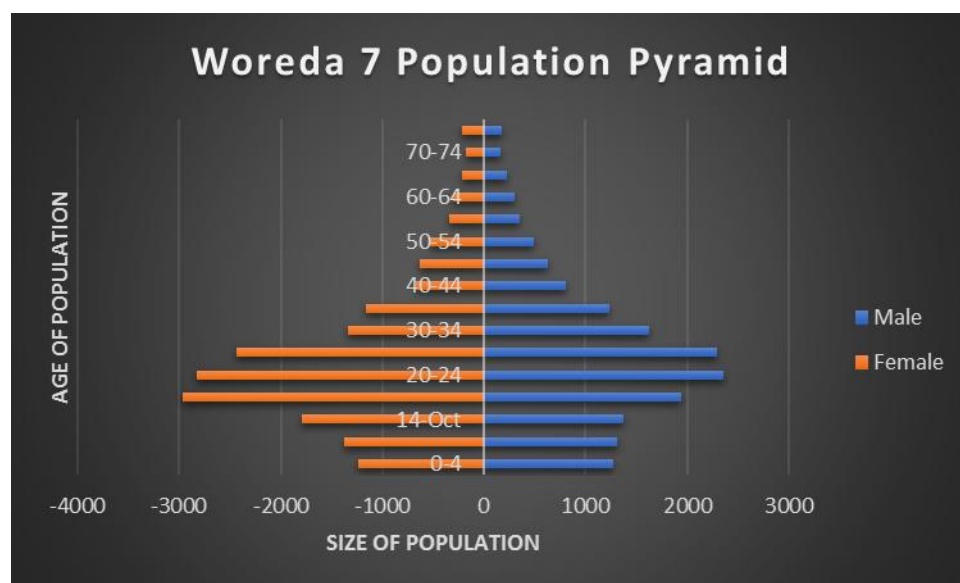


Figure4.1.15 Population Pyramid of woreda 7, Addis ketema sub city 2016/17

#### 4.1.4.4 Facilities /Infrastructure

The woreda has main road is asphalt the other gravel.in the woreda have 4 kebeles of these 3 kebeles have road transportation access to woreda in all weather. Telecommunication is one of effective mode of communication in the woreda. Area of the woreda have supplied with wave satellite type of communication and mobile network is working in the woreda. In this woreda, all kebeles have supplied with electricity power.

#### 4.1.4.5 Health Facility

Regarding to health facility there are 1 health center and 10 private health facilities of which 7 clinics and 3 pharmacies in the woreda. The government health center established for preventive and curative service while the private clinic also for curative service. It comprises to serve one health center in urban are 40,000 people and one private clinic serve for 5,000 people according to national health indicator on 2016/17. When looking at the woreda, health center to population ratio is 1:35272(100%) and private clinic to population ratio is 1:5039(100%).The woreda health service coverage by health center is 100%.

Table4.1.14 Number of Health facility in the woreda7, Addis ketema subcity2016/17.

Facility	Hospital	Health Center	Special Clinic	Medium Clinic	Primary Clinic	Pharmacy	Drug store	Total
Government	0	1	0	0	0	0	0	1
Private	0	0	2	4	1	2	1	10
NGO	0	0	0	0	0	0	0	0
Others	0	0	0	0	0	0	0	0

#### 4.1.4.6 Woreda Health System

The currently revised woreda health office structure after BPR is organized in to four technical team and two supportive teams. These technical teams are plan, supervision, training and administration, communicable disease control, family health and health extension worker. The two supportive teams at woreda health office are secretary and recording and documentation.

Primary health care unit is a system designed by Ministry of Health to enhance the linkage between health center and health extension worker. In this system, all health center staff is expected to support technically the health extension worker under their catchment.

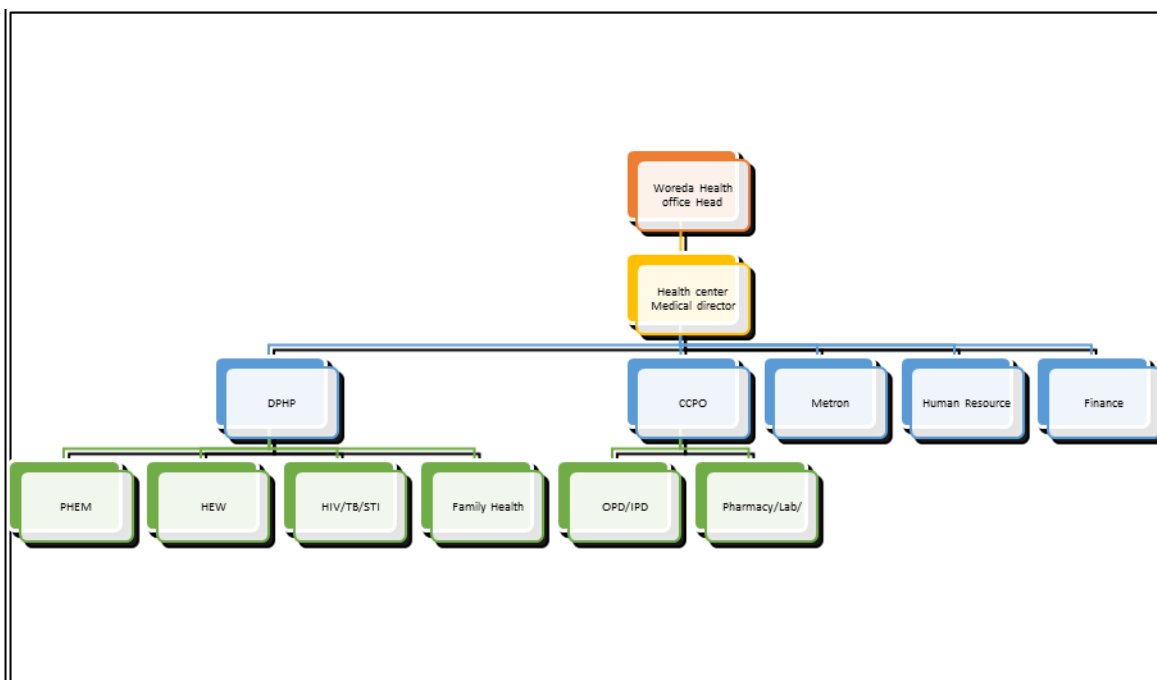


Figure4.1.16 Oregano graph of woreda health office Addis ketema sub city 2016/17.

#### 4.1.4.7 Human resource

The total numbers of government health employees of the woreda are 74 health workers. Among those 17-health officer, 21 nurses (degree, & diploma), 9 midwives (degree, diploma), 8 pharmacists (degree & diploma), 5 laboratory technology and technician; 1 environmental health and 13 health extension workers.

When looking health professional to population ratio; health officer 1:2075, nurse 1:1680 midwife 1:3919 pharmacists 1:4409 laboratory 1:7054 environmental health 1:35272, one health extension worker by house hold 1:291.

Table 4.1.15 Human resource by profession in woreda 7 Addis ketema sub city2016/17

Facility	Doctors	Health officer	Nurse	Midwife	Pharmacy	Laboratory	Environmental health	Health Extension	Total
Government	0	17	21	9	8	5	1	13	74
Private	5	3	12	0	6	6	0	0	32
NGO	0	0	0	0	0	0	0	0	0
Total	5	20	33	9	14	11	1	13	106

#### 4.1.4.8 Maternal and child immunization coverage

Expanded Program on Immunization is focused on vaccine preventable diseases, and now included about 10 diseases vaccine. In 2016/17 a total of 798 live births projected in the woreda, among those 351(44%) were vaccinated for BCG, 365(46%) of them were immunized for Penta-3 and 377(48%) of OPV3, 348(44%), of measles vaccinated and fully immunize 346(44%) are vaccinated and 345(44%) PAB vaccinated in woreda.

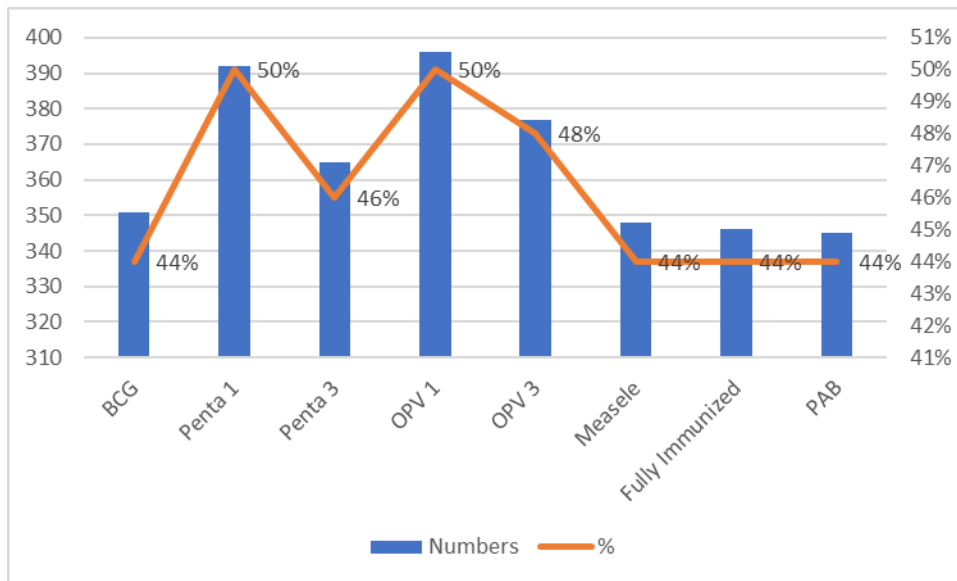


Figure4.1.17 Immunization coverage of children in woreda 7, Addis ketema sub city 2016/17

#### 4.1.4.8.1 Maternal Health

##### 4.1.4.8.1.1 ANC and Delivery

Proper care during pregnancy, delivery and after is important for the health of both the mother and the baby. In the woreda 2016/17 projection 825 eligible for pregnant women among these 526(63.7%),190(23%) received antenatal care service 1<sup>st</sup> and 4<sup>th</sup> respectively.259(31.3%) attended their delivery by skilled health professional, 151(58.3%) receive postnatal care service within 2-6 days. Among pregnant women attended for ANC follow up 513(97.5%) PMTCT-were tested for HIV. from these 18(3.5%) are HIV positive mother in the woreda.

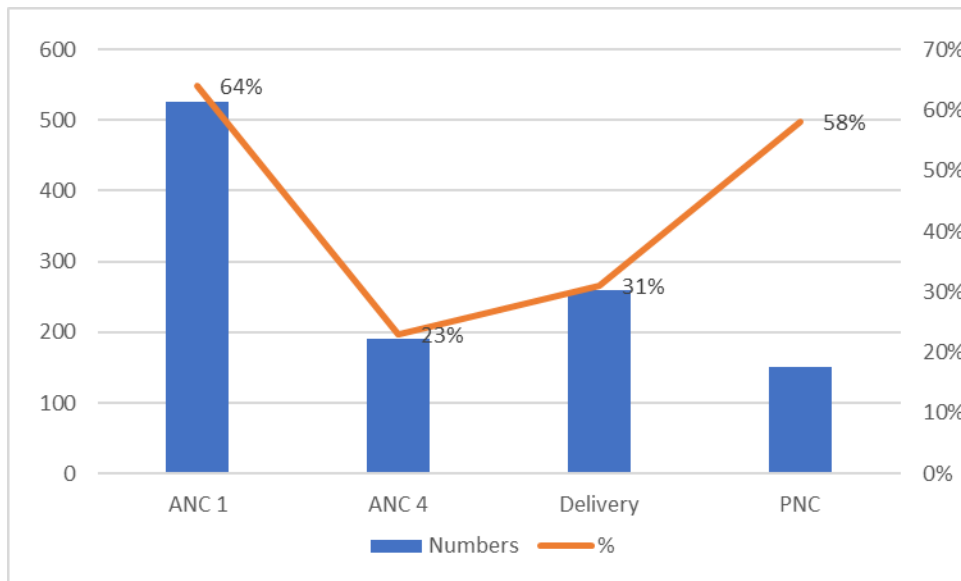


Figure 4.1.18 Antenatal, delivery, postnatal coverage in Woreda 7, Addis Ketema Sub-city 2016/17.

#### 4.1.4.8.1.2 Family planning

In the Woreda 2016/17 projection of women of reproductive age (15-49 years) are 12,218. 3,660 (30%) are targeted for the year. From these 376 (10.2%) are accepted modern contraceptive methods. Of which short-term contraceptive method is 304 (8.3%) and long-term contraceptive method are 72 (2%). The most commonly used contraceptive methods are oral contraceptive, injectable, implant, and IUCD.

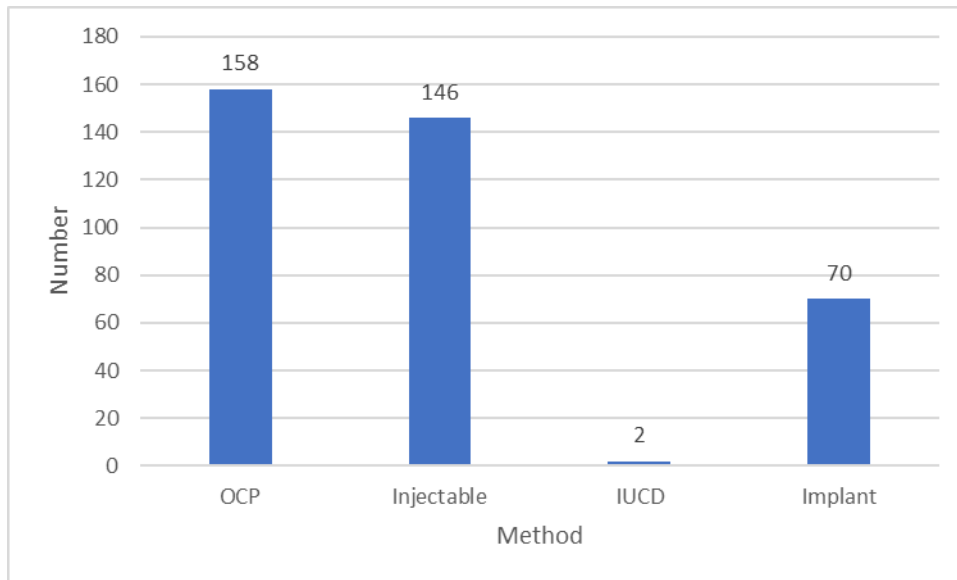


Figure 4.1.19 Family planning achievement by methods in woreda 7, Addis ketema sub city 2017.

#### 4.1.8.2 Disease prevention and control

In 2016/17 the leading causes of morbidity in Adult and children in outpatient department(OPD) are among the leading ten top diseases were Acute upper respiratory infection 2397(21.5%); followed by Acute febrile illness1221(11%); and Trauma1216(10.9%). Detail of leading causes of OPD visit is shown in the table 4 and 3.

Table4.1.16 Top ten leading causes of outpatient morbidity in woreda 7, Addis ketema subcity 2016/17

Rank	Disease	Number of case	%
1	Acute Upper Respiratory Infection	2397	21.5
2	Acute Febrile Illness	1221	11
3	Trauma	1216	10.9
4	Urinary Tract Infection	1114	10
5	Hypertension	1089	9.8
6	Diarrhea non-bloody	1025	9.2
7	Disease of muscular skeleton system & connective tissue	892	8
8	Dyspepsia	859	7.7
9	Infections of the skin and subcutaneous tissue	765	6.7
10	Helminthiasis	556	4.9

Table4.1.17 Pediatrics Five Top leading causes of outpatient morbidity in woreda 7, Addis ketema subcity 2016/17

Rank	Disease	Number of case	%
1	Acute Upper Respiratory Infection	1113	50.8
2	Diarrhea non-bloody	557	25
3	Pneumonia	226	10
4	Infections of the skin and subcutaneous tissue	198	9
5	Helminthiasis and Parasitic disease	96	5

#### 4.1.8.2.1 HIV/AIDS

In the Woreda a total of 1453 people were screened for the presence of HIV antibody in their blood and Among those 78(5%) are HIV positive of which 61(78%) were females and 17(22%) were male in 2016/17. Among the positive 18(23%) of them were pregnant women. 162 were people living with HIV/AIDS (PLWHA) in woreda. Of which 80 peoples are currently on ART and 82 are on pre-ART. Among the health facilities in woreda one health center gives ART service.

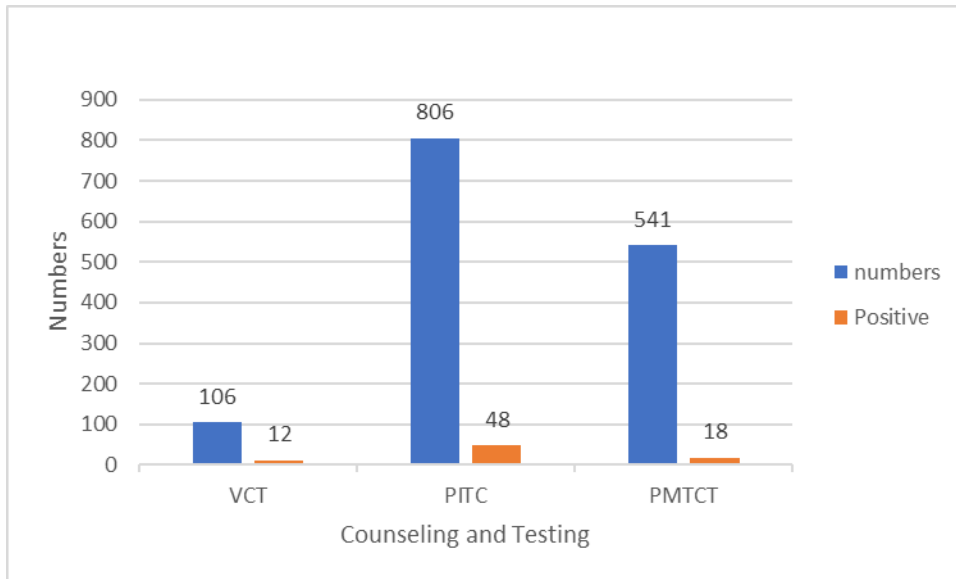


Figure 4.1.20 Number of HIV tested in woreda 7, Addis Ketema sub city 2017.

#### 4.1.8.2.2 Tuberculosis

A total of 95 case of tuberculosis (all forms) were detected in 2016/17; Among those 33(35%) were smear positive pulmonary TB, 24 (25%) were smear negative pulmonary TB, 38(40%) were extra pulmonary TB. Outcome of TB there were 1 deaths caused by TB and 2 lost follows up TB case detection rate 33(100%), treatment success rate 54(69%), TB cure rate 15(75%) and treatment completion rate 39(67%). during the period there is no cases of leprosy case reported. From the total number of 95 TB patients enrolled in TB treatment, 95 (100%) of them were screened and tested for HIV. of these 26 (27%) of them were HIV positive.

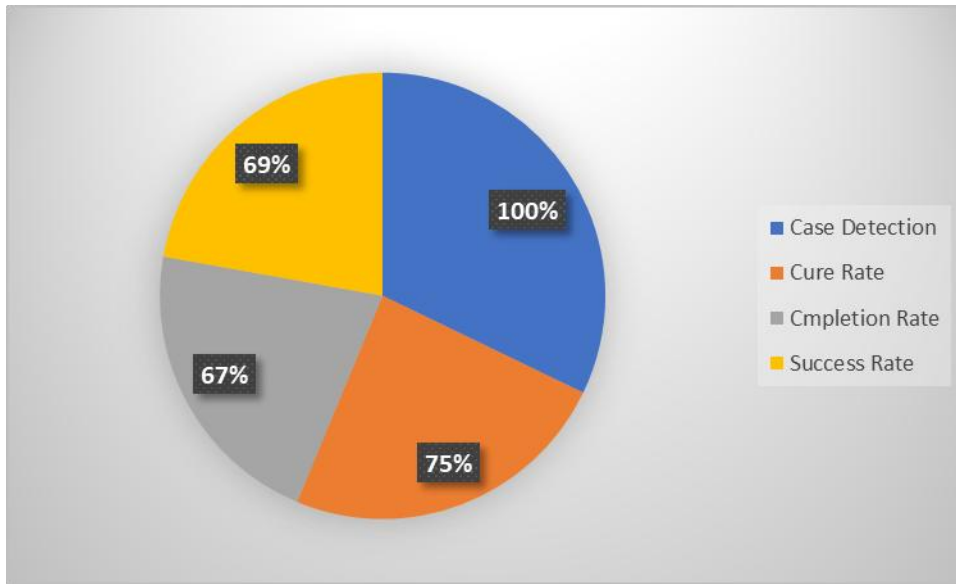


Figure 4.1.21 TB outcome of woreda 7, Addis ketema sub city 2016.

#### 4.1.8.2.3 Hygiene and environmental sanitation

According to woreda health extension worker report in 2016/17 a total of 3785 household in the woreda, among those 1148(30%) households have access latrine. of which 431(37.5%) have private latrine and 717(62%) have a communal latrine. The main source of water in woreda are from pipe line. In the woreda well organize solid waste management by which they collected solid wastes from house to house, but there is no proper and well organize liquid waste and sewerage management system.

#### **4.1.8.3 Essential drugs**

In the woreda 7, Gov, health center mostly utilized essential drug lists are Cipro floxacillin, Amoxicillin, Doxycycline, Paracetamol, Ceftriaxone, Diclofenac, ORS, Ringer lactate, Globin claimed and Metformin.

#### **4.1.8.4 Budget allocation**

In 2016/17 13,254,878.00 ETB was allocated for the woreda Administrative. Of these total budget, 329,285.53 (2.5%) allocated for woreda health office. Among these 202814.12(61%) utilizes. In 2017/18 14,901,529 birr was allocated for woreda administrative. when compare to last year woreda budget allocated increased by 11%. But for woreda health office budget allocated 201,609 (1.4%) which means decrease by 0.6% compare to last year's budget.

#### **4.1.8.5 Education**

In 2017/18 there were 2 non-governmental kinder garden, 2 Primary school (1-8) and 1 secondary school, 1 preparatory school woreda.as information obtained from woreda education office total number of student are 3561 of these 1590 are male and 1971 are female. There are 243 teachers in the woreda among these 168 males and 75 females.

#### **4.1.8.6 Discussion**

Acute upper respiratory infection was the leading cause morbidity adult and pediatric outpatient visit in woreda. It accounted for 2397 (22%) in adult and 1113(51%) in under 5 children of total outpatient visit so woreda should give priority to this disease.

Family planning has a great role in significant reduction of maternal mortality by reducing exposure to unintended pregnancy and exposure to unsafe abortion in developing countries where the majority of maternal deaths occur. Looking at the performance of family planning services, Contraceptive Acceptance Rate (CAR) coverage of the woreda was 10.2% which lower than last year contraceptive Acceptance rate 10.4% performance of 2015/16. Addis ketema sub city, Contraceptive Acceptance Rate (CAR) increased from 42% to 69.9% in 2015/16.

Antenatal care (ANC) is more benefit to prevent out come to mother and child timely follow up of pregnancy lead to early detection related problem and to take appropriate action. Regarding ANC coverage of the woreda was 64% which lower than last year antenatal care performance of 100%. Skilled birth delivery coverage of the woreda was 31% which lower than last year skilled birth delivery of which was 60%., The proportion of pregnant women counseled and tested for the prevention of mother to child transmission (PMTCT) of HIV of the woreda was 98% which higher than last year PMTCT service coverage of which of 74%.

In immunization coverage, pentavalent 3 of the woreda was 46% which lower than last year immunized of which was 76% and measles immunization coverage 44% which lower than last year immunized of which of 62%.

Tuberculosis case detection rate of the woreda was 100% which higher than the last year case detection rate of which was 86%. TB cure rate, completion rate, success rate (75%,67%,69%) respectively which higher than last year out come but lower in national (WHO) expected level 80%.

#### **4.1.8.7 Limitation**

- There is no vital health indicators data at woreda.
- There is no important information about history, back ground of woreda
- Incompleteness and inconsistency of some data
- Getting appropriate person on time on their seat place was very difficult.

#### **4.1.8.8 Conclusion**

Acute upper respiratory infection, acute febrile illness, non-bloody diarrhea and pneumonia is a top leading cause of outpatient morbidity in adults and pediatrics in woreda. So woreda health office priority to these diseases and give more attention.

Regarding tuberculosis, the cure rate, completion rate of the woreda was below the recommendation of WHO. There for the woreda has to work more. On the maternal health activity, Family planning, Skilled delivery, postnatal service was low coverage in the woreda compare to last year performance also gives more attention to educate community by using health extension worker.

#### **4.1.8.9 Recommendation**

- Treatment of acute febrile illness should be supported with specific laboratory diagnosis at health center to rule out typhoid fevers or other diseases with fever like symptoms which sometimes mimic one over the others.
- TB program should have to be strengthen in health center and more efforts have to be done on the TB case detection rate, cure rate, completion rate.
- Awareness creation by health extension workers to improved family planning utilization coverage in the woreda.
- Any OPD pregnant mothers visiting the health facility should have to be awareness to important of institutional delivery and postnatal care.
- Woreda administrative health office with other stakeholder should be improve sewerage system and Latrine coverage.

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**Chapter-V**  
**Scientific manuscript**  
**for peer reviewed**  
**Journal**

## 5.1 Relapsing fever Outbreak investigation in Arada sub city, Addis Ababa, Ethiopia, 2018

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### Abstract

**Introduction:** Ethiopia is the main endemic focus of louse borne relapsing fever. *Borrelia recurrentis* is the etiologic agent for louse-borne relapsing fever and occurs as epidemic under conditions of poor socioeconomic status, overcrowding, poverty, draught and famine. Therefore, the aim of investigation was to investigate the occurrence outbreak of relapsing fever, identify the risk factors and suggest practical control measures to alleviate the disease burden of the community.

**Methods:** We conducted facility based unmatched case control study to investigate the outbreak. All patients from 3 January to 29 January 2018 were included. fifty patients un matched with hundred controls that had no previous history of relapsing fever and admitted to for other case in the facility. Study was conducted in on a daily basis and data was analyzed using Microsoft Excel and Epi-Info version 7.2.0.1.

**Results:** Among all confirmed patients 100% (50), was male. There was no death during the outbreak. Mean age of case respondents was 26 years and their median age was 24 years. Statistically significant associations were Mass sleeping (AOR = 6.2, 95% CI [2.02-19.06]), who did not change cloth at night (AOR = 8.8, 95% CI [1.5-50.8]) and residency status at street (AOR = 26.4, 95% CI [4.79-145.5]) and residency status at daily bed room (AOR=48.2,95% CI [7.5-83]) showed a statistically significant association. Those Not changing cloth at night was about eight times, Mass sleeping was six times, residency status on street was about twenty-six times and residency status on daily bed room was about forty-eight times likely hood of acquiring relapsing fever compare to those who change cloth at night, who did not sleep in mass and not sleeping in street and daily bed room.

**Conclusion:** Among all case mass sleeping in street, daily bed room and lack of alternative clothes change at night were source and risk factor for the outbreak. Education on the

transmission of Relapsing Fever was given to homeless and daily laborer people. The outbreak was contained due to prompt interventions taken and strong preventive measures were recommended to prevent emergence of future outbreak of relapsing fever.

### **5.1.1 Introduction**

Relapsing fever is a recurrent febrile infection caused by various *Borrelia* spirochetes transmitted either by lice (epidemic relapsing fever) or by ticks (endemic relapsing fever).

It is transmitted from human to human by the body louse, *Pediculus humanus*. The pathogen multiplies in the gut of the louse and is transmitted when an infected louse is crushed or scratched while feeding in the human host [2].

Relapsing fever (RF) was once a disease of global epidemic importance. *Borrelia recurrentis* is the etiologic agent for louse-borne relapsing fever and humans are the only known reservoirs. It 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 [3], [4].

Louse-borne relapsing fever has been restricted to countries with poor socio-economic status, the most important foci being Burundi, Rwanda and Ethiopia.

Large outbreaks of louse-borne relapsing fever had occurred throughout the past century. These outbreaks usually occur following man-made break downs in public health, as typified by the epidemic following World War II that involved about 10 million cases and one million deaths during this epidemic [3].

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 [5], [6].

Ethiopia is main endemic focus of louse borne relapsing fever. It was reported as seventh of the top ten leading causes of admission and death among adults in the country, in 2002/03. More than 9000 cases were reported to the ministry of health in the same year. However, lack of diagnostic facilities in rural health set up and incomplete reporting make it difficult to estimate total number of cases [3], [7].

Several large epidemics were recorded in the country, usually following war and famine. Localized epidemics continue to occur when circumstances become favorable. The latest epidemic occurred in 1991/92, at the end of the civil war in Ethiopia. It occurred among military recruits returning to their residence areas, and later spread to different sections of the community, including schools. Among 389 patients from Arsi, southern Ethiopia, during this epidemic, the case fatality rate was 3.5 % [3].

Therefore, the aim of investigation was to investigate the occurrence outbreak of relapsing fever, identify the risk factors and suggest practical control measures to alleviate the disease burden of the community in mission of charity, Arada sub city.

### **5.1.2 Methods and Materials**

Arada sub city administration divided in to 10 woreda with Area of 9.9 sq.km. according to 2017/2018 population projections was 272,356 of which 130,730(48%) are male and 141,625 (52%) are female. and the population density per sq.m:22, 805. Study was undertaken 50 cases and 100 controls from 3 January to 29 January 2018 in Arada sub city, Mission of charity clinic. We conducted facility based unmatched case control study. Data was entered, summarized and analyzed by using Epi-info version 7.2.0.1 and Microsoft office Excel 2016 software's.

### **5.1.3 Result**

#### **5.1.3.1 Descriptive Analysis**

A total of 50 cases confirmed relapsing fever case (AR: 21.7/10000 Pop) with no deaths were reported during the investigation. The index case was reported from mission of charity clinic on 1 January 2018 who had daily laborer and residency at daily bed room in mass on Addis ketema sub city at gojamberenda. Of the total reported cases 50(100%) were from mission of charity clinic in different sub city and woreda.

Among all identified cases 50(100%) were male and 84% (42) were within age range of 10-68 years. Age group between 15-44 years were 44(88%) most affected, Age group were 5 (10%) were between 5-14years, and 3(6%) was +44years were less affected compared to 15-44 years populations. The overall attack rate was 3.8 per 10,000 population with a CFR of zero. Age group 15-44years was the most affected with an AR was 2.5 per 10,000 population. Followed 0.8/10,000 population in 5-14 years old and 0.7/10,000age above 44 years old. (Table 5:19).

Table 5.1.18 : Relapsing fever case distribution place and person in mission of charity clinic, Arada sub city, Addis Ababa, Ethiopia 2018.

Variable		Population	Number of case	Percentage	Attack rate per 10000	Case fatality ratio %
Age group	5-14yrs	65,284	5	10	0.8	0
	15-44yrs	165,838	44	88	2.5	0
	44+ yrs.	41,234	3	6	0.7	0
Sex	Male	130,760	50	100	3.8	0
	Female	141,625	0	0	0	0
Total		272356	50	100	3.8	0

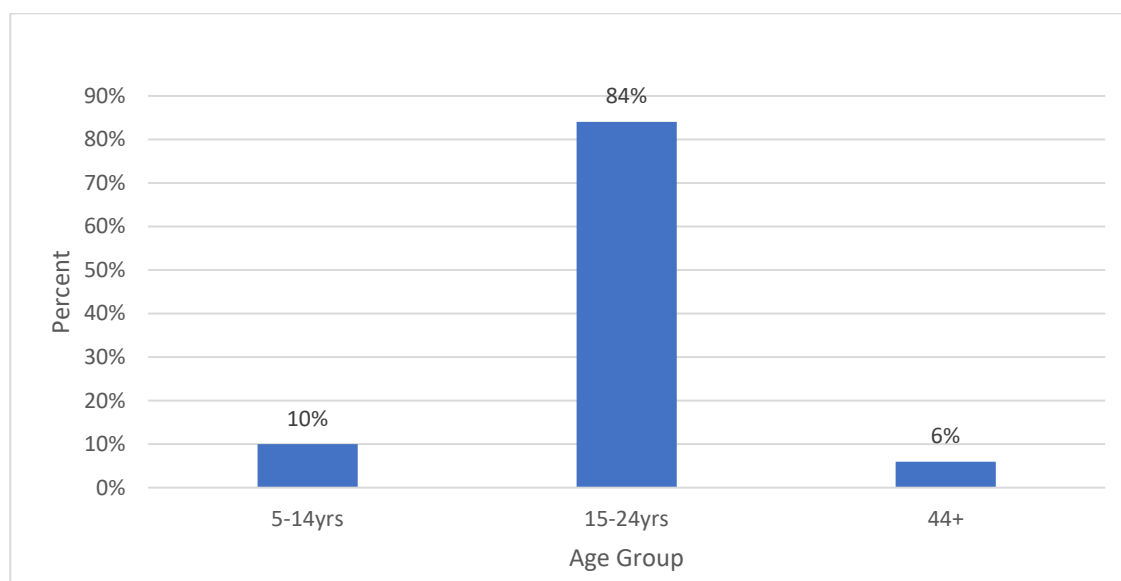


Figure 5.1.22 distribution of relapsing fever by Age group in mission of charity clinic, Arada sub city, Addis Ababa, Ethiopia 2018.

As we see the epi curve index case had onset of symptoms on 12/25/2017. The case was a 17-year-old male and interventions (treatment of cases, delousing, health information by health professional health worker about the outbreak was provided however investigation was started on the 1/5/2018 almost a two week after the outbreak onset. The outbreak lasted for two weeks this was due to late notification of outbreak by health facility to next level (Fig.5: 21).

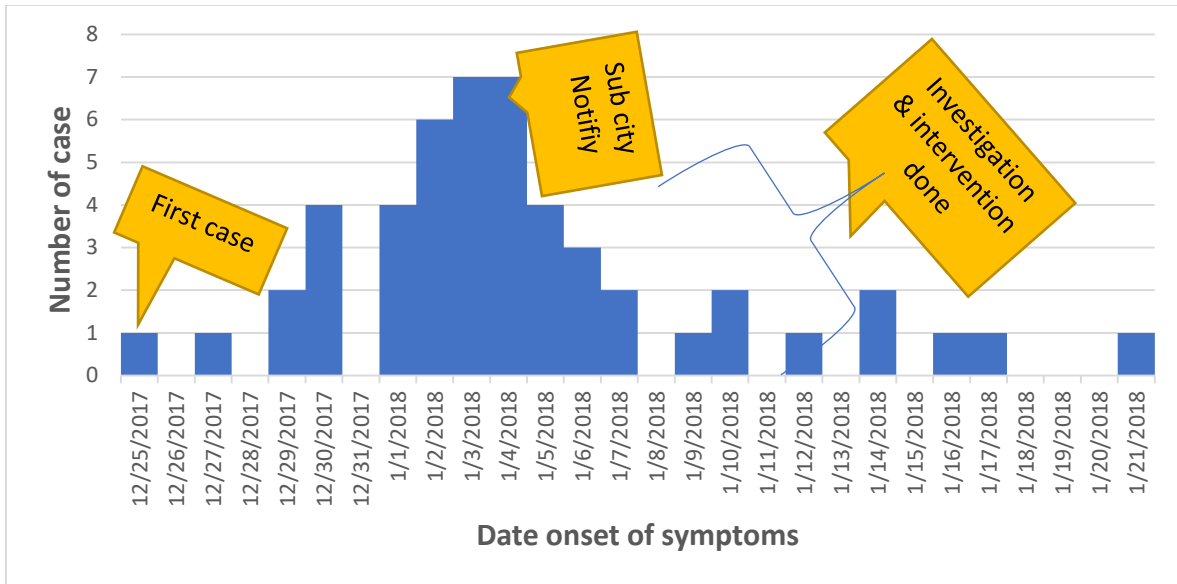


Figure5.1.23: Relapsing fever Cases by Date of Onset, Mission of charity clinic, Arada sub city, Addis Ababa, Ethiopia 2018

### 5.1.3.2 Analysis

During this case-control study, 50 relapsing fever case-patients and 100 controls were selected and interviewed patient to admitted by other case in mission of charity clinic. Selected controls were unmatched by age and sex with case-patients. With regards to age distribution 42(84%) of the cases and 86(86%) of the controls were 15-44years. The mean and media age of case were 26 and 24years respectively. for control the mean and media was 31 and 32years respectively. Regarding sex, 50(100%) of the cases and 100(100%) of the controls were male. In education 39(78%) of cases and 85(85%) of controls were primary school attended. On the knowledge level 19(38 %) case and 39 (39 %) control was good and 31(62%)case and 61(61 %) were poor. Of the interviewed cases 25(50%) and 75(75%) were daily laborers. (Table 5:20).

Table 5.1.19: Socio Demographic Distribution, in mission of charity clinic, Arada sub city, Addis Ababa, Ethiopia 2018

Variables	Category	Case (n=50)	Control(n=100)	P Value
Age groups	5-14yrs	3(6%)	1(1%)	Reference
	15-44yrs	44(88%)	86(86%)	0.039
	44+ yrs.	3(6%)	13(13%)	0.028
Educational status	Illiterate	9(18%)	14(14%)	Reference
	Primary	39(78%)	85(85%)	0.470
	Secondary	2(4%)	1(1%)	0.363
Residency status	Home	10(20%)	51(51%)	Reference
	Street	32(64%)	36(36%)	0.0002
	Bed room	8(16%)	13(13%)	0.038

During bi variate analysis six independent variables were associated with the occurrence of Relapsing fever outbreak. therefore from respondents of the study 50% (25) case and 30% (30) controls mass sleeping (COR = 2.3 95%CI [1.2-4.7]and p-value 0.016) , 39% (78) case and 48% (48) controls were not changing cloth at night COR = 3.8, [1.7-8.3] and p-value 0.0004,64%(32)case and36%(36) control were residence status on street (COR = 4.5, [2.0-10.4] and p-value 0.0002),16%(8) case and13%(13%) control were residence status daily mass bed room (COR = 3.1,[1.0-9.5] and p-value 0.038), 3(6%) case and 43(43%)body bath habits at list once a week (COR=0.1[0.01,0.2]and p-value 0.00000), 2(4%) case and 47(47%) control were frequency of washing clothes At least once per two weeks (COR= 0.02[0.003,0.09] p-value 0.00000) and 26(52%) case and 38(38%)control were frequency of washing cloths Once a month (COR= 0.2[0.1,0.8]and p-value 0.022) the associations were statistically significant.(table 5:21)

Table 5.1.20 Bi variate Independent Predictors of Relapsing fever in mission of charity, Arada sub city, Addis Ababa, Ethiopia 2018

Variables	Category	Case (n=50)	Control(n=100)	COR	P Value
Mass sleeping	Yes	25(50%)	30(30%)	2.3 (1.2,4.7)	0.016
	No	25(50%)	70(70%)		
Body bath habits	Above Three weeks	27 (54%)	22(22%)	Reference	0.00000
	At least once a week	3(6%)	43(43%)	0.1(0.01,0.2)	
Frequency of washing cloths	Not wash at all	11(22%)	4(4%)	Reference	0.00000
	At least once per two weeks	2(4%)	47(47%)	0.02(0.003,0.09)	
	Once a month	26(52%)	38(38%)	0.2(0.1,0.8)	
Not Changing cloth at night	Yes	39(78%)	48(48%)	3.8(1.7,8.3)	0.0004
	No	11(22%)	52(52%)	Reference	
Residency status	Home	10(20%)	51(51%)	Reference	0.0002
	Street	32(64%)	36(36%)	4.5(2.0,10.4)	
	Bed room	8(16%)	13(13%)	3.1(1.0,9.5)	

During multivariate analysis three independent variables were associated with the occurrence of relapsing fever outbreak. factors that remained independently associated with contracting relapsing fever outbreak in mission of charity were, mass sleeping, Residency status and not changing cloth at night. Case from of mass sleeping (AOR = 6.2, 95% CI [2.02-19.06]), not changing cloth at night (AOR = 8.8, 95%CI [1.5-50.8]) and residency status at street (AOR = 26.4, 95%CI [4.79-145.5]) and residency status at daily bed room (AOR=48.2,95%CI [7.5-83]) showed a statistically significant association. The likelihood of acquiring relapsing fever for those Not changing cloth at night was about eight times, Mass sleeping was six times, residency status on street was about twenty-six times and residency status on daily bed room was about forty-eight times higher compared to control. (Table 5:22).

Table 5.1.21 Multivariate independent Predictors of Relapsing fever in mission of charity, Arada sub city, Addis Ababa, Ethiopia 2018

Variables	Category	Case (n=50)	Control (n=100)	COR	AOR	P Value
Mass sleeping	Yes	25(50%)	30(30%)	2.3 (1.2,4.7)	<u>6.2(2.02,19.06)</u>	<u>0.0014</u>
	No	25(50%)	70(70%)	Reference		
Residency status	Home	10(20%)	51(51%)	Reference		
	Street	32(64%)	36(36%)	4.5(2.0,10.4)	<u>26.4(4.79,145.5)</u>	<u>0.0002</u>
	Bed room	8(16%)	13(13%)	3.1(1.0,9.5)	<u>48.2(7.5,83)</u>	<u>0.0000</u>
Not Changing cloth at night	Yes	39(78%)	48(48%)	3.8(1.7,8.3)	<u>8.8(1.5,50.8)</u>	<u>0.0157</u>
	No	11(22%)	52(52%)	Reference		

### 5.1.3.3 Public health intervention

Active search and management were conducted in Mission of charity clinic of the Arada sub city. Additionally, all patient was delousing and clean and change close in the admission time. Mission of charity clinic health professionals was conducted health education to all come to clinic about relapsing fever transmission, prevention and control measures.

#### **5.1.3.4 Discussion**

The onset date of the first case was on 25 of December 2018 in Mission of charity clinic reported. But the study was conducted from 1 January to 29 January 29. Among all cases 100% (50) were males and 88% (44) were within age group of 15 -44 years. The age ranges from 10 to 68years.

The reason for rapid spread of outbreak might be due to mass sleeping, lack of alternative clothes at night, poor personal hygiene. The number of cases was two times more than the previous year (2017) cases (only 24cases) reported to the sub city health office in the same period. The evidence showed that all daily laborers who live in mass sleeping, daily bed room and Not changing cloth at night condition were at risk of the outbreak.

The death rate from relapsing fever in this sub city was zero and the attack rate was four out of 10,000 populations which are more than Bahir Dar as a case-control outbreak investigation study done in 2012 which shows attack rate of 2.6 out of 10,000 populations [2], and two times less than Mekele, Tigray which was 8/100,000 population in 2016. On the other hand, our study shows the likelihood of acquiring relapsing fever for those sleep-in mass (more than six-member) and not changing clothes at night was six times and eight times higher compared to those not sleep in mass (sleeping in a member of less than six) and changing clothes at night respectively. And people who are commonly living on street and in Bed Room are 26 times and 48 times more affected than those who were living in their House respectively. This finding aligns with the study done in Mekele, Tigray in 2016. Those people who are commonly living on street and in Bed Room are 14 times and 16.5 times more affected than those who were living in their House respectively.

#### **5.1.3.5 Limitation**

- Relapsing fever line-list was not properly filled by clinic.
- Specific place of patient not identified.

### **5.1.3.6 Conclusion**

Among all case daily laborers, mass sleeping, street, daily bed room in mass and lack of alternative clothes change at night might contribute to increase the magnitude of the outbreak.

Exchanging information between different levels and providing prompt response in reducing undesirable disease outcomes, increasing daily laborer's awareness, solution to interrupt the occurrence and distribution of the relapsing fever out-break requires more effort from lower level health facility to woreda, sub city health office and stake-holders. This finding suggests that relapsing fever was a threat to daily laborers.

### **5.1.7 Recommendation**

- Strengthen active surveillance activities of the sub city for early detection of the outbreak.
- All stake holder to discuss the way how to minimize mass sleeping on daily bed room houses and solutions for daily laborers
- Increase daily laborer's awareness through continuous health information facility level and woreda level.

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# **Chapter-VI**

## **Abstracts for scientific presentation**

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### **6.1.1 Surveillance data analysis on Typhoid fever in Addis ketema sub city from 2012-2016 Addis Ababa Ethiopia.**

#### **Abstract**

**BACKGROUND:** - 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.

Typhoid fever is acute and often life-threatening febrile illnesses caused by systemic infection with the bacterium *Salmonella enteric sero type typhi* and paratyphoid, respectively. The most recent global burden of disease estimates for typhoid and paratyphoid fever reported that in 2010, there were 22 million new cases. Typhoid fever a significant health burden, especially in low- and middle-income countries. there for surveillance data analysis will carry out to describe the disease burden and trend.

**METHODS:** - A 5-year descriptive cross-sectional study on typhoid fever was conducted from January 6/2012 to April 8/2016. with the objective of describing the epidemiology of the disease, determining the burden, describing the disease in time, Person and place. data analyzed by using MS-Excel.

**RESULT:** -In year 2012 to 2016 reportable surveillance disease 53446 typhoid fever incidence cases were reported but there was no death in related to the case. Among these reported cases the highest incidence reported in 2015 ,11968(23%) and woreda 1with amount of 13765(26%) The disease mostly occurred during dry season or month of May with these 7279(14%) reported during the period.

**CONCLUSION:** -All Typhoid fever cases were treated at outpatient's department. The highest number of typhoid fever cases were reported during dry season on May during the reported period also the highest incidence reported by woreda one during the reported period. All governmental, non-governmental and NGO institutions should emphasis on hygiene and sanitation activity of the community. Training should be given on data analysis, documentation and reporting for PHEM officer of woreda and health facility.

**Key Word:** Surveillance analysis, Typhoid Fever,

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## Abstract

### 6.1.2 Relapsing fever outbreak investigation in Arada sub city, Addis Ababa, Ethiopia 2018

**Introduction:** Ethiopia is the main endemic focus of louse borne relapsing fever. *Borrelia recurrentis* is the etiologic agent for louse-borne relapsing fever and occurs as epidemic under conditions of poor socioeconomic status, overcrowding, poverty, draught and famine. Therefore, the aim of investigation was to investigate the occurrence outbreak of relapsing fever, identify the risk factors and suggest practical control measures to alleviate the disease burden of the community.

**Methods:** We conducted facility based unmatched case control study to investigate the outbreak. All patients from 3 January to 29 January 2018 were included. fifty patients un matched with hundred controls that had no previous history of relapsing fever and admitted to for other case in the facility. Study was conducted in on a daily basis and data was analyzed using Microsoft Excel and Epi-Info version 7.2.0.1.

**Results:** Among all confirmed patients 100% (50), was male. There was no death during the outbreak. Mean age of case respondents was 26 years and their median age was 24 years. Statistically significant associations were Mass sleeping (AOR = 6.2, 95% CI [2.02-19.06]), who did not change cloth at night (AOR = 8.8, 95%CI [1.5-50.8]) and residency status at street (AOR = 26.4, 95%CI [4.79-145.5]) and residency status at daily bed room (AOR=48.2,95%CI [7.5-83] showed a statistically significant association. Those Not changing cloth at night was about eight times, Mass sleeping was six times, residency status on street was about twenty-six times and residency status on daily bed room was about forty-eight times likely hood of acquiring relapsing fever compare to those who change cloth at night, who did not sleep in mass and not sleeping in street and daily bed room.

**Conclusion:** Among all case mass sleeping in street, daily bed room and lack of alternative clothes change at night were source and risk factor for the outbreak. Education on the transmission of Relapsing Fever was given to homeless and daily laborer people. The outbreak was contained due to prompt interventions taken and strong preventive measures were recommended to prevent emergence of future outbreak of relapsing fever.

**Keywords:** *Borrelia recurrentis*, Relapsing Fever, Arada sub city, Ethiopia

**Chapter- VII**  
**Protocol/ Proposal for**  
**Epidemiologic**  
**Research Project**

## **7.1 Burden of Road Traffic Accident and Associated Factors in Addis Ababa, Ethiopia 2018**

### **Summary**

**Background:** Road traffic injuries claim more than 1.25 million lives each year globally and have a huge impact on health and development. They are the leading cause of death among young people aged between 15 and 29 years, and cost governments approximately 3% of GDP. In 2013, over 85% of all deaths and 90% of disability adjusted life years (DALYs) lost from road traffic injuries occurred in low- and middle-income countries, which have only 47% of the world's registered vehicles. Road traffic accident is in a state of rise and recognized as a major socio-economic concern facing Ethiopia as the country is known as having one of the highest accident records in Africa--about 64 deaths per 10,000 vehicles. The capital city of Ethiopia, Addis Ababa, shares 65% of the total accident in the country.

**Objective:** The objective of this study is to describe the burden and its determinant factors of road traffic accident in Addis Ababa city administration.

**Methods:** A retrospective cross-sectional study, using both quantitative and qualitative methods, will be conducted from February 2018 to April 2018 in Addis Ababa city administration. The data for the quantitative method will be collected from registry of traffic police commission of Addis Ababa city Administration from January 2016 to December 2017, and for the qualitative method purposively selected traffic police officers, pedestrian and drivers will be used for key informant interview. The quantitative data will be entered and cleaned using Epi-info Version 7 and analyzed using SPSS version 23 statistical program. Logistic regression and Chi-square test will be carried out to identify factors associated. The qualitative portion of the study will be analyzed using a content analysis technique.

**Dissemination of Results:** The results of the study will be given to Addis Ababa university health science college school of public health and Addis Ababa city administration road traffic police commission.

### **7.1.1 Introduction**

Road Traffic Accident (RTA) can be defined as an accident that occurs on a way or street open to public traffic, resulting in one or more persons being killed or injured, and involving at least one moving vehicle (1) Every year the lives of approximately 1.25 million population are killed and more than 20 million are injured or disabled by road traffic accident globally. Although road traffic accident is a major global public health problem, most of it occurs in low middle-income countries including Ethiopia (3).

According to WHO Over 3 400 people die on the world's roads every day and tens of millions of people are injured or disabled every year. Road traffic injuries have become the leading cause of death for people aged 15–29 years. Over 90% of road traffic deaths and injuries occur in low-income and middle-income countries, which have only 48% of the world's registered vehicles. Nearly half (46%) of those dying on the world's roads are “vulnerable road users”: pedestrians, cyclists and motorcyclists.

In Africa, the numbers of road traffic injuries and deaths have been increasing over the last three decades. According to the 2015 Global status report on road safety, the WHO African Region had the highest rate of fatalities from road traffic injuries worldwide at 26.6 per 100 000 populations for the year 2013. In 2013, over 85% of all deaths and 90% of disability adjusted life years (DALYs) lost from road traffic injuries occurred in low- and middle-income countries, which have only 47% of the world's registered vehicles (3).

Road traffic injury is high in Ethiopia, at least 70 people die for every 10,000 vehicle accidents annually. According to Road Transport Authority report, 1,800 people died and 7,000 injured in 2003 across the country. In 2007/8, a total of 15,082 accidents occurred in the country. Of them the number of people killed was 2,161 while 7,140 experienced non-fatal injuries.

The capital city of Ethiopia, Addis Ababa, shares 65% of the total accident in the country (6).

### **7.1.2 Statement of problem**

In Ethiopia, the rate of road traffic accidents (RTAs) is very high; because road transport is the major transportation mechanism along with poor road infrastructure, poor traffic laws enforcement and other factors. The Ethiopian traffic control system archives data on various aspects of the traffic system, such as traffic volume, concentration, and vehicle accidents. With more vehicles and traffic, the capital, Addis Ababa, takes the lion's share of the risk, with an average of more than 20 accidents being recorded a day and even more going unreported (3).

Road traffic accident is one of the contemporary leading human security threats because it is the global socio-economic crisis. Currently, it has been ranked 9<sup>th</sup> leading cause of mortality, morbidity, diseases burden, in terms of disability adjusted life years (DALYs) lost globally. It is one of the most leading health problems along with diseases such as Diarrhea, Malaria, HIV/AIDS and Tuberculosis especially in low and middle-income countries (3).

Road traffic injuries place a heavy burden on national economies as well as on households. In low- and middle-income countries they particularly affect the economically active age group, or those set to contribute to family, society and the workforce in general. Many families are driven deeper into poverty by the loss of a breadwinner, or by the expenses of prolonged medical care, or the added burden of caring for a family member who is disabled from a road traffic injury.

Data suggest that road traffic deaths and injuries in low- and middle-income countries are estimated to cause economic losses of up 5% of GDP. Globally an estimated 3% of GDP is lost to road traffic deaths and injuries (4) (5).

Road traffic injury is high in Ethiopia, at least 70 people die for every 10,000 vehicle accidents annually. According to Road Transport Authority report, 1,800 people died and 7,000 injured in 2003 across the country. In 2007/8, a total of 15,082 accidents occurred in the country. Of them the number of people killed was 2,161 while 7,140 experienced non-fatal injuries.

The capital city of Ethiopia, Addis Ababa, shares 65% of the total accident in the country. Pedestrians are the most vulnerable ones in Addis Ababa; over 81% of accident fatalities are of accident type "car hit pedestrian" [6].

### **7.1.3 Significant of study**

Road traffic accidents are associated with area with high population densities of people and large number of vehicles. Addis Ababa as a political, commercial center represents the most complex motor and pedestrian traffic system. And has the highest population density and biggest number of vehicle registered in Ethiopia and also has the largest number of road traffic accidents, fatalities, injuries. Frequently road crashes are reported in public media on daily basis in the City of traffic police commission it was demand necessary to look at road traffic accident as “hidden epidemic causing injury related death.

The revelations that road traffic accidents would become 3rd major causes of global burden of disease by 2020 and that 85 % of these deaths occur in low and medium-income countries.

So, this study scientifically explored the burden of road traffic accidents and associated factors that are occurring in the city and try to fill the gaps by providing solutions to the problem in Addis Ababa.

#### **7.1.4 Literature Review**

Over 1.2 million people die each year on the world's roads, with millions more sustaining serious injuries and living with long-term adverse health consequences. Globally, road traffic crashes are a leading cause of death among young people, and the main cause of death among those aged 15–29 years. Road traffic injuries in 1990 are estimated to be the ninth leading burden of disease across all age groups globally and are predicted to become the 3rd leading contribute to the global burden of disease and injury by 2020 (7). This rise is driven by the escalating death toll on roads in low- and middle-income countries particularly in emerging economies where urbanization and motorization accompany rapid economic growth (4).

The pedestrian death rate in Western sub-Saharan Africa, 13.4 per 100,000, is the highest in the world, 8 times the rate in Western Europe the road user distribution of deaths and DALYs varies substantially across regions. However, the distribution of deaths does not differ much from that of DALYs in any given region. Pedestrians comprise 44% of road injury deaths in sub-Saharan Africa overall, 55% in the Central region, and 50% in the Eastern region.

In contrast, pedestrians account for only 35% of global road deaths. Taken together with bicyclists, non-motorized road users comprise half of all victims of fatal road injuries in sub-Saharan Africa, 60% in the Eastern region, and 58% in the Central region. Non-motorized modes comprise 42% in the Western region and 40% in the Southern region, similar to the global average of 41%. As expected from the lower level of motorization in sub-Saharan Africa, occupants of cars, buses, and trucks comprise a smaller proportion of road deaths. Vehicle occupants (3+ wheels) were victims in 30% of the fatalities in sub Saharan Africa compared with the global average of 36%. In the Central and Southern regions, the proportion of occupants was even lower at 26%.

Finally, motorcycle riders comprise 17% of deaths in the Southern and Western regions. The motorcyclist death rate in Western sub-Saharan Africa is the highest in the world, slightly higher than the rate in Southeast Asia (8). Four countries, Nigeria, Ethiopia, South Africa, and Sudan, together account for half of all road injury fatalities in sub-Saharan Africa (8).

The causes of road traffic accidents are multi-factorial. These factors can be divided broadly into driver factors, vehicle factors and roadway factors. Accidents can be caused by a combination of

these factors. Driver factors solely contribute to about 57 per cent of road traffic accidents and 93 per cent either alone or in combination with other factors (9).

Driver factors in road traffic accidents are all factors related to drivers and other road users. This may include driver behavior, visual and auditory acuity, decision making ability and reaction speed. Drug and alcohol use while driving is an obvious predictor of road traffic accident, road traffic injury and death (7).

Speeding, traveling too fast for prevailing conditions or above the speed limit, is also a driver factor that contributes to road traffic accidents. The risk of being injured increases exponentially with speed much faster than the average speed. The severity of injury depends on the vehicle speed change at impact and transfer of kinetic energy. Though vehicles traveling slower than average speed are also at increased risk of road traffic accidents, most involve speed too fast for the conditions (10).

Vehicle factors can be divided into vehicle design and vehicle maintenance. Some safety features of vehicles like seat belts and airbags are likely to reduce the risk of death and serious injuries. A well-designed and maintained vehicle is less likely to be involved in accidents. If the brakes and tires are good and the suspension well-adjusted, the vehicle is more controllable in an emergency and thus, better equipped to avoid accidents. Road design and maintenance is also a factor that contributes to road traffic accidents. The causes of road traffic accidents are not just human error or driver negligence. Unfortunately, Nigerian highways are arguably one of the worst and most dangerous in the world (10).

The study that has been conducted in central Ethiopia from the year 2002-2011 collected from sixteen traffic police stations has shown that, a total of 4,053 crashes occurred on the Addis Ababa Adama/Hawassa main road during the study period. Almost half, 46.4% (1,880) were property damage only crashes; 29.4% (1,193) fatal crashes and the rest 24.2% (980) injury crashes. From 1,193 fatal crashes 1,392 people were dying, on average 1.2 deaths per fatal crashes. Of these deaths, more than half 57.5% (800) were pedestrian, 32% (445) vehicle occupants and 10.5% (147) drivers. During the 980 injury crashes 1,749 people were injured, on average, 1.8 injuries per crash, over half, 55.2% (965) were vehicle occupants, followed by pedestrian 35.1% (614) and the rest 9.7% (170) were drivers (12).

Study on taxi drivers in Mekele, Ethiopia in 2014 shows that, among the 712 taxi drivers, 26.4% (n = 188) of them reported involvement in a road traffic crash within the past 3 years. Drivers who listened to mass media had decreased likelihood of road traffic crash involvement (AOR = 0.51, 0.33–0.78), while speedy driving (AOR = 4.57, 3.05–7.44), receipt of a prior traffic punishment (AOR = 4.57, 2.67–7.85), and driving a mechanically faulty taxi (AOR = 4.91, 2.81–8.61) were strongly associated with road traffic crash involvement. Receiving mobile phone calls while driving (AOR = 1.91, 1.24–2.92) and history of alcohol use (AOR = 1.51, 1.00–2.28) were also associated with higher odds of road traffic crash involvement (12).

Two studies focused in particular on the enforcement of existing road traffic safety measures. One study in Uganda increased police presence on four major roads in the capital city of Kampala; results found a point reduction of 17% in the number of road traffic deaths on these roads (13). Another study in Mexico examined the effect on increasing drunk driving law enforcement while also increasing seat-belt awareness campaigns in two major cities; this involved a focus on enforcement during the first year and the addition of the awareness campaign in the second year. Results revealed a decrease in road traffic crashes after the first year, but no significant reduction in deaths or injuries was seen in either year (14).

Traffic calming bumps, or speed bumps, are also another method of speed control. In a South African study, an interrupted time-series study examined the effect of speed bumps in two different residential locations. The addition of speed bumps reduced the number serious pedestrian-vehicle collisions by 22% and 23% while fatal pedestrian-vehicle collisions decreased by 50% and 68% in the two different locations (15).

## **7.1.5 Objective**

### **7.1.5.1 General objective**

- To describe the burden and factors associated of road traffic accident in Addis Ababa, Ethiopia, 2017.

### **7.1.5.2 Specific Objectives**

- To Determine the burden of road traffic accidents.
- To Identify associated factors of road traffic accidents.

## **7.1.6 Methods and Materials**

### **7.1.6.1 Study Design**

A retrospective cross-sectional study will be conducted on relevant police reports from all Sub city and city administration police commission found in Addis Ababa. The study will include all reports from January 2016 to December 2017. Both quantitative and qualitative methods will be used.

### **7.1.6.2 Study Area and Period**

Addis Ababa is In Ethiopian languages: Amharic, means “new flower” in Oromofia, Finfinnee it is the largest city in Ethiopia, the site of Addis Ababa was chosen by Empress Taytu Betul and it was founded in 1886 by her husband, Emperor Menelik II.

Addis Ababa is the seat of the Federal Democratic Republic of Ethiopia (FDRE) government. It is also home to the African Union, the Economic Commission for Africa and other international organizations. For administrative purposes, Addis Ababa city administration is divided into 10 sub-cities. Hence, Addis Ababa has a significant contribution to the economic, social and political sector development of the country. Located at the heart of the country with population around 3 million according to the 2007 population census, has a total land area of 54,000 hectares. The rapid increase in urban population with an annual growth rate of 3.8 percent per year. The study will be conducting in Addis Ababa city administration Traffic police commission and 10 sub city traffic police commission that will be included in the study. The study conducts from March 2018 to April 2018.

### **7.1.6.3 Study Population**

All RTCs from January 2016 to December 2017 reported in the registry of police commission from 10 Sub cities will be included in the study, and purposively selected traffic police officers and drivers will be used as key informant.

### **7.1.6.4 Inclusion Criteria**

All RTAs that has been registered on 10 Sub city of police station from January 2016 to December 2017.

### **7.1.6.5 Exclusion Criteria**

Records that lacks the relevant information needed will be excluded.

### **7.1.6.6 Data Collection Process and Data Quality Control**

Data will be collected from the 10 Sub city police commission RTC registry, using a checklist that is prepared based on the RTC registry format. 15 key informant interviews (five drivers, five pedestrians and five traffic police officers) will be conducted in Addis Ababa town. Informant drivers and police officers were purposively selected. A content analysis approach will be applied to the information obtained from interviewees.

The checklist for data collection is prepared in English and it will be translated into Amharic. The data collectors and the data collection supervisors will be training about the objectives, relevance of study. Confidentiality of information and data collection procedures. Every day, after data collection, data will be checked for completeness and coherence. Data will be cleaned and edited by removing missing values, using the Epi-info Version 7 statistical package.

### **7.1.6.7 Variables**

#### **7.1.6.7.1 Dependent Variables**

- Road traffic accidents
- Death due to RTA
- Disability Due to RTA

#### **7.1.6.7.2 Independent Variables**

- Socioeconomic characteristics such as; age, sex, marital status, occupation, religion, ethnicity,
- Drink drive
- Seat-belts
- Education status
- Weather condition
- Road type and condition

- Experience of driving
- Speed

These are summarized by conceptual frame work as follows:

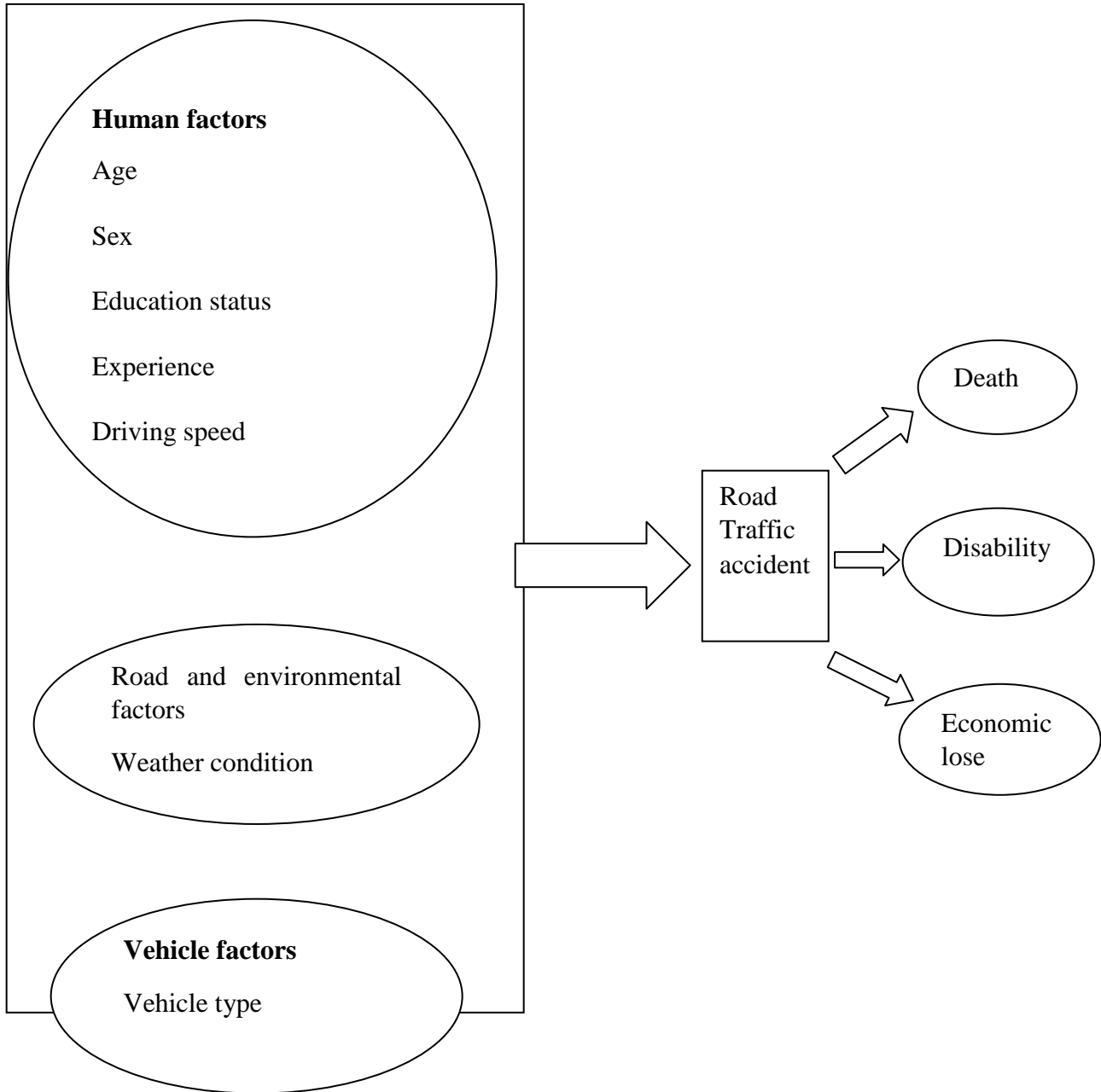


Figure 7.1.24: Determinants of RTAs-A Conceptual Framework

### 7.1.6.8 Data Analysis

All collected data will be entered using epi-info-7 software. The final data file will export into SPSS 24 statistical package for analysis.

All road traffic accidents registered at police commission will be described in place, time, and other measures of descriptive statistics. Cross tabulations will be made to calculate Crude odds ratio and adjusted odds ratio with its corresponding 95% CI will be computed to look into associations between variables. Chi-square test will be used to identify the association between road traffic accident and dependent variables. Binary logistic regression will be used to check variables association with the dependent variable and road traffic accident fatality. Those variables found to have p- values of  $\leq 0.2$  will be eligible to multivariable logistic regression to control the effects of con-founders. Odds ratios with 95% CI will be computed and variables having  $\square$ -Values  $\leq 0.05$  in the multiple logistic regression models Will be considered as significantly associated with the dependent variable statistically.

The qualitative data will be analyzed using a content analysis technique. The transcribed text will be imported into open Code to facilitate the coding process. Units of relevant meaning will be examined line-by-line and coded.

### 7.1.6.9 Operational Definitions

**Road Traffic;** A Movement of people, animals and vehicles from one place to another along roads and streets.

**Traffic Mix:** Form and structure of different modes of transport, motorized and non-motorized, that share the same road network.

**Road Traffic Accident;** A collision involving at least one vehicle in motion on a public or private road that results in at least one person being injured or killed

**Road Traffic Injuries:** fatal or non-fatal injuries incurred as a result of road traffic crash

**Road Traffic Fatality:** A death occurring within 30 days of the road traffic crash

**Severe injury:** At least one person was injured and admitted in hospital, but no deaths occurred.

**Slight injury:** At least one person required medical care, but no fatalities or injuries that required hospitalization occurred.

**Property damage:** All collisions that did not result in injuries or deaths.

#### **7.1.6.10 Ethical Considerations**

Ethical clearance will be secured from ethical review committee of Addis Ababa University School of Public Health. An official letter of cooperation will be written by the department of Public Health to Addis Ababa Police Commission in the study area. Information about the study will be provided to the police officials working on RTCs. Informed written and oral consent will obtain from each study subject after explanation of, what they will take part in the research and any involvement will be done after his or her complete consent. Confidentiality will be ensured from all data collectors and principal investigator's side via using code numbers than names and keeping questionnaires locked. Data collectors interview separately from other people to keep the privacy of the clients.

#### **7.1.6.11 Dissemination of the Research Finding**

The results of the study will be given to Addis Ababa university health science college school of public health and Addis Ababa city administration road traffic police commission.

### Annex 7.1.0 Work Plan (Project Time/Task Chart)

N <sup>o</sup>	Activities	Responsible	Time periods					
			January, 2018	February, 2018	March, 2018	April, 2018	May, 2018	June, 2018
1	Accomplishing the project proposal and literature review	Investigator						
2	Questionnaire development	Investigator						
3	Approval of Ethical clearance	AAUSPH						
4	Budget securing	Investigator & AAUSPH						
5	Recruitment of supervisors and training	Investigator						
6	Data collection	Investigator & supervisors						
7	Data coding entry and cleaning	Investigator						
8	Data analysis	Investigator						
9	Writing up	Investigator						
10	Submission of first draft	Investigator						
11	Second draft submission	Investigator						
12	Final report submission	Investigator						
13	Defense	Investigator						

## 1. Budget

Annex7.1.0. Budget breakdown to describe the burden and its determinant factors of road traffic accident in Addis Ababa, Ethiopia 2017.

Sr. No	Budget category		Unit	QTY	Unit cost	Multiplying factor	Total cost
					/ETB/		
1.	Personnel	Supervisors	No	2	200	2*4*200	1600
		Data collectors	No	10	200	10*4*200	8000
		Data entry	No	2	100	2*3*400	2400
2.	Supplies	Pen					
			Pcs	10	10	10*10	100
		Pencil	Pcs	10	3	10*3	30
		Eraser	Pcs	10	3	10*3	30
		Sharper	Pcs	10	5	10*5	50
		Printing paper	Ream	5	120	3*120	360
		Printing and binding	Draft	4	100	4*100	400
3.	Total	Total					12970
		Contingency (15%)					1945
		Grand total					14,915

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# **Chapter- VIII**

## **Other Additional out put**

## 8.1 Addis Ketema Sub city weekly bulletin surveillance Trend Analysis

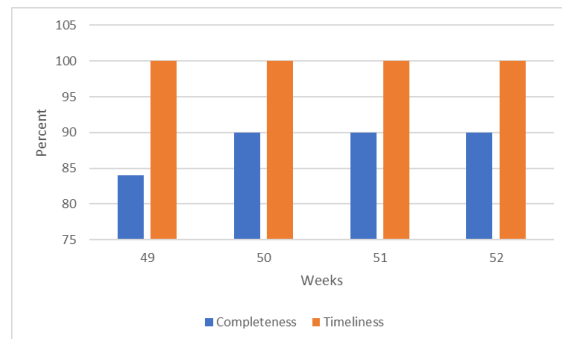
### Highlights

- Addis ketema subcity surveillance report timeliness and completeness rates in the 52 epidemiological weeks of 2017 were 100% & 90%.
- Number of malaria cases were 6 in the 52 weeks of 2017. There was a decrease in 1 case when compared to last weeks.
- 51 relapsing fever cases were reported in the 52 weeks. It shows an increment in 47(92%) when compared to the last week.
- Numbers of typhoid cases were 346 in week 52 of 2017. It shows an increase by 28 case compared to the last week.
- Numbers of epidemic typhus cases were 187 in the 52 weeks 2017. There was a decrease in 8 case compare to last weeks
- Number of dysentery case were 45 in the 52 weeks of 2017. There was increase in 26 case compare to last week.

emergency management activities and summarizes surveillance data and performance on epidemic prone diseases and other public health emergencies. The bulletin mainly includes surveillance data in the epidemiological week 52 of 2017. received through SMS and telephone call. It highlights the surveillance completeness and timeliness across epidemiological weeks, trends of diseases under surveillance, cluster of cases and events, ongoing outbreak and responses undertaken at all levels in the sub city.

### 8.1.2 completeness and timeliness.

In the epidemiological week 52 of 2017 the aggregated surveillance result of completeness and timeliness rate were 90% & 100%. It shows same as compared to the last weeks of 2017. The completeness and timeliness in 52 weeks of epidemiological were above the standard value.



### 8.1.1 Introduction

This weekly epidemiological bulletin serves to provide key information on public health

Figure8.1.25. completeness and timeliness by epidemiological week 49-52 of 2017.

### 8.1.3 Diseases and conditions

#### 8.1.3.1 Malaria

Total malaria confirmed cases in the 52 weeks of 2017. were 6. It has decreased by 1 case when compared to the last weeks. Among the confirmed cases, P. Vivax and Falciparum were 5 and 1case diagnosed and reported in epidemiological week 52.

#### 8.1.3.2 Typhoid fever

A total of 346 typhoid cases with no death were reported in the week 52 of 2017. It shows an increment in 8% compared to the last weeks. Higher numbers of cases were reported at week 52 woreda 1,

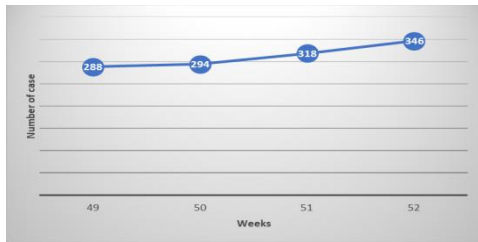


Figure8.1.23 Trends of Typhoid fever cases, Addis ketema sub city, week 49-52,2017.

#### 8.1.3.3 Dysentery

A total of 45 dysentery cases were reported during the week 52 of 2017. The number of cases show decrease in 37% when compared to the last weeks.

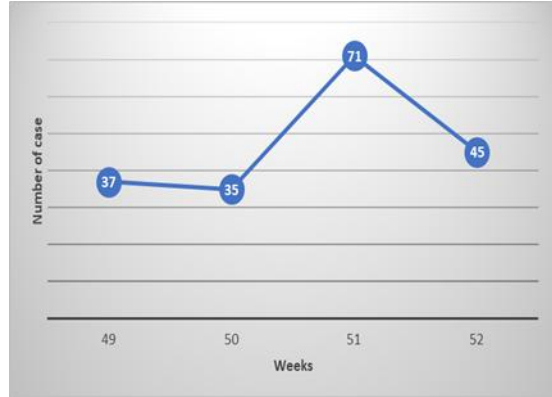


Figure8.1.26-Trends of Dysentery cases, Addis Ketema subcity, week 49-52 of 2017.

#### 8.1.3.4 Relapsing Fever

A total of 51 relapsing fever cases were reported in epidemiological week 52. There was an incremental in 47(92%) cases when compared to the last weeks.

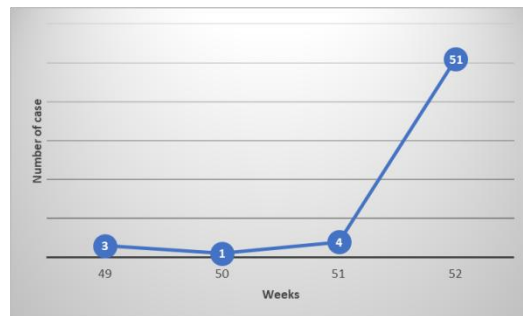


Figure 27Trends of Relapsing fever cases, Addis Ketema subcity at the week 52 of 2017.

#### 8.1.3.5 Epidemic Typhus

A total of 187 Epidemic Typhus cases were reported during the week 52 of 2017. The number of cases show a decrease 8 case

compared to the last weeks. Higher numbers of cases were reported from woreda 8, followed by woreda 9 and woreda 5.

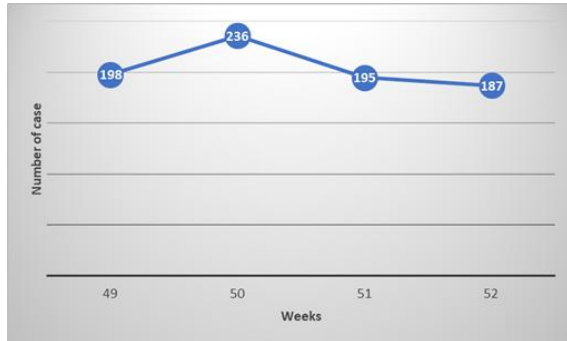


Figure 8.1.28-Trends of Epidemic Typhus Cases, Addis Ketema subcity, week 52 of 2017

### 8.1.3.6 Malnutrition

A total of 11 cases were reported in this 52 weeks of 2017, of which 4 were SAM and 7 were MAM.

In this quarter, NNT, SARS, polio, Anthrax, rabies, Guinea worm, VHF, Yellow fever and

other immediately reportable diseases were reported 0.

### 8.1.4 Recommendations

- Community surveillance should be strengthened.
- The issue of MDSR is neglected. It should be strengthened.

### 8.1.5 Response

- ❖ Official letter has been written to trade and industry and FMHACCA offices concerning making illegal bed renters under the control of FMHACCA.
- ❖ For all woreda community awareness to prevent and control of relapsing fever outbreak.

**Annex1.1.0 Questionnaires for case control study on Relapsing Fever Outbreak Investigation in Arada sub city, 2018**

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

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

Name of principal investigator-----

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

<b>S/n</b>	<b>Questions</b>	<b>Multiple choice</b>	<b>Skip</b>
	<b>Part I Socio demographic data</b>		
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)	
7.	House N <sup>o</sup> (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	<ol style="list-style-type: none"> <li>1. Orthodox</li> <li>2. Muslim</li> <li>3. Protestant</li> <li>4. Catholic</li> <li>5. Others</li> </ol>	
12.	Ethnic group	<ol style="list-style-type: none"> <li>1 Amhara</li> <li>2 Oromo</li> <li>3 Tigray</li> <li>4 SNNP</li> <li>5 Other(specify)-----</li> </ol>	
13.	Respondent's educational status	<ol style="list-style-type: none"> <li>1. Illiterate</li> <li>2. Elementary</li> <li>3. Secondary</li> <li>4. Preparatory</li> <li>5. Higher education</li> </ol>	
14.	Respondent's occupation	<ol style="list-style-type: none"> <li>1. Employed</li> <li>2. Private owner</li> <li>3. Daily laborer</li> <li>4. House wife</li> <li>5. Student</li> <li>6. No Occupation</li> </ol>	If Student or No occupation skip Q 15 & 16
15.	Working place	-----	
16.	Respondent's monthly in come	-----	
17.	Respondent category	<ol style="list-style-type: none"> <li>1 Case</li> <li>2 Control</li> </ol>	

<b>Part II Participant status and clinical description</b>		
18.	Referral information	1. Self-referral 2. Private 3. Hospital/clinic 4. Gov, facility

<b>S/n</b>	<b>Questions</b>	<b>Multiple choice</b>	<b>Skip</b>
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 N <sup>o</sup> 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 delouse before discharge	1. Yes 2. No	NA for Controls

30.	What is the symptoms that the patient experiencing? (History + PE) <b>(Circle all that applies)</b>	1. Fever 2. Chills 3. Headache 4. Nausea or Vomiting 5. Malaise Myalgia 6. Joint Pain 7. Enlarged Liver 8. Enlarged Spleen 9. Jaundice 10. Photophobia 11. Nosebleeds 12. Sweating	
-----	---	---	--

		13. Blood in urine 14. Skin Rash	
31.	Did the patient experience rash	1. Yes 2. No	If No Skip Q 33
32.	Describe the rash	-----	
<b>Part III Laboratory test and Treatment</b>			
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 hemiparasite seen 2. Borrelia species seen	
36.	Laboratory Name	-----	
37.	Did the patient got medication?	1. Yes 2. No	If no go to Q. N <sup>o</sup> 39
38.	Types of Drug given for the patient	-----	

Part IV Knowledge questions			
39.	Do you know RF?	<ol style="list-style-type: none"> <li>1. Yes</li> <li>2. No</li> </ol>	
40.	How RF can be transmitted?	<ol style="list-style-type: none"> <li>1. Through body louse</li> <li>2. Sleeping with RF ill person</li> <li>3. Sleeping in overcrowded house(place)</li> <li>4. Other(specify)_____</li> <li>5. I don't know</li> </ol>	
41.	How RF can be prevented	<ol style="list-style-type: none"> <li>1. Keeping personal hygiene</li> <li>2. Keeping environment clean</li> <li>3. I don't know</li> <li>4. Other ____</li> </ol>	
42.	Who can be more affected by RF?	<ol style="list-style-type: none"> <li>1. Poor people</li> <li>2. Street /orphans</li> <li>3. Other</li> <li>4. I don't know</li> </ol>	

S/n	Questions	Multiple choice	Skip
43.	Do you think personal hygiene can prevent RF?	<ol style="list-style-type: none"> <li>1. Yes</li> <li>2. No</li> <li>3. I Don't know</li> </ol>	
44.	Where did you go first when you get ill?	<ol style="list-style-type: none"> <li>1. Health facility</li> <li>2. Traditional healer</li> <li>3. Holy water</li> <li>4. stays at home</li> <li>5. Other(Specify)_____</li> </ol>	

45.	Which method do you think is best for RF treatment?	<ol style="list-style-type: none"> <li>1. Modern medicine</li> <li>2. Traditional medicine</li> <li>3. Holly water</li> <li>4. Nutritious food</li> <li>5. Stays indoor</li> <li>6. Delousing</li> </ol>	
<b>Part V EXPOSURE: - Risk or exposure of louse born relapsing fever</b>			
46.	How many peoples sleep together?	-----	
47.	How frequent do you groom your hair?	<ol style="list-style-type: none"> <li>1. Every two weeks</li> <li>2. Every month</li> <li>3. Every two to three months</li> <li>4. More than three months</li> </ol>	
48.	How frequent do you take body bath?	<ol style="list-style-type: none"> <li>1. At least once a week</li> <li>2. Twice a week</li> <li>3. Every two to three weeks</li> <li>4. Other -----</li> </ol>	
49.	How frequent you wash your clothes	<ol style="list-style-type: none"> <li>1. Once a week</li> <li>2. Every two weeks</li> <li>3. Every three weeks</li> <li>4. Once a month</li> <li>5. Not wash at all</li> </ol>	
50.	Do you change your cloths at night?	<ol style="list-style-type: none"> <li>1. Yes</li> <li>2. No</li> </ol>	
51.	Have you Contact with LBRF ill person	<ol style="list-style-type: none"> <li>1. Yes</li> <li>2. No</li> </ol>	

## Annex 1.2.4 Questionnaire for Case - control study on Measles outbreak in Arada sub city, woreda 2, Addis Ababa 2018.

### Case status”

1. Case

2. Control

Patient Name \_\_\_\_\_ Date of Data collection \_\_\_\_\_

Region \_\_\_\_\_ Zone \_\_\_\_\_ Woreda \_\_\_\_\_ Kebele \_\_\_\_\_ Got \_\_\_\_\_ Phone \_\_\_\_\_

Location: Longitude: \_\_\_\_\_ Latitude: \_\_\_\_\_

### I. Socio-demographic Characteristics

S. No	Questions	Alternatives
1.1	Sex	1. Male 2. Female
1.2	Age	years _____ Months _____
1.3	Occupation of the patient/control	1. Farmer 2. House wife 3. Student 4. Unemployed 5. Daily laborer 6. Merchant 7. Gov't 8. Other (specify) _____
1.4	Family Occupation	1. Farmer 2. House wife 3. Student 4. Unemployed 5. Daily laborer 6. Merchant 7. Gov't 8. Other (specify) _____
1.5	Religion	1. Orthodox 2. Protestant 3. Muslim 4. Catholic 5. Other (specify) _____
1.6	Ethnic group	1. Oromo 2. Tigre 3. Amhara 4. Other (specify)
1.7	Educational level of the patient/control	1. Illiterate 2. Read and write 3. Elementary

		4. Secondary 5. Above secondary 6. Under school age
1.8	Educational level of the family	1. Illiterate 2. Read and write 3. Elementary 4. Secondary 5. Above secondary
1.9	Marital status of the patient/control	1. Single 2. Married 3. Divorced 4. Widowed 5. Separated
1.10	Family size	_____
1.11	Is there any sick person with rash, fever, running nose/conductivities (illness)? In the family?	1. Yes    2. No
1.12	If yes, number of sick person	_____

**II. Clinical History of Diseases:**

2.1	What was the symptom?	1.fever 2.Rash 3.cough, 4.coryza (runny nose), 5. conjunctivitis (red eyes) 7. Ear discharge 8. pneumonia 10. Vomiting 11. Others_____
-----	-----------------------	--

2.2	<b>ONLY if complication</b>	i) Pneumonia: yes, no j) Cornea: yes, no k) Blindness: yes, no l) Convolution: yes, no m) Otitis media (ear discharge): yes, no n) diarrhea: yes, no o) Feeding problem: yes, no
2.3	Date of rash on set	/ / _____
2.4	Duration of rash _____	
2.5	Date seen at health facility	___ / ___ / ___
2.6	Illness duration before visiting the health facility	_____ in days/hours
2.7	Did you (he/she) take treatment?	1.Yes 2.No
2.8	Location when rash started?	woreda _____ Kebele _____
2.9	Did you recover after the treatment?	1.cure 2. partially 3. deteriorated/disabled 4.death

### III. Risk factor

3.1	Did you ever vaccinate for measles?	1.Yes 2.No 3. Unknow 4.Not applicable
3.2	If yes last vaccination date	1. Patient recall _____ dd/mm/yy 2. Vaccination card _____ dd/mm/yy 3. Don't remember

3.3	Number of vaccine doses received	1. One dose 2. Two doses 3. Three and above 4. Don't remember
3.4	Age of vaccination at first vaccinated.	_____
3.5	If not vaccinated why?	<input type="checkbox"/> lack of knowledge about vaccination campaign, <input type="checkbox"/> absence during vaccination campaign, <input type="checkbox"/> other, specify
3.6	Did you have any travel history 7-18 days to areas with active measles cases before onset of symptoms?	1. Yes 2. No

		If Yes where _____
3.7	Did you contact with a person with measles symptoms within the last 2-3 weeks?	Yes No
3.8	Do you have any travel history four days before and after rash onset	1. Yes 2. No If yes where _____
3.9	Do you have any contact history with someone else four days before and after rash onset	1. yes 2. No If yes with whom _____
3.10	If Yes to question 3.5 place of travel	1. School 2. Neighbor 3. Market 4. Other _____
3.11	Do you know modes of transmission for measles?	1. Yes 2. No 3. If yes specify _____

3.12	Nutritional status of the cases	1.Normal 2.Moderate 3.Severely malnourished
3.13	What is the estimated area of the house?	_____
3.14	House condition?	ventilated not-ventilated
3.15	Distance from house to HC?	greater than 5 km equal or less than 5 km
3.16	Where did you go first when you get ill?	1. Health Facility 2. Traditional Healers 3. Holy Water 4. Stayed at home 5. Other :( Specify) _____
3.17	How do you think people get measles?	1. Contact with a virus from ill person 2. From God 3. Bad attitude of other people 4. Other(Specify)
3.18	Do you Know measles is vaccine preventable?	1. Yes 2. No 3. Don't Know
3.19	Who do you think can be affected by measles?	1. Children of aged less than 5 years 2. Children of aged less than 18 years 3. Women of any ages 4. Any age groups of both male and women 5. Other (specify): _____
3.20	How do you think measles can be cured?	1. Using modern medicine 2. Using traditional Medicine 3. Holly water 4. By feeding nutritious foods 5. Keeping the sick person indoor 6. Other(Specify)_____

**Annex3.1.0 Questionnaire for Evaluation of surveillance system in Addis ketema sub city 2017.**

No.	Question	Coding Classification
<b>1. Background Information</b>		
1.1	Region	Addis Ababa
1.2	Zone/Sub-city	Addis Ketema
1.3	Woreda	
1.4	Name of Health Facility	
1.5	Respondent Name:	
1.6	Catchment total Population	_____
<b>2. Case Detection and Registration</b>		
2.1	Is there national manual/guide line for surveillance at your office?	1.Yes 2. No
2.2	Do you have <b>Cholera</b> and Typhoid fever case definition?	1.Yes 2. No
2.3	If yes, is it posted?	1.Yes 2. No
2.4	Does all professionals are aware of it?	1.Yes 2. No
2.5	Do you have rumor log book?	1. Yes 2. No
2.6	If answer for 2.5 is <b>yes</b> did you register rumor and did verification?	1. Yes 2. No
<b>3. Case confirmation</b>		
3.1.	Do your health facility/health office have the capacity to collect sputum, blood/serum, stool or other specimens?	1.Yes 2. No
3.2	Does your Woreda/HC have the capacity to transport specimens to a higher-level lab?	1.Yes 2. No
3.3	Does your Woreda/HC have guide line for specimen collection, handling and Transportation?	1.Yes 2. No
<b>4. Reporting</b>		
4.1	Did you send Cholera & Typhoid fever surveillance data to the next level?	1.Yes 2. No
4.2	Did you know national time dead line report for immediately	1.Yes 2. No

	and weekly reportable disease?	
4.3	If answer for 4.2 is <b>Yes</b> , in what time and when did you report to the next level respectively?	_____
4.4	Does your Woreda/HC have access to communication facility?	1.Internet 2. Fax 3. Phone
4.5	How do you send the data to the next level?	1.mail 2. phone 3. others
4.6	When do you expected to send surveillance data to next level?	
4.7	Have you lacked a recommended format in last 6 months?	1.Yes 2. No
<b>5. Data analysis and interpretation</b>		
5.1	Had you trained on Cholera & Typhoid Fever surveillance system?	1.Yes 2. No
5.2	Did you have computer?	1.Yes 2. No
5.3	Is it functional?	1.Yes 2. No
5.4	Did you have computer skill?	1.Yes 2. No
5.5	Did you analyze Cholera & Typhoid Fever surveillance data?	1.Yes 2. No
5.6	Did you use computer to analyze Cholera & Typhoid Fever surveillance data?	1.Yes 2. No
5.7	If answer for 5.6 is <b>yes</b> , did you describe data by time, place and person?	1.Yes 2. No
5.8	Did you perform trend analysis of case by time (line graph)	1.Yes 2. No
5.9	Did you have appropriate <b>denominator</b> for data analysis?	1.Yes 2. No
5.10	Did you notify the results of your analysis to the sub-city?	1.Yes 2. No
5.11	Do you have an action threshold for any of country priority disease/ ( <b>Cholera&amp; Typhoid Fever ...</b> )?	1. Yes 2. No
5.12	If answer for 5.11 is <b>yes</b> , what is it? (Ask 2 priority disease)	_____case _____% increase
5.13	How often did you analyze collected data? (Daily, weekly, monthly, Quarterly, as needed_____)	_____
<b>6. Outbreak investigation</b>		
6.1	Is there suspected outbreak of Cholera & Typhoid Fever in the last 6months? ( <b>Obs.</b> Report and take copies if possible)	1.Yes 2. No

6.2	If answer for 5.2 is <b>Yes</b> , has your Woreda/HC investigated the outbreak?	1.Yes 2. No
<b>7. Epidemic preparedness</b>		
7.1	Did your Woreda/HC have written plan for Epidemic preparedness and response?	1.Yes 2. No
7.2	Did your Woreda/HC had emergency stocks of drugs and supplies at all time in the last 1 year?	1.Yes 2. No
7.3	Has your Woreda/HC experienced shortage of drugs, Vaccines or supplies during the most recent Epidemic/outbreak?	1.Yes 2. No
7.4	Is there a budget line or access to funds for epidemic response?	1.Yes 2. No
7.5	Does your Woreda/HC have rapid response team for epidemics?	1.Yes 2. No
<b>8.Responses and Controls</b>		
8.1	Has your Woreda/HC have implemented prevention and control measures based on local data for Cholera & Typhoid fever? ( <b>at least for 1 disease</b> )	1.Yes 2. No
8.2	Does your Woreda /HC respond within 48 hrs. Of notification of most recently reported out break?	1.Yes 2. No
8.3	Does your woreda/HC's rapid response team /Epidemic management committee have evaluated their preparedness and response activities in the last year? (Obs. written report to conform)	1.Yes 2. No
<b>9. Feedback</b>		
9.1	Did you provide Feedback to lower level in the last 6 months?	1.Yes 2. No
9.2	How did you give your feedbacks?	1.Oral 2. Written
9.3	If answer for 9.2 is yes, how often did you provide? (weekly, monthly quarterly biannually, annually)	_____
9.4	Did you receive feedback from higher level in the last 6 months on the data you provided?	1. Yes 2. No

No.	Question	Coding Classification
<b>10. Training</b>		
10.1	Did you take training on Cholera & Typhoid Fever surveillance within the last year?	1. Yes 2. No
10.2	How many staffs were trained?	_____
<b>11. Supervision</b>		
11.1	Did you conduct supervision in the last 6 months?	1. Yes 2. No
11.2	If answer for 11.1 is <b>yes</b> , how many times did you supervise?	_____
11.3	How often you supervise? (Weekly, monthly, quarterly ...)	_____
11.4	Did you have supervision checklist?	1. Yes 2. No
<b>Surveillance Attribute</b>		
<b>12. Completeness</b>		
12.1	Number of sites expected to report and reported in the last 1 month respectively	Exp.    Reported ____    ____
12.2	Are all Cholera & Typhoid Fever cases in the last one month from registry was reported?	1. Yes 2. No
12.3	Number of Cholera and typhoid cases from registry and report format in the last 1 month respectively	____    ____ ____    ____
<b>13. Timeliness</b>		
13.1	Is the surveillance data come on time?	1. Yes 2. No
13.2	Percentages of HF submit their report on time?	_____
<b>14. Usefulness</b>		
14.1	Did the suspected outbreaks were detected early by the surveillance system?	1. Yes 2. No
14.2	Did the response initiated in a timely manner?	1. Yes 2. No
14.3	Did any epidemiological investigation conducted?	1. Yes 2. No
14.4	For what purposes do you use the surveillance data? (E.g.	_____

	early warning and routine program monitoring)	
<b>15. Simplicity of the system</b>		
15.1	Is the case definition easy?	1.Yes 2. No
15.2	Does the system allow all levels of professionals to fill data?	1.Yes 2. No
15.3	Does the system help to record and report data on time?	1.Yes 2. No
15.4	How long does it take to fill the format?	_____
15.5	How long does it take to have laboratory confirmation?	_____
<b>16. Acceptability</b>		
16.1	Did you believe the surveillance is important for public health intervention?	1.Yes 2. No
16.2	Did you accept the Cholera and Typhoid Fever surveillance system?	1.Yes 2. No
16.3	Do you think the reporting agents accept and well engaged to Cholera and Typhoid Fever surveillance activities?	1.Yes 2. No
16.4	If yes, how many are active participants in your health center/Woreda	_____
16.5	If No, what is the reason for their poor participation in the surveillance activity	_____
16.6	Were all participants using the standard case definition to identify cases?	1.Yes 2. No
16.7	Were all the reporting agents sending their report using the current and appropriate surveillance reporting format?	1.Yes 2. No
<b>No.</b>	<b>Question</b>	<b>Coding Classification</b>
<b>17. Flexibility</b>		
17.1	Can the current reporting formats be used for other newly occurring health event (disease) without much difficulty?	1.Yes 2. No
17.2	Did you think that any change in the existing procedure of case detection and reporting format	1.Yes 2. No

	will be difficult to implement?	
17.3	Is the system easy to add new variables?	1.Yes 2. No
17.4	Is the system easy to integrate with other systems?	1.Yes 2. No
<b>18. Data quality</b>		
18.2	Are all reported forms Complete?	1.Yes 2. No
18.4	Is the recorded data clear to read and understand?	1.Yes 2. No
<b>19. Representativeness</b>		
19.1	Was the surveillance system enabled to follow the health and health related events in the whole community?	1.Yes 2. No
<b>20. Stability</b>		
20.1	Was any new restructuring affecting the procedures and activities of the surveillance?	1.Yes 2. No
20.2	Was there lack of resources that interrupt the surveillance system?	1.Yes 2. No
20.3	Was there any time /condition in which the surveillance is not fully operating?	1.Yes 2. No

**Annex4.1.0 Data collection tool for community health profile assessment in Woreda 7, Addis ketema sub city 2017.**

**1. Historical Aspects of the woreda**

- Woreda Name -----
- When was the woreda established -----
- How & why the name given -----
- Any other historical aspect -----

**1. Geography and Climate (including map, altitudes, agro ecological zones etc.)**

- Woreda map -----
- Location (distance from sub city --03km\_Direction -----
- Surface Area ----- square meter (\_\_\_\_? \_\_\_% from the sub city) -----
- Woreda boundaries
  - North, ----South, ----East -----West -----

**2. Political and Administrative Organization**

- Total no. of kebeles/ketena: -----

**3. Population and Population structures**

**A. Demographic data**

- Total Population ----- Male -----Female ----- sex ratio male/female -----
- Population under 1yrs -----
- Population under five yrs. -----
- Population < 15 years -----
- Population 15-24years -----
- Population 15-59 -----
- Women 15\_49 years of age -----
- Total population by kebele or ketena (each kebele pop) -----
- Average household size -----
- Annual population growth rate (%) -----
-

## B. Ethnic/language

- Tigre \_\_\_\_\_ (\_\_\_\_ %),
- Oromo \_\_\_\_\_ (\_\_\_\_\_%), Amhara \_\_\_\_\_ (\_\_\_\_\_%),
- Others \_\_\_\_\_ (\_\_\_\_\_%)

## C. Religion

- Muslim \_\_\_\_\_ (\_\_\_\_\_%), Orthodox \_\_\_\_\_ (\_\_\_\_\_%),
- Protestant \_\_\_\_\_ (\_\_\_\_\_%), Other \_\_\_\_\_ (\_\_\_\_\_%)

## 4. Economy (mainstay of the economy, average income levels etc.)

- Main income sources
  - ✓ Government employment
  - ✓ NGO employment
  - ✓ Tourism
  - ✓ Trade
  - ✓ Other business

## 5. Education and school Health

- Number of educational institution
  - ✓ K.G -----
  - ✓ Primarily and Secondary School -----
  - ✓ Preparatory -----
  - ✓ College/ University -----
  - ✓ TVET -----
- Total School Age Children (target) -----
  - ✓ Total Enrolment -----Male ----- Female -----
  - ✓ School dropout in 6 months or year -----
  - ✓ If there is school dropout, why. -----
- Educational status of the community
  - ✓ Total non-Educated people -----
    - Male -----
    - Female -----
- Number of teacher in the woreda ----- Male -----Female -----

## 6. Facilities

### A. Transport

- Road network with respect to health facility -----
- How many kebeles/ketena have access to transportation -----

### B. Telecommunication

- How many people have access to fixed telephone? -----
- How many people have access to mobile phone? (coverage) -----

### C. Power supply

- How many house hold get power supply ----- house hold?

### D. Water

- Total safe water coverage ----- House hold -----
- Safe water supply coverage by kebele/ketena -----
- Main source of water supply -----
- Kebeles/ketena getting safe water ----- house hold from total -----house hold
- Population getting safe water -----

## 7. Woreda Health system

- The general health system structure of the woreda health center (flow chart) -----
- Is there rapid response team (RRT) at woreda level? Yes/No-----
- If yes, describe the HMT in detail (composition and function)-----
- Do you have NGOs working on health and health related issues? Yes /No-----
- List the NGOs and their work in related to health.-----

## 8. Vital Statics and Health Indicators

- Infant Mortality Rate (IMR) ----- (total <1 yr. deaths  
2007 E.C -----2008 E.C -----2009 E.C -----)
- Child Mortality Rate -----(this year's total <15 yr. Deaths)  
2007 E.C-----2008 E.C ----- 2009 E.C -----
- Crude Birth Rate -----  
2007 E.C-----2008 E.C ----- 2009 E.C -----
- Crude Death Rate ----- (total deaths)

- 2007 E.C -----2008 E.C----- 2009 E.C -----
- Maternal Mortality Rate -----(total maternal deaths)  
2007 E.C -----2008 E.C ----- 2009 E.C -----
  - ANC rate (how many of the total expected pregnancies attended 1st ANC)  
2007 E.C ----- 2008 E.C ----- 2009 E.C -----
  - ANC rate (how many of the total expected pregnancies attended 4th ANC)  
2007 E.C ----- 2008 E.C ----- 2009 E.C -----
  - Percentage of deliveries attended by skilled birth attendants  
2007 E.C ----- 2008 E.C ----- 2009 E.C-----
  - PNC 2007 E.C ----- 2008 E.C ----- 2009 E.C -----

**Immunization Coverage (for children and Women);**

VARIABLE	2007 E.C			2008E.C			2009E.C		
	plan	Number	%	Plan	Number	%	plan	Number	%
BCG									
OPV1									
OPV3									
Penta1									
Penta3									
PCV 1									
PCV 3									
Rota 1									
Rota 2									
Measles									
Fully immunize									
PAB									

**9. Health Service**

**A. Type and Number of Health Institution**

Type		Number	Total No. of beds
Gov. Hospital			
Gov. Health center			
Private H. Fs (clinics/diag. lab/drug stores)	Clinics (all type)		
	Diag. Lab.		
	Drug store & pharmacy		
Gov. Health posts			
NGOs	H. Ps		
	H. Cs		
	Hospitals		
	Clinics		
Facilities under constructions	HP		
	HC		
	Hospital		

- Health institution to pop ratio: HC: Pop -----
- Private clinic pop ratio ----- Health service coverage-----

**B. Type and Number of health professionals**

- HO: pop. Ratio -----Nurses: pop. Ratio-----
- Mid. Wife: pop. Ratio -----HEW: house hold. Ratio-----

**C. Top causes of morbidity and mortality**

- Top ten leading causes of OPD visit (morbidity): -----
- **Top ten causes of admissions**

Adult		Pediatrics/ <5 year
1	No data	No data
2		
3		
4		
5		

6		
7		
8		
9		
10		

- **Top ten causes of deaths (mortality).**

	Adult	Pediatrics/ <5 year
1	No data	No data
2		
3		
4		
5		
6		
7		
8		
9		
10		

**C. Health budget allocation:**

- **Government**

- ✓ Annual budget allocated for the woreda (birr) -----  
2007 E.C-----2008 E.C-----2009 E.C-----
- ✓ Annual budget allocated for health or health institutions is (\_\_\_\_%)  
2007 E.C -----2008 E.C ----- 2009 E.C -----
- ✓ Annual budget allocation increment or decrease percent comparing to the  
previous year -----
- ✓ Utilization of budgets in 2008E.C -----  
2007 E.C----- 2008 E.C ----- 2009 E.C -----

- **Funds from NGO**

✓ Total \_\_\_\_\_ (purpose/programs)

**10. Community Health Services;**

- Status of services provided by health extension workers namely
  - ✓ No. of HEWs -----
  - ✓ Responsibility of HEWs -----
  - ✓ Others -----

**11. Status of Primary Health Care Components with focus on the eight PHC elements and MDG.**

Method	Plan	Achieve 2007	Plan	Achieve 2008	Plan	Achieve 2009	Remark
Depo Provera							
IUCD							
Implant							
Oral contraceptive							
Total							

- Environmental Health & sanitation.
  - ✓ Latrine coverage 30.3% & utilization rate 1148 household
  - ✓ Solid waste management All house hold
  - ✓ Liquid waste management 3289 household are access and 182 household not access .

**Endemic disease**

- **TB/Leprosy**

TB case detection and out come	2007 E.C	2008E.C	2009E.C
Total TB cases			
PTB positive			
PTB negative			
Extra PTB			

TB detection rate			
TB Rx completion rate			
TB cure rate			
TB Rx success rate			
Lost follow up			
Death on TB Rx			
Total TB patients screened for HIV			
Positive for HIV			
Total Leprosy cases			
Leprosy on Rx			

• **HIV/AIDS**

VARIABLE	2007E.C	2008E.C	2009E.C
Total people screened for HIV			
HIV prevalence			
HIV Incidence (new cases/yr.			
Total PLWHA			
Current ON ART			
Pre-ART			

- ✓ Other HIV prevention activities -----
  - Essential drugs (shortage): - shortage -----
  - Essential Drug -----

**The Woreda Integrated disease surveillance and Report in 2009 E.C**

PHEM reportable disease	Case	Death
CHOLERA		
MEASLE		
NNT		
AFP		
ANTHRAX		
SARS		
SMALLPOX		

VHF		
YF		
RABIES		
Dracunculiasis/Guinea worm		
Pandemic Influenza		
Malaria		
Meningitis		
Dysentery		
RF		
Typhoid Fever		
Epidemic Typhus		
SAM		
MDSR		

**12. Disaster situation in the woreda**

- Was there any disaster (natural or manmade) in the woreda in the last one year?
- Any recent disease outbreak/other public health emergency
- If yes cases ----- and deaths -----

13. Discussion of the highlights and the main findings of the health profile assessment and description -----

14. Problem Identification and Priority Setting – set priority health problems based on the public health importance, magnitude, seriousness, community concern, feasibility ---

15. Conclusions made about the health status of the Woreda based on the findings -----

16. Action plan and recommendations- on how to address the problems identified clearly depicting responsibilities, required resource and timeline

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**Annex 5.1.6 Data collection tools for road traffic accident**

**Questionnaire for key informants**

1. Do you think road traffic accidents are public health important problem in your Area?  
-----
2. What factors do you think facilitate the occurrence of road traffic accident in Addis Ababa?
  - In terms of Vehicles -----  
-----
  - In terms of (environment) road network-----  
-----
  - In terms of Peoples behavior-----  
-----
  - In terms of legislation and regulations-----  
-----
  - other-----
3. Who do you think should be responsible for traffic accident? -----  
-----
4. What kind of measures should be taken to reduce traffic accidents in your office? -----  
-----
5. How do you compare the magnitude of motor traffic accidents In Addis Ababa to those of previous year? -----
6. What are your recommendations/opinions on how to road traffic accidents in Addis Ababa? -----  
-----

### Checklist for Data Collection

No.	Question	Coding Classification
<b>1. Demography</b>		
1.1	Outcome	1.Death 2. Seriously injured 3. Slightly injured 4. Property damage
1.2	Driver license	_____
1.3	Address	Region_____ Zone_____ Woreda_____ Kebele_____ Got _____ House No _____
1.4	Place of the accident	.....
1.5	Ethnicity	1.Amhara 2. Oromo 3. Tigrine 4. Gurage 4.Other(Specify)_____
1.6	Age	_____ Year (s) _____ Month(s)
1.7	Sex	1.Male 2. Female
1.8	Occupation	1. Merchant 2. Student 3. Daily Laborer 4. House wife 5. Unemployed 6. Gov't Employee 7. Private Employee 8. Not applicable 9. Other _____
1.9	What is your religious	1. Orthodox 2. Protestant 3. Muslim 4.Catholic 5. other _____
1.10	What is your marital status?	1. Single 2. Married 3. Widowed 4. Divorced 5. NA
1.11	Level of Education	1.Illiterate 2. Read and writing only 3.Elementary school (1-8) 4. Secondary School (9-12) 5.Tertiary School(college+)
1.12	7. Date and time of accident:	_____

No.	Factors	Coding Classification
2.1.	Weather conditions	1. Clear
		2. Cloudy
		3. Snow
		4. Rain
		5. Smoke or dust
2.2.	Visibility of the road	1. Visibility good
		2. Visibility fair
		3. Visibility poor
2.3.	Light conditions	1. Artificial good
		2. Artificial fair
		3. Artificial poor
		4. Dark
		5. Other specify.....
2.4.	Type of road	1. Asphalt
		2. Brick or cobble
		3. Concrete
		4. Earth
2.5.	Road conditions	1. Dry
		2. Muddy
		3. Wet
		4. Defect in roadway
		5. Heavy traffic
		6. Normal
		7. Under construction
		8. Slippery
2.6.	Condition of vehicle	1. Apparently good
		2. Brakes defective
		3. Glaring headlights

		4. Headlights dim	
		5. One headlight out	
		6. Both headlights out	
		7. Parking lights on	
		8. Chains	
		9. Puncture, blowout	
		10. Steering gear defective	
		11. Tail light out or obscured	
		12. Badly worn tires	
		13. Windshield wiper not working	
2.7.	Estimated speed	1. Before taking action to avoid accident	
		2. At moment of impact	
2.8.	What was driver doing?	1. Car run away	
		2. Car standing in roadway	
		3. Cutting in	
		4. Cutting left corner	
		5. Did not have right-of-way	
		6. Drove off roadway	
		7. Drove through safety zone	
		8. Exceeding speed limit	
		9. Failing to signal	
		10. Following too close	
		11. Giving incorrect signal	
		12. Hit and run	
		13. On wrong side of road	
		14. Passing at intersection	
		15. Passing on curve or hill	
		16. Passing on wrong side	
		17. Passing stand, bus/st.car	
		18. Pulling out from curb	
2.9.	Condition of driver	1. Extreme fatigue	

		2. Had physical defect
		3. Normal
		4. Believe intoxicated
		5. Impaired
2.10.	What was pedestrian doing?	1. Coming from behind parked/moving vehicle
		2. Crossing street diagonally
		3. Crossing intersection with signal
		4. Crossing intersection against signal
		5. Crossing intersection no signal
		6. Getting on/off bus/street car
		7. Getting on/off other vehicle
		8. In street, not at intersection
		9. Not on roadway
		10. Playing in street
		11. Riding
		12. Stand. On safety island
		13. Crossing intersection in crosswalk
2.11.	Condition of pedestrian	1. Careless
		2. Had physical defect
		3. Normal
		4. View obstructed
		5. Was confused by traffic
		6. Believe intoxicated
		7. Other, please specify