COLLEGE OF HEALTH SCIENCE, SCHOOL OF PUBLIC HEALTH,

ETHIOPIAN FIELD EPIDEMIOLOGY TRAINING PROGRAM (EFETP)

Compiled Body of Works in Field Epidemiology

By

Roman Mengistu (BSC)

Cohort IX

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

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ADDIS ABABA UNIVERSITY COLLEGE OF HEALTH SCIENCES SCHOOL OF PUBLIC HEALTH

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Mentors

Dr Alemayehu Bekele (MD, MPH, MA, PHD)

Mr. Mengistu Yelma (MPH, PHD Fellow)

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ADDIS ABABA UNIVERSITY SCHOOL OF GRADUATE STUDIES

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Approval by Examining Board

_____ _____

Chairman, School Graduate Committee

_____ _____

Advisors/Mentors

_____ _____

Examiner

_____ _____

Examiner

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Abbreviation

ACA	Addis Ababa city Administration
AACAHB	Addis Ababa city administration Health Bureau
AFI	Acute Febrile Illness
AFP	Acute Flaccid Paralysis
AFRO	Africa Regional Office
AIDS	Acquired immune deficiency syndrome
ANC	Ante natal care
ART	Anti-retro viral therapy
AURTI	Acute Upper Respiratory Tract Infection
AWD	Acute Watery Diarrhea
BoFED	Bureau of Finance & Economic Development
BPR	Business Process of Reengineering
CAF	Chloramphenicol
CAR	Contraceptive acceptance rate
CBS	Community based surveillance
CCPO	Curative core process
CDC	Center of Disease Control
CLTS	Community Led Total Sanitation
CSA	Central statistical agency
CSR	Common disease surveillance and Response
DM	Diabetics Mellitus
DMSS	Disease of Musclo Skeletal System
DPHP	Disease prevention and health promotion
DRC	Democratic Republic of Congo
EDHS	Ethiopian Demographic and Health Survey

EFETP	Ethiopian field epidemiology training program
EFMACA	Ethiopia food & medication administration and control authority
EFY	Ethiopian Fiscal year
EHNRI	Ethiopian Health and Nutrition research institute
EPHI	Ethiopia public health institute
EPI	Expanded Immunization Program
EPTB	Extra Pulmonary Tuberculosis
EVD	Ebola Virus Disease
FAT	Florescent Anti Body Test
FMoH	Federal Ministry of Health
FP	Family Planning
HIS	Health Information System
HIV	Human Immuno-Deficiency Virus
HMIS	Health management information system
HMT	Health Management Team
HTN	Hypertension
I/P	Intestinal parasites
IACS	International Alliance for Control of Scabies
IDP	Internally Displaced People
IDSR	Integrated Disease surveillance and response
IHR	International Health Regulation
IMR	Infant Mortality Rate
IPD	Inpatient department
IUCD	Intrauterine contraceptive device
L & D	Labor & Delivery
LBW	Low birth weight
MAM	Moderate Acute Malnutrition

MCH	Maternal and Child Health
MDG	Millennium Development Goal
MDR	Multi drug resistance
MDSR	Maternal death surveillance and report
MOH	Ministry of Health
MOR	Minor Operation room
NDRMC	National Disaster Risk Management Commission
NNT	Neonatal Tetanus
NPW	Non-Pregnant Women
OPD	Outpatient Department
OPV	Oral Polio Vaccine
P. F	Plasmodium Falcifurm
P. V	Plasmodium Vivax
PAB	Protected at Birth
PCV	Pneumococcal Conjugated Vaccine
PEP	Post Exposure Prophylaxis
PHEM	Public Health Emergency Management
PICT	Provided Initiative Counseling & testing
PMTCT	Prevention of Mother to Child Transmission
PNC	Postnatal Care
PPT	Place, person and time
PVP	Positive Predictive Value
RDT	Rapid diagnostic test
RHB	Regional health bureau
RIG	Rabies Immunoglobulin
RRT	Rapid Response Team
RRT	Rapid Response Team

S. TYPHI	Salmonella typhi
SAM	Sever Acute Malnutrition
SARS	Sever Acute Respiratory Syndrome
SD	Standard Deviation
STI	Sexually Transmitted Infection
TAT	Tetanus Anti Toxin
TF	Typhoid fever
TTC	Tetracycline
UHEW	Urban Health Extension workers
UTI	Urinary Tract Infection
AAUCHS	Addis Ababa University College of Health Science
VHF	Viral Hemorrhagic Fever
WHO	World Health Organization

Excutive summary

The Ethiopia Field Epidemiology Training Program (EFETP) is an in-service training program in field epidemiology adapted from the United States Centers for Disease Control and Prevention (CDC) and Epidemic Intelligence Service (EIS) program. The goal of the EFETP is to strengthen the Ethiopian Public Health Emergency Management system by: Improving public health event detection and response; creating a robust disease surveillance system; building capacity in field epidemiology and public Health; Enhancing evidence-based decision making for public health practice; and Reducing morbidity and mortality associated with priority diseases. Residents are expected to prepare and submit this body of work which will be assessed and evaluated by examiners to make sure that resident has acquired the expected level of competencies during his/her residency.

Therefore, this body of work summarizes the required field residency 's outputs accomplished at field base during two years' residencies. It has Nine chapters namely Outbreak Investigation, Surveillance Data Analysis Report, Evaluation of the Surveillance System, Health Profile Summary Report, Scientific Manuscript for peer review journals, Abstract, Protocol/Proposal of Epidemiologic Research Project, Public Health Emergency Management Weekly Bulletin and a Summary of Disaster Situation Visited/Risk Assessment. Accordingly, the document is organized to nine chapters.

The first chapter includes two outbreak investigations and response. One of the investigations was conducted in Gotera refugee Shelter on scabies Outbreak using case control study design and the other Investigation was descriptive study on human exposure to Dog bite in woreda ten of Yeka sub-city Addis Ababa City administration, 2019.

The second chapter contains five years (2013 to 2017) Surveillance Data Analysis of Typhoid Fever in Bole sub city, Addis Ababa City administration. Chapter Three describes Measles Surveillance System Evaluation in Bole sub city. Chapter four contains Health Profile Description of woreda nine, Bole sub city, Addis Ababa in 2017. Chapter five and Six contains Loss and damage from flooding in Akaki Kality sub city, Addis Ababa, Ethiopia, 2018 and Scientific manuscripts for peer reviewed journals respectively. In addition, three abstracts (which were developed from the two outbreak investigation and Surveillance Data analysis) are found in Chapter seven. Chapter Eight presents an Epidemiologic research project entitled "Assessment of Report completeness and factor affecting reporting disease under surveillance among private

health facilities in Addis Ababa, Ethiopia, 2019. The last chapter (Chapter 9) contains additional out puts (One Epidemic Bulletin, Conference attended, Training received and provided, ……. etc.).

1 CHAPTER I OUT BREAK INVESTGATION.

1.1 SCABIES OUT Break Investigation and Response in Gotera shelter Nifas selk lafto sub-city Addis Ababa Ethiopia 2018.

ABSTRACT

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

Methods and materials: We conducted 1:2 unmatched case-control studies from September04-sepetmber16 2018 in Gotera refugee Shelter 19 Cases and 38 controls were randomly selected from the refugee Shelter. We used structured questionnaire which were adopted from different studies. All cases were interviewed. Statistical analysis was made using IBM SPSS statistics 23, with Epi info 7.1.1. Odds Ratio, 95% CI and P-value were used to measure the significance of association in bivariate and multivariate analysis. Variables with p value of equal to or less than 0.05 were reported to be significantly associated with dependent variable.

Results: We identified a total of 19 Scabies cases with over all attack rates of 2% and Zero CFR All of 19 cases were compared with 38 controls and interviewed for case control study. Of reported cases 58% of them were Male and the mean age of affected population was 25.7 (SD=11.3). Sharing cloths (aOR=5.9, 95% CI 1.1-30.8) and Marital status (married aOR= 21.4, 95% CI 1.2-36.6) were found to be the independent determinates of scabies outbreak in study site.

Conclusion: In this study, we verified the presence of Scabies outbreak which is significantly associated with sharing of clothing materials with others. With contracted scabies associated with higher frequency of scabies disease. Therefore, increasing awareness creation about the transmission, prevention and control methods of this scabies disease and providing additional clothes to prevent cloth sharing is recommended.

1.1.1INTRODUCTION

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

The most commonly affected areas are the hands, feet, the inner part of the wrists and the folds under arms. It may also affect other areas of the body, like elbows and the areas around the breasts, genitals, umbilicus and buttocks [(4)]. A person infested with mites can spread scabies even if he or she is asymptomatic. Scabies has been classified as a water shortage disease because of its association with inadequate water supply leading to poor personal hygiene and thus increased risk of transmission [(5)]. Globally, it affects more than 300 million people in each year. Rates of scabies occurrence vary in the recent literature from 0.3% to 46% [(5)]. In the developed world, outbreaks in health institutions and vulnerable Communities contribute to significant economic cost in national health Services.

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

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

Statement of the problem

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

Significance of the study

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

1.1.2LITERATURE REVIEW

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

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

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

Currently, Ethiopia is experiencing scabies outbreak in drought affected areas where there is shortage of safe water for drinking and poor personal hygiene as a result of direct impact of the drought caused by El Nino **[17].** The outbreak investigation conducted in Amhara Region, South Wollo Zone Bati District in 2016 shows the Scabies attack rate was higher among Males than females [19]. In the same year the study conducted in North West Ethiopia also reports high prevalence of Scabies among Male populations [19, 18]. As study done in SNNPR East Badowacho District in 2016, age-group less than fifteen years, family size > greater 5 members, and sleeping with scabies cases were found to be significantly associated with scabies infestation [17].

Accordingly, those persons aged less than 15 years were 2.6 times more likely to develop scabies with [AOR (95% CI) =2.62 (1.31-283 5.22)] compared with age >=15 years of age. The odd of developing Scabies Infestation was 2.6 284 among family members with size >= 5 persons compared to those whose family size <= 5 members 285 with [AOR (95%) =2.63 (1.10-6.27)] [17].

1.1.3. OBJECTIVES

General objective

- To investigate the scabies outbreak and its associated factors in Gotera shelter, Addis Ababa.

Specific objectives

- To assess the magnitude of the scabies outbreak
- To determine factor associated with scabies infection.

1.1.4. METHODS AND MATERIALS

Study area and Period: - The outbreak investigation was conducted in one Addis Ababa city administration Gotera site refugee Shelter. It located in Nifas Silk Lafto Sub city at the south-West of the town on the left side of the roads from Gotera Meselacha/Ehil Depo/ to Kera. These populations were internally displaced people from Oromia and Ethio-Somali border due to insecurities happened at the place. The total population of the IDPs in this Shelter was about 2000. To give first level health services for this population, temporary clinic was established and being serving them with full man power and medical services. In the shelter/Shelter city line water is available and on top of this water line, to increase water supply in the site regional Health bureau along with partners provides two Water containers with a capacity of 10000L. The investigation was conducted from Jun 27 – July 07, 2018

Study Design: - Descriptive study followed by Case- Control study was used to investigate the outbreak.

Study population: Our study population was populations those who were displaced from Oromia and Ethio-Somali border and sheltered in Gotera IDP Shelter.

Study Participants

Any people who were clinically diagnosed among those living in the shelter were taken as a case and 38 randomly selected non case persons among those living in the same Shelter were taken as our study participants.

Sample size Determination

Because the total scabies cases are small, all scabies cases were enrolled to our study and 1:2 cases to control ratio was used. Accordingly, 19 cases were compared to 38 Controls.

Sampling techniques and procedures

Any person who is living in the shelter and present with the complain of generalized itching which often becomes worse at night, and abnormal skin lesions which are papules, pustules, nodules or urticarial were taken as case and controls were selected by Simple Random sampling among residents of the shelter.

Case Definitions:

We used the WHO standard case definition these are: -

a) **Suspected case:** Any person with generalized itching which often becomes worse at night, and abnormal skin lesions which are papules, pustules, nodules or urticarial.
b) **Confirmed case:** A person who has a skin scraping in which mites, mite eggs or mite feces have been identified by a trained health care professional.
c) **Contact history:** A person without signs and symptoms consistent with scabies that had direct contact with a suspected or confirmed case in the two months preceding the onset of scabies signs and symptoms in the case.

Study Variables

a) **Dependent Variable:** Scabies cases

b**) Independent Variables**

- Age
- Sex

- Size of family member
- Contact of the respondents
- Hand washing practice per day
- Using soap for hand washing
- Body wash practice per week
- Cloth wash practice per week
- Frequency of Changing cloth

Data collection method

The investigation was conducted through dorm to dorm searching for scabies case in the Shelter. We used structured questionnaires which adopted and modified from previously used and interviewed cases and controls. Data was collected by principal investigator, the collected data was checked and when entering the data in to the computer the missing variables and consistency of filling of questionnaires and completeness of data checked out carefully.

Data entry and Analysis

Collected data were checked for completeness and inconsistencies. Then coded, entered into Epi Info Version 7.1.1 and Exported to excel. Data from excel was imported to SPSS version 23 software and recoded. The entered data were cleaned and edited before subsequent analysis. Bivariate and multiple logistic regression analyses were done to identify the relationship between the independent variables (Age, Sex, Size of family member, Contact of the respondents, Hand washing practice per day, Using soap for hand washing, Body wash practice per week, Cloth wash practice per week, Frequency of Changing cloth) and dependent variable (Scabies illness). The socio-economic factors; Participant age, education, occupation, Participant sex, etc. were entered to the bivariate model with participant category. The three sets of independent variables (socio-economic, Personal and environmental factors) that have p-value equals to or less than 0.2 in the bivariate logistic regression analysis were re-entered into multiple logistic regressions analysis. Median and IQR was calculated for cases and controls age groups. AOR, 95% CI, P values were

also calculated for each independent variable. All statistical tests were two sided and significant associations was declared at p-value less than 0.05.

Ethical issue

The outbreak investigation was done after the approval of Support letter was obtained from RHB. Informed Consent was taken from all respondents for under 18 years old we obtained informed consent form their parents or guardians and study participants found scabies were linked to clinic.

1.1.1 Result

Descriptive Epidemiology

We identified a total of 19 scabies cases from 06 September to 16/09/2018 with overall attack rate of 2% and Zero case fatality rate. In Gotera refugee Shelter the first date of onset of itching was presumed on September 06/2018 and on the second day it is doubled. The information was communicated to regional PHEM through mobile phone that the case of scabies is increasing and regional PHEM deployed investigation team on the third day when the case is reached pick. The outbreak investigation was started on September 08/2018 and intervention was begun on the same day. The outbreak ended within ten days of the first case.

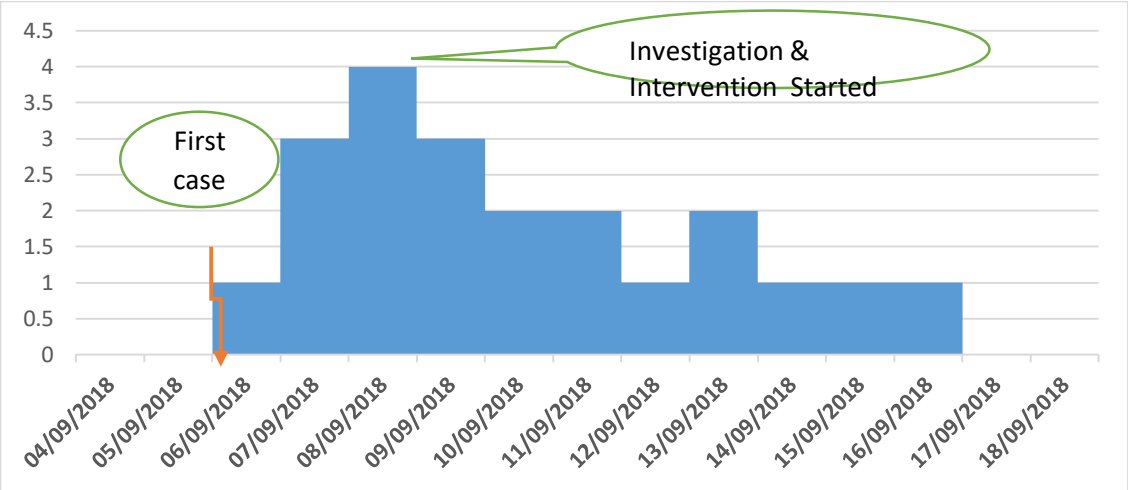

Figure 1. Epi curve of scabies outbreak in Gotera refugee Shelter 2018.

Of the total cases, 10 (53%) of them were Male while 9(47%) of them were Female. From age group of <15 years, six cases were found. From this four were female and two were male. From the age group of 15-44, 12 cases were found. From this, seven were male and five were female. And from the age group of >44, one case was found. That was male. From the total case that was reported male

Table 1: Socio demographic information of Scabies cases, N/silk lafto sub city , Addis Ababa, Ethiopia, 2018

S/n	Variables	Category	Frequency	Percent
1.	Age group	<15yrs	6	32%
		>44yrs	1	5%
		15-44yrs	12	63%
2.	Sex	Male	10	53%
		Female	9	47%
3.	Family size	>5 member	1	5%
		1-3member	11	58%
		4-5member	7	37%
4.	Marital status	Single	1	5%
		Married	13	68%
		NA	5	26%
5.	Educational status	Illiterate	5	26%
		Primary(KG-8)	7	37%
		Secondary (9-12)	5	26%
		Tertiary (above 12)	2	11%

Analytic study

We conducted unmatched case control study among 19 cases and 38 controls. Case of scabies was defined as Any person with generalized itching which often becomes worse at night, and abnormal skin lesions which are papules, pustules, nodules or urticarial. Controls were defined as any person

who has similar characteristics as that of cases except absence of the disease. Among the study participants 25(62%) of cases and 35(44%) of controls were Female participant.

Bi-variable logistic regression analysis shows, the statistical difference was observed among the Marital status of the respondent with cOR16, 95% CI 1.9-23.8) among Married individuals compared to single individuals. Sharing cloths (cOR= 5.4, 95% CI 1.6-18.3) and Knowledge level of the participants (cOR = 4.8, 95% CI 1.4-16.8) are also found to be associated factors with scabies in bi-variable analysis.

Table 2: Bi-variable analysis of scabies outbreak in N/silk lafto sub city Addis Ababa,2018

S.n	Variables	Category	Case	Control	OR (95% CI)	P Value
1.	Age group	<15yrs	6(32%)	2 (5%)	Reference	
		>44yrs	1(5%)	1(3%)	0.33(0.01-8.18)	0.4900
		15-44yrs	12(63%)	35(92%)	0.11(0.02-0.6)	0.0058
2.	Sex	Male	10 (52.63%)	14 (36.84%)	1.9(0.6-5.8)	0.2550
		Female	9 (47.37%)	24 (63.16%)	Reference	
3.	Family size	>5 member	1 (5%)	1(3%)	Reference	
		1-3member	11(58%)	28(74%)	0.4(0.02-6.8)	0.5088
		4-5member	7 (37%)	9(24%)	0.8(0.04-14.7)	0.8668
4.	Marital status	Single	1(5%)	20(53%)	Reference	1
		Married	13(68%)	16(42%)	16(1.9-23.8)	0.0001*
		NA	5(26%)	2(5%)	50(3.7-66.8)	0.0001*
5.	Educational status	Illiterate	5(26%)	4 (11%)	Reference	
		Primary(KG-8)	7(37%)	12(32%)	0.5(0.09-2.3)	0.3500

		Secondary (9-12)	5(26%)	12(32%)	0.33(0.06-1.9)	0.1923
		Tertiary (above 12)	2 (11%)	10(26%)	0.16(0.02-1.2)	0.0613
6.	Scabies Hx before	Yes	1 (5%)	1 (3%)	2.1(0.12-34.7)	0.6100
		No	18 (95%)	37 (97%)	Reference	
7.	Frequency of body bath	Weekly	7 (37%)	11 (29%)	1.43(0.4-4.5)	0.5455
		2-3 days	12 (63%)	27 (71%)	Reference	
8.	Using Detergent	Yes	33 (87%)	15 (79%)	0.6 (0.13-2.4)	0.4409
		No	5 (13%)	4 (21%)		
9.	Frequency of washing cloths	Weekly	4 (21%)	5 (13%)	1.8(0.4-7.5)	0.4409
		More than a week	15 (79%)	33 (87%)		
10.	Knowledge level	Poor	14 (74%)	13 (34%)	5.4 (1.6-18.3)	0.0048*
		Good	5 (26%)	25 (66%)	1	
11.	Sharing cloths with other	Yes	9 (47%)	6 (16%)	4.8 (1.4-16.8)	0.0107*
		No	10 (53%)	32 (84%)	1	

In multivariate logistic regression Sharing clothes (aOR=5.9, 95% CI 1.1-30.8) and Marital Status Married (aOR= 21.4, 95% CI 1.2-36.6) shows significant association with scabies illness. There was no difference observed between cases and controls that either have good or poor knowledge about scabies case.

Table 3: Multi variate analysis of scabies of N/silk lefto sub city ,Addis Ababa ,2018

Variables	**Category**	**Case**	**Control**	**aOR**	**P-Value**

Knowledge	**Poor**	14 (74%)	13 (34%)	4.7 (0.97,23.1)	0.0544
	Good	5 (26%)	25 (66%)	1	
Sharing Cloths	**Yes**	9 (47%)	6 (16%)	5.9 (1.1-30.8)	0.0358
	No	10 (53%)	32 (84%)	1	
Educational Status	**Primary (KG-8)**	5 (26%)	4 (11%)	0.4 (0.05-3.2)	0.3971
	Secondary	7 (37%)	12 (32%)	1.7 (0.2-19.9)	0.6528
	Tertiary	5 (26%)	12 (32%)	1.1 (0.04-30.4)	0.9420
	Illiterate	2 (11%)	10 (26%)	1	
Marital status	**Married**	1 (5%)	20 (53%)	21.4 (1.2-36.6)	0.0347
	NA (Children)	13 (68%)	16 (42%)	10.2 (2.9-35.4)	0.0109
	Single	5 (26%)	2 (5%)	1	

Intervention under taken

- Case management activity was done for all scabies patients (BBL was provided for them)
- Contact tracing was done and about three people who did not visit health facility was identified.
- Health education on mode of transmission, prevention and control measures including proper personal hygiene and environmental sanitation.
- Hand washing demonstration was practiced.

1.1.2 Discussions

This study tried to identify the possible risk factors for contracting scabies pertaining to socio demographic characteristics, living conditions, contact history, level of education, and access to water. We found that males are more affected (63%) than Females which is supported by study done in north western Ethiopia in 2016 [18] and Amhara region South Wollo, Bati District in 2016 [19]. The possible assumption is females are more access to water every day than males and able to keep their personal hygiene relatively.

The case report ended with in 10days of the identified case which is possibly the result of early detection and intervention by site coordinator and health bureau. Well organized health service being provided and healthy coordination among Woreda Health office and Regional PHEM was a fuel for early detection and intervention which is the power for controlling the outbreak not only within a short period of time, but also to minimize the attack rate (2%) of the cases. Because of its' highly contagiousness, in such environment different studies reported higher attack rates than our study which shows positive outcome of the intervention implemented at the place.

Sharing cloths with other was found to be significantly associated with being a case. The odds of developing scabies disease were found to be 5.9 times among Peoples those share clothes with others when compared to those do not sharing clothes (aOR=5.9, 95% CI 1.1-30.8). This result aligns with the study done in North Gonder among "Yekolo temari" in 2015 (AOR =2.76 95% CI 1.04, 7.41). In addition to this, married individuals were found to be 21.4 times more affected than single individuals (aOR= 24, 95% CI 1.2-36.6). The possible assumptions may be because the probability of cross contamination among the couples having daily close contacts than single individual.

Age groups, Family size, Knowledge level, frequency of body bath and frequency of cloth washing are not significantly associated with the occurrence of scabies outbreak in our study area which is different from the study done in Bedwecho district, Hadiya Zone in 2016. The difference may be due to difference in the life style of the community in the Shelter and Hadiya. Most of hygienic services such as water and soups were provided for the community in the Shelter by health bureau along with different stake holders. Therefore, most of the populations in our study area have relatively similar exposure for cloth washing and body bath even though their body bath

and washing cloth practice may differ. On the other hand, before the occurrence of the outbreak, starting from the very beginning of their settlement in the shelter, woreda Health office and regional PHEM was providing continuous health education on different health hazards those could be happen following mass gathering including scabies. Hence, they may have similar exposure for the awareness on the scabies disease.

1.1.3 Conclusion

- There was scabies outbreak in the shelter
- The AR of Scabies were higher among Males than Females
- Sharing others person clothes and being couple is found to be associated factors with scabies
- Age group of under 18 was found to be at risk than other age group

1.1.4 Recommendation

- Providing Health education on personal hygiene for displaced people (Woreda HO & HC)
- Providing cloths to avoid cloth sharing *(Labor & Social affairs Bureau)*
- The Family should control and follow their children hygiene

1.1.5 Reference

1. Raza N, Qadir SNR, Agha H. Risk factors for scabies among male soldiers in Pakistan: Case-control study. East Mediterr Heal J. 2012; 15(5):1105–10. (1)
2. Zeba N, Shaikh DM, Memon KN, Khoharo HK. Scabies in Relation to Hygiene and Other Factors in Patients Visiting Liaquat University Hospital, Sindh, 2014;(6)
3. Mohammed A, Mustafa A, Ibrahim M, Ihesiulor U. Maternal risk factors for neonatal conjunctivitis in Aminu Kano Teaching Hospital, Kano, Nigeria. Niger J Basic Clin Sci. 2013. (8)
4. WHO. Neglected tropical diseases scabies. 2015;4–6. (12)
5. Steer AC, Jenney AWJ, Kado J, Batzloff MR, La Vincente S, Waqatakirewa L, et al. High burden of impetigo and scabies in a tropical country. PLoS Negl Trop Dis. 2012;3(6). (13)
6. Federal Democratic Republic of Ethiopia. Interim-guideline for multi-sectorial 414 scabies outbreak emergency response, Ethiopia December 2015
7. Health Grove, Scabies in Ethiopia statics on overall impact and Specific effect on demographic Groups, 2013.
8. Lay. Risk Factors for Delayed Diagnosis of Scabies in Hospitalized Patients from Long-Term Care Facilities. J Clin Med Res [Internet]. 2011;3(2). (10)
9. CDC.Prevention&Control.2015;(888):30329.Availablefrom:http://www.cdc.gov/parasites/scabies/prevent.htm (11)
10. Veranda. Sehgal SM and VR. Nodular Scabies of the Genitals. Int J Dermatology. 2015;(12)
11. Kline K, McCarthy JS, Pearson M, Neglected Tropical Diseases of Oceania: Review of Their Prevalence, Distribution, and Opportunities for Control. PLoS Negl Trop Dis. 2013;7(1):1–9. (14)
12. Engelmann D, Kiang K, Chosidow O, et al. Toward the Global Control of Human Scabies: Introducing the International Alliance for the Control of Scabies. 2013;7(8):5–8. (15)
13. Steer AC, Jenney AWJ, Kado J, Batzloff MR, La Vincente S, et al. (2012) High Burden of Impetigo and Scabies in a Tropical Country. PLoS Negl Trop Dis 3(6):

14. Yassin ZJ, Dadi AF, Nega HY, et al. Scabies Outbreak Investigation among "Yekolo Temaris" in Gondar Town, North Western Ethiopia, 2015. Electronic J Biol, 13:3:
15. Walker SL, Lebas E, De Sario V, Deyasso Z, Doni SN, Marks M, et al. (2017) The prevalence and association with health-related quality of life of tungiasis and scabies in schoolchildren in southern Ethiopia. PLoS Negl Trop Dis 11(8):
16. WHO. El Niño and health ETHIOPIA overview, January 2016. WHO, NFORM index 13.
17. Jarso S. Et al, Scabies outbreak investigation and risk factors in East Badewacho District, 4 Southern Ethiopia: Unmatched case control study: 2016.
18. Science M. Prevalence of scabies in dermatology clinic. 2016; (January):279–80.
19. Ali Indris: Outbreak Investigation in Amhara Region South Wollo zone bati District, 2016
20. Meklit mekonen: Scabies Outbreak investigations in Enarj Enawuga Woreda, East Gojjam Zone, Amhara region, 2015.

1.2 RABIES OUT BREAK INVESTEGATION IN YEKA sub-city,woreda ten ADDIS ABABA, 2018

Abstract

Background:-

RabiesisAn infectious, highly fatal viral disease of warm blooded animals that attacks the cent ralnervous system; symptoms include excitement, aggressiveness, and dementia, followed by paralysis and death. It is caused by Lyssaviruses of the *Rhabdoviridae* family.

is estimated to cause 59 000 human deaths annually in over 150 countries, with 95% of cases occurring in Africa and Asia. Due to widespread underreporting and uncertain estimates, it is likely that this number is a gross underestimate of the true burden of disease. 99% of rabies cases are dog-mediated and the burden of disease is disproportionally borne by rural poor populations, with approximately half of cases attributable to children under 15.

An estimated 21 476 human deaths occur each year in Africa due to dog-mediated rabies. Africa is estimated to spend the least on PEP and have the highest cost of human mortality. With improved access to PEP and reduced prevalence of dog-mediated rabies, a significant number of lives could be saved.

. In Ethiopia human exposure to rabies due to dog bit is immediately reportable event. Accordingly, woreda ten of Yeka sub city reported mass dog bites since 25 December 2018. The aim of our investigation was to assess Human exposure to rabid dog bite and tracing human contacts at Wolo sefer of Yeka sub city, Addis Ababa,25 December 2018 to January nine 2018.

Methodology: - We conducted cross- sectional to assess human exposure to rabid dog. Exposure status, vaccination status of the dog, husbandry system of the dog, occupation, sex, age group and marital status of the individual study participant was assessed using structured questionnaire.

Results: - A total of five persons were exposed to confirmed rabid dog and none of the exposed were developed the sign and symptoms of rabies. Majority of the exposed persons were male and they were below the age of 37years. About 02 of them were experienced exposure to Rt upper limb 01person exposed on Lt upper limb 01-person wear exposed on Lt lower limb.01 person exposed

at Rt thigh all of human exposer taken post exposer prophylaxis and the wound is cleaned with soap and water.

Conclusion& Recommendation: **-** Males were more exposed to the rabies the females during the outbreak. Many dogs were found to be street in the district. Additional suspected dogs were identified in the district. There were no human cases during our investigation. Strengthening rabies surveillance for immediate response to take interventional measures until the locals' dogs are declared free from rabies by veterinary authorities is important.

1.2.1 Introduction

RabiesisAn infectious, highly fatal viral disease of warm blooded animals that attacks the central nervous system; symptoms include excitement, aggressiveness, and dementia, followed by paralysis and death. It is caused by Lyssaviruses of the *Rhabdoviridae* family (1, 2). People and animals can get rabies if they are bitten, licked or scratched by an animal infected with the disease. Less commonly, exposure to the virus occurs by entry of saliva, brain or spinal cord fluid of an infected animal into cuts or breaks in the skin or mucous membranes (e.g., eyes, nose, and mouth). Rare exposures have occurred under special situations, such as aerosol in laboratory settings or organ transplantation (2-7).

Dogs, cats, and ferrets have an incubation period 6 months or less based on observational studies (averages: dogs, 3-8 weeks; cats, 4-6 weeks). Variation in incubation period is due to species exposed, size of viral inoculum, proximity of the bite to the nervous system, and virus variant. There are few data about incubation periods in other mammals. In most human cases, signs of rabies develop 1 to 3 months after exposure.

Early symptoms include fever, headache, itching at the site of the bite, confusion and abnormal behavior. Hypersensitivity to light and sound, and difficulty swallowing can also occur. Once signs of disease begin, recovery is very rare. Death usually occurs within 2 to 10 days. Fortunately, treatment before signs develop is highly effective and life-saving (1-6).

Regardless of whether or not rabies is present in wildlife reservoirs, over 90% of human deaths from rabies are caused by dog bites. Therefore, if we control dog rabies, we will prevent human rabies. In many developing countries, unvaccinated dogs and other canines (e.g., foxes,) are the primary reservoir of the virus (3, 4, and 5).

Rabies can be diagnosed in laboratory by; Detection of rabies viral antigens by direct fluorescent antibody test (FAT) or by ELISA in clinical specimens, preferably brain tissue (collected post mortem), Detection by FAT on skin biopsy (ante mortem), FAT positive after inoculation of brain tissue, saliva or CSF in cell culture, or after intra cerebral inoculation in mice or in suckling mice, Detectable rabies-neutralizing antibody titter in the serum or the CSF of an unvaccinated person, Detection of viral nucleic acids by PCR on tissue collected post mortem or intra Vitim in a clinical specimen (brain tissue or skin, cornea, urine or saliva) (2,3,4 and 6).

There is no specific treatment for rabies, which is a fatal disease but, Supportive treatment alone has been successful. WHO promotes human rabies prevention through; well-targeted post exposure treatment using modern vaccine types and, when appropriate, Anti rabies immunoglobulin (RIG), pre-exposure prophylaxis using modern vaccine types for certain professional groups at higher risk and also if vaccines are easily accessible, increased access of safe and effective rabies vaccines, dog rabies elimination through mass vaccination of dogs and dog-population management (2-7).

Rabies occurs in nearly every country worldwide. Dog-mediated human rabies causes tens of thousands of human deaths annually despite being 100% preventable. The World Health Organization (WHO) estimates that at least 55,000 people die of rabies every year of which 40% were children under 15 years of age mostly in rural areas of Africa and Asia.

Because rabies cases are often not recognized or reported in rural areas, the true number is probably higher. Approximately 99% of human rabies cases are due to dog bites (4, 7). A retrospective study in Tanzania revealed that Human exposure rabies varied from 6–141/100,000 per year. Risk of exposure to rabies was greater in an area with agro pastoralist communities (and larger domestic dog populations) than an area with pastoralist communities (8).

Rabies was first reported in Ethiopia (Addis Ababa) in 1903. Currently it is one of the public health importance diseases and Human rabies is immediately reportable diseases in Ethiopia (9, 10). During the period 1996-2000 a total of 153 fatal human rabies cases were recorded of which 79.74% these cases came from Addis Ababa and its surroundings and the Diagnosis of the cases was based on history of animal bites and clinical signs and symptoms (9). Another retrospective study in Ethiopia showed a fatal human case of 386 humans with annual range of 35 to 58. The overall post exposure treatment for humans was 17,204 within and around Addis Ababa. During the same period 20,414 suspected rabid animals were clinically examined; nevertheless, only 10%were positive for rabies (11). Generally, in Ethiopia there is immediate report of human exposure to rabies due to dog bite based on the national reporting time schedule.

Accordingly, woreda ten of Yeka sub city reported Suspected Rabid dog bites on 25 of December 2018. Then Addis Ababa regional health bureau public health emergency management unit organized and deployed a team including FETP residents to Woreda ten of Yeka sub city on 26 of December 2018.

As Soon as AARPHEM and AAU field epidemiology residents informed the human rabid dog exposure, we contact the woreda ten health office.

Field epidemiology resident with District PHEM officer, local leader, and one veterinary trained officer from Yeka sub city veterinary clinic start the investigation on 26/12/2018 in the morning. After the suspected dog is killed and laboratory test confirmed to be Rabid Dog, the team started tracing all human exposed to rabies confirmed and suspected dogs.

1.2.2 OBJECTIVES

1.2.2.1 General Objectives

- To assess Human exposure to rabid dog bite and tracing human contacts at Wolo efer of Yeka sub city, Addis Ababa, 25 December 2018 to January nine 2018.

1.2.2.2 Specific Objectives

- To trace rabies suspected dogs from the outbreak areas.
- To trace persons having exposure to rabies proven or suspect dogs for post exposure prophylaxis and treatment.
- To create awareness on control and prevention measures of rabies and exposures to rabies

1.2.3 METHODS AND MATERIAL

Study Area and Period

The investigation was done in Yeka sub city woreda ten Addis Ababa from December 26,2018 to January 09,2018. which is located to the northeastern part of Addis Ababa the investigation area of The total populations is 32,100 of which 2297 were under five the proportion of male is 48%. The place where rabies suspected dogs reported at chelelko and wolo sefer have a population of 5600 and 1400 household respectively.

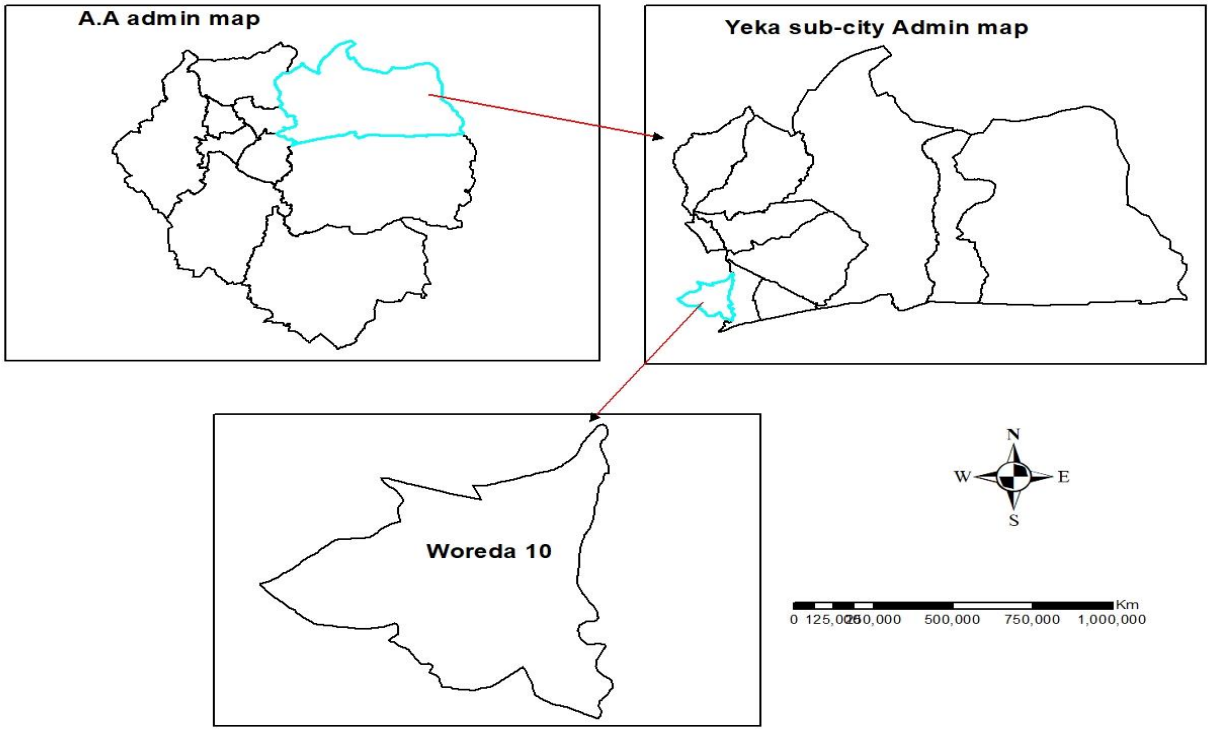

Figure 2: Map of study area woreda 10 ,Yeka sub city ,2018

Study Design:

We used descriptive cross sectional study.

Study Population:

All Households found in two ketenas of Woreda Ten (575 in Cheleleko and (270 inWolo sefer) of Yeka sub city.

Study unit:

All individual from Cheleleko and Wolo sefer Woreda Ten who have dog bite history during the study period.

Sample size:

All of the five individuals were included in our study.

Data Collection procedure:

A structure questionnaire adopted from different literatures with a face-to-face interview was administer to all the participants and fill in by the data collectors during the interaction. We used

owner of rabid dog and local association leader (youth edir) to found the address of the contact persons with rabid dog. During this study we assessed the exposure status of the exposed individuals and the dog including vaccination status of the dog, husbandry system of the dog, occupation, sex, age group and marital status of the individual study participant. All HH in two districts (Wolo Sefer270 and Cheleleko 575) was assessed and asked whether they have Dog, if they have whether it is vaccinated or not with vaccination date, whether their dog has contacts with the rabid dog or have sign and symptoms of Rabies or shows any abnormal behavior.

Laboratory Investigation: Suspected dogs were killed after bite Five people and immediately sent the dead bodies to Ethiopian public health institute on the next day of the bite.

Case Definitions

Standard case definition

Human rabies

Suspected: A case that is compatible with the clinical case definition. (Paresis or paralysis, delirium, convulsions, death in about 6 days without medical attention)

Probable: A suspected case plus history of contact with a suspected rabid animal.

Confirmed: A suspected case that is confirmed in laboratory

Human exposure to rabies

Possible exposure: A person who had close contact (usually a bite or scratch) with a rabies-susceptible animal in (or originating from) a rabies-infected area.

Probable exposure: A person who had close contact (usually a bite or scratch) with an animal displaying clinical signs consistent with rabies at time of the exposure, or within 10 days following exposure in a rabies-infected area.

Exposed: A person who has had close contact (usually a bite or scratch) with a laboratory confirmed rabid animal

Data quality assurance: The questionnaire was adopted and modified into our context from previous different literatures and guidelines, to measure appropriateness and understandability of questionnaires.

Data Dissemination: Findings of this investigation was communicated with Addis Ababa Regional Health Bureau, Yeka sub city health office, Woreda ten health offices and Addis Ababa University in both soft and hard copy. Additionally, the finding will be presented in different conference if we got the opportunity.

Ethical Consideration: A letter of Support was written from regional health bureau to the sub city and the woreda health office. We obtained support and willingness to conduct the study from woreda health office. Informed consent was obtained orally from the participants by telling them the Objective of the investigation briefly.

1.2.4 1.2.4. Result

During our assessment flowing the confirmation of Rabid Dog, we traced five human exposure in two districts (Wolo sefer & Cheleleko). One human exposed from chelelko, four human exposures from wolo sefer. In addition to this contact tracing among Dogs was performed on street and in House to house. Six street dogs were identified to have contacts with Suspected Rabid Dog.

The first bitten person was a three years old boy from chelelko. The dog is homeless showed abnormal signs such as barking and bitten the son on 25/12/2018. The four, seven, and seventeen years old boys were bitten by the same dog in another village, on 26/12/2018.

Laboratory investigation

The suspected dog was killed on 26/12/18 and the sample was sent to EPHI for laboratory confirmation of rabies from brain tissue of the suspected dog. Rapid rabies Ag test and fluorescent antibody test (FAT) was done and confirmed that the dog was infected by Rabies Virus.

Clinical investigation & Management

Wound care by irrigating with water and soap for 05 minutes was done by applying antiviral agent iodine and alcohol to the wound and left it open until they get rabies immunoglobulin. Anti-rabies vaccine, TAT 3000IU IM after skin test and broad spectrum oral antibiotics was given to the exposed people (table 3).

Table 4 Clinical details of the suspected rabies case of dogs and human exposer

Sex	Age	Site of bite	Type of wound	Date of bitten	Immediate Measure taken	Measure at health facilities

Male	3	RTU limb	Penetrating	25/12/2018	WRX,TAT, Antibiotics	Referred to EPHI for Vaccine
Male	4	RTU limb	scratching	26/12/2018	WRX,TAT ,Antibiotic	Referred to EPHI for Vaccine
Male	17	LTLimb	Scratching	26/12/2018	WRX,PEP,TAT, Antibiotics	Referred to EPHI for Vaccine
Male	37	LTU limb	scratching	26/12/2018	WRx,PEP,TAT, AntiBio	Referred to EPHI for Vaccine
Female	7	RT thigh	Penetrating	26/12/2018	WRX,TAT, Antibiotics	Referred to EPHI for Vaccine

PEP: Post exposure prophylaxis using sheep brain tissue vaccine. The PEP was given within 36 hours after exposure in all three cases. The PEP was subcutaneous injection of phenolized sheep brain tissue vaccine for 14 days.

WRx; comprehensive wound treatment at health facility

WRx: Wound treatment using soap and water

TAT; injection of tetanus anti toxoid

Antibi; Antibiotics for contaminated penetrated wound for bacterial infection.

Public Health intervention

After we reached at the woreda we reactivated the woreda rapid response team to coordinate the outbreak and for active surveillance of the human exposure together with the woreda PHEM officer and health extension worker. All exposed people were sent to EPHI to take anti rabies virus. AAU field epidemiology and district PHEM officer were followed human contacts to rabies virus until they complete the full dose of rabies vaccine. On 27th February 2018 onwards we conducted a Sheltering to kill street dogs and 06 dogs were killed and vaccination for 133 dogs. At the same time, we give health education to community and awareness creation on rabies prevention and control measures for the woreda residents.

1.2.5 DISCUSSION

Despite the increased provision of anti- rabies vaccine and PEP the annual incidence of human rabies exposure is increasing from time to time in Ethiopia (13). We identified that in the outbreak,

males were more affected when compared to females. This aliens with the study conducted in Tigray region which indicates that in Adigrat out of a total of 864 cases, 60.3% (521) were in males [13]. In addition, under five age groups were commonly affected (exposed) by human rabies comparatively.

In this investigation all of human exposed to rabies had got post exposure prophylaxis. Except one person, which was presented to health center after many counseling, the others seek treatment early without any external body initiation. Rabies infection is always fatal unless prompt post exposure treatment is administered before symptoms begin [4]. Due to 100% fatality rate of rabies, rabies vaccine is given to people at high risk of rabies to protect them if they are exposed. It can also prevent the disease if it is given to a person after they have been exposed. Sometimes some people prefers traditional medicine and the other relies on their spiritual belief in such circumstances. Due to this they deny to take modern medicine or they come to health facility after they develop the clinical features. Among peoples those exposed to rabid dogs in our study area no one was treated by traditional medicine.

1.2.6 CONCLUSION

- One confirmed rabid dogs were identified exposing five person
- Most of the exposed person were Male.
- Many dogs were found to be street in the district
- Additional suspected dogs were identified in the district and killed
- There were no human cases during our investigation

1.2.7 RECOMMENDATIONS

- Mass vaccination/avoiding of street dogs is important (*Agriculture Bureau)*
- Awareness creation on Rabies transmission and prevention for community
- Close flow up and surveillance among dogs (Woreda Health office)
- Frequent assessment of dogs (Domestic & Street) for the sign and symptoms of rabies (Owner, woreda HO, agricultural Bureau)

1.2.8 REFERENCES

1. The center for food security and public health fast fact, LOWA state University, America, 2013.
2. WHO Communicable Diseases Surveillance and Response (CSR) “recommended standards and strategies for surveillance, prevention and control of communicable diseases" Geneva 27, Switzerland.
3. Report of Global conference on the elimination of dog-mediated human rabies, Geneva, Switzerland, 10-11 December 2015.
4. International Fund for Animal, Welfare Practical Guide to Understanding the Risks and Prevention of Rabies in People and Dogs.
5. Technical content reviewed by the Centers for Disease Control and Prevention, Immunization Action Coalition, USA.
6. Suspected Rabies Exposure Reporting and Surveillance Guidelines, Washington, America/September 2017.
7. OIE, General disease information sheet (rabies).
8. Katie et.al. Rabies Exposures, Post-Exposure Prophylaxis and Deaths in a Region of Endemic Canine Rabies, Neglected tropical disease, 2008.
9. Eshetu Y. Rabies in Ethiopia, Country report, Sixth SEARG meeting, Lilongwe 18-21 June 2001.

10. The Ethiopian Health and Nutrition Research Institute, Proceedings of the National Workshop on Rabies Prevention and Control, Ethiopia /2012.
11. Asefa d. ET. Al. The status of rabies in Ethiopia: A retrospective record review, Ethiopian Journal of Health Development, December 2010.
12. Ministry of Agriculture, Rabies occurrence and control in Ethiopia, country reports.
13. Teklu Get.al. High Incidence of Human Rabies Exposure in Northwestern Tigray, Ethiopia: A Four-Year Retrospective Study, 2017

2 CHAPTER II SURVEILLANCE DATA ANALYSIS

2.1 Surveillance data Analysis of Typhoid fever in Bole sub city, from 2013 to 2017 G.C

ABSTRACT

Introduction: Typhoid fever is an infectious disease caused by Salmonella typhi bacteria which can be spread through contact with contaminated feces. It is also common in areas of the world with poor sanitation and lack of access to clean water. Globally 21 million cases and 222 000 deaths occur related typhoid fever. About 2.8 per 100000 mortalities and 174.4 per 100000 morbidities is estimated in Ethiopia. This study is aimed to know the magnitude, trends and distribution of typhoid case and deaths in Addis Ababa, Ethiopia.

Method: We conducted a Cross-sectional study design using the secondary data from health management information system of the city. We used Epi info and Microsoft excels 2007 to analyze the data. The results were presented narration and figures.

Results: A total of 53,012 cases were identified and 0 deaths were recorded over the past five years. The case rate was highest at the year of 2017and the prevalence rate is increasing year to year with the pick prevalence in 2017(53%). The seasonality of the Typhoid Fever was observed in the study area which starts increasing from the beginning of Ethiopian Rainy season. As typhoid report data in 2017 shows Woreda 10 is the leading among 14 Woredas.

Conclusion: Typhoid fever is a common disease in the sub city also increase when the season is rainy because of this is there is Safe water problem. So we can control by providing clean and adequate water plus improving sewerage system in the sub city.

2.1.1 INTRODUCTION

Typhoid fever is a life-threatening systemic disease characterized by stepwise rise of fever (38-41ºC) and frequent abdominal manifestations. It continued to be a major endemic disease in developing countries where there are unsanitary practices. The reports of global burden of typhoid fever suggested that up to 11 to 21million cases and 128 000 to 161, 000 deaths occur each year. Over past decades varying trend observed in developing countries, which reported of having an average incidence of 540 per 100, 000 populations [1].

It 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. Regional typhoid fever incidence rates ranged from <0.1/100 000 in Central and Eastern Europe and Central Asia to 724.6/100 000 in Sub-Saharan Africa. The estimated total number of typhoid fever episodes in 2010 was 13.5 million (inter quartile range 9.1–17.8 million) [3].

Typhoid is transmitted by water or food contaminated by Salmonella typhi. As it is water borne or food borne, a small infecting dose can cause the disease in someone who drinks contaminated water or eat contaminated food. As so many water sources are inadequately protected in Ethiopia, the disease is very common, particularly among overcrowded urban migrants who often live in wretched conditions. It can also be described as water borne disease since it results from fecal or urinary contamination of food and drink. Subjects who are particularly susceptible to typhoid infection include those patients with chronic schistosomiasis who may become chronically infected homozygous sickle cell subjects and HIV patients [1,2].

If the patients treated with prompt antimicrobial therapy, case fatality rate will be less than 1%. However, the mortality rate can be higher in areas with lower diagnostic and case management potential though there are regional discrepancies [4].

Health Problems Related to Environmental Risk Factors Morbidity and mortality related to poor sanitation, hygiene and unsafe water supply remain a major source of environment related deaths in the country. The populations who have access to improve drinking water have risen to 59.5% in 2007/08). Similarly, the proportion of population which have access to sanitation in

2007/08 was 37% (2007/08). Inadequate water and sanitation services affect women and girls more severely than other family members as they are the once who spend much of their time fetching water for the whole family and caring for ill family members [5].

There was a significant difference in prevalence of typhoid fever admissions from 2008-2010 compared to 2011 (X2= 5.6651; p <0.019) globally. A surge was observed in typhoid fever admissions associated with widespread use of pre-admission antibiotics. Low rates of pathogen isolation and unaffordable costs precluded appropriate antibiotic choice for many at admission, and led to poor treatment response. Public health education should emphasize water hygiene and judicious use of antibiotics. [6]

The sero-prevalence of typhoid fever was 38 (19%), but 1 (0.5%) with blood culture. Malaria typhoid fever confection was 13 (6.5%). 2–5-year-old children and poor hand washing habit were significantly associated with malaria and typhoid infection, respectively ($P < 0.05$). [2]

Carrier rate was higher among those diagnosed than those never been diagnosed for salmonellosis which was 5(2.9%) out of 171 food-handlers. In this study, 158(67.8%) food-handlers have been found to have a history of serological medical checkup inconsistently for typhoidal Salmonella organized by the university. In spite of the fact that there were practices of irrational drug use (self-treatment misdiagnosis extravagant prescription, under dose, improper drug sources the resistivity of salmonella species to most drugs is increased (e.g. Ampicillin, TTC, CAF), though still promising for ceftriaxone and gentamycin. [1]

All food handlers had no previous medical checkup and 54 (14%) were certified as food handlers. One hundred fifty-eight (41.1%) food handlers had intestinal parasites and 6 (1.6%) were found positive for S. typhi. Of these, 25 (6.5%) were suffering from diarrhea. [3,10]

Inexperienced and poor personal hygienic food handlers play a role for transmission of food borne infections. Local health authorities should implement food handler's training on food safety, institute periodic focused medical check-up for food handlers and improve human waste disposal. [5]. Seasonality of the occurrence of typhoid fever is not strongly evidenced with studies. However, the incidence of typhoid rises at the end of the dry season when the rural water supply is lowest and people congregate at the source of water: The infection is more common from October to February when the rain helps spread already contaminated water supplies. [3]

Statement of the problem

Typhoid fever is a systemic prolonged febrile illness caused by certain Salmonella serotypes including Salmonella typhi, S. paratyphi A, S. paratyphi B and S. paratyphi C. Human beings are the only reservoir host for typhoid fever, and the disease is transmitted by fecal contaminated water and food in endemic areas especially by carriers handling food. Options for the diagnosis of typhoid fever are clinical signs and symptoms, serological markers, bacterial culture, antigen detection and DNA amplification. Blood, bone marrow and stool culture are the most reliable diagnostic methods but they are expensive techniques and some bacterial culture facilities are often unavailable. [12]

The World Health Organization (WHO) estimates about 21 million cases of typhoid fever with >600,000 deaths annually. The cases are more likely to be seen in India, South and Central America, and Africa i.e. in areas with rapid population growth, increased urbanization, and limited safe water, infrastructure, and health systems. [2,12]. Surveillance for typhoid fever is hampered by the lack of laboratory resources for rapid diagnosis, culture confirmation and antimicrobial susceptibility testing. Nonetheless, in 2010, typhoid fever was estimated to cause 725 incident cases and 7 deaths per 100,000 person years in sub-Saharan Africa. [1]

In Ethiopia, several factors including under and malnutrition, HIV-AIDS, the unhygienic living circumstances and the close relations between humans and animals may substantially contribute to the occurrence of typhoid fever. The pooled prevalence estimates of Salmonella in stool samples of diarrheic children, diarrheic adults and carriers were 8.72%, 5.68%, and 1.08% respectively [13]. In Bole sub city Typhoid Fever is the one among Top Ten Causes of morbidity in 2017. Thus, this study helps to assess the magnitude of the disease in the area in the past five-year.

Significance of the study

Knowing the current status and the recommendation given eventually about typhoid fever will assist the sub city to decide on how to proceed for the future weather to uphold or change its schemes and overall typhoid preventive pattern This study is important to the government in that unprotected areas and population.

It also contributes to other sub cities, they can learn from other experience and therefor can achieve better result, especially in creating win-win condition. For residents of the study area, the benefit they can reveal their problems regarding lack of awareness and health education.

This paper will try to fill the gap of this problem and also recommends for the reduction of the epidemic of typhoid fever in Bole sub city Addis Ababa, Ethiopia.

Furthermore, the finding of this study initiates researchers for further studies. Lastly this study serves as reference for other researchers in related area. Thus it can minimize the literature gap in the area of study particularly in Ethiopia.

LITERATURE REVIEW

Typhoid fever is caused by Salmonella typhi, a Gram-negative bacterium. A very similar but often less severe disease is caused by the Salmonella serotype paratyphi A.

Typhoid fever remains a global health problem for Salmonella typhi. It is difficult to estimate the real burden of typhoid fever in the world because the clinical picture is confused with many other febrile infections, and the disease is underestimated because of the lack of laboratory resources in most areas in developing countries. As a result, many cases remain under-diagnosed.

Humans are the only natural host and reservoir. The infection is transmitted by ingestion of facially contaminated food or water. The highest incidence occurs where water supplies serving a large population are facially contaminated.

Anyone can get typhoid fever if they drink water or eat food contaminated with the S. typhi bacteria. Travelers visiting developing countries are at greatest risk for getting typhoid fever. Typhoid fever is still common in the developing world, where it affects about 12.5 million persons each year. Only about 400 cases occur each year in the United States. Food or water can be contaminated by a food handler with S. typhi, or may be contaminated if sewage accidentally gets into the food or water. Some infected persons may not show any symptoms of typhoid fever but can shed the S. typhi bacteria in their feces for many years. These persons are called typhoid fever "carriers.

It 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. Regional typhoid fever incidence rates ranged from <0.1/100 000 in Central and Eastern Europe and Central Asia to 724.6/100 000 in Sub-Saharan Africa. The estimated total number of typhoid fever episodes in 2010 was 13.5 million (inter quartile range 9.1–17.8 million). The sero-prevalence of typhoid fever was 38 (19%), but 1 (0.5%) with blood culture. Malaria typhoid fever confection was 13 (6.5%). 2–5-year-old and poor hand washing habit were significantly associated with malaria and typhoid infection, respectively ($P < 0.05$. [3]

The seasonality of Typhoid fever was reported in different literatures. As the study conducted in Addis Ababa, Ethiopia in 2012 showed Starting from late autumn, the typhoid suspected patients were decreased in number to trough point in middle of all winters, February (6.37%); the positivity rate was proportionally varying with that of number of patients. Gradually, before start of rainfall the patients number was rising that by far peaked in May (10. 78%).Over the summers, the significant rise in number was observed after once again fall in July, which remained high in autumn with second larger peak in October. [11]

2.1.2 OBJECTIVE

2.1.2.1 General objectives

- ✓ To analysis of Typhoid fever data in Bole sub-city over the last Five year (from 2013 to 2017)

2.1.2.2 Specific objective

- ✓ To assess the trend of typhoid fever over the past five year in sub-city
- ✓ To describe the morbidity and mortality of a typhoid Fever by person, time, and place over the last Consecutive five years.

2.1.3 METHODOLOGY

Study Area and period

This surveillance data analysis was conducted in Bole Sub city. Bole sub city is one of the 10 sub cities in Addis Ababa city administration with total population of 360,387 (168,545 Males and 191,842 females). Having a total area of around 11,856 Hectare, it borders with Yeka sub city in the north, Akaki sub city in the south, Oromia Region in the east, and Kirkos sub city in the west. A five years {2013_2017} surveillance data was analyzed using excel epi info, spss version. The increment in health service coverage in Bole sub city is promising the establishment of at least one Health center in every woreda & additional one hospital is planned to construct at the new settlements areas. Currently there are 9 functional & 2 nonfunctioning Health centers 7 Private MCH clinics & 13 private Hospital in the sub city.

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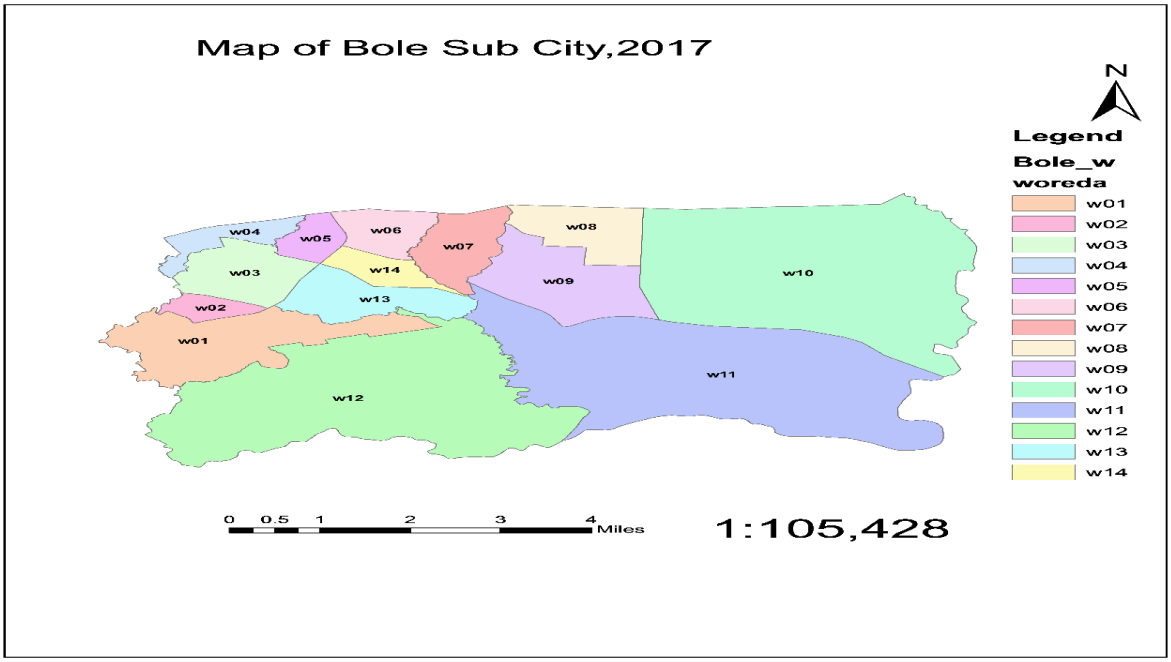


Figure 3: Map of Bole Sub city ,2018

Study design:

A retrospective descriptive study design was conducted to assess the last 5 years (2013-2017) surveillance data of Typhoid fever.

Data analyzing Procedure

Secondary data of typhoid fever for the last consecutive five years from regional PHEM, sub city PHEM will reviewed. In addition, hard copy of typhoid fever reports at sub city health office was reviewed. The data include reports of health facilities of all woredas, Clinics, health centers and hospitals are included in the PHEM network in the respective woredas. All reported Typhoid fever cases, clinically treated, confirmed typhoid fever cases, typhoid outpatients, inpatients and deaths due to typhoid fever are counted.

Data quality management: Data quality was maintained in the collection from the line list register, case based disease report form, checked for completeness, then it was adhibit into Microsoft Excel for analysis.

Ethical consideration: A support letter from the RHBPHEM was presented to the sub city health office and additional request letters was requested from the sub city office after the proposal was approved.

Case Definition

a) **Suspected Typhoid fever case**

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

b) Confirmed typhoid fever case

A suspected case with Widal test, "O" titer of 1/160 and more, is very suggestive, a suspected case with positive blood culture at the 1st week or positive stool culture at 3rd, 4th and 5th week illness is very definitive.

Dissemination of Results: Report /result of this Typhoid Fever surveillance data analysis was submitted timely to AAUCHS /School of public health/Department of EFETP, AAHB and Bole sub city Health Department by hard copy and electronic soft copy.

2.1.4 RESULT

We identified 53,012 Typhoid cases with in the last five years. The overall Typhoid Fever case in Bole sub city in the last five years was 14% with case fatality rate of zero. All typhoid cases were treated as outpatient. As the trend line below shows the prevalence was increasing from year to year with high prevalence rate in 2017 having 53 per 1000 population.

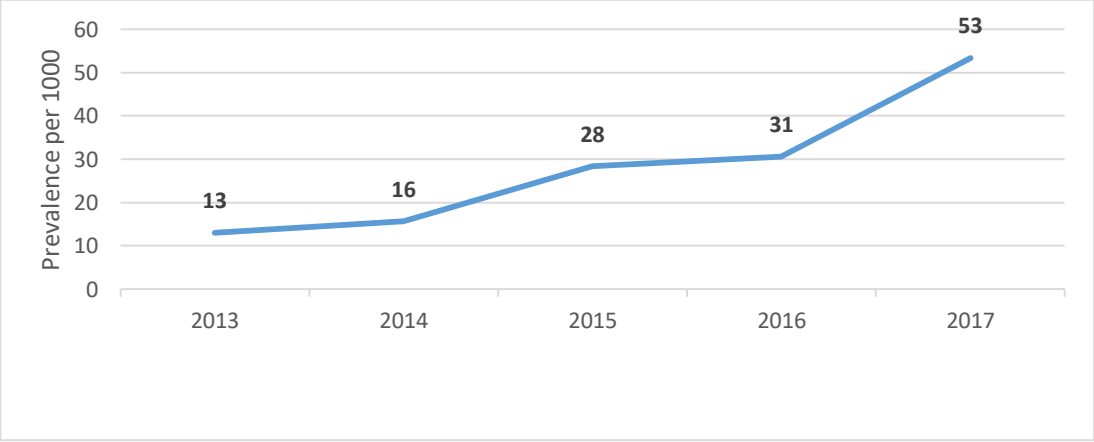


Figure 4 :Trend of Typhoid fever prevalence in Bole Sub city, 2013-2017

In Bole Sub city high number of Typhoid Fever were reported through the year with high prevalence in Ethiopian rainy season (from May to September) having prevalence of 13-14. In addition, the case which was reported in December is also high as that rainy season.

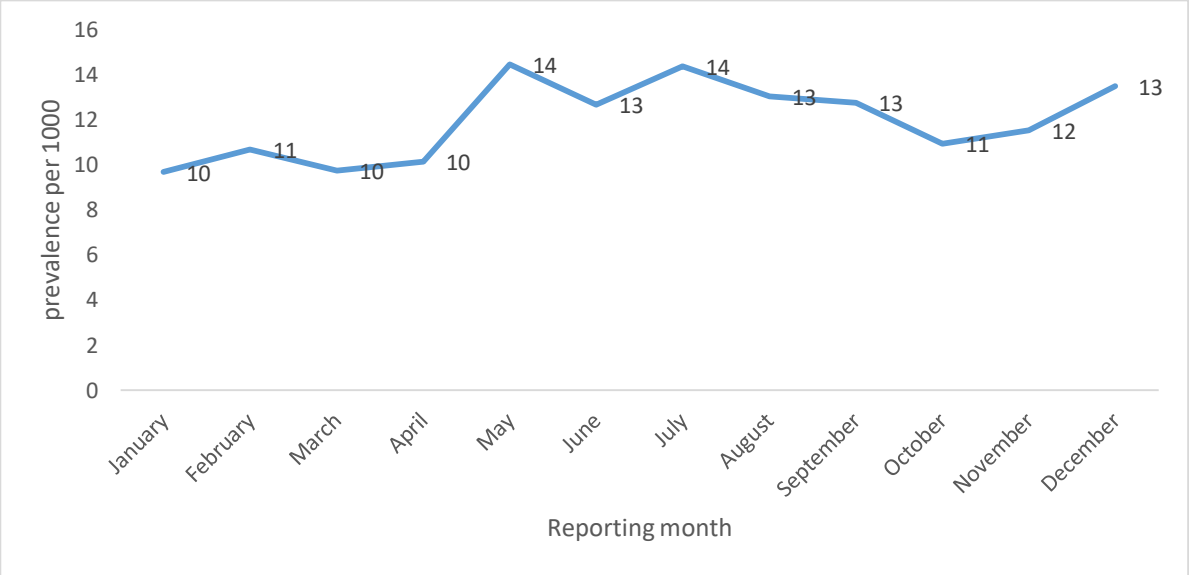


Figure 5 : Prevalence of Typhoid fever by month in Bole Sub city, 2013-2017

In Bole sub city the data was not registered by Woreda based before 1917 because PHEM Officer were not assigned for each woreda before. But we tried to identify the one-year data from each Woreda since the establishment of Woreda Based PHEM officers and in the last one year (2017) higher number of Typhoid fever were reported from Woreda Ten with prevalence rate of 16% followed by Woreda Twelve having prevalence rate of 14%. On the other hand, among 14 Woredas in the sub city the lower prevalence rate was reported from Woreda Four which was 0.5%.

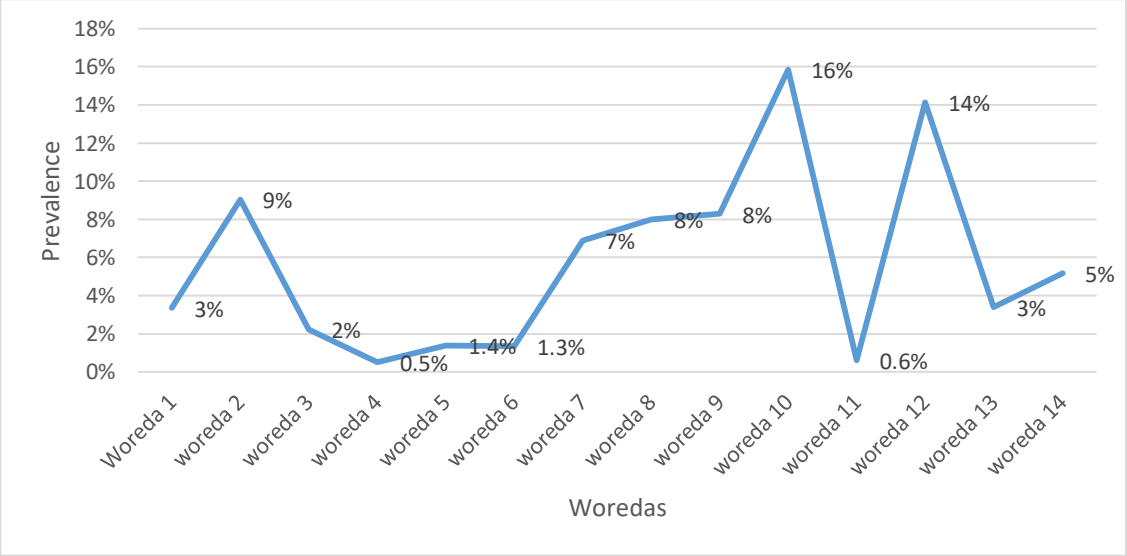


Figure 6: prevalence of typhoid fever by woreda 2017

2.1.4.1 LIMITATION

- Almost all of the typhoid fever cases that were reported in this analysis were widal test positive which is the sensitive type of diagnostic test with the possibility of counting all febrile cases as reactive for typhoid fever and no identified bacterial specious as a causative agents of typhoid fever.
- All suspected cases without confirmatory tests were counted as a case.
- The PHEM data lacks the age and sex category which hinders us from describing the Typhoid Fever distribution by person.

2.1.5 Discussion

We identified typhoid fever is the major health problem in Bole sub city. The trend of typhoid fever cases was increasing in the sub city with the highest records in 2017. This may be due newly structured PHEM systems in each Woreda which helps to report all cases regularly for sub city including new health facilities those did not reporting before. Before 2017 there were no structured PHEM at woreda level and the surveillance system was not strengthened. In addition, after establishment of new PHEM structure at Woreda level many health facilities those were not addressed before were enrolled to surveillance system. This in turn may increase the number of typhoid due increased health facilities.

In our study finding, the high cases of Typhoid were reported starting from the entrance of Ethiopian rainy season (May) and continued up to end of summary season (September). This is supported by the study done in Addis Ababa in 2012 which reported before start of rainfall the patients number was rising that by far peaked in May (10. 78%).Over the summers, the significant rise in number was observed after once again fall in July [16].

The distribution of Typhoid Fever in Bole Sub city differs among Woredas. As one-year data shows the highest prevalence of Typhoid fever was from Woreda Ten followed by woreda Twelve. In addition, in these areas there is unprotected water sources (rivers which they use for domestic use. When compared to other, Woreda Four where there is low prevalence of typhoid Fever, is well constructed and Environmental sanitation is well kept due to its location and approximated to Bole International Airport. This reveals that Typhoid is more of Hygiene related disease.

2.1.6 Conclusion

- There was high prevalence rate of Typhoid Fever in this sub city with increasing trend.

- High number typhoid cases were reported from Woredas located at the border of the sub city where there are new settlements are and bordering rural Kebeles
- More Typhoid fever cases were reported during rainy season

2.1.7 Recommendation

- The sub city health office together with the regional health bureau should provide specific diagnostic test laboratory services.
- The city administration should provide continuous and adequate water for all sub cities in general and the bordering newly settled sub cities in particular.
- The Sub city health office should strengthen the community health education and sustainable environmental protection in the city.

2.1.8 References

1. Rachel B. Slayton, Kashmira A. Date3 and Eric D. Mintz: Vaccination for typhoid fever in Sub-Saharan Africa. Human Vaccines & Immunotherapeutics, 2013, 9:4, 903–906. Available at www.landesbioscience.com
2. Crump JA, Luby SP, and Mintz ED: The global burden of typhoid fever. Bull World Health Organ 2004, 82(5):346–353.
3. Geoffrey C. Buckle, Christa L. Fischer Walker, Robert E. Bayeh Abera 1, Fantahun Biadegelgen 1, Belay Bezabih Prevalence of Salmonella typhiand intestinal parasites among food handlers in Bahir Dar Town, Northwest Ethiopia Ethiop. J. Health Dev.2010;24
4. American Public Health Association, Control of Communicable Diseases Manual 19th ed, 2008.
5. Bayeh Abera 1, Fantahun Biadegelgen 1, Belay Bezabih Prevalence of Salmonella typhiand intestinal parasites among food handlers in Bahir Dar Town, Northwest Ethiopia Ethiop. J. Health Dev.2010;24
6. Typhoid fever in children presenting to pediatrics medical wards of Ahmadu Bello University Teaching Hospital Zaria: A 13-month review DOI: http://dx.doi.org/10.4314/njp.v40i3,2.
7. Ethiopian fact sheet of health statistics 2014G.C. WHO regional officer for Africa.
8. FDROE MOH health sector development program 4 2010/11 to 2014/15.
9. Annual reports of Bole sub city in 2014/15.
10. Geoffrey C. Buckle, Christa L. Fischer Walker, Robert E. Typhoid fever and paratyphoid fever: Systematic review to estimate global morbidity and mortality for 2010. Global journal of health
11. Bayeh Abera 1, Fantahun Biadegelgen 1, Belay Bezabih Prevalence of Salmonella typhiand intestinal parasites among food handlers in Bahir Dar Town, Northwest Ethiopia Ethiop. J. Health Dev.2010;24
12. Willke A, Ergonul O, Bayar B: Widal test in diagnosis of typhoid fever in turkey. Clin Diagn Lab Immunol 2002, 9:4, 938–941.
13. Tadesse G: Prevalence of human Salmonellosis in Ethiopia: a systematic review and meta-analysis. BMC Infectious Diseases 2014, 14:88, 1471-2334. Available at http://www.biomedcentral.com/

14. Ethiopian Health and Nutrition Research Institute Public Health Emergency Management Centre February 2012 Addis Ababa Ethiopia.
15. Planning and Programming Department Health Information Processing & Documentation Team, Ethiopian health and health related indicators 2004G.C
16. Fentabil Getnet, Solomon Gebre-Selassie, Haile Alemayehu, Tesfu Kassa and Nigatu Kebede: Prevalence and Antimicrobial Resistance of Salmonella Isolated from Food Handlers in Addis Ababa University Students' Cafeteria, Ethiopia. African Journal of Basic & Applied Sciences 6 (6): 210-216, 2014 ISSN 2079-2034 © IDOSI Publications, 2014.
17. Onyido AE.et al. Co-Infection of Typhoid and Malaria Fevers Among the Inhabitants of a Sub-Urban Community in The Southeastern Nigeria, Nature and Science 2015;13(12)

3 CHAPTER III SURVEILLANCE SYSTEM EVALUATION

3.1 Measles Surveillance System evaluation in Bole Sub-city, Addis Ababa, Ethiopia, 2018

Abstract

***Back ground*:** - The initiative to strengthen the disease surveillance system that promotes the integration of surveillance activities in Ethiopia was started in 1996. The information from a public health surveillance system can be used for immediate public health action, program planning and evaluation, and formulating research hypotheses. This study was aimed to evaluate the performance of the existing surveillance system and the attributes of surveillance systems in 2018.

***Methodology*: -** A descriptive cross-sectional study design was used. Data was collected from sub city Health office, five Health centers and five woreda health office which were selected purposefully. Secondary data from registry were reviewed and primary data was collected from 11 surveillances focal person using Standard tools adapted from CDC surveillance system guide line. The study was conducted from July to August, 2018.

***Result*: -** 136 measles cases were reported. Sample sent to national laboratory for Confirmation. 60% of Woredas and 60% of health centers perform trend analysis for Measles. Completeness and timeliness of reports in the sub city was 100% and 100% respectively. all Woredas conducted supervision for corresponding health facilities in the last six months. No budget allocated for surveillance purpose at sub city level, woredas level and health center level. All health facilities in sub cities were well engaged to surveillance system. Urban health extension workers are actively participating in community case detection and reporting. Positive predictive value of measles in sub-city was 0%

***Conclusion and Recommendation*: -** From our study we observed that there were Poor trend data analysis performance, no allocated budget for Surveillance system, poor supervision and feed back in woredas. Accordingly, we recommended regular supervision, proper feedback and budget allocation is important to improve the surveillance system in the sub city.

[1]

[1] Key words: - System Evaluation, Surveillance, Measles, Bole Sub City

3.1.1 INTRODUCTION

Effective Communicable and non-communicable diseases control rely on effective public health surveillance and response system that promote better coordination and integration of surveillance function through ongoing, systematic collection, analysis, interpretation, and dissemination of data regarding a health-related event for use in public health action. Recognizing this, the initiative to strengthen the disease surveillance system that promotes the integration of surveillance activities in Ethiopia was started in 1996 [1].

The information disseminated by a public health surveillance system can be used for immediate public health action, program planning and evaluation, and formulating research hypotheses. Therefore, a functional disease surveillance system is essential for defining problems and taking action. Not only the presence of public health surveillance system is enough, but also Proper understanding and use of this essential epidemiological tool (public health surveillance) helps health workers to set priorities, plan interventions, mobilize and allocate resources, detect epidemics early, initiate prompt response to epidemics, and evaluate and monitor health interventions. It also helps to assess long-term disease trends [2].

Surveillance should be conducted for diseases and conditions considered to be of public health importance. The list of diseases and syndromes in the national health information system (HIS) is useful for planning and routine management but too expensive for effective and useful surveillance in view of the limited human and financial resources.

Ethiopia had introduced Integrated Disease Surveillance and Response (IDSR) in 1998, focusing on 17 priority communicable diseases for early detection and effective response. Integrated Disease Surveillance and Response (IDSR) is a comprehensive regional framework endorsed by Member States of the World Health Organization Regional Office for Africa (WHO/AFRO) for strengthening national public health surveillance and response systems in Africa. In Africa, ministries of health are organizing and strengthening national disease surveillance programs by adopting IDSR and modifying the strategy to meet their country's epidemiologic profile [3,4].

Recently Federal Ministry of Health (FMoH) underwent the Business Process of Reengineering (BPR) and identified the IDSR to be one of the core processes of FMoH. Accordingly, IDSR was evaluated and recommended to establish Public Health Emergency Management (PHEM) in 2009 [5]. This new structure is extended down to the district level in their capacities. This is designed as a cutting edge for better tracking and monitoring of diseases of public health concerns. Moreover, as member state of the WHO, Ethiopia is implementing the International Health Regulation (IHR)

which was declared by member states in 2005. These all are good opportunities to strengthen surveillance [6].

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 [1].

Based on the assignment, PHEM identified 19 communicable diseases and two health problems (Sever Acute Malnutrition (SAM) and Maternal Death) based on their potential to cause outbreaks, became international concern and diseases on eradication/elimination and health burden for the country (Table1). In addition to these 19 communicable diseases and two health problems, PHEM is also monitoring any clustering of diseases in the country. Other diseases, which are not included and moitored by PHEM, will be monitored through Health management and Information system (HMIS) [5]. These diseases and conditions are selected based on one or more of the following criteria [7]:

- Diseases which have high epidemic potential (anthrax, avian human influenza, cholera, Measles, meningococcal meningitis, pandemic influenza, smallpox, severe acute respiratory syndrome (SARS), viral hemorrhagic fever (VHF), and yellow fever),
- Required internationally under IHR 2005 (smallpox, poliomyelitis due to wild-type poliovirus, human influenza caused by a new subtype, SARS),
- Diseases targeted for eradication or elimination (poliomyelitis due to wild-type poliovirus, dracunculiasis, neonatal tetanus (NNT),
- Diseases which have a significant public health importance (rabies, dysentery, malaria, relapsing fever, typhoid fever, typhus and severe malnutrition);
- Diseases that have available effective control and prevention measures for addressing the public health problem they pose [7].

Measles is one of the diseases among the 21 Nationally Notifiable diseases in Ethiopia and is among diseases those have high epidemic potential and Immediately reportable disease.

Table 5 Disease under surveillance in Ethiopia

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

The overall purpose of surveillance of these diseases is to monitor the trend against the seated tolerance limits, and pick any deviation from the limit at the earliest point in time and have prompt response. Furthermore, as early warning system, it guides prevention and risk reduction actions like vector control and so on [6]. For these purposes, each of these diseases has case definition(s) and integrated diseases reporting formats defined by the FMOH/PHEM and the WHO; and reporting is institutionalized into the health facilities and health offices. And also, for each immediately or weekly re portable diseases FMOH/PHEM states thresh holds (The maximum tolerable level of disease). If the thresh hold is passed by considering out break it should be notified to next level as soon as possible [7].

Nationally the reporting channel and periodicity of measles is as follows: -

- From community or health post or health center to woredas health office within 30 minutes,
- From woreda health office to zone/region within another 30 minutes,
- From zone to regional office within another 30 minutes,

- From region health bureau to federal level within another 30 minutes,
- MOH to WHO within 24 hours of detection.

Therefore, because of its essential role in better tracking and monitoring of public health events from its root, and only the literally presence of tracking and monitoring system is not enough to achieve the goal, frequent and timely evaluation of the system is highly required which should be standardized for all districts, zones, region and as well country wide.

Statement of the Problem

Measles is a highly contagious, leading cause of death but vaccine preventable disease. It results in a systemic illness which causes profound immunosuppression often leading to severe complications. In 2010, the World Health Assembly declared that measles can and should be eradicated. It has been eliminated in the Region of the Americas, and the remaining five regions of the World Health Organization (WHO) including Ethiopia have adopted measles elimination goals. Significant progress has been made through increased global coverage of first and second doses of measles-containing vaccine, leading to a decrease in global incidence of measles, and through improved case-based surveillance supported by the WHO Global Measles and Rubella Laboratory Network [8,9,10].

Despite the fact that a safe and effective vaccine has been available for over 50 years Measles is a leading cause of death among children. It is life threatening especially in low-income countries where children have limited or no access to medical treatment, and are often malnourished. Measles outbreaks are particularly deadly during emergency settings in communities experiencing, or recovering from conflict or natural disaster**.** During outbreaks, public health authorities spend time tracing potential contacts, answering calls from the public and money treating people in hospital. Sick children stay home from school and parents stay home to care for them [11].

As CDC reports of 2016 shows Globally, each year there is about 267,000 measles cases reported and 146,000 estimated deaths, mostly children [12]. In the same manner in Ethiopia, only in 2015, a total of 2,190 suspected measles cases was reported in 61 separate outbreaks. Of these, 929 have been positively confirmed. Children under 5 years of age made up 28% of the cases, whereas those over 15 years of age represented 33% of the measles cases [13].

Since 2002, Ethiopia adopted accelerated measles control activities to reduce measles morbidity and mortality as a regional goals and strategies and has been taking important steps to control and ultimately to eliminate measles by 2020. Among those strategies, Case-based measles surveillance is the one which is currently undergoing in the country as well in Bole sub-city which needs periodical evaluation to keep sustainability, effectiveness and efficiency of the system [14].

Hence, Effective and efficient Public Health Surveillance plays a great role in minimizing the impact of all infectious disease. Measles is among infectious disease prioritized public health problem, which are under routine surveillance system of Ethiopia. Because of socio-economic status and different predisposing conditions, Bole sub city is one part of Addis Ababa city administration where outbreak of Measles happen sometimes.

Even though, Public health surveillance systems should be evaluated periodically to ensure that problems of public health importance are being monitored efficiently and effectively. But the information from the study area PHEM officer shows, public health surveillance system evaluation was not conducted before more efforts needed to be done to promote and strengthen Measles surveillance system for early outbreak detection and to plan possible interventions.

Rationale of the study

Assessing the effectiveness and efficiency of Public health surveillance system in achieving the stated objectives of health sector is part of the development or improvement of the existing resources, infrastructure and design. This improves the information provided and thereby helps improve service provision and delivery. Especially, with the implementation of the new structure for surveillance system (PHEM) in the sector, the change in the quality of information need to be assessed particularly for diseases which exert high public health stress. Measles is of such diseases which can be impacted for the better or worse by the change in the structure.

Therefore, this study was conducted to evaluate public health surveillance systems in Addis Ababa region Bole Sub city, to determine how well they operate to meet their stated purpose and goal as well to provide specific recommendation towards improving surveillance quality, efficiency and usefulness of the system.

3.1.2 OBJECTIVES

3.1.2.1 General Objective

- To determine the public health important problems towards its efficient and effective monitoring in Bole sub city, 2018.

3.1.2.2 Specific objectives:

- To evaluate the performance of the existing surveillance system of Measles.
- To evaluate the key attributes of surveillance system (sensitivity, simplicity, positive predictive value, flexibility, completeness, timeliness, acceptability, representativeness, acceptability and specificity).
- To describe the core activities (case detection, reporting, data analysis and response) of the surveillance system in Bole Sub-city.

3.1.3 METHODS AND MATERIALS

Study Area and Period

This Measles Surveillance System Evaluation was conducted in Bole Sub city which is one of the 10 sub cities in Addis Ababa city administration. It has a total population of 360.387. Having a total area of around 11856 Hec, it bordered by Yeka sub city in the north, Akaki sub city in the south, Oromia Region sub city in the east, and Kirkos sub city in the west. The district is located in the northwestern area of the city, not far from its center Megenagna. There is 15 woredas who are actively reporting surveillance information daily and weekly. Each woreda has established woreda PHEM officer. This surveillance system evaluation was conducted from July 13, 2018 to August 30, 2018.

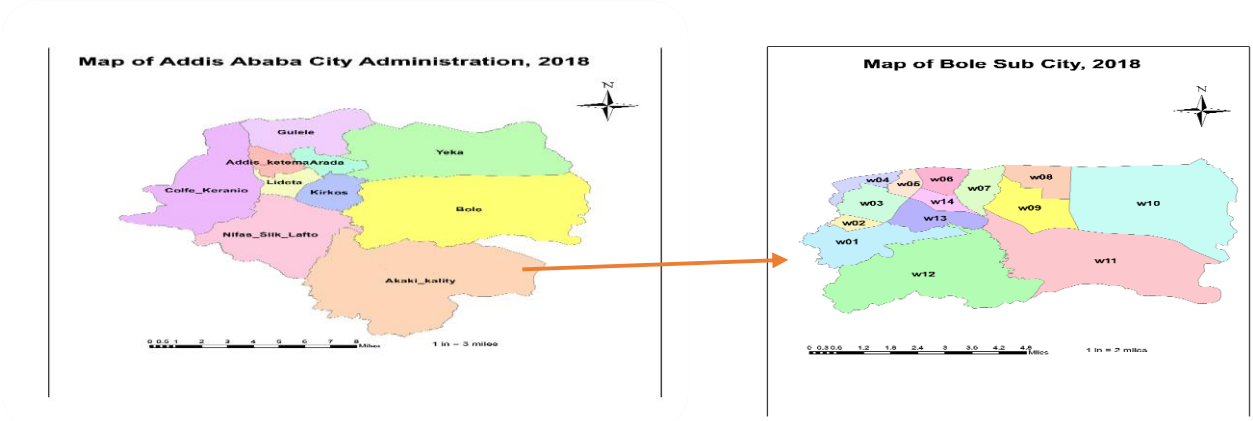


Figure 7 Map of Addis Ababa city Administration

Study Design: A descriptive cross-sectional study was conducted to evaluate the performance of Measles surveillance system in Bole sub city.

Study Population: Woreda Health Offices those are Expected to report health events to bole Sub City Health Office.

Study Unit: Woreda health offices with their corresponding governmental health centers were used as our study unit.

Sampling Method & Sample size: Five woredas with their corresponding governmental health centers were purposefully selected.

Source of Data

Secondary data of Measles reports from the most recent one year during data collection was obtained from PHEM departments of health facilities, Woredas and sub city health offices. Records of disease and laboratory registration books, feedback reports of surveillance and summery report sheet was reviewed. Surveillance focal persons at sub city, Woredas and at health facility levels was interviewed to get the important data of the existing surveillance system of the sub city. To get Measles laboratory test results, data was also received from Measles national laboratory (EPHI).

Data Collection methods

Data was collected using check lists adopted from WHO and updated CDC surveillance system evaluation guide lines which are designed for the assessment of national communicable disease surveillance system. Performance of the core activities, supportive activities and attributes of surveillance system of the sub city was assessed by observing posted charts and tables, checking availability of guidelines and standard case definitions, reviewing records from registrations and report formats. Focal persons of PHEM at sub city, Woreda and at health facilities was interviewed.

Meeting with Stakeholders

Before we conduct this evaluation, we had had a meeting with Sub City Disease prevention and health promotion head office, and Sub city PHEM case team who are working in area of surveillance. We discussed on the purpose of this evaluation, point to be evaluated and area of interest. Accordingly, we identified areas of interest and got some important information about and found no previous baseline assessments done on Measles Surveillance system. They recommended us to conduct our evaluation on one immediately reportable disease (Measles). This meeting was helped us as a first step for our assessment.

Data Quality Control

After the data collected using WHO/CDC tools for surveillance evaluation by principal evaluator daily, Completeness and consistency of collected data was checked before data entry and analysis. To keep the quality of information data collection method was supported by physical observation.

Dissemination of the Result

The result of this study was presented to Addis Ababa University School of Public Health, Ethiopian Field Epidemiology Training Program Department. It was communicated to Bole Sub-City Health Office, and Addis Ababa City Administration Health Bureau (AACAHB) PHEM department.

Standard cases definition

Suspected: - Any person with fever and maculopapular (non-vesicular) generalized rash and cough, coryza or conjunctivitis (red eyes) OR any person in whom a clinician suspects measles.

Confirmed: - A suspected case with laboratory confirmation (positive IgM antibody) or epidemiological link to confirmed cases in an epidemic.

Ethical consideration

Ethical clearance was secured by writing formal letter from Addis Ababa university school of public health to Bole Sub-city health office and Official permission was obtained from Sub city health office. Verbal consent was requested to all the participants during data collection. To insure confidentiality names and other identifying information was not included.

Operational Definitions

Feasibility; Ease which statistical information can be obtained from the agency. This includes the ease with which the existence of information can be ascertained, as well as the suitability of the form or medium through which the information can be accessed. The cost of the information may also be an aspect of accessibility for some users. Willingness of persons and organizations to participate in the surveillance system. And it will be measured quantitatively through reviewing completeness of report forms for the past three months and timeliness of data reporting.

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.

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

Flexibility: 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 accommodate, for example, new health-related events, changes in case definitions or technology, and variations in funding or reporting sources. In addition, systems that use standard data formats (e.g., in electronic data interchange) can be easily integrated with other systems and thus might be considered flexible.

Sensitivity: The sensitivity 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.

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

Representativeness: 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.

Timeliness: Interval between the occurrence of an adverse health event and (I) the report of the event to the appropriate health agency, (ii) the identification by that agency of trends or outbreaks, or (iii) the implementation of control measures.

Completeness: proportion of all expected data reports that were actually submitted to the public health surveillance system.

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

Validity: Degree to which statistical information correctly describes the phenomena it was designed to measure.

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

3.1.4 RESULT

Public Health Importance of Measles in Bole sub city

In the last 29 epidemiologic weeks of 2018 about 136 Measles was reported to sub city. Among them (87%) were under five children, (10%) of them were 5-14yrs old and the rest (3%) was above 15 yrs. Old.

In our study area the Measles cases were continuously reported through the year with high cases per week of 15 as shown in the below trend line.

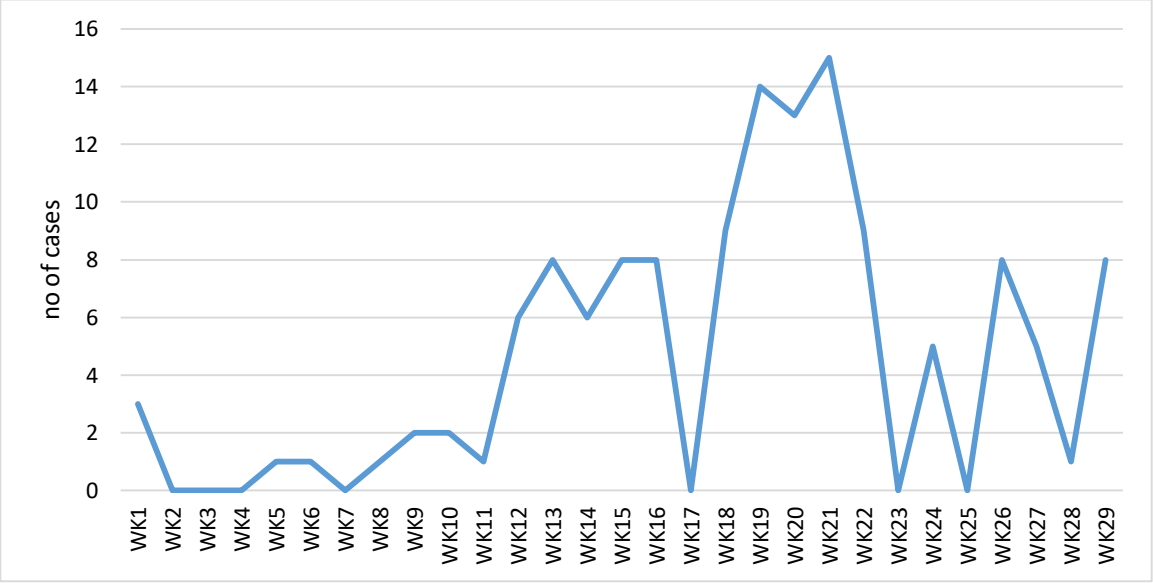


Figure 8: Measles cases trend in Bole Sub city, 2018

Reporting Flow in Sub City

Following the national PHEM guideline, In Bole sub city, the cases of Measles are reported to Woreda PHEM officer Immediately with in 30min. District health office collects immediately report of Measles and send immediately with in 30 min to sub-city. For those weekly reportable disease Woredas collect reports from each health facilities and report for sub city on Monday. The sub city health office reports to regional health bureau on Wednesday.

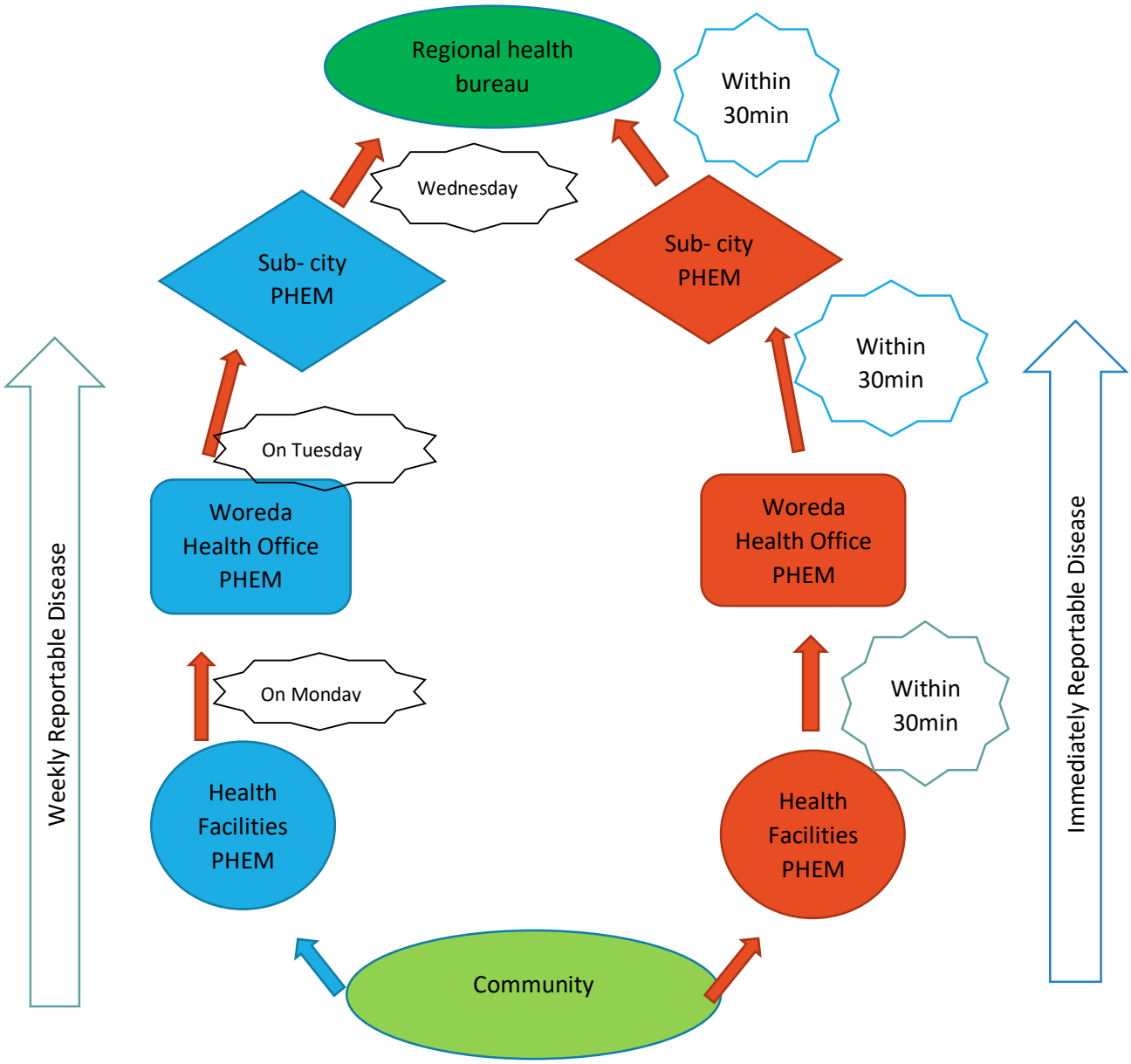


Figure 9: Case Reporting system flow in Bole Sub-city2018

The national PHEM targets all the population in the country to be under surveillance for all twenty-one priority diseases. Bole sub city follows the same structure, with a total population of 360.387 (projected from the 2007 national census).

Table 5: Population under Surveillance in the assessed Woreda /districts of Bole Sub city, 2018.

Woredas	Under surveillance Population	Total Number of Health Facility	Total HF engaged to Measles and RF surveillance system
Woreda 3	36,000	9	9
Woreda 8	25,886	15	15
Woreda 10	100,000	10	10
Woreda 13	39,050	9	9
Woreda 15	30,000	8	8
Total (Sub city population)	230,936	51	51

HF: - Health Facility, Source Each woreda Health office

Core functions of the surveillance system

Case Detection and registration: - Standard case definitions for all prioritized diseases and National Guide line for notifiable disease are available at sub city level, woredas and visited Health Facilities. The measles cases are detected and reported by using this standard case definition and guide line. Sub city PHEM office, and all woredas have Rumer logbook. (table 5 below).

Table 6: Case detection, registration and case confirmation in Bole sub-city,2018

Indicators	Sub city (n=1)	Woreda (n=05)	Health Facilities (n=05)	Remark
Availability of National guide line	1	05	05	
Standard case Definition	1	05	05	
Rumer logbook	1	05	05	
Case detection capacity	NA	05	05	Clinically

Reporting: - Bole Sub city obtains notifiable disease reports regularly from 15 woredas, except sometimes as a rumor some reports are received directly from community or private clinics. Sub city reports for Addis Ababa Health Bureau every Wednesday using email Phone and paper by compiling immediately and weakly reportable disease after summiting reports from expected Woredas. Within the last six months there was no shortage of reporting format in all visited health center and health offices. The weekly report rates of visited health centers, Woredas and sub city health offices over the past 29 weeks (WHO week 1-29/2018) prior to assessment were 100%. All

reports were sent to the next level via personal mobile phones except sub city health office uses personal e-mail and office telephone service to report to the regional health bureau by PHEM focal person.

Case confirmation (Laboratory): - The laboratory capacity to collect, test, transport and roles in surveillance of Measles and other priority diseases like Malaria and AFP were assessed. Neither of Woredas PHEM office or Sub city PHEM office have capacity to confirm cases because they are assigned to receive reports from each health facilities rather than case confirmation. Malaria, Dysentery, Typhoid, Typhus, relapsing fever cases are confirmed at health center level by laboratory staff. However, Other priority diseases of surveillance like measles and AFP laboratory test (virology) are performed at national lab center. Because of the result of Measles dalliance, it is difficult to confirm outbreak of measles easily. All visited health centers have the capacity to collect and transport these samples to regional or national (EPHI) lab center using guidelines (table 6 below).

Table 7: The capacity of case confirmation in Bole sub city at different level,2018

Capacity to confirm cases of	Sub city (n=1)	Woredas (n=05)	Health Facilities (n=05)
Acute Flaccid Paralysis (AFP)	No	No	No
Anthrax	No	No	No
Avian Human Influenza	No	No	No
Cholera	No	No	No
Measles	No	No	Yes
Pandemic Influenza	No	No	No
Rabies	No	No	No
Severe Acute Respiratory Syndrome (SARS)	No	No	No
Small Pox	No	No	No
Viral Hemorrhagic Fever	No	No	No
Yellow Fever	No	No	No
Dysentery	No	No	Yes (10)
Malaria	No	No	Yes (10)
Meningitis	No	No	No
Relapsing Fever	No	No	Yes (10)
Typhoid Fever	No	No	Yes

Typhus	No	No	Yes

Data Analysis and interpretation: - Sub city officer has trained on surveillance system. The data was being analyzed regularly every month describing the trends in terms of time place and Person. But, in all Woredas and visited health facilities there were limitation of data analysis regularly. Out of Five Visited woreda health office and Five corresponding health centers three of woredas and only three of health centers have trend of data analyzing for some reportable disease (commonly for measles, typhoid fever and dysentery). To detect possible out breaks early for each notifiable disease the threshold is clearly stated in all woredas and Health facilities, which is adopted from national disease under surveillance guide line (EPHEM Guide line). Accordingly, all of the staff are informed that the threshold for measles.

Table 8: Data analysis and interpretation practice in Woredas and Health centers, 2018

Variables	**Woreda**		**Health centers**	
	Measles	%	Measles	%
Have trend of data analyzing	3	60%	3	40%
Threshold is clearly stated	10	100%	10	100%
Staffs are well informed the threshold of measles and RF	10	100%	10	100%

Epidemic Preparedness: -if the outbreak is happening the outbreak was reported within 48hrs to respective health office. Sub city health office. and most of woredas, health office has written plan of epidemic preparedness and response. also, all visited health Facilities Have Written plan of Epidemic preparedness and response plan. There were emergency stocks of drugs and supplies during the year in all visited Woredas and Health facilities. All visited health facilities and health offices have organized rapid response team.

Outbreak Investigation: - In this year (2018) measles suspected out breaks were happened in Bole Sub city and Investigation was conducted at central laboratory (EPHI) but there is no confirmed case. in 2018 there were no relapsing fever and other cases outbreak in this sub city.

Responses and Controls: - measles out breaks were happened and the risk factors was identified., many interventions were done by sub city in all woredas and Health Centers including sub city the

Rapid Response Team (RRT) routinely evaluate their performance level of preparedness and response activities in the last one year.

Supporting functions of the Surveillance system

Supervision and Feed Back: - To strengthen surveillance system and support the staffs, Sub city conducts supervision for Woredas and Health Facilities. Sub city provide feed backs in written form at least monthly. Otherwise, Dissemination of surveillance information and supervision at all Woreda levels of health system assessed were limited in the past six months. Among 15 Woredas visited, all of them conducted supervision every two –four weeks with support of checklist. Woredas those had conducted supervision provided feedback for the corresponding health facility orally and in written form.

Training: - There are two PHEM staffs working at sub city level on surveillance system. Both of them were trained on surveillance. All visited Woreda health office have one trained PHEM focal person and Among 05 Health centers five of them has trained IDSR focal person

Materials and Resources Available for Surveillance: - Resources for data management, communications and logistics were available at sub city health office level only. Sub city health office PHEM has computers, telephone and internet services but has no independent access of budget line. The districts health offices PHEM have no computers and internet services. The logistics and budget constraints were complained at all assessed level of health institutions. Regarding man power, in sub-city two trained persons are working on collecting, compiling, reporting cases to higher level and supervising lower levels. One person in each woredas and health centers are allocated for surveillance purpose but some of them have no enough training on surveillance.

SURVEILLANCE ATTRIBUTES

Completeness and Timeliness

As shown in the table below Completeness of sub city report in the last 29 weeks was calculated in two ways. The first one is sub city level completeness which is about 100% and the second is Woreda level which is 100%.

The other measurement is the timeliness of report which is 100% in Sub-city level and 83% to 100% at Woreda level. (See table below)

Table 9: Completeness and timeliness of measles reports in Bole sub city, 2018

Reporting site	Total HF expected to report	Average Health Facility Reported	Health Facilities report on time	Completeness	Timeliness
Sub City (Bole)	15 woredas	15 woreda	15	100%	100%
Woreda 3	9HF	9HF	9	100%	98%
Woreda 8	15	15	15	100%	100%
Woreda 10	10	10	10	100%	96%
Woreda 13	9	9	9	100%	100%
Woreda 15	8	8	8	100%	83%

Use fullness

Early detection of epidemics of diseases under surveillance was a common understanding of all the respondents as the major use of the surveillance system and most of them replied they use the system for assessment of routine program monitoring and some of them also uses it for early warning as well. Surveillance system is considered to be useful if it addresses detection of diseases or events, detecting changes in trends including outbreak detection and permitting assessment of prevention and control programs. Moreover, this well understood use of the surveillance system has so many challenges in the area of case detection, reporting and response following it. The surveillance system in the PHEM is organized in such a way that the community and all other health facilities under the FMoH will have active role in the detection of cases with the help of case definitions. In the study area, dissemination of case definitions of these diseases was very good and there were two types of case definitions. Standard case definition and community cases definitions in all visited districts. However, there were lack of budget for supervision of the health facilities affects surveillance performance. there was no regular surveillance data analysis (40%) of assessed Health Facilities and (40%) of Woredas which highly contributes to detect changes in disease trends or to detect outbreaks.

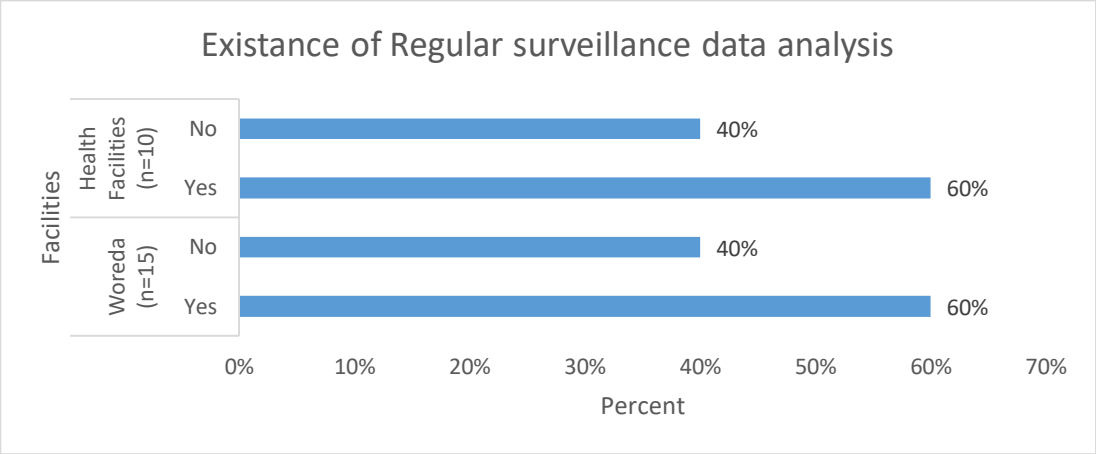


Figure 10 Surveillance data analysis practice in assessed woredas and health centers

Simplicity

All respondents agreed that the case definitions of Measles for identification of suspected cases are easy to understand and apply by all levels of health professionals. But to confirm cases, it was limitation on Measles because the facilities did not receive the result from National Laboratory where the test is performed. This leads to dalliance of epidemiological intervention at the time of outbreaks. Otherwise, the route of data flow is clear and simple as it was set in the surveillance guideline. There was no lack of reporting format at all level. In the case of measles case-based reporting it takes only 5 to 10 min to complete case-based format. But, collecting weekly reports from registration books was one challenge in Health facility which took 40-60 min to fill a single report by collecting data from registers. Logistics like telephone, public transport and internet service were other major challenges especially in all health centers to facilitate reporting system. This affects timeliness of the report. The health workers at the health facility and districts usually use their personal mobile phones.

Acceptability

Acceptability of the surveillance system was assessed based on the engagement of the reporting agents and active participation in case detection and reporting. The reporting rate of all assessed health facilities were 100% over the past 29 reporting weeks. But the average completeness of surveillance data was only 92.5% in all visited health centers. There is a total of 150 health facilities in Bole Sub city. All of Health facilities are Expected to be engaged to Surveillance system 100% of them were well engaged to surveillance system and are expected to send Measles reports to Sub city through 10 woreda Health offices. Accordingly, they are sending Measles reports to the next level using National surveillance system. All of selected and interviewed health

facilities and Woredas replied they believe the existing surveillance system is very important for public health intervention and they accept Measles surveillance system. All participants (disease reporting facilities) follow and identify all reportable disease using standard case definitions and reports them by using the current reporting format.

Flexibility

Most of the respondents nine (82%) reported that the current reporting format (weekly and immediately) is not difficult to use for new diseases or events, while the rest two (18%) reported it is difficult to use existing format for newly occurring disease. Some gaps raised by the respondents were no place is available for personal variables like age and sex in the current reporting format for weekly reportable diseases that makes difficult to analyze the personal variables. However, adding new variables like age and sex for weekly reportable diseases is difficult for implementation but it is easy for immediately reportable diseases (case-based format). All of the respondents said integration of the existing surveillance is not easy to integrate with other reporting systems.

Table 10: Flexibility of current reporting format of Bole sub city ,2018

Variables	**Difficult (n= 11)**		**Easy (n= 11)**	
	Immediately reporting format	Weekly reporting format	Immediately reporting format	Weekly reporting format
Current reporting format use for new event	2	2	9	9
To analyze the disease in terms of personal variables	0	11	11	11
Adding new variables like age and sex to existing format	0	11	11	11

The Quality of Data

We assessed the quality of data in terms of completeness, cleanness of reports, validness of the number of cases in registration and those in reporting format, inclusion of all the necessary variables that should filled in reporting format and summary report of weekly re portable disease on weekly basis. For health facilities, we counted and compared the reported Measles cases with summary report to go to higher level and Out Patient Department (OPD) registration books for the previous months. Accordingly, all of the assessed health facilities 5 (100%) the number of cases

recorded in Registration book is similar with those reported to next level, report formats are clearly filled and no missed variables on formats while reporting.

Sensitivity

The sensitivity of the surveillance of Measles in the detection of cases and outbreaks were seen separately. In detection of cases, Health facilities use standard case definitions. All person with fever and maculopapular (non-vesicular) generalized rash and cough, coryza or conjunctivitis (red eyes) OR any person in whom a clinician suspects measles is reported to the second level and the sample is sent to national laboratory to confirmation. But due to the dalliance of the result sometimes it is difficult to confirm early. Depending on the case definitions that currently the health facilities are using to detect cases, most probably all suspected cases of measles were correctly being reported to the next level without any missing of cases. Even though, in Bole sub city Measles cases were being identified and reported in this way, it was not possible to measure the sensitivity quantitatively because of lack false negative Value. On the other hand, Outbreak detection depends on regular data analysis, health-seeking behavior of the society, availability of laboratory services, definitions and prevalence of action thresholds, timeliness and completeness of reporting. action threshold was available in all assessed health facilities and health offices but, Data analysis is not regularly performed in most of Woredas and assessed Health facilities which may decrease the sensitivity of the system to detect the outbreak.

Positive Predictive Value

In the past 29 epidemic weeks about 136 suspected Measles samples were sent to laboratory from Bole sub city for confirmation among this 136 suspected Igm Positive for measles virus0%.

Representativeness

All respondents replied the surveillance system enables them to follow the health and health related events in whole community. In Bole Sub City the case definitions those used to monitor disease outbreak is classified into two. Community based and standard case definitions. Health extension workers monitors disease occurrences in the community level using the loose community-based case definitions and reports cases for corresponding Health Center. By using standard case definition and laboratory if possible, the health workers in health center again screen them for suspected cases. In this integrated way, the report is compiled and transferred to next level. However, other than health facilities, there were different traditional healers and religious areas where some of community may visit at the time of illness. The existing surveillance system did not incorporate those areas and none of either traditional healers or Religious organization were

engaged to reporting system. Lack of this makes the surveillance systems of Bole Sub city unrepresentative.

Stability

The surveillance system ensured to function in proper way and according to the standard guideline. As all participants replied there were no new restructuring affects the procedure and activities of the surveillance and there was no lack of resources that interrupt the system. Reports were collected and aggregated by health facility and reported directly to the regional PHEM regularly without any interruption.

Table 11: Surveillance Attributes Summery table, Bole Sub city, 2018

S/n	Surveillance attributes	Finding in sub-city
1.	Completeness	• 100% sub city level • 60%(average) in Woreda level
2.	Timeliness	• 100% in sub-city level • 60% to 100% at Woreda level.
3.	Useful ness	• All believed the existing system helps them to detect any outbreak • But only 40% of health Centers and 60% of Woreda health office perform trend analysis of measles
4.	Simplicity	• It takes 5-10min to fill the format • Lab. Confirmation takes more than week/Absent
5.	Acceptability	• All health facilities in sub-city (100%) accepted and engaged to the system • Cases are being identified using standard case definition in facilities and community-based case definition in communities.
6.	Flexibility	• Easy to use for new disease (82%) • Difficult to use for new disease (18%)
7.	Sensitivity	• Measles case definition at facility level and Community level is very broad enabling communities and health professions to easily identify measles cases.

		• But to put the sensitivity of the case definition quantitatively there were no documented true positive value.
8.	PPV	• 0%
9.	Representativeness	• Disease identified at community level and health facility level • Traditional healers and holy water places were ignored
10.	Stability	• No any restructuring affected the existing reporting system in the study period.

3.1.5 DISCUSSION

Among 21 diseases under surveillance in Ethiopia, Measles was the major disease burdens of Bole sub city that were being reported from most of woredas and remain main threats of epidemic to community. Detection of a priority disease under surveillance depends on the availability and sensitivity of its case definitions. These case definitions must be used at all levels including the community, health professionals working at health posts, health centers, hospitals, health offices at different levels, private health facilities, other government health facilities and NGO clinics to detect easily.

In the study area availability of Measles case definition and community case definition helps to identify any suspected measles case outbreak early. The challenge of Measles case confirmation laboratory is the major problem in outbreak identification in visited sub city. The report flow of Measles in Bole Sub city is the same with national reporting system.

In strengthening Surveillance system, capacitating the staffs by up-to-date training, Supportive supervision and providing feedback are a key function of public health surveillance system. Regarding this there is a gap on regular/continuous supervision for lower level and documenting feed backs especially in health facilities. This may negatively affect the of surveillance system.

Epidemic preparedness refers to the existing level of preparedness for potential epidemics and includes availability of preparedness plans, stockpiling, designation of isolation facilities, setting aside of resources for outbreak response. There is no written epidemic preparedness and response plan at Some of visited woredas and Health facilities. This may result in weak case detection and response during epidemics. The aim of preparedness is to strengthen capacity in recognizing and responding to public health emergencies through conducting regular risk identification and analysis, establishing partnership and collaboration, enhancing community participation and implementing community-based interventions and strategic communication during the pre-emergency phase and ensuring their monitoring and evaluation. Additionally, shortage of resources for data management is being a challenge to generate and disseminate PHEM reports timely through maintaining their quality. There were no problems on the simplicity of the system regarding case definitions of selected diseases, reporting system and additional data collected on cases at all visited levels.

Reliable reporting of surveillance data throughout the country is important so that program managers, surveillance officers and other health care staff can use the information for action. The routine flow of surveillance data is usually from reporting sites (community and health facility) to

the next level up to the central levels. The reporting rate of visited heath centers and health offices over the past 29 weeks were high 100% and Average completeness of reporting health facilities at Woreda and sub city level is also high 94% and 100% respectively. This includes all private and governmental health facilities of the sub city which indicates that there is representativeness of the surveillance system. According to national PHEM guidelines acceptable level of completeness were 80% and above. But completeness of Measles case surveillance data cross checked from registry and summery report format of two of visited Woredas were below 80% which is low when compared to the acceptable standard.

It was agreed by most of respondents that the surveillance system is flexible for newly occurring health and health related events. But still there are some challenges on the flexibility of report format especially for weekly reporting format as 100% of the respondents accepted on adding newly occurring disease. Reporting formats of priority diseases are easy and clear to fill for data collectors at Woreda and Health facility level.

Furthermore, to perform and monitor disease surveillance in a better way resource allocation is important. But, in the study area lack of resources and logistic for early case investigation at the community level and lack of budget for conducting supervision and providing feedback to health facilities and Woredas affects the use fullness of the system. In addition, Lack of, refunding of transport and telephone expenditures and perdiem has impact on the overall performance of the surveillance system.

3.1.6 CONCLUSION

- Measles cases are detected early in all assessed woredas using standard case definition for Health facilities and Community case definitions for community-based surveillance.
- Early Measles case confirmation was challenging due to dalliance of the result from national laboratory.
- Poor trend data analysis performance was observed in most of Health centers and some of woredas.
- There is good epidemic preparedness in sub-city, Woredas, and Health centers.
- In the study Year, one outbreak (measles suspected) was happened and investigation with intervention was done accordingly but the ppv was 0%.
- The completeness and Timeliness of Measles reports in some woredas was Lower than expected national standard.
- Acceptability of Measles surveillance is very high in Sub city.
- Good Flexibility of reporting format, low measles positive predictive value was identified.
- Inadequate resources for communication (telephone, internet), for data management (computer at Woredas), budget for conducting supportive supervision.
- Representativeness of surveillance system were affected due to not involving reports from Traditional healers and religious organization

3.1.7 RECOMMENDATION

- Regular supervision and Feedback provision to strengthen the system from higher level (woreda, Sub city, Health bureau).
- Regular trend analysis to detect possible out breaks at Health facility level, Woreda level, and Sub city level.
- Allocating enough budget to facilitate Surveillance system independent of the other budget.
- Availing communication system for health centers and woredas for early information sharing with higher level.

3.1.8 REFERENCES

1. Ethiopian Health and Nutrition Research Institute Public Health Emergency Management Centre, February 2012
2. Centers for Disease Control and Prevention (CDC). Updated Guidelines for Evaluating Public Health Surveillance Systems. Recommendations from the Guidelines Working Group. MMWR, July 27, 2001; 50 (RR-13)
3. Evaluation of the integrated disease surveillance and response system for infectious diseases control in northern Ghana, 2015
4. Integrated Disease Surveillance and Response AFENET Pre-Conference Workshop, November 17, 2013
5. Federal Democratic Republic of Ethiopia Public Health Emergency Management, Guidelines for Ethiopia. Ethiopian Health and Nutrition Research Institute Public Health Emergency Management Centre, February 2012, Addis Ababa, Ethiopia
6. Health Sector development program- IV, annual performance report EFY 2003 (2010/11, Version 1)
7. Public Health Emergency Management Guidelines for Ethiopia 2012
8. Mariner, J.C.; House, J.A.; Mebus, C.A.; Sollod, A.E.; Chibeu, D.; Jones, B.A.; Roeder, P.L.; Admassu, B.; van't Klooster, G.G. Rinderpest eradication: Appropriate technology and social innovations. Science **2012**, 337, 1309–1312. [CrossRef] [PubMed]
9. Patel, M.K.; Gacic-Dobo, M.; Strebel, P.M.; Dabbagh, A.; Mulders, M.N.; Okwo-Bele, J.; Dumolard, L.; Rota, P.A.; Kretsinger, K.; Goodson, J.L. Progress toward regional measles elimination—Worldwide, 2000–2015. Morb. Mortal. Wkly. Rep. **2016**, 65, 1228–1233.
10. **Melissa M. Coughlin, Andrew S. Beck, Bettina Bankamp and Paul A. Rota ***Measles, Mumps, Rubella, and Herpesvirus Laboratory Branch, Division of Viral Diseases, Centers for Disease Control and Prevention, 2017
11. CDC, WHO report**,** www.measlesrubellainitiative.org
12. https://www.cdc.gov/measles/downloads/measlesdataandstatsslideset.pdf
13. https://www.interhealthworldwide.org/home/health-resources/health-alerts/2015/april/06/measles-and-dephteria
14. Guideline on measles surveillance and outbreak management 3rd edition, *January 2012 Addis Ababa, Ethiopia*

4 CHAPTER IV HEALTH PROFIL ASSESEMENT

4.1 Health Profile Description of Woreda 09 Bole sub City, Addis Ababa City Administration, 2018

ABSTRACT

Introduction: Health profile is information used to improve availability and accessibility for health and health related information.it provides a summary of health information of the community as a whole which helps in disease prevention, health promotion, and intervention for health related issues. The Main objective of this study is to assess the health and health related profile of Bole sub city Woreda 09 in, 2018.

Methods and Materials*:* This health profile description was done on June 2018 in Bole sub city Woreda 09. Cross sectional descriptive study was conducted. Woreda historical background, overall health profile, maternal health, child health, epidemic prone disease situation, and other health hazard situation were assessed by using Standard check list which was adopted from previous study. The information was collected by face to face interview with key informants in woreda and through observation of materials.

Result: -In Woreda 9 the health service is being provided by 12 Health facilities (all type). In this woreda Crude birth rate was 7 per 1000 with zero neonatal mortality rate. The contraceptive acceptance rate of this Woreda accounts about 100% ANC1 coverage in 2018 was >100%. The majority of TB cases detected in 2018 in Woreda 9 was clinically diagnosed (smear negative) type of TB which accounts about 48% of the total cases. In this year among total live born babies, low birth weight percentage (<2500gm) were 2.4%. Only 17 % of the population in Woreda 9 are using community latrine and about 80% are using private latrine.

Conclusion: -. TB treatment cure rate and treatment success rate were less than expected, Vaccine coverage, TB detection rate, ANC, and PNC were good. Problem of Poor sewerage system. Community mobilization on maternal health improving liquid waste disposal is recommended to build healthy community.

[2]

[2] *Key words: - Health profile, Bole Sub city, Woreda 9, Morbidity & Mortality, Maternal health.*

4.1.1 INTRODUCTION

Health Profiles is an information used to improve availability and accessibility for health and health-related information. It provides a summary of health information of the community as a whole which helps in disease prevention, health promotion, and health related issues intervention. The profiles give a snapshot overview of health status for each local authority. [1]

Well organized information is an input in democratization process, good governance and for filling the development gaps. The availability of reliable, adequate and up-to-date information has a paramount significance for the purpose of allocating budget, planning, formulating and monitoring development projects. In addition, it provides relevant and up to date information, which could serve as an input by both decision and policy makers. Among the major information required in one country or district, which enables government, policy makers and all other stake holders to allocate important resources, Health profile is the one [2].

The health and wellbeing of any population requires a holistic approach that includes the involvement of many agencies and gives ownership to the communities involved. The increasing return to the principles of public health signifies that a merely medical approach to health issues cannot by itself resolve multi-directed health problems in increasingly complex cities. Government health strategy documents increasingly recognize the need of views of the people receiving services in needs-based service delivery and support the involvement of individuals and communities as a key objective in the future delivery of health services [3].

Currently, the concept of health, as defined by the World Health Organization (WHO), is a state of complete physical, mental and social well-being and not merely the absence of disease or infirmity. Taking this perspective, one moves beyond disease absence as defining health status to one that incorporates the complex perceptions about health and health related conditions.

Hence, Health Profiles are about the health of people and about the conditions in which they live. The preparation of profiles provides a lively, scientifically and evidence based account of health in the district; it can stimulate public interest and political commitment; and it can identify targets for the future and monitor progress towards them.

The health profile description highlights several important aspects of public health data; Demographic data, infrastructure of the district, socio-economic information, health care coverage,

vital statistics, education coverage and other all health-related information were collected to address important public health problems and to facilitate effective public health actions.

Health description is also crucial for prioritizing health and health related problems of the community at any level. Housing is one of the critical problems of the Addis Ababa. Most houses of the city are old, unplanned and inconvenient for living. Because of rural-urban migration and natural increase there is an alarming population increase in the city. This causes shortage of social utilities including housing. Sanitation and sewerage management and disposal is a serious socio-economic problem of the city [4,5,6].

Therefore, this health profile description is important for advocacy, program planning, implementation and evaluation of health care in Bole sub city Woreda 09.

Significance of the study

Health profile description is crucial for prioritizing health and health related problems of the community at any level. By compiling all aspects of community health information, this study is aimed to provide relevant information for government, non – government organizations, policy makers and researchers, which helps them for taking appropriate decision making and designing appropriate intervention, development strategies.

Specially, the information generated from this health profile description could help sub city health office, Health center, woreda and other health stake holder in public health planning, resource allocation, intervention and system evaluations as well.

4.1.2 OBJECTIVE

4.1.2.1 General Objective

- ✓ To assess the health and health related profile of Bole sub city Woreda 09 in 2018

4.1.2.2 Specific Objectives

- ✓ To describe the demographic characteristics of the population in Bole sub city Woreda 09 in 2018;
- ✓ To describe health service infrastructures in Bole sub city woreda 09 in 2018;
- ✓ To assess the status of health delivery system in Bole sub city woreda 09 in 2018;
- ✓ To describe the health status of the population in Bole sub city Woreda 09 in 2018 by using different health and health related indicators;

- ✓ To identify the health problems of the Woreda.

4.1.3 METHODS AND MATERIALS

Study Area and Period

Addis Ababa lies 9°1′48″N latitude and 38°44′24″E longitude. The city is located at the center of the country, at an altitude ranging from 2100 meters at Akaki in the south to 3,000 meters at Entoto Hill in the North. This city has a sub-tropical highland climate with average temperature differences of up to 12.2°C, depending on elevation and prevailing wind patterns.

This city administration is built up from 10 sub cities. Among 10 sub-cities found in Addis Ababa, this health profile was collected in Bole sub city Woreda 09. Woreda 09 is one of woredas found Bole Sub city, located in North - East part of the sub city and It has a total of 30,630 populations settled on land mass of 656 hectares. The district is bounded by Bole sub-city Woreda 11 on South, woreda7 on North, Woreda 8 on West, and woreda 10 in the East. This study was done from January 9,2010 to February 9, 2018 by collecting health and health related issues of the woreda.

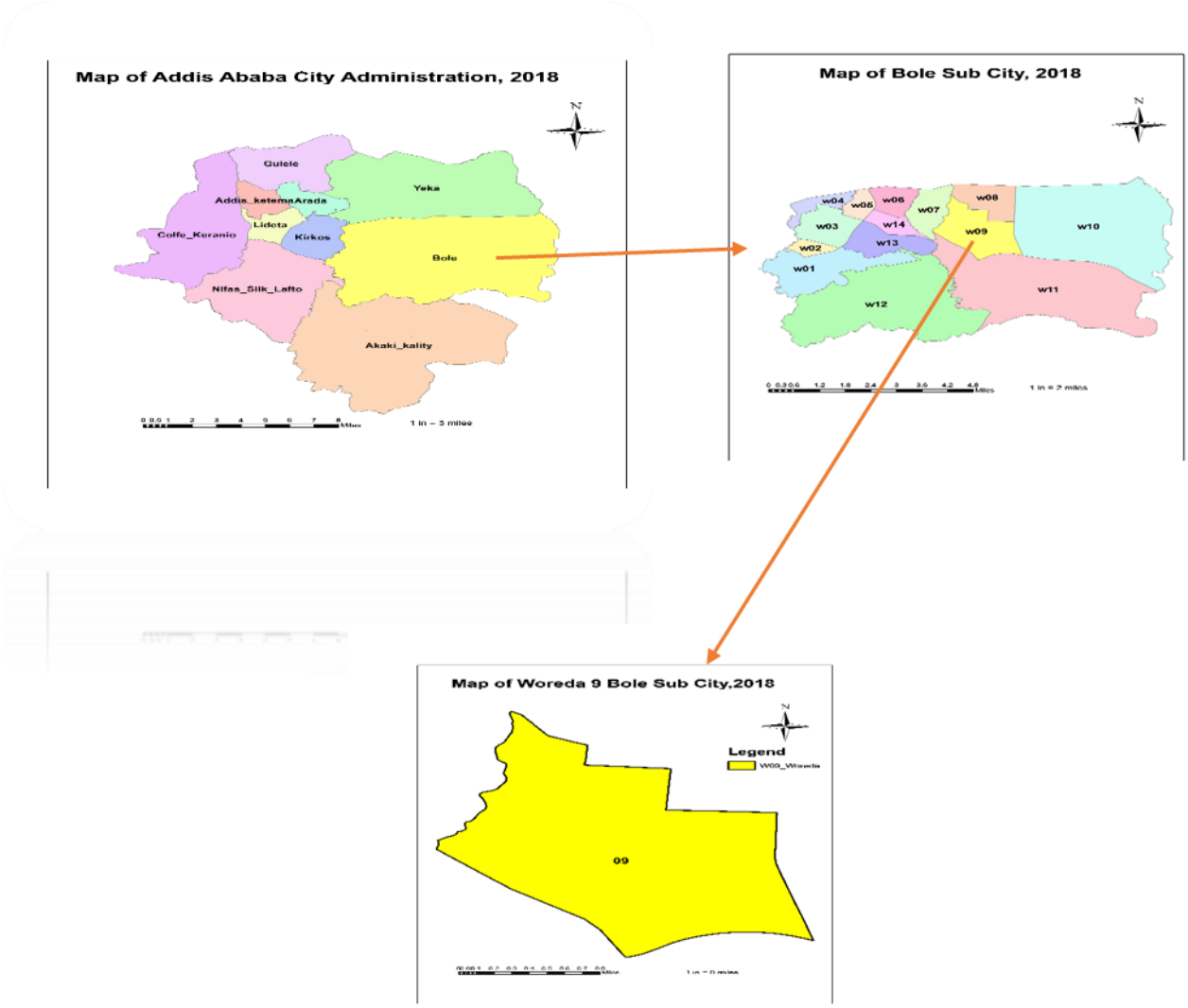


Figure 11: Map representation of Study area woreda 9,2018

Study Design

Cross sectional descriptive study was conducted to assess the health profile of Bole Sub city Woreda 9 in 2018.

Sample size and sampling techniques

Convenient sampling technique was used to select one woreda in the sub city by discussion with sub city PHEM officer as the Sub city information shows there were no assessment done before in this woreda. Because of this there may be different health related events those need improvement and provokes health profile assessment.

Data collection procedures

Data was collected by using prepared standard checklists. Accordingly, all concerned body were interviewed and in addition direct observation and discussion with authorized person was conducted. All data was collected by principal investigator

Source of the Data

Secondary data (administrative data) was used to prepare/compile this profile. The sources of data include:

- Bole Sub-Cities health office, Plan and Program Core Process
- Sector Bureaus, Authorities and Agencies in sub cities (Bole Sub City Education Office Bole Sub City Bureau of Finance and Economic Development (BoFED)
- Woreda 09 administrative bureaus
- Review of related Literatures conducted in Addis Ababa & Bole Sub City

Data Analysis Procedure

Data was analyzed by using Microsoft Excel, to organize and analyze data appropriately. Frequency distribution tables and figures (descriptive statistics) are used to show the results.

Data Quality Assurance

To keep the data quality check list was prepared accordingly the information to be collected. Then data was checked for completeness and clearness principal investigation.

Data Management and Presentation

The data collected from the above organizations was checked for completeness and validity; entered into Excel sheets and then it was analyzed using M. Excel The results were presented using tables, different figures and charts.

Ethical considerations

Official letter was obtained from Bole sub city Health office to the study area of woreda health office and other relevant offices to accept the legality of this study. The purpose and objective of the study was briefly explained to the respected Offices based on their level of responsibility.

Dissemination of findings

The result of the study was disseminated to Addis Ababa university school of public health, Bole sub city Health office, and Woreda 09 Health Office.

Definition of terms

Maternal mortality rate: - Number of deaths assigned to pregnancy-related causes during a given time interval

Infant mortality Rate: - Number of deaths of children < 1 year of age reported during a given time period among Number of live births reported during the same time period.

Crude Mortality Rate: - The crude mortality rate is the mortality rate from all causes of death for a population.

Crude Birth Rate: - Number of live births during a specified time interval

Neonatal mortality Rate: - Number of deaths among children < 28 days of age during a given time interval

Fully vaccinated: - Children under one who took whole vaccinations available in Ethiopia.

Skilled Birth Attendant *Delivery*: - delivery which is attended by health professionals in Facility

Traditional Birth Attendant Delivery: - Delivery attended by Non-health professionals (home Delivery)

New OPD visit: - a person who visits Health Facility for a compliant of disease he didn't treated before

Repeat OPD visit: - a person who visit Health facility for some complaints of disease he had treated before in the same year and not improved.

Expected pregnancy: - Number of women expected to be pregnant in the given year among reproductive age groups

Live birth: - It is proportion of stillbirths from total births attended by skilled health attendants.

Contraceptive acceptance Rate(CAR): - proportion of women of reproductive age (15-49 years) who are not pregnant who are accepting a modern contraceptive method (new and repeat acceptors).

Ante natal care 1(ANC1): - Number of pregnant Women received ante natal care at least one time.

Antenatal care 4(ANC 4): - Number of pregnant Women received ante natal care at least four time.

Institutional maternal Death: - number of maternal deaths among all deliveries attended in the given institution by condition related to pregnancy.

Post Natal Care Coverage: - Proportion of women who seek care, at least once during postpartum (within 42 days after delivery), from a skilled health attendant.

Still Birth rate: - proportion of stillbirths from total births attended by skilled health attendants.

TB treatment cure rate: - percentage of a cohort of new smear-positive TB cases registered in a specified period that was cured as demonstrated by bacteriologic evidence (a negative sputum smear result recorded during the last month of treatment and on at least on one previous occasion during treatment).

TB detection Rate: - TB case detection rate is number of new pulmonary and extra pulmonary (all forms) TB cases detected, among the TB cases estimated to occur countrywide.

TB treatment success rate: - **a** percentage of a cohort of new TB cases registered in a specified period that successfully completed treatment.

4.1.4 RESULT

Historical Aspects of Woreda 9

Woreda 9 administration is one of Woredas found in Bole Sub city which is built up of nine Ketenas as current classification. years ago, this woreda is known by the history of somehow rural But currently as a result of different development strategic plan prepared by Woreda administration through a time this history of rural is being changed. Among strategies that was applied to convert the history of rural, grouping societies into constricting is the major one. Currently many of peoples living in this woreda are employee and the part of populations are Civil servant that is why the society's is well.

Geography and Climate

Woreda 9 District is one of the district in bole Sub-city, located in North - East part of the sub city and It has a total land mass of 656 hectares. The district is bounded by bole sub-city Woreda 11on South, woreda7 on North, Woreda 8 on West, and woreda10 on East. Its annual average temperature is about 18 ^{0}c. Regarding the specific altitudes of Woreda 9 there is no data, but as a sub city.

Administrative and Political Structure

Woreda 9 is classified in to 9 Ketena. All Sector offices are accountable for Woreda administration.

Demographic Information

Woreda 9 has a total population of 30630 in 2010, of which 15621 (51%) are Female and 15087 (49%) are Male; female to male ratio was 1:0.97. Out of the total population 686 (2.2%) are under 1 year, 2,205 (7.2%) are under 5 years and women of child bearing age 15-49-year accounts 10,598 (34.6%) of the District population. The average population living in one hectare is about 47 People.

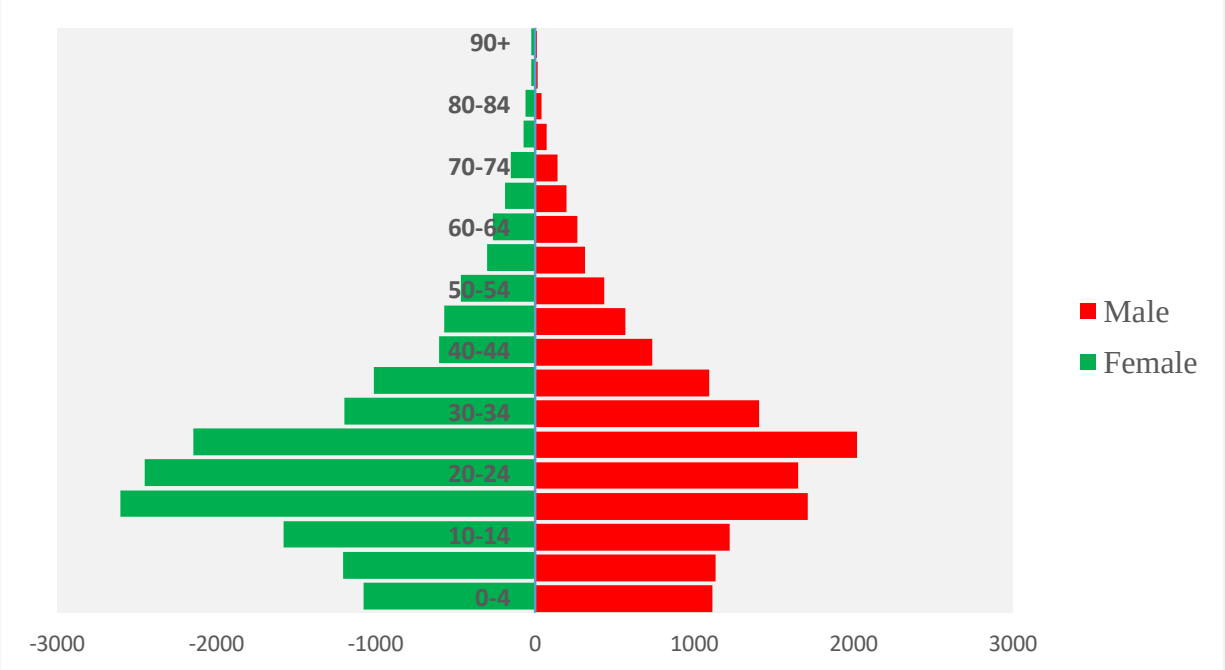


Table 12 Population Pyramid of Woreda 9, bole Sub city, 2010 EFY

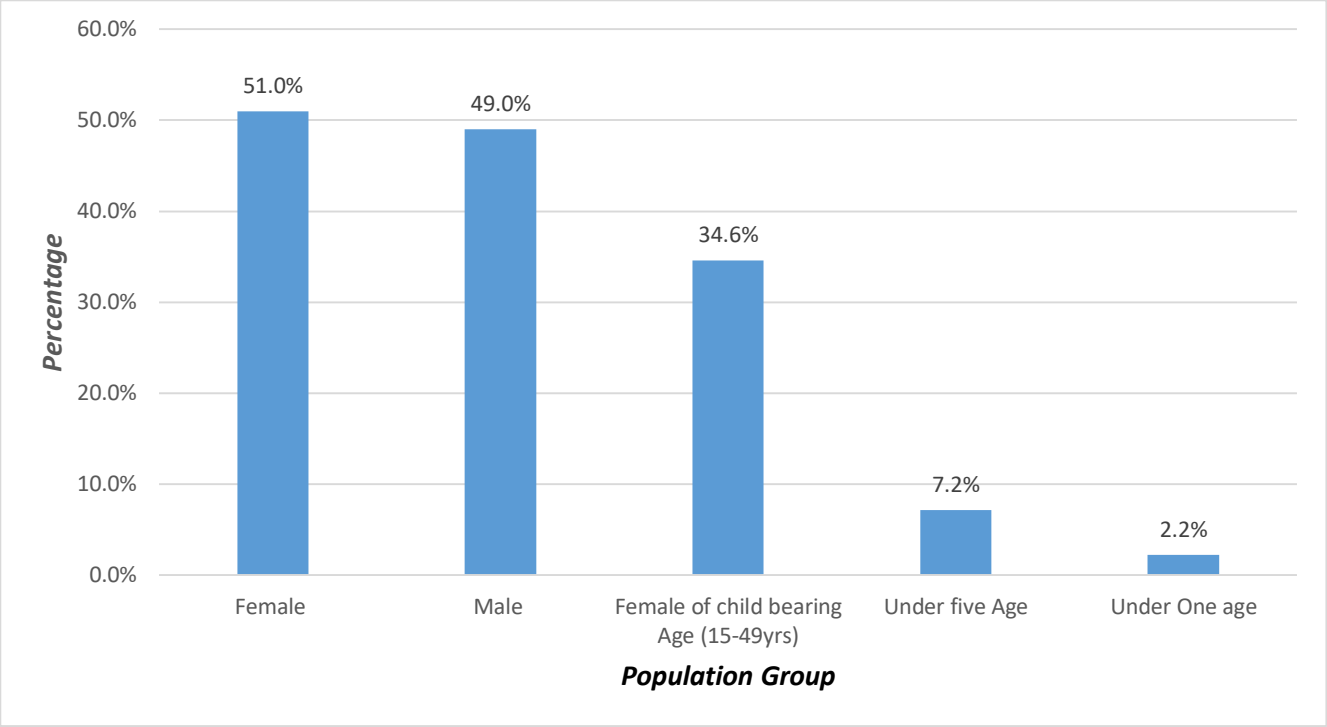


Figure 12: Woreda 09 population classification by sex and age 2018

Infrastructures (Public Service Facilities)

Communications: - in Woreda 9has 100% telecommunication coverage.

Transportation: -All woredas in the sub city has assess to road whether.in woreda nine there are 16 kilometers asphalt road and each ketena covered by cobblestone.

Water Supply: - Water supply coverage is 95% in this Woreda. most hose hold has their own pipe and some are one to five.

Energy Supply: - Electric Power is the main sources of energy in the this Woreda. As other part of Addis Ababa Bole Sub city Woreda 9 population gets 24 hrs. electric power supply. Even though there is interruption.

Education and School Distribution

Bole Sub city Woreda 9 administration has a total of 37 schools; of these 22 KGs, 13 primaries and two secondary exist with a total of 13,229 in kGs 2040 males and 1870 females in primary

4050 males 4680 females in secondary268 males 321 female regular students, are enrolled in 2010 EFY. Females account 53% of the total regular students enrolled.

To increase the coverage of education in Woreda 9 the learning teaching process is performed in two ways; Regular and irregular. Regular learning process is being given at day time for all eligible students. Irregular type of learning is prepared for a person who is unable to attend regular type of learning because of their work which includes older peoples.

Table 13 : Number and types of schools, number of students and teachers found in Woreda 9, 2018

S/No	Types of School	Number School	Owners of school		Number of student			Number of Teachers		
			P	G	**Male**	**Female**	**Total**	**certificate**	**Diploma**	**Degree**
1.	KG	22	20	2	2040	1870	3910	94	60	26
2.	Primary	13	11	2	4050	4680	8730	-	182	128
3.	Secondary	2	2	0	268	321	589	-	-	40

P= private owner, G= governmental owner: Source woreda 9 Educational bureau

In addition to the regular students there are also about 214 irregular students; 83 Males and 131 Females. The Majority of the schools in this woreda is owned by private owner 20 KG and 11 primaries and 2 secondary schools. Only four schools, two KG and two primary schools, are owned by government. There are two secondary schools in this woreda. When we see the number of teachers in this woreda about 94 with certificate are teaching in KG schools and the total of 320 are teaching in primary schools 182 teachers are with diploma and138 teachers are with degree in case of secondary all teachers are degree holders. In average teacher to regular student ratio in this Woreda is 1:100 in primary school and 1:41 in KG school.

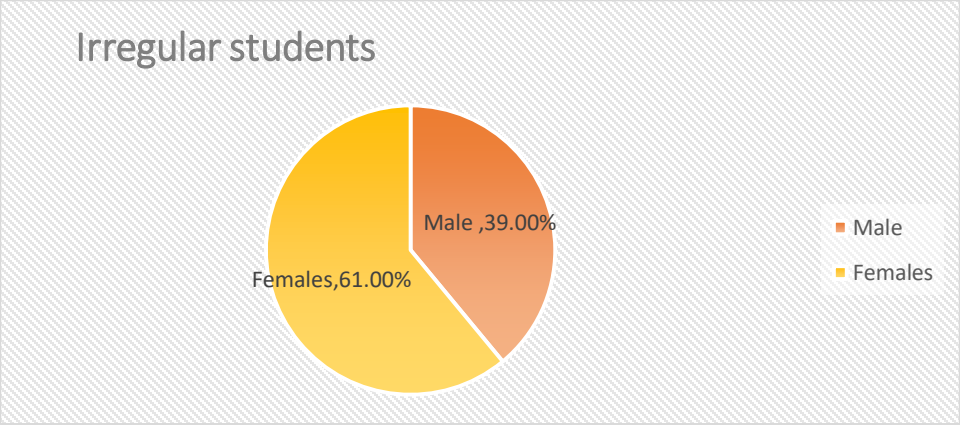


Figure 13: Irregular (Night) students by sex, 2018 (Source: - Woreda Education Bureau)

From the above when we see educational coverage of Bole Sub city Woreda 9 there is about 99.6% of KG education coverage, 91% Regular primary education coverage and 45% irregular primary and basic educational coverage in 2018 (Figure 15).

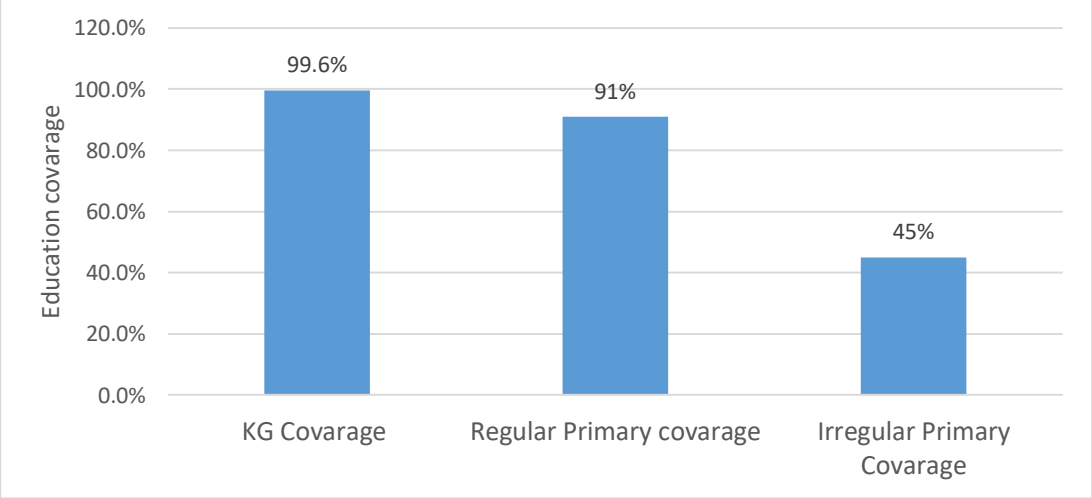


Figure 14 ; Educational coverage in Bole Sub city Woreda 9,2018 (source: - Woreda Education Bureau)

Woreda's Health system.

The Woreda Health Office is currently well organized, and to achieve the maximum Health coverage, it is integrated with a total of 12 health facilities among which there is one governmental Health Center with Health center to population ratio of 1: 30630 and one private hospital, two private primary clinics and 8 medium clinic. There is no diagnostic Laboratory in the woreda. There are also seven drug stores and four pharmacies that found in woreda.

Woreda Health Service Delivery Oregano-Gram

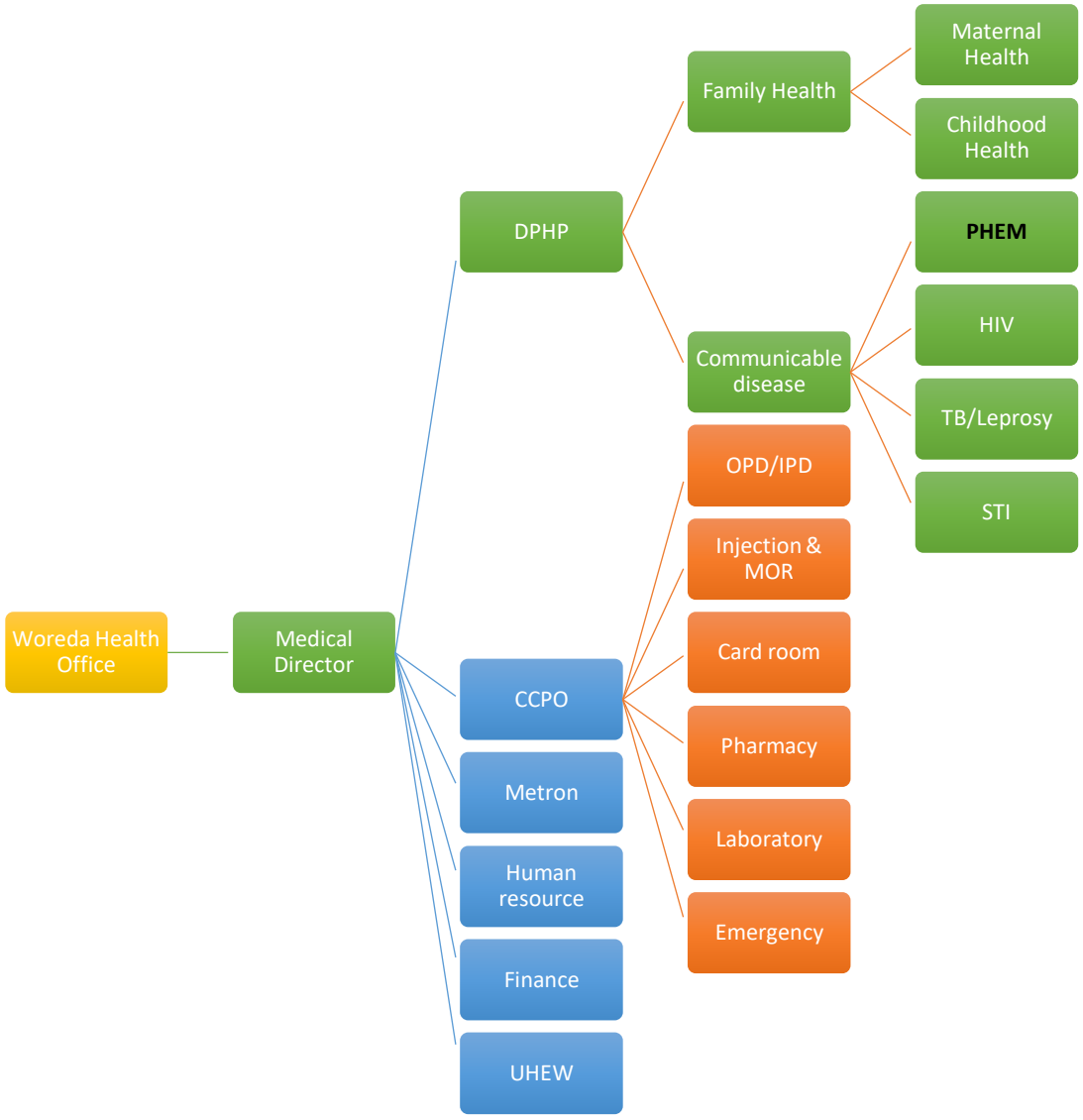


Figure 15. Oregano-gram of Woreda 9 health service in, 2018

Table 14:Health Facilities distribution in Bole Sub city Woreda 9,2018

S/N	Type		Number			Health facility to Population Ratio	Remark
			Governmental	Private	Total		
1	Hospital		0	1	1	-	
2	Health Center		1	-	1	1:30630	
3	Pharmacy/Drug stores		0	12	12	1:2553	
5	Diagnostic laboratory		0	0	0	0	
6	Clinics	Primary	0	2	2	1:15315	
		Medium	0	8	8	1;3829	
		Higher/specialty	0	0	0	0	
Total			1	16	17		

The health centers found in this Woreda currently is serving as the seat of Woreda Health Office and Woreda Health Extension workers on the top of community Health serves. When we see accessibility of transportation in woreda Health facility, there are 16 kilometers length of the roads, all facilities are easily accessible by community using asphalt roads and other wise cobblestone roads. All facilities have 100% safe water coverage and get 24 hrs. electric power.

Health indicators and Vital statistics.

Health indicators and vital statistics are important for estimation of the district's or country's development to know the health service coverage of one country or one district. In Bole Sub- city Woreda 9 some of important Vital statistics were not well documented and there is no data about death. In this Woreda, in 2018 crude birth rate was about 8/1000

Table 15: Major Health indicators and Vital statistics in Woreda 9 , 2018

S/n	Indicators	2010 EFY	
		Number	%
1.	Total population	30630	100%
2.	Female	15621	51%
3.	Male	15009	49%
4.	Under 1 years old	686	2.24%
5.	Under 5 years old	2205	7.16%
6.	Under 15yrs	9317	29.9%
7.	Women 15- 49 years old	10597	34.64%
8.	Expected Pregnancy	714	2.33%
9.	Urban population	30630	100%
10.	Rural population	0	0%
11.	Total live births	608	1.9%
12.	Neonatal mortality Rate	0	0%
13.	Crude birth rate	8/1000	0.6%
14.	Crude death rate	No data	
15.	IMR	No data	
16.	Under 5 Mortality Rate	No data	

Maternal Health

Maternal Health is the health service which focuses on basic maternal health service indicators, i.e. Antenatal, delivery, postnatal care and Family Planning. In Bole Sub city Woreda 9 administration Maternal health service is being provided by one Governmental Health center and one private hospital.

Contraceptive acceptance rate (CAR):

CAR is proportion of women of reproductive age (15-49 years) who are not pregnant who are accepting a modern contraceptive method (new and repeat acceptors 2010 EFY). There were about 9,924 reproductive age women Expected to receive Family planning service. From this, any types of contraceptive acceptance rate of this Woreda accounts about >100% (Table 15).

On the other hands, in 2010 EFY, when we see the CAR by methods long term methods are mostly used accounting about 1023 (60%) among which Implant is the leading method followed by IUCD types of method while Short term methods account about 679 (40%).

Source: - goro Health center

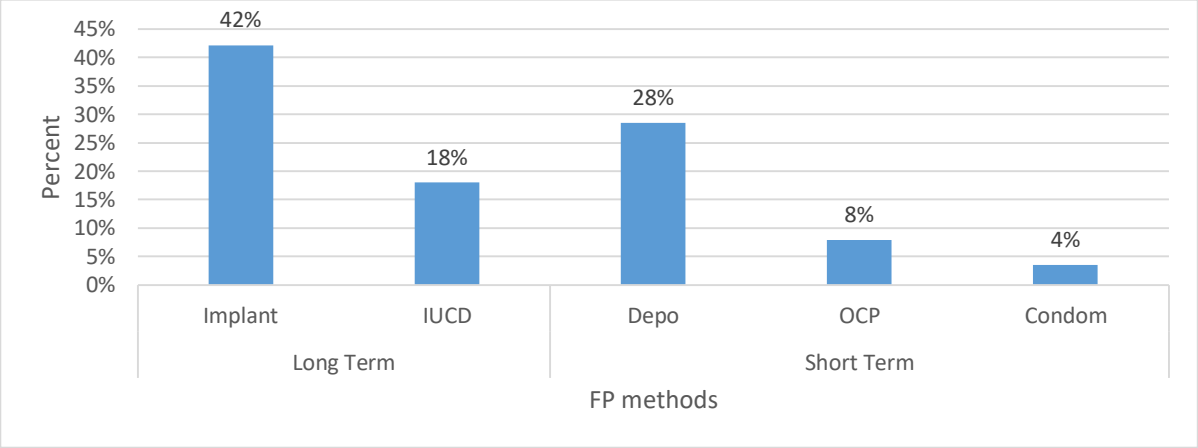


Figure 16; Contraceptives services by methods, 2018

CAR of Woreda 9 was decreasing from month to month in the aspects of methods.

Table 16: Contraceptive acceptance rate by methods in woreda 90f b0le sub city ,2018

Method	1st Q	Percent	2nd Q	Percent	3rd Q	Percent	4th Q	Percent	Total	Coverage
IUCD	110	21%	134	28%	10	4%	52	12%	306	18%
Implant	195	37%	208	43%	89	32%	225	52%	717	42%
Depo	156	30%	84	17%	132	48%	113	26%	485	28%
OCP	33	6%	49	10%	29	11%	23	5%	134	8%
Condom	27	5%	8	2%	15	5%	10	5%	60	4%

Antenatal care (ANC) coverage

To have healthy pregnancy and to save the life of mother and new born infant antenatal care is crucial. Starting from the early pregnancy time all mothers have to receive at least three time of checkup by skilled health profession. Accordingly, the Antenatal care coverage of Woreda nine was assessed and it shows ANC1 >100% in 2010 (Table 16)

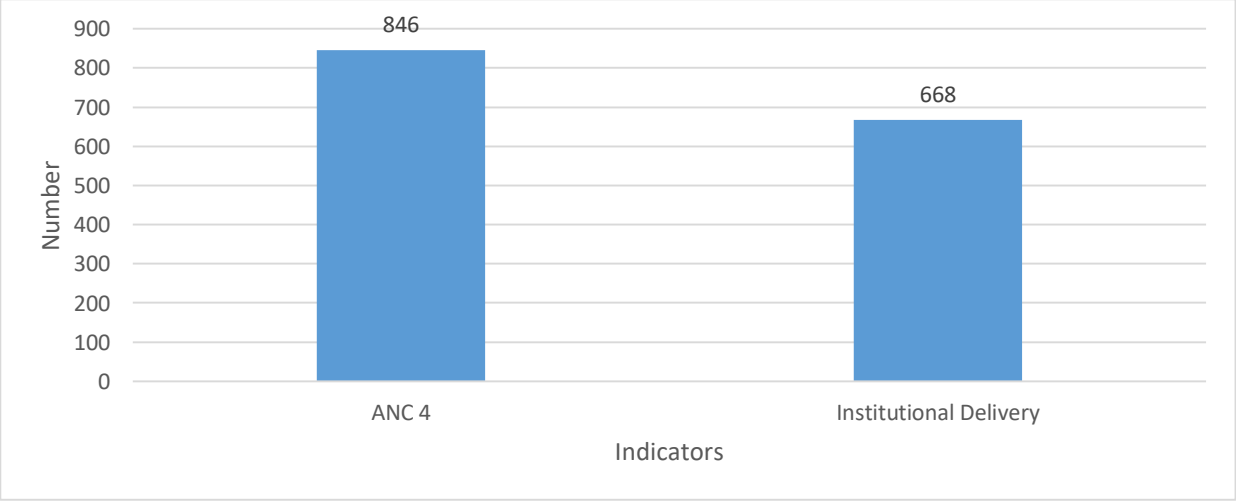
Table 17: ANC 1 and ANC 4 coverages in Woreda 9, 2018

Indicators	Expected	Performance	Coverage
ANC1	714	2158	>100%
ANC4	2158	1265	59%
Institutional Delivery	1265	1684	>100%
PNC	1684	784	47%

Source: - *Goro Health center*

Deliveries attended by Skilled Health Attendant:

It is a Proportion of deliveries attended by skilled health skilled birth attendant is an accredited health professional – such as a midwife, doctor or nurse – who has been trained in the skills needed to manage normal (uncomplicated) pregnancies, childbirth and the immediate postnatal period, and in the identification, management and referral of complications in women and newborns [4]. In Woreda 9 in the year of 2018 there were about 668(79%) Institutional deliveries which is attended by skilled health professionals.



Source: - Goro Health center

Figure 17 : Proportion of Delivery attended by skilled birth attendants in Woreda ,2018

Institutional Maternal Death

Maternal death is stands for number of maternal deaths among all deliveries attended in the given institution. It is death of a woman from conditions caused by pregnancy, which occurs from time of conception to six weeks postpartum, but not from incidental or accidental causes. The cause of death could be direct – abortion, hemorrhage, hypertension, obstructed labor or sepsis; or could be indirect like heart disease aggravated by pregnancy, or malaria in pregnancy. In Woreda nine Institutional delivery service is being given in Goro Health center. Within one year (2010 EFY) there were no Institutional maternal death reported.

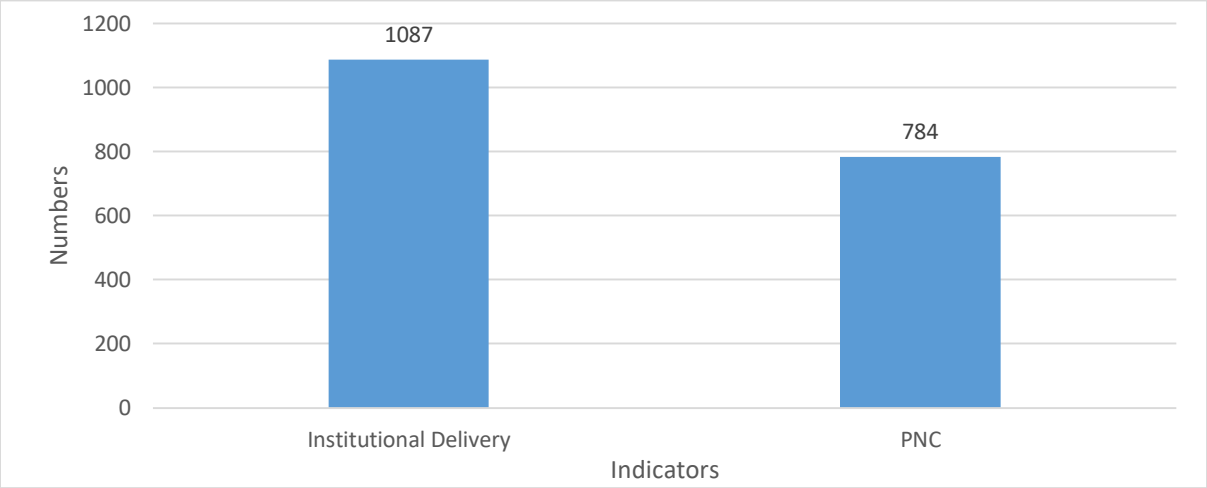


Figure 18 :Post-natal care (PNC) coverage of woreda 9 Bole sub city , 2018

Postnatal care (PNC) coverage:

PNC coverage is Proportion of women who seek care, at least once during postpartum (within 42 days after delivery), Accordingly, in Bole sub city Woreda 9 the average post-natal care (PNC) coverage were 47% in 2010 EFY, (Figure19 above)

Stillbirth Rate:

It is proportion of stillbirths from total births attended by skilled health attendants [4]. In Woreda 9 there were no still births in 2010 EFY.

Neonatal Death Rate

It is proportion of deaths within the first 28 days of life. Total births attended by skilled health attendants in the facility by 2010 E.C were about 668. From this, Neonatal death rate in Woreda 9 was 0%.

Child Health

Child health is health service focused on children from neonatal age. Among these health services the main indicators which are going to be discussed in this writing are: -proportion of Low birth rate, proportion of Moderate or Severe malnutrition, protection at birth(PAB) against neonatal Tetanus, and Immunization coverage.

Nutritional assessment

Proportion of low birth weight (LBW) is percentage of live born babies who weigh less than 2500g. In Woreda 09 in 2010 EFY, of 668 live births there were about 26 (2.4%) of live births.

Proportion of moderate/severe malnutrition: percentage of weights reflecting moderate/severe malnutrition amongst weights-for-age recorded for children under 5 years of age. In Woreda 9 in 2010 E.C there were about 1435 (65%) under five children were assessed and measured for malnutrition among which about 9 (0.8%) were found to be moderately malnourished(MAM) and 18 children (1.7%) were found to be severely malnourished (SAM).

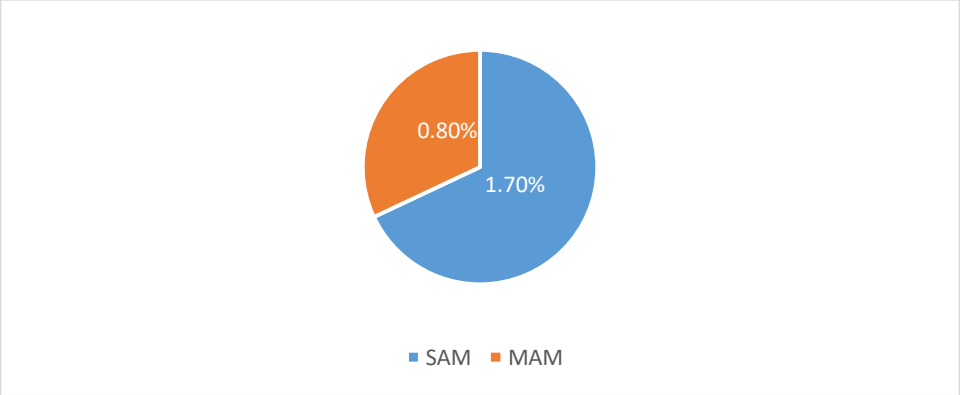


Figure 19 : Proportion of moderate/severe malnutrition in woreda 9 of Bole sub city , 2018

Key: - MAM: - Moderately Acute malnutrition, SAM: - Sever acute malnutrition

Immunization coverage

Immunization coverage is a proportion of surviving infants who were vaccinated with different types of antigen. Among vaccination those have being given in Ethiopia the major indicators are Pentavalent one, Pentavalent three, BCG, Measles, number of infant whose mothers had protective doses of TT against NNT (at least TT2) and Fully immunization.

Pentavalent first dose(DPT1-HepB1-Hib1) immunization coverage: is proportion of surviving infants who receive a first dose of pentavalent vaccine before their first birth day. It is a vaccine type given to prevent against Diphtheria, Pertussis Tetanus toxoid, Hepatitis B, and Hemophilus influenza b. Accordingly, with in the past nine month about 2843 infants were vaccinated Pentavalent 1 which accounts pentavalent coverage of >100%.

Pentavalent third dose (DPT3-HepB3-Hib3) immunization coverage: is proportion of surviving infants who receive a third dose of pentavalent vaccine before their first birth day. In 2018 about 4124 infants received Pentavalent third dose accounting >100% of pentavalent three coverage in the Woreda (Table 18)

Measles immunization coverage: proportion of surviving infants who receive a dose of measles vaccine before their first birthday. Measles vaccine is a vaccine given to prevent against measles disease. In woreda 1388 infants were received measles vaccine in 2018. From this, measles vaccine coverage of this Woreda within one year is about 34%.

Fully immunization coverage: proportion of surviving infants who receive all doses of infant antigens before their first birthday. About 771 infants received all types of vaccines before their first birth date which shows the coverage of fully immunization of the Woreda is about 88.9% in 2018 (Table 18).

Protection at birth (PAB) against neonatal tetanus: proportion of infants who were protected from neonatal tetanus (NNT) at birth by the immunization of their mothers with tetanus toxoid (TT) before the birth. In 2018, among estimated live births during the year, 1227 mothers of infants received at least two doses of TT before the birth. This shows the proportion of PAB accounts more than 100% in Woreda 9.

Table 18 :EPI Coverag of woreda 9, Bole sub city ,2017

Indicators	Expected	Performance	Coverage
Survival Infant	686	1087	>100%
BCG	1087	1385	>100%
Penta 1	1385	2843	>100%
Pent 3	2843	4121	>100%
Measles	4121	1388	34%
Fully Immunized	1388	1388	100%
PAB	668	1227	184%

Disease prevention and Control

Top 10 causes of morbidity

In Bole Sub city Woreda 9administration acute upper respiratory infection 27% followed by Disease of diarrhea non bloody (24%) and other unspecified 4.4% are the top three causes of morbidity in adults' outpatient visit in 2018.

On the other hand, in the same year again acute upper respiratory tract infection 48%, pneumonia (15%) and diarrhea 13% are the top three causes of morbidity in under five children Outpatient visit.

Table 19: Top ten causes of morbidity in woreda nine among adult and children population, Bole sub city 2018

S/no	Adult (>5 year)	**Number**	**%**	**Pediatrics (under 5 year)**	**Number**	**%**
1	Acute Upper respiratory infection.	5009	27%	Acute Upper respiratory infection.	2229	48%
2	Diarrhea	4395	24%	Pneumonia	682	15%
3	Other or un specified diseases of the eye adnexa	1833	10%	Diarrhea (non- bloody)	632	13%

4	Infⁿ of the skin and subcutaneous tissue	1366	7%	Other or un specified disease of skin and sub cutaneous tissue	556	12%
5	UTI	1289	7%	Other or unspecified disease of the eye and adnexa	209	4%
6	Trauma (Injury, Fracture)	1171	6%	Other or unspecified disease of the skin and subcutaneous tissue	139	3%
7	Acute febrile illness	1127	6%	Other or un specified infectious and parasitic disease	121	3%
8	Dyspepsia	1066	6%	Otitis	76	2%
9	Pneumonia.	865	5%	Trauma (injury ,fracture)	23	0.5%
10	Other or unspecified infection and parasitic diseases	500	3%	Burns and corrosions	21	0.4%

Top 10 causes of Mortality

There was no information on mortality in the Woreda 9.

Communicable Disease

Malaria

Even though Addis Ababa is not a malarias area, sometimes, because of the migrant, people come to this town from all direction. While this they may come after they infected by malaria and develops clinical features after they arrive in the town. Accordingly, in 2018, among 52 RDT done, there were about 9 confirmed Plasmodium falciparum and 27 Plasmodium vivax malaria cases treated in Woreda 9. There were no admission and death from malaria in this Woreda (Figure 21).

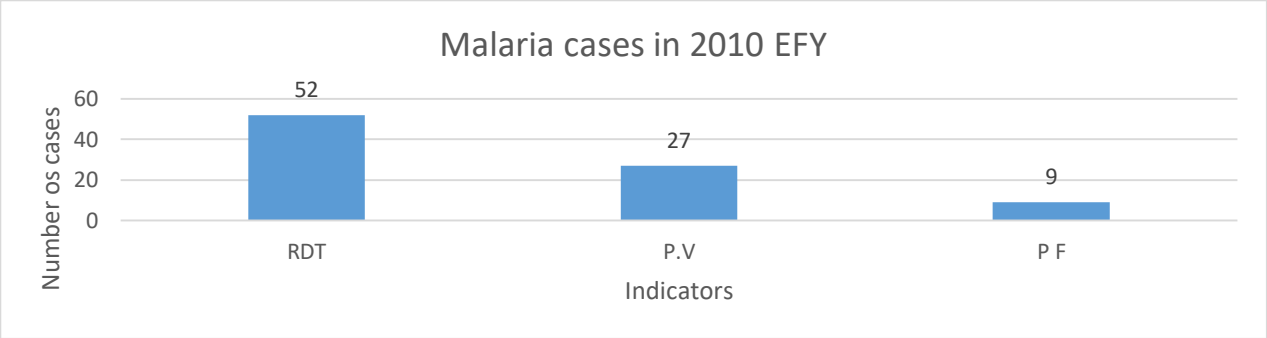


Figure 20 ; Malaria cases seen9 by type in Woreda 9 of Bole sub city , 2018

Tuberculosis and Leprosy

TB and Leprosy treatment service is being given by only one Health center (Goro HC) in Woreda 9. This health center started TB and Leprosy treatment service in 2008 EFY. Since then there is no leprosy cases detected.

A) Tuberculosis case Detection and treatment

There are different measures (indicators) of TB services in a given area. In this writing *TB* detection Rate, TB treatment success rate and TB treatment cure rat*e* are measured. According to data taken from Goro Health Center, since this service is being provided only in this health center in Woreda, within the past one year about 24(Prevalence rate of 7.8/10,000) New bacteriologically confirmed PTB case, about 22 (prevalence rate 7.2/10,000) New clinically diagnosed PTB and about 34 (11.1/10,000) Extra Pulmonary Tuberculosis cases were detected.

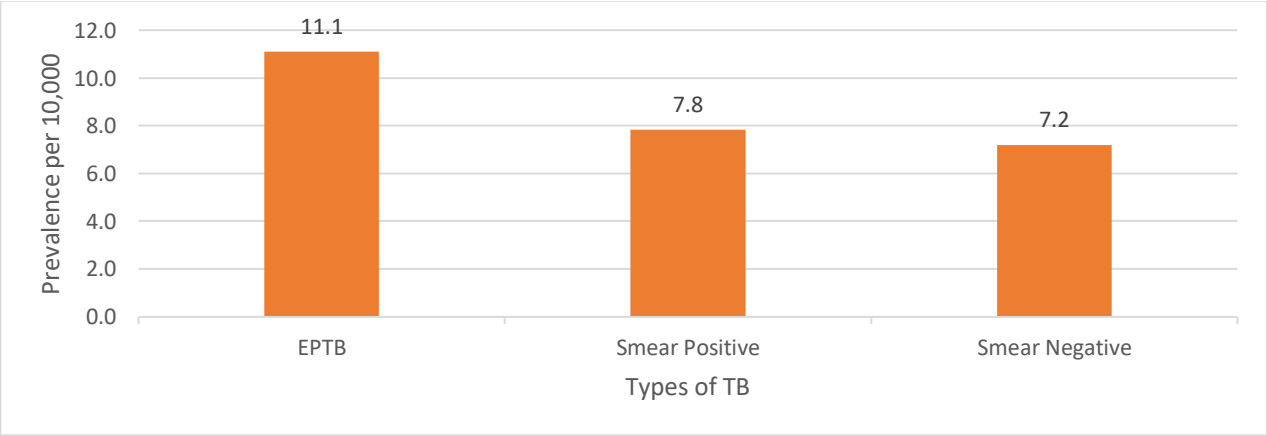


Figure 21 : Prevalence of all forms Tuberculosis in, Woreda Nine, Bole Sub city ,2018

TB case detection rate is number of new pulmonary and extra pulmonary (all forms) TB cases detected, among the TB cases estimated to occur countrywide.

TB detection rate = All forms of TB detected during reporting period X 100

Estimated number of all new forms of TB cases

TB detection rate of woreda 9 was greater than 100% in 2018 the annual estimated TB case (all type) was 69 cases per total population. In this Woreda about 80 all type of TB cases was detected. This accounts about >100% TB detection rate. The overall TB prevalence rate was about 26.1 per 10,000 populations in 2010 with Zero death rate.

When we see the prevalence of TB by sex, it is highly prevalent among Male population than Female population which is about 29.8/10,000 among male and 22.4/10,000 among Female population (Figure 23).

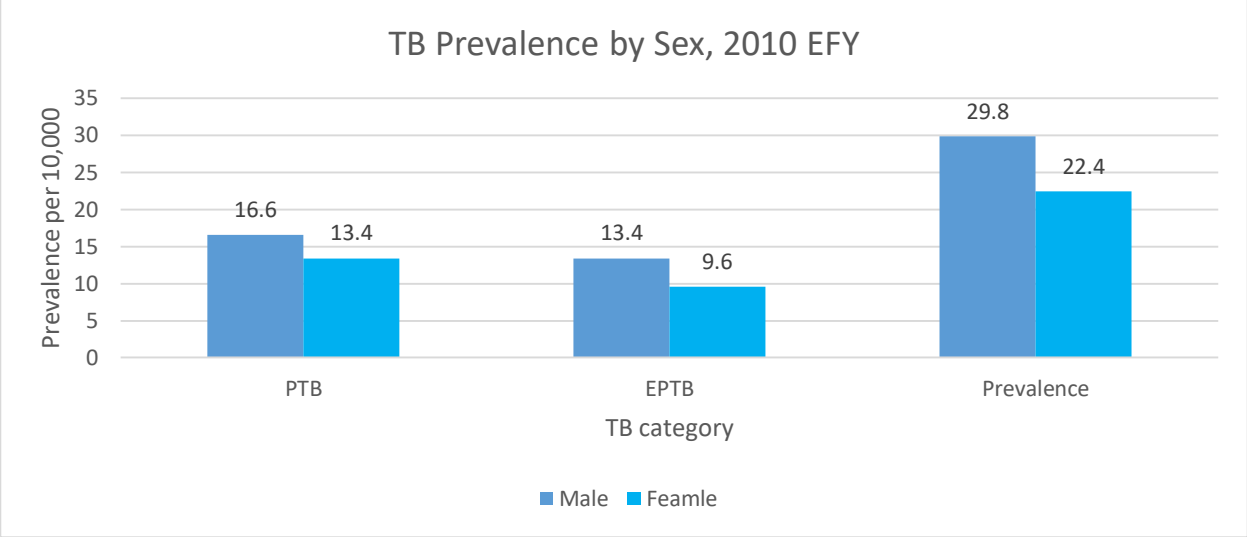


Figure 22 : TB case distribution by sex in Woreda 9 Bole sub city, 2018

TB treatment cure rate: is percentage of a cohort of new smear-positive TB cases registered in a specified period that was cured as demonstrated by bacteriologic evidence (a negative sputum smear result recorded during the last month of treatment and on at least on one previous occasion during treatment).

TB Rx Cure Rate = Smear negative after treatment in a cohort X 100

New smear positive in the specified cohort

TB/HIV

TB/HIV is one health indicators which is given for weather HIV positive patient or TB patients. It is classified in to two.

- HIV screening for TB patients
- TB screening for HIV positive patients

In Bole Sub city woreda 9 Health delivery, there were about 80 TB patients tested for HIV in 2018. Of tested, 4 (5%) of them were found to be HIV positive (Table 19)

Table 20: Proportion of HIV screening for TB patients Enrolled to TB clinic in Goro Health center 2018

Year	HIV screening for TB patients				
	2010				
	Male		Female		Total cases
	#	%	#	%	
Total TB patient enrolled to DOTs	45	56%	35	44%	80
Enrolled TB case and Tested for HIV	45	56%	35	44%	80
TB patient tested HIV positive	0	0%	4	100%	4
Screening rate	45	100%	35	100%	100%
HIV Prevalence rate among TB patients	0	0	4	11.4%	5%

As stated below, TB, TB/HIV and HIV service is being provided in Goro Health Center in woreda 9 and TB treatment service and HIV treatment service was started in 2005 EFY. So, TB screening for HIV patients are 22 and there wear 3 positives, HIV screening for TB patients are 100%.

Table 21:Proportion of TB screening for HIV patients Enrolled to ART clinic in Goro Health centercenter, 2018

Year	TB screening for HIV patients				
	2010ff				
	Male		Female		Total
	#	%	#	%	
Enrolled HIV patient case and screened for TB	18	82%	4	18%	22
Found have active TB	18	82%	4	18%	22
TB prevalence among HIV patients	2	67%	1	33%	3

HIV/AIDSHIV testing and counseling(HCT)

HIV/AIDS testing is other health indicators that is done in different health service delivery site whether by voluntary initiated counseling and testing or by provider initiated testing and counseling. In 2010 EFY about 1688 Male and 2580 Females were tested of which 30 Male and 54 Female found to be HIV positives (Table 21).

Table 22: HCT Coverage and positivity rate in woreda 9 by sex, 2018

Activity	2010 EFY				
	Male		Female		Total
	#	%	#	%	
Number of individuals who have been tested for HIV (VCT + PICT)	1688	40%	2580	60%	4268
Clients testing positive for HIV	30	37.5%	54	62.5%	84
Positivity Rate		1.7%		2.1%	2.0%

Anti-retro viral Therapy

Anti-retro viral therapy is given only in Goro Health center in woreda 9 and was started in 2005 EFY. Since then about 421 patients started ART among which 413 of them are adult and 8 are less than 15 yrs. old children. HIV positive clients are actively following their medication.

Table 23: ART coverage of woreda 9,bole sub city ,2018

Indicator	**Age group**	**Sex**	
		Male	Female
Newly Enrolled	0-4yrs	0	0
	5-15yrs	2	2
	>15yrs	28	35
	Total	30	37
Ever Started	0-4yrs	2	1
	5-15yrs	2	3
	>15yrs	160	252
	Total	164	256
Newly Started	0-4yrs	0	0
	5-15yrs	2	2
	>15yrs	28	35
	Total	30	37
Currently On ART	0-4yrs	2	1
	5-15yrs	2	4
	>15yrs	160	252
	Total	164	257

Source:Goro Health center

PMTCT

In Bole sub city like the other HIV related service, PMTCT service is being provided only in Goro Health center. Accordingly, in 2010 EFY about 1697 pregnant women were tested for HIV and among them about 15 of them were found to be HIV positive. Of those tested HIV in this year all of them started ART. The proportion of HIV Positivity among pregnant women were 1%. HIV positive Pregnant women is started on ART based on Option B^+ which is 100%. (Table 23).

Table 24 :PMTCT and Option B+ service in Bole Sub-city Woreda 9, 2018

Indicators	2018
Number of pregnant and lactating women who were tested for HIV and who know their results	2512
Number of women tested positive for HIV	15
Number of HIV Positive pregnant and lactating women who received ART at ANC+L&D+PNC for the first time based on option B+.	15
Positivity rate	1%
Percentage started ART	100%

Public health emergency management (PHEM)

There were one Health facilities expected to report Daily and weekly reportable disease in this woreda. Accordingly, Disease under surveillance are regularly reported to sub city from one Governmental Health center and in the reporting, Year of 2010s EFY there were about 36 confirmed malaria cases 44 dysentery cases (Prevalence = 1.4 per 1000population) and 1733 (Prevalence = 56/1000 population) typhoid and 1611 (prevalence = 52/1000 population) Typhus cases were reported among weekly reportable disease (Table 24).

Table 25 :Weekly reportable disease in Bole Sub city, Woreda 9 2018

Weakly Reportable		Number Reported
Malaria	RDT	52
	P. V	27
	P F	9
Meningitis		0
Dysentery		44
Typhoid Fever		1733
Relapsing Fever		0
Epidemic Typhus		1611
SAM		2

In the above table shows typhoid fever is the leading next to this epidemic typhus Among reportable disease

Table 26: Immediately Reportable Disease in Bole Sub city, Woreda 9 2018.

Diseases	Number of reported	Diseases	Number of reported
Acute Flaccid paralysis	0	Pandemic Influenza	0
Anthrax	0	Rabies	0
Cholera(AWD)	0	MDSR	0
Dracunculiasis (Guinea Worm)	0	SARS	0
Avian Human Influenza	0	Small Pox	0
Measles	1	Viral Heamorogic Fever	0
Neonatal Tetanus	0	Yellow Fever	0

Hygiene and Environmental Health

Latrine coverage

The latrine coverage of Bole Sub city Woreda 9 is estimated to be about 29,711 (97%) among which 5,942(17%) of them are using community latrine and about 23,769(80%) of the population have their own toilet. Still there are 3% of populations who have no access to latrine.

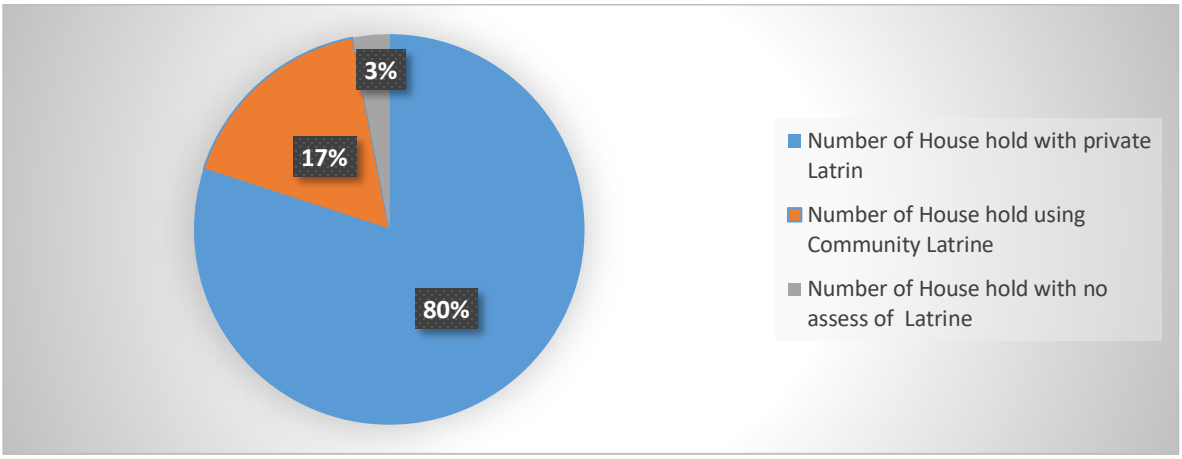


Figure 23 : Latrine coverage in Bole Sub city Woreda 9, Bole sub city ,2018

Waste management (Solid & Liquid).

In Bole Sub-city Woreda 9 administration environmental contaminants are dispelled in two ways. Solid wastes are avoided by Woreda employed staffs for this purpose. According to information from Woreda municipal under the office of the municipal, there are about 33 road cleaners (29

females and 4 male) and there are a total of 67, house to house Solid waste collectors. These solid wastes are collected in to specific area and it is transported to city solid waste disposal area by vehicles. The second types of environmental contaminants are liquid waste. This type of waste is such as toilet, road side sewerage, and different liquid produced at home. Toilet waste is managed by the city's water and sewage authority. This authorized body collect the waste from each toilet by vehicles and dispose it when the community informs them. There is no clear data regarding the schedule, and how quickly they collect this wastes after the community inform them. The road side waste management is a concern of road and construction authority and regarding this there is no data. But from the woreda health office information, in this woreda, there is road side sewerage system management.

Budget allocation for health

The main source of budget for Health expenditure in Bole sub city Woreda 9 is a budget that is allocated from Ethiopian Government. In 2018 about 1.6% of total Woreda's budget was allocated for health sector which is higher than the last year (2017). (Figure 25)

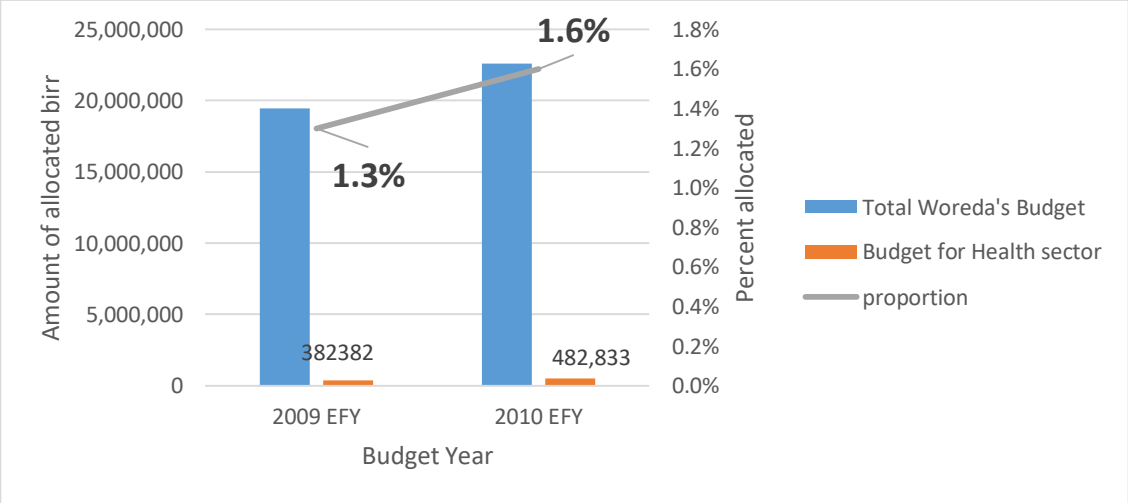


Figure 24 : Budget allocation for Woredahealth office , 2018

Human Resources

There are a total of 134 staffs working in government health facilities and 11 private clinics (no data about others private clinic human resource) in which all health facilities were staffed with all types of professionals and each facility communicate with Woreda health office. When we see the ratio of Health worker to population in this Woreda one health officer is suspected to give servefor about 19,141 and one BSC or Clinical Nurse is suspected to serve about 988 people. (Table 27)

Table 27: Man power of district health office and health facility in 2018

S/no	Type	Number		Total	HW: Population Ratio (Total Pop. 30630)	Remark
		M	F			
1.	Physician	-	-	-		
2.	Health officer	6	10	16	1: 2254	
3	Laboratory technician/technologist	1	5	6	1: 5105	
4	Pharmacy technician/pharmacist	1	6	7	1: 4375	
	Nurse (BSC & clinical)	7	24	31	1: 988	
6	Midwife (degree & Diploma)	1	9	10	1 :3063	
7	Radiologists	-	-	-	-	
8	Sanitarian	-	-	-		In health center
9	HEWs	0	23	23	1: 1332	
10	Other health workers	-	-			
11	Supportive staffs.	15	26	41	-	

Disaster situation in the woreda

In Bole Sub city Woreda 9 administration with in the last year there were no any Disaster (natural & Manmade). For the future there is no risk area.

4.1.5 DISCUSSION

Health center is One of the satellite facility in the primary Health Care Unit which provides both preventive and curative out and in-patient service, and designed to serve 25,000 populations in rural area and 40,000 in urban area according to the new health policy (FMOH policy). Woreda 9 administration has one Health center which is serving Woredas population which accounts greater than 30,000.

Through the year 2018 the crude birth rate is increasing which may urge the improving of contraceptives acceptance rate. In contrast long-term contraceptive acceptance rate shows slight increments. Intrauterine contraceptive device where accepted. One of the Ethiopian MDG goal is decreasing maternal and child mortality and morbidity rate by increasing ANC coverage and institutional delivery. ANC1 coverage in this woreda was > 100% in 2018. In the same manner equivalent to ANC and Institutional delivery, Postnatal care has a great role in reducing Infant and Maternal death. and this also increase from month to month. This is good indicator according to MDG goals and it needs more appreciation to upgrade Institutional delivery and PNC.

The other child health indicator is Vaccination against vaccine preventable disease. Currently in our country there are around 10 types of vaccines being provided fee free. Compared to EDHS report in 2017 EFY in the case of Addis Ababa, vaccination coverage in woreda 9 is good. for BCG >100% woreda 9 measles coverage is34% There for, to decrease child morbidity and mortality rate, early prevention of disease is mandatory. So, the coverage of BCG Vaccines was good in woreda 9.

On the other hand, in Woreda 9, AURTI is the leading cause of morbidity both in pediatrics and adults through the last one year accounting 83.7%, 15%, of the top 10 cause of morbidity respectively Hence, this issue also needs intervention to decrease the problem. In addition to this, the prevalence of TB in this woreda was low in 2018. But in 2017 the prevalence of TB in this woreda is much equal to Addis Ababa TB prevalence which was 261/100,000 in woreda 9 and 261/100,000 in Addis Ababa. it also be because of good TB detection rate in Woreda.

TB detection is a tool that plays a great role to decrease TB prevalence by increasing early initiation of TB treatment and in such a way that enables us to decrease TB transmission. when we see TB detection rate of Woreda 9 in 2018 it was about 92% which is good performance.

Nutritional assessment and support is being done in Woreda 9 and proportion of underweight babies is found to be fluctuated when compared to the month. The proportion of Moderate acute malnutrition is also decreasing in the continues month but sever acute malnutrition is increased month to month.

Finally, when we come to HIV status in the Woreda, the prevalence rate is decreasing. HIV testing rate is higher among female which is 6.8% and male is 4.4%.

LIMITATIONS

- There were no vital statistics registration and to calculate the crude mortality rate, Infant mortality rate, and under five mortality rate there were no information.
- Most of the information was collected from One health center.
- Poor sewerage system
- Poor liquid waste management

4.1.6 CONCLUTION

- The health service of Woreda is 100%
- URTI is the leading cause of morbidity among children and adult population in Woreda 9
- The crude birth rate of the woreda is increasing from month to month
- The vital health service such as HIV testing and Treating, TB treatment, maternal health service (ANC, Delivery, PNC, PMTCT) and Immunization services are limited to one health center.
- There were poor liquid waste managements in Woreda

4.1.7 RECOMMENDATION

Depending on the above result & conclusion, the following recommendations are stated.

- Woreda Health office in collaboration with stake holders have work on Environmental health.
- Continuous Health education for community on Environmental Sanitation Expanding of Vital health service such as Family health, TB and HIV is important.
    - Health education for mothers on family planning.Improving sewerage system and liquid waste management system which is highly affects human health.

4.1.8 References

1. Addis Ababa Atlas of Key Demographic and Socio-Economic Indicators, 2010
2. Socio-Economic Profile of Addis Ababa for the Year 2016. Policy Study and Analysis Sub Process
3. FMoH, Health and Health Related Indicators 2013 Version 2, Oct 2014
4. Health sector development program IV Annual performance report EFY 2015 (2014/15 version 1
5. CSA. Ethiopia Demographic and Health Survey (EDHS)-2016, Key Indicators report.
6. FMoH, Guidelines for clinical and programmatic management of Tuberculosis, Leprosy and TB/HIV in Ethiopia, 5th Editions, March, 2013

5 CHAPTER V DISASTER SITUATION ASSESEMENT

5.1 Loss and damage from flooding in Akaki Kality sub city, Addis Ababa, Ethiopia, 2018

ABSTRACT

Back ground: disaster is a sudden, calamitous event that seriously disrupts the functioning of a community or society and causes human, material, and economic or environmental losses that exceed the community's or society's ability to cope using **its** own

resources. Though often caused by nature. Also is an event of nature or man-made that leads to sudden disruption of normal life of a society, causing damage to life and property The Akaki River over flow affected community living in Akaki Kality sub city woreda three and woreda eight and their economy in August,16-23 2018. The aim of this report is to describe response challenge and magnitude of flood in terms of person, place and time in Akaki Kality sub city.

Method: - In August,2018 two districts (three and eight) of Akaki kality sub city was affected by Flooding and sub city notified health bureau by phone on this date. Immediately after the information was obtained the assessment team from health bureau PHEM along with sub city and woreda PHEM was moved to affected area. The assessment was started from the time of disaster, 16th August. We collected data using check list and line list. All affected person was interviewed. The data was collected by health extension workers assisted by woreda PHEM officer.

Result: - In Woreda three about 344 *Households* a total population of 1254 was displaced. Out of them majority (50.1%) of them were Females. On the other hand, in woreda eight about 38 households with a total population of 153 in Three Ketena were affected and displaced by the flooding. Among them, 84 (55%) were Females. Several houses were got inundated and house properties were severely or partially damaged.in addition to this 22 person were sick and treated atAkaki, Selamferi health center and Terunesh Beijing Hospital. Affected households received assistance from government and neighboring community. One school and Youth center was given for temporary shelter. The community provides daily foods for displaced population at their shelter along with the woreda.

CONCLUSION: - Akaki River over flow Flooding resulted from heavy fall at the time accompanied by the manual spilling of Lega Dadi Dam was the cause of flooding that affected the populations settled on the basin of Akaki river Many populations were displaced from their house for one month.

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

5.1.1 INTRODUCTION

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

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

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

The National Disaster Risk Management Commission (NDRMC) reported flash flooding in communities within the Awash River basin and of the potential for additional flooding in areas that lie downstream. As of 14 September 2017, over 20,000 people in Oromia Region are reported

to be affected by floods. Some areas in Gambella region have also reported flooding affecting about 13,000 people. According the NDRMC, more flooding is expected in Amhara Region alongside Lake Tana where Tana- Beles hydro-electric power dam is located and in Somali Region where the Wabe Shebelle River has reportedly surpassed its maximum threshold [6].

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

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

The Akaki River over flow affected community and their economy in August, 2018 at woreda Three tow times every week and at woreda eight for the first time and it affected three ketenas

5.1.2 OBJECTIVE

5.1.3 General objective

- To describe the Loss and damage from flooding in Akaki Kality sub city, Addis Ababa, Ethiopia, 2018

5.1.4 Specific objective

- To describe the flood impact in terms of Person
- To describe the flood impact in terms of time
- To describe the flood impact in terms of place

5.1.5 METHOD AND MATERIAL

Study area and period

Akaki-Kality sub city is one of the 10 sub city of Addis Ababa. It is located in southern direction of the city. The sub city has the distance of 13-14 Km from the center of Addis Ababa. The total Population of the sub city is 229,859 of which 48.5% male. The sub city has 11 districts. In the affected area, most people are involved in multiple income source. The main income are crop cultivation and livestock keeping. In the floodplains, farmers mainly grow Crops like Teff and Vegetables like Cabbage, Carrots, Potato, and Tomato especially in Woreda three. They cultivate by using both rain-fed cultivation and Irrigation from Akaki river in dry season.

In addition, some of households' income is from livestock, Trade, and daily laborer. Flooding affect two districts (three and eight). The study period was from August 15 to 30, 2018.

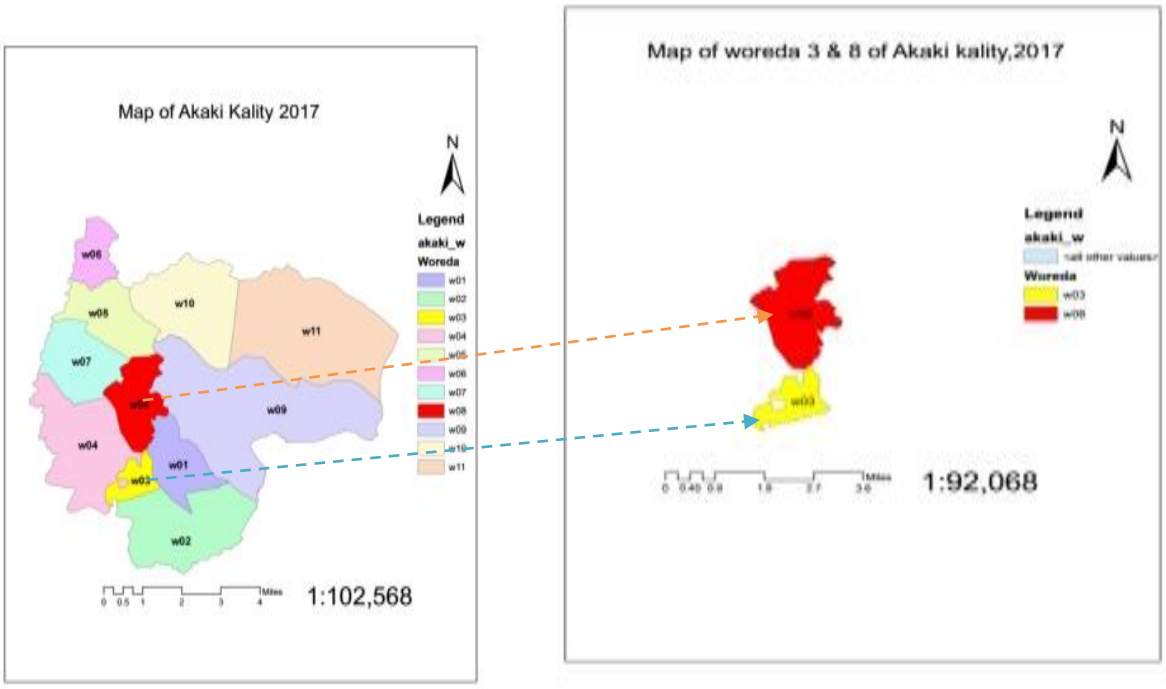


Figure 25Woreda 3 and Woreda 8 Map, Akaki kality sub city, Addis Ababa, Ethiopia, 2018 (source Akaki Kality sub city, 2017)

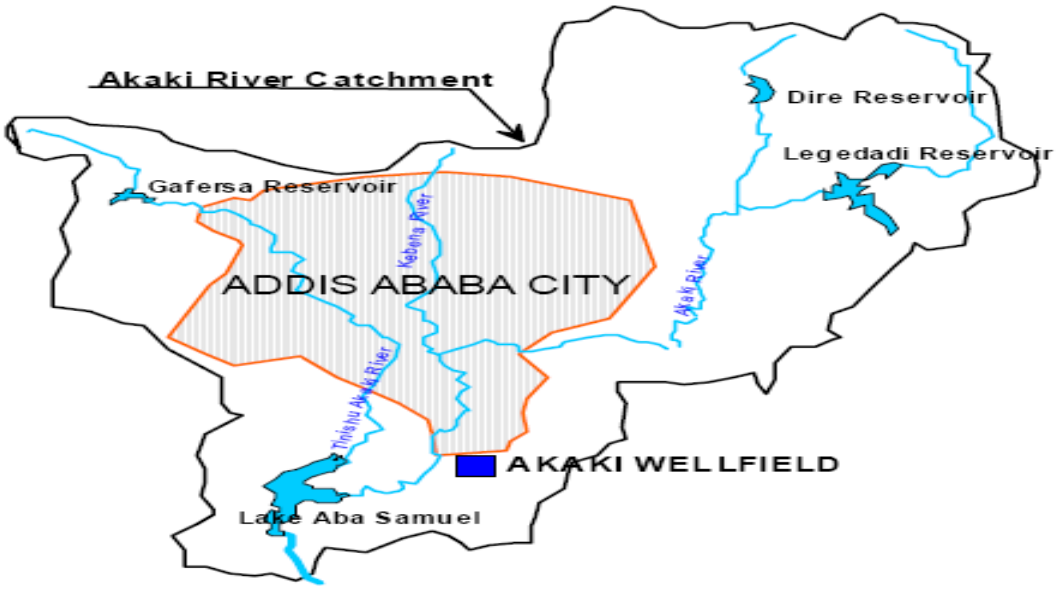


Figure 26 : Akaki River catchment area, Akaki Kality, Addis Ababa, Ethiopia, 2018

Study Design

Descriptive record review and physical observation was used.

Study population

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

Data collection tools and method

The data was collected using Check lists developed by sub-city. All affected population was interviewed to know damaged properties and for their health status. Information was extracted from the filled line list.

Dissemination of the result

Written reports were prepared and shared to Addis Ababa Health Bureau PHEM, Addis Ababa university school of public health Field Epidemiology Training Program and Akaki Kality sub city health office. On top of this the result was presented to Sub City Health office and Addis Ababa Health Bureau PHEM.

Ethical consideration

Before collecting data support letter was written to Akaki Kality Sub City Health office from Addis Ababa city Administration Health Bureau PHEM directorate and permission was obtained from the sub city health office.

SITUATIONAL DISCREPTION

Cause of Flooding

The main water resources that provide the Addis Ababa city by man-made water reservoirs in A wash basin are Legedadi, Gefersa, Dire and Aba Samuel. Among them, Legedadi is the largest attributor of Akaki River. Legedadi is found on south east direction of Addis Ababa in Oromia region near to Sendafa. It is located at an elevation of 2376 meter above the sea level. In rainy season the LegDadi Dam become filled and cause over flow which drains to Akaki Kality after long distance due to its topographic locations from Akaki River. Some times because of overfilling of the Dam, Addis Ababa Water authority spills the dam manually. Along with the heavy rain fall on 16th August, 2018 the manual spilling of the dam is claimed to causes the over flow of Akaki River which cause damages to human and human property. In addition, some contributing factors for flooding are: -

- As a result of the merging of two sewer line from the direction of Tulu Dimtu and a former line which used to directly link with the Akaki River, the main sewer line was overloaded.

- The sewer line from the second direction was filled with solid waste.
- High load of sewerage from Akaki public school is disposed directly to the victims' area (ketene 1, 3,4,5,6).

Figure 27 :The blocked sewerage needs machinery cleaner Akaki Kality Woreda 3.2018

Figure 28: Blocked Sewerage due to alluvium secondary to Flooding, Akaki Kality Sub city, woreda 3, 2018

FLOOD IMPACT

Socio- Economic Impact

In Akaki Kality from flooding during August 2018, two woreda were affected (Woreda Three and Woreda Eight). Due to the flooding a total of 382 households with a total population 1407 were displaced from their residency for a month and 22 people were got sick. During the flooding events there was no death.

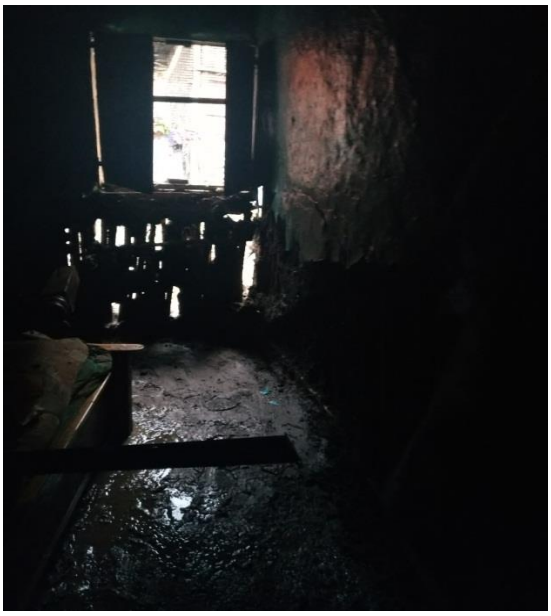


Figure 29 : Affected houses due to flooding In Akaki kelity woreda 8.2018 **.**

Of the total displaced population, 344 Households were from Woreda 3 with a total population of 1254. Most of them, 654(50.1%), were Female. Age group of 15-49yrs were more affected in woreda three with the mean age of 26.4yrs (SD $\pm$ 16.4yrs) (Figure 30).

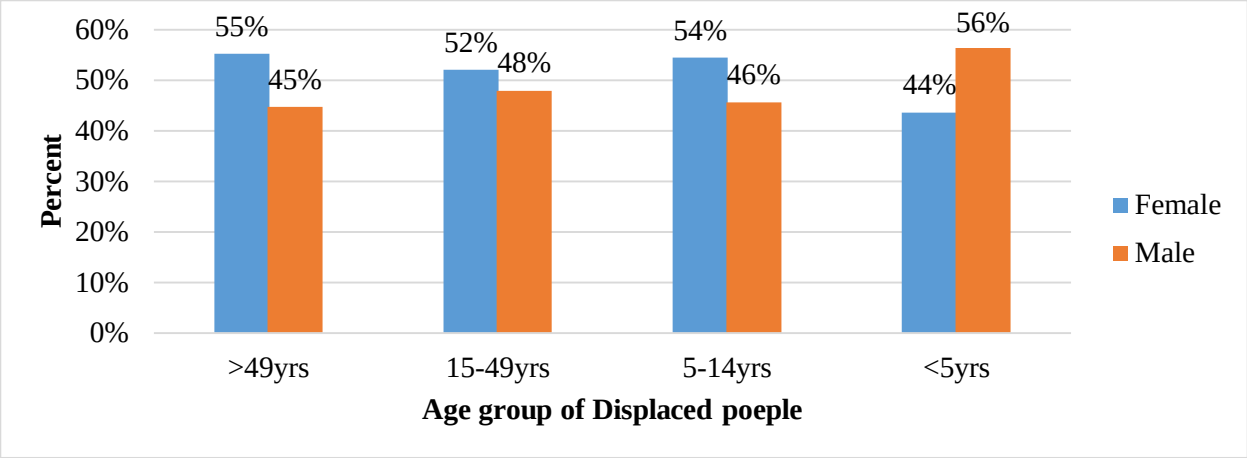


Figure 30: Number of populations affected/displaced by flooding from Akaki River in Woreda three, 2018

In Woreda eight about 38 households in three Ketena with a population of 144 were affected and displaced by the flooding. Out of displaced population 81 (56%)Female.

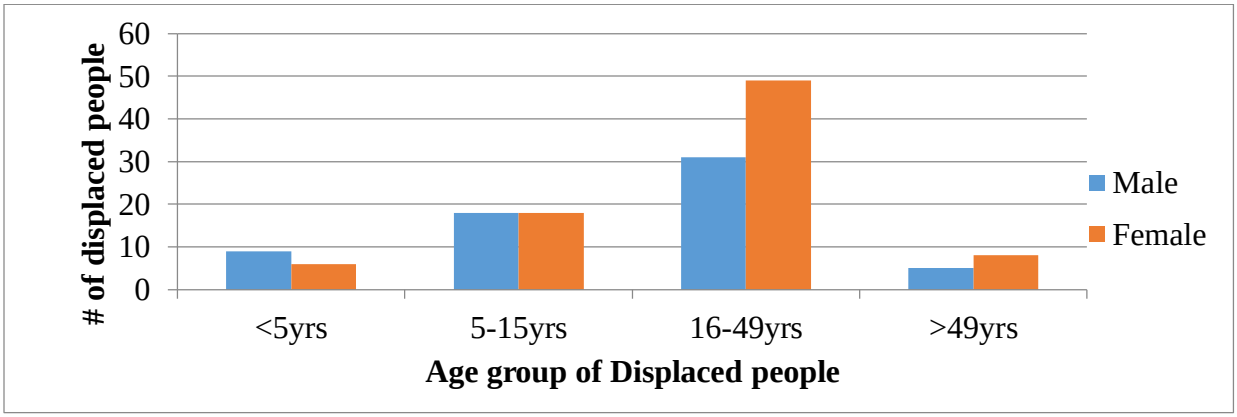


Figure 31 : Number of population affected/displaced by flooding from Akaki River in Woreda Eight, 2018

Many of the houses in the affected area are built from wood and mud walls, which are easy to be damaged. These building materials are not strong enough to withstand an extreme flood. About 382 Households (344 from Woreda three and 38 in Woreda 8) was affected among which 118 (9%) were severely damaged by the 2018 flooding. Several houses got inundated and house properties were severely or partially damaged.

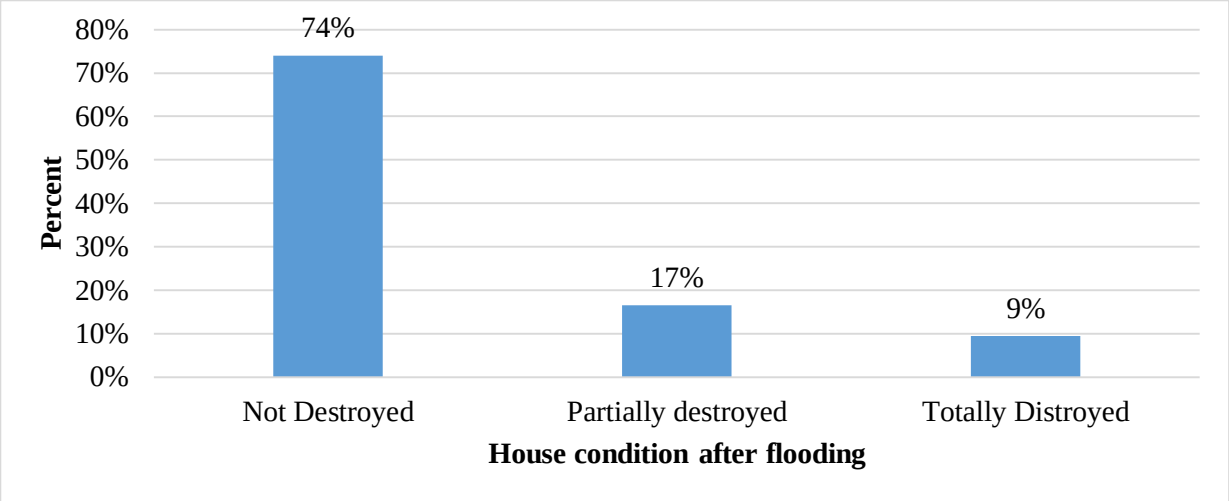


Figure 32 : status of Houses during flooding events in affected area, Akaki Kality sub city ,Addis Ababa Ethiopia,2018

RESPONSE ACTIVITIES AFTER FLOODING

Immediately after the flooding, Sub city and Woreda RRT committee activated. Water and sewerage Authority, labor and social affairs, Sub city WASH, Sub city and Woreda health office was working collaboratively. Affected households received assistance from government and neighboring community. This assistance was mostly in the form of food and material aid. One school and Youth center was given for temporary shelter. The community provides daily foods for displaced population at their shelter along with the woreda. Clothing, Hygiene materials (Soup, Omo, Bleach, Water guard and Aqua tabs) was distributed for each house hold. The sub city establishes temporary clinic to solve possible health problem following the flooding.

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

- The woreda health extension worker give health education to Displaced people.
- All displaced assign temporary refuges school and youth center.
- Food and water supplied to the displaced refuges.
- Destroyed Houses were reconstructed and maintenance for partially damaged houses and other properties was distributed by community and sub city.

Table 28: Supply distributed to displaced population, Akaki Kality Sub city, 2018

Properties	Number distributed	Provided by	Price
Grecian	126 pcs	AAHB PHEM	
Bleach	60 Lit.	Labor & Social affairs	
Jog	14 pcs	Labor & Social affairs	
Soap for cloth wash	700 pcs	Labor & Social affairs & AAHB PHEM	
soap/body	200 pcs	Labor & Social affairs	
Carpet	21 pcs	Labor & Social affairs	
T-shirt	79 pcs	Labor & Social affairs	
Rotto{1000Lit}	3	AAHB PHEM	
aqua tab	1407 tabs	AAHB PHEM	
Omo	100 pcs	Labor & Social affairs	

Figure 33 ; Health education for displaced people in Temporary shelter by HEW, Akaki Kality SC, 2018

5.1.6 RESPONSE CHALLENGES

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

5.1.7 CONCLUSION

- Heavy rain along with the manual spilling of Lega Dadi Dam was resulted in Akaki River over flow which was affected the populations settled on the basin of the river.
- Blocked Sewerage system due to alluvium was contributed to the river overflow
- Many populations were displaced from their house and many properties was damaged and taken off by flooding.
- No out breaks and significant health problem was resulted in affected Woredas.

5.1.8 RECOMMENDATION

- The sub city has to work on Early warning for community on the possible occurrence of river over flow flowing rainy season
- The Addis Ababa Water authority has to announce the community when to spill the Dam.
- Old sewerage line should be clean and permanently well-organized sewerage line should be prepared.

5.1.9 REFERENCE

1. Ethiopia Public Health Training Initiative, Jimma University: Disaster Prevention and Preparedness Guide line, 2006.
2. Pauw, K., Thurlow, J. and van Seventer, D. (2010) *Droughts and Floods in Malawi, Assessing the Economy Wide Effects*, IFPRI Discussion Paper 00962.
3. Hernández-Guerrero, J., Vieyra-Medrano, A. and Mendoza, M.E. (2012) 'Adaptation strategies in communities under precarious housing: flooding risks in the peri-urban sector of the city of Morelia, Michoacán, México', *Applied Geography*, Vol. 34, pp.669–679.
4. Alemseged T. Loss and damage from flooding in the Gambella region, Ethiopia, 2013
5. Alemu Yonas Tadesse: Socio Economic impact of flooding in Dire Dawa, Ethiopia, 2006
6. OCHA, Ethiopia-Flooding Flash Update 1: 14 September, 2017
7. Eticha Fufa Guta: Socio Economic Problem of Water Pollution: In the case of Akaki River,2015

6 CHAPTER VI SCIENTIFIC MANUSCRIPT FOR PEER REVIEW JOURNAL

6.1 Surveillance data analyses of typhoid fever in bole sub city of Addis Ababa, Ethiopia, 2018

Auteur Roman Mengistu[1] Dr, Alemayehu Bekele[2] Mengistu Yelma [3]

Adress[1] EFETP Resident Addis Ababa university

Email romkib2010@gmail.com

Adress[2] Email alemayehubekele2002@yahoo.com Adress[3] Email newmany55@gmail.com

ABSTRACT

Background: - Typhoid fever is an infectious disease caused by Salmonella typhi bacteria which can be spread through contact with contaminated feces. It is also common in areas of the world with poor sanitation and lack of access to clean water. Globally 21 million cases and 222 000 deaths occur related typhoid fever. About 2.8 per 100000 mortalities and 174.4 per 100000 morbidities is estimated in Ethiopia. This study is aimed to know the magnitude, trends and distribution of typhoid case and deaths in Addis Ababa, Ethiopia.

Method: We conducted a Cross-sectional study design using the secondary data from health management information system of the city. We used Epi info and Microsoft excels 2007 to analyze the data. The results were presented narration and figures.

Results: A total of 53,012 cases were identified and 0 deaths were recorded over the past five years. The case rate was highest at the year of 2017and the prevalence rate is increasing year to year with the pick prevalence in 2017(53%). The seasonality of the Typhoid Fever was observed in the study area which starts increasing from the beginning of Ethiopian Rainy season. As typhoid report data in 2017 shows Woreda 10 is the leading among 14 Woredas.

Conclusion: Typhoid fever is a common disease in the sub city and is apparent in the areas where there is Safe water problem. So we can control by providing clean and adequate water plus improving sewerage system in the sub city.

6.1.1 INTRODUCTION

Back ground

Typhoid fever is a life-threatening systemic disease characterized by stepwise rise of fever (38-41ºC) and frequent abdominal manifestations. It continued to be a major endemic disease in developing countries where there are unsanitary practices. Typhoid is transmitted by water or food contaminated by Salmonella typhi. As it is water borne or food borne, a small infecting dose can cause the disease in someone who drinks contaminated water or eat contaminated food. As so many water sources are inadequately protected in Ethiopia, the disease is very common, particularly among overcrowded urban migrants who often live in wretched conditions. It can also be described as water borne disease since it results from fecal or urinary contamination of food and drink. Subjects who are particularly susceptible to typhoid infection include those patients with chronic schistosomiasis who may become chronically infected homozygous sickle cell subjects and HIV patients. [1,2] The reports of global burden of typhoid fever suggested that up to 16 to 22 million cases and 200 000 to 600, 000 deaths occur each year. Over past decades varying trend observed in developing countries, which reported of having an average incidence of 540 per 100, 000 populations. [1]

It 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. Regional typhoid fever

incidence rates ranged from <0.1/100 000 in Central and Eastern Europe and Central Asia to 724.6/100 000 in Sub-Saharan Africa

6.1.2 METHODOLOGY

Study Area

This surveillance data analysis was conducted in Bole Sub city. Bole sub city is one of the 10 sub cities in Addis Ababa city administration with total population of 360,387 (168,545 Males and 191,842 females). Having a total area of around 11,856 Hectare

Study Period

Secondary data of Five years' typhoid fever surveillance data was collected from PHEM and interpreted from 2013 to 2017.

Study design

A Retrospective record review study design will be used to analyze typhoid fever surveillance data in terms of time and place.

Source population

Bole sub city populations are used as source of population

Study Population

Bole sub city populations are used as study population

Study unit

A person who was diagnosed to have typhoid fever and reported to sub city with in the last five years were used as our study unit

6.1.3 RESULT

We identified 53,012 Typhoid cases with in the last five years. The overall prevalence of Typhoid Fever in Bole sub city in the last five years was 14% with case fatality rate of zero. All typhoid cases were treated as outpatient. As the trend line below shows the prevalence was increasing from year to year with high prevalence rate in 2017 having 53 per 1000 population.

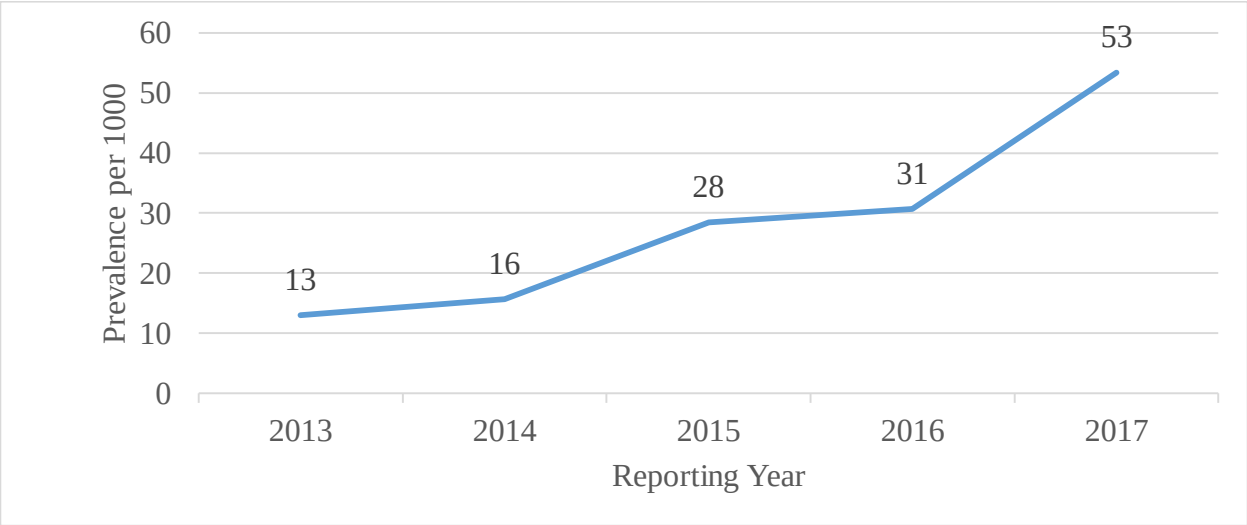


Figure 34 : Trend of Typhoid fever prevalence in Bole Sub city, 2013-2017

In Bole Sub city high number of Typhoid Fever were reported through the year with high prevalence in Ethiopian rainy season (from May to September) having prevalence of 13-14. In addition, the case which was reported in December is also high as that rainy season.

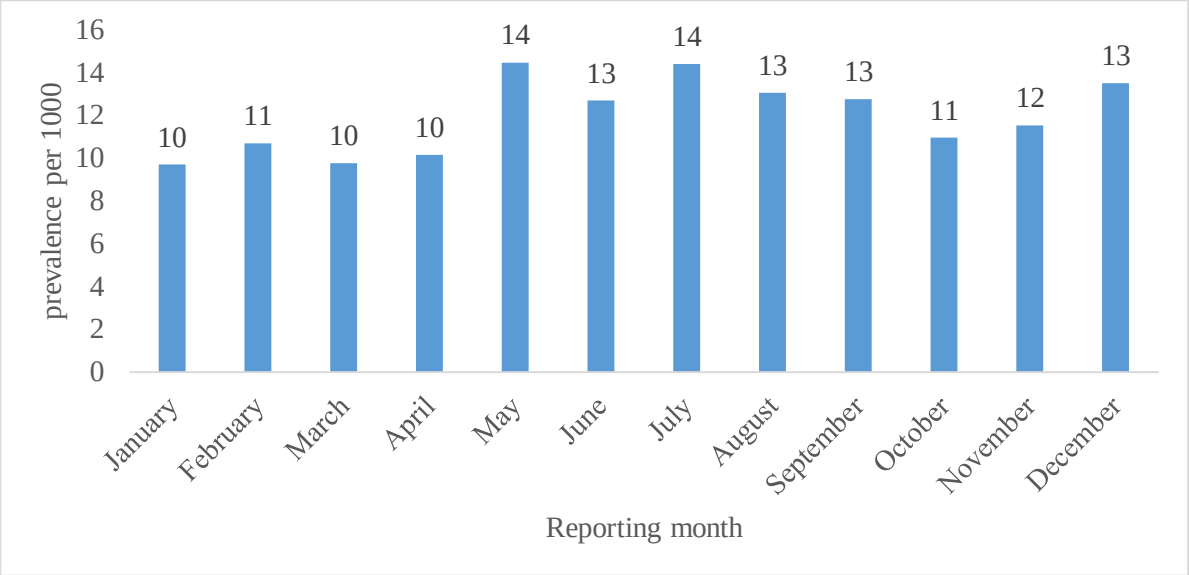


Figure 35 : Prevalence of Typhoid fever by month in Bole Sub city, 2013-2017

In Bole sub city the data was not registered by Woreda based before one year because PHEM Officer were not assigned for each woreda before. But we tried to identify the one-year data from each Woreda since the establishment of Woreda Based PHEM officers and in the last one year (2017) higher number of Typhoid fever were reported from Woreda Ten with prevalence rate of 16% followed by Woreda Twelve having prevalence rate of 14%. On the other hand, among 14 Woredas in the sub city the lower prevalence rate was reported from Woreda Four which was 0.5%.

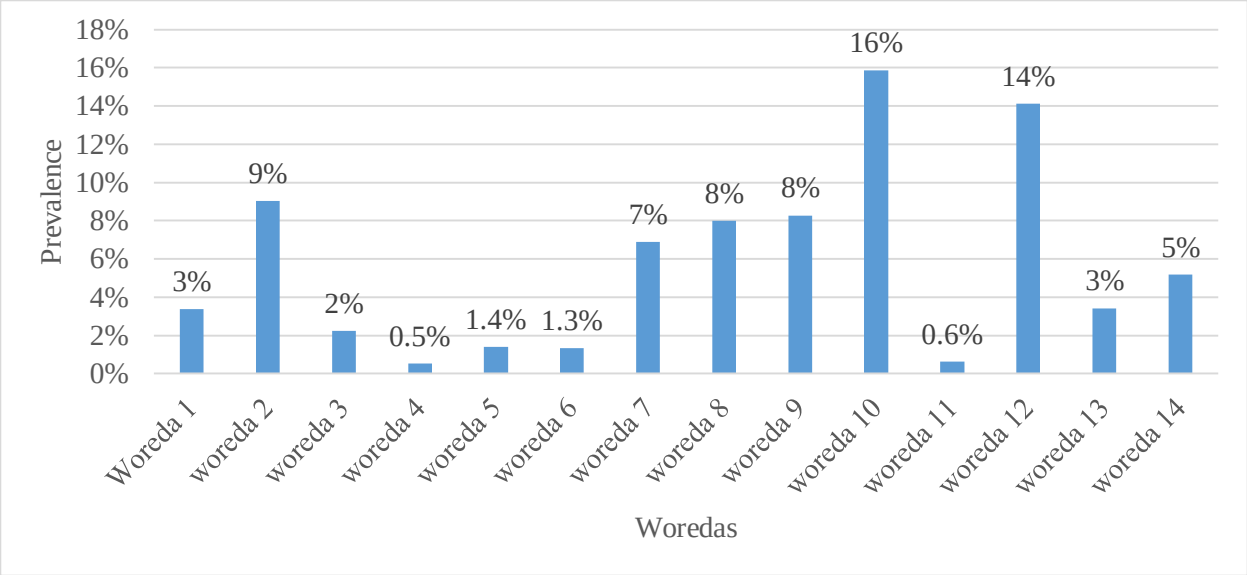


Figure 36 : Prevalence of typhoid fever by woreda 2017

6.1.4 DISCUSSION

We identified typhoid fever is the major health problem in Bole sub city. The trend of typhoid fever cases was increasing in the sub city with the highest records in 2017. This may be due newly structured PHEM systems in each Woreda which helps to report all cases regularly for sub city including new health facilities those did not reporting before. Before 2017 there were no structured PHEM at woreda level and the surveillance system was not strengthened. In addition, after establishment of new PHEM structure at Woreda level many health facilities those were not addressed before were enrolled to s There was high prevalence rate of Typhoid in this sub city with increasing trend.

The sensitive diagnostic test for detecting typhoid fever cases and inconsistent water provision in the bordering sub cities may have accounted for the increased prevalence rates of the case in the region The Sub city health office should strengthen the community health education and sustainable environmental protection in the city.

The sub city health office together with the regional health bureau should provide specific diagnostic test laboratory services.

6.1.5 References

Rachel B. Slayton, Kashmira A. Date3 and Eric D. Mintz: Vaccination for typhoid fever in Sub-Saharan Africa. Human Vaccines & Immunotherapeutic, 2013, 9:4, 903–906. Available at www.landesbioscience.com

Crump JA, Luby SP, and Mintz ED: The global burden of typhoid fever. Bull World Health Organization 2004, 82(5):346–353.

7 CHAPTER VII ABSTRACT FOR SCIENTIFIC PRESENTATION

7.1 Surveillance data analyses of typhoid fever in bole sub city of Addis Ababa, Ethiopia, 2018

Author: - Roman Mengistu[1] Dr, Alemayehu Bekele[2] Mengistu Yelma [3]

Adress[1] EFETP Resident Addis Ababa university

Email romkib2010@gmail.com

Adress[2] Email alemayehubekele2002@yahoo.com

Adress[3] Email newmany55@gmail.com

ABSTRACT

Background Typhoid fever is an infectious disease caused by Salmonella typhi bacteria which can be spread through contact with contaminated feces. It is also common in areas of the world with poor sanitation and lack of access to clean water. Globally 21 million cases and 222 000 deaths occur related typhoid fever. About 2.8 per 100000 mortalities and 174.4 per 100000 morbidities is estimated in Ethiopia. This study is aimed to know the magnitude, trends and distribution of typhoid case and deaths in Addis Ababa, Ethiopia.

Method: We conducted a Cross-sectional study design using the secondary data from health management information system of the city. We used Epi info and Microsoft excels 2007 to analyze the data. The results were presented narration and figures.

Results: A total of 53,012 cases were identified and 0 deaths were recorded over the past five years. The case rate was highest at the year of 2017and the prevalence rate is increasing year to year with the pick prevalence in 2017(53%). The seasonality of the Typhoid Fever was observed in the study area which starts increasing from the beginning of Ethiopian Rainy season. As typhoid report data in 2017 shows Woreda 10 is the leading among 14 Woredas.

Conclusion: Typhoid fever is a common disease in the sub city and is apparent in the areas where there is Safe water problem. So we can control by providing clean and adequate water plus improving sewerage system in the sub city.

8 CHAPTER VIII: PROTOCOL/PROPOSAL FOR EPIDEMIOLOGIC RESEARCH PROJECT

8.1 Assessment of Report completeness and factor affecting reporting disease under surveillance among private health facilities in Addis Ababa Ethiopia

Executive Summery

Introduction: Ethiopia had introduced Integrated Disease Surveillance and Response (IDSR) in 1998, for early detection and effective response to communicable disease which is currently changed to Public Health Emergency Management (PHEM) in 2009 [4,5]. This is designed as a cutting edge for better tracking and monitoring of diseases of public health concerns and is extended down to the district level in their capacities involving all private and government health facilities. In Addis Ababa when we compare the report completeness among Private health facility with governmental health facilities it remains lower there by affecting the overall reporting completeness. Therefore, this study aims to assess factors affecting report completeness among private health facilities.

Methods and Materials: Cross Sectional study design will be used among randomly selected 340 private health facilities. The sample size was calculated by Facility survey sampling formula with assumptions of 95% confidence level, width of the confidence interval at p ± .1p, relative error or coefficient of variation is 10% and 50% of probability of having report completeness of greater than 80%. The number of Health Facilities to be recruited from each Sub city (10 sub cities) will be identified proportionally according to number of health facilities found in each sub cities. Health facilities those are assigned to provide specialty health service such as Dental care; Ophthalmology, Physiotherapy, etc. are excluded from the assessment. The Officer in Charge (OIC) of data/reporting and when not feasible, matron/manager or available health workers will be interviewed using interviewer administered structured questionnaire. Epi info will utilize for data entry and analysis will be done by SPSS.

Schedule and Budget: This assessment will be accomplished from 15th May to 30th July. A total of 30,806 birr will be required to perform this assessment.

8.1.1 INTRODUCTION

Back ground

Public health emergency management (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 [1]. This is guaranteed only when all health facilities (governmental and non-governmental) are equally engaged into surveillance system and report public health events continuously to the next level where analysis is conducted and data interpretation done for public intervention.

Effective Communicable and non-communicable diseases control rely on effective public health surveillance and response system that promote better coordination and integration of surveillance function through ongoing, systematic collection, analysis, interpretation, and dissemination of data regarding a health-related event for use in public health action [1]. The information disseminated by a public health surveillance system can be used for immediate public health action, program planning and evaluation, and formulating research hypotheses. Therefore, a functional disease surveillance system is essential for defining problems and taking action. Not only the presence of public health surveillance system is enough, but also Proper understanding and use of this essential epidemiological tool (public health surveillance) helps health workers to set priorities, plan interventions, mobilize and allocate resources, detect epidemics early, initiate prompt response to epidemics, and evaluate and monitor health interventions. It also helps to assess long-term disease trends [2].

In Africa, ministries of health are organizing and strengthening national disease surveillance programs by adopting IDSR and modifying the strategy to meet their country's epidemiologic profile [3, 4].

The initiative to strengthen the disease surveillance system that promotes the integration of surveillance activities in Ethiopia was started in 1996 [1]. Ethiopia had introduced Integrated Disease Surveillance and Response (IDSR) in 1998, focusing on 17 priority communicable diseases for early detection and effective response which is currently changed to Public Health Emergency Management (PHEM) in 2009 [4,5]. This is designed as a cutting edge for better tracking and monitoring of diseases of public health concerns and is extended down to the district level in

their capacities involving all private and government health facilities. All health facilities providing health service for community are expected to report both daily and weekly reportable disease per national schedule continuously. However, different literatures reveals that report completeness may be affected by different institutional or personal or program related factors which makes report completeness differ from facility to facility. Therefore this study will assess the level of report completeness among private health facilities and associated factors.

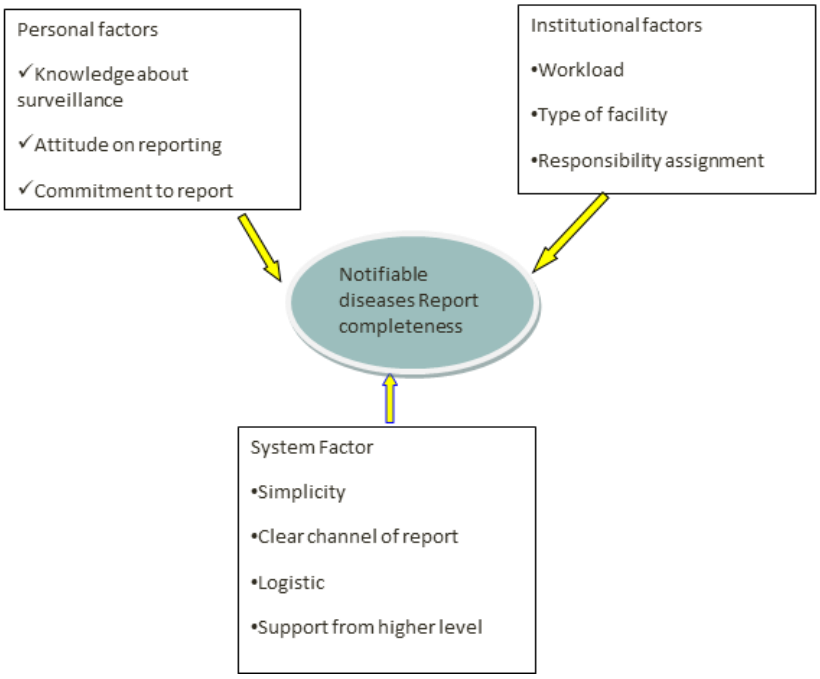


Figure 37 : Conceptual frame work of associated factors Private Health facilities ,2019

8.1.2 Statements of the problems

Ethiopian Federal Ministry of Health adopted PHEM system and extended down to the district level in their capacities to strengthen infectious and non-infectious diseases reporting system where each health facilities are expected to report disease under surveillance according to the national reporting algorithms. In Ethiopia and in Addis Ababa as well, different outbreaks are being identified every year through existing surveillance system. This indicates the improvement of surveillance system at place. In the last six months the overall average report completeness of Addis Ababa City Administration was found to be about 90% which is above the minimum requirement of report completeness (6). However, when we compare the report completeness

among Private health facility with governmental health facilities it remains lower there by affecting the overall reporting completeness in Addis Ababa.

Significance of the study

To monitor the trend of disease against the seated tolerance limits, and pick any deviation from the limit at the earliest point timely for prompt response, report completeness from expected reporting sites is very important. Therefore, this study helps to identify the factors influencing the reporting system of private clinics which may give a clue for stakeholder on the area of intervention to strengthen the surveillance system and increase report completeness among Private health facilities in Addis Ababa City Administration. Furthermore the result of this study may use as reference for other researcher regarding surveillance system in Addis Ababa & in Ethiopian at a large.

8.1.3 OBJECTIVES

8.1.3.1 General Objectives

- To assess the status of reporting completeness for disease under surveillance and factors associated in private facilities in Addis Ababa City Administration from the first to sixth epidemiologic week, 2019.

8.1.3.2 Specific Objectives

- To determine reporting completeness of immediately/weekly reportable disease among private health facilities
- To identify factors associated with reporting of disease under surveillance in private health facilities in Addis Ababa.

8.1.4 METHODS AND MATERIALS

Study Area and Period

This study will be conducted in Addis Ababa city Administration among currently Health staffs in governmental Health facility. Addis Ababa is one of city administration of Ethiopia which was administered by the city council. The city serves as the site for many national and international offices such as African union. Most of the people lead their life as being civil servant, merchant and daily laborer.

Addis Ababa City Administration is the capital of Ethiopia, located at the center of the country. It covers an area of 51948.85 hectares, Located between 8049’55.929’’ and 905’53.853’’ North

latitude and between 38038’16.555’’ and 38054’19.547’’ East longitudes. It is situated in the Central Part of Ethiopia, bounded from South West by Sebeta from West by Road to Ambo, from East by Dukem and from North by Sululta and North East by Sendafa. Its’ altitude ranged from 2500 to 2522 meters above sea level. The highly elevated land exists in the north while relatively lower elevation exists in South. The highest peak of Addis Ababa, at Semen Mazegaja, indicated high altitude value of 2522m. The city divided in to 10 Sub cities, and 119 weredas. According to the 2007 CSA projection, the total population within Addis Ababa city is 3,601,694. From the total population 1,728,813(48%) are male while 1,872,880(52%) are female. The health service is being provided by 98 governmental Health center, 12 Public Hospital and 935 Private all type Health facilities. Hence, immediately and weekly reportable disease is expected from a total of around 1045 Health facilities via Ten Sub cities’ PHEM Structure. This study will be conducted from May to July, 2019 including the information from reporting period of January first to June 30, 2019 (1st to 6th epidemiologic week).

Figure 38 : Addis Ababa City Administration Map Addia Ababa ,2019

Study Design

Descriptive cross sectional study design will be used to assess the surveillance data report completeness and influencing factors among private facilities.

Source Population

All private Health facilities found in Addis Ababa city Administration

Study Population

Randomly selected private health facilities those are licensed to provide health services.

Exclusion and Inclusion criteria

Inclusion Criteria

- All private health facilities currently providing comprehensive health service are included.

Exclusion criteria

- Health facilities those are providing a single service/specialized service listed below are excluded because of probability of lack of full information
    - Dental clinic
    - Psychiatric clinic
    - Dermatology clinic
    - Pharmacy
    - Laboratory/diagnostic centre
    - Cardiac centre
    - Ophthalmology
    - Physiotherapy
    - Traditional healers

Sample size

For Objective one: - The sample size for the first objective is calculated by using Facility survey sampling formula with assumptions of 95% confidence level, width of the confidence interval at p ± .1p, relative error or coefficient of variation is 10% and 50% of probability of having report completeness of greater than 80%.

$$n = \frac{Z^2 * fq}{V^2 p} = \frac{(1.96)^2(1.2)(0.50)}{(0.1)^2\,(0.5)} = 461$$

Where; Z = 1.96 with 95% of confidence level

P = an estimated probability of having report completeness of greater than 80%.

q = 1-p, V^2 = relative variance or coefficient of variation, f = design effect, n = the required sample size.

Because, the total number of Private Health facilities in Addis Ababa is less than 10, 000 to get the final sample size we use adjusting formula which is:

$N_f = \frac{ni}{n+\frac{ni}{N}} = Nf = \frac{461}{1+\frac{461}{935}} = 308$

There for the final sample size will be N_f + 10% N_f = 309 +31 which is 340.

For objective two: The sample size for the second objective will be calculated by using epi info version 7.1.1 calc for different factors from different literature at 95% CI, and 80%. Among associated factors used to calculate the sample size, variable with higher sample size (Availability of Reporting format) was taken using 41.4% of having reporting format but not reporting regularly, 58.6% of No reporting format and not report regularly with OR of 2.2 and p value of 0.007 [7]. Accordingly, we found the sample size of 315 including 10% non-respondent rate. By taking the higher sample size among the two, our final sample size will be 340.

Sampling methods

The number of Health Facilities participated from each Sub city (10 sub cities) will be identified proportionally according to number of health facilities found in each sub cities. After all private health facilities are identified Those facilities expected to report notify able disease will be filtered because some speciality clinics such as Dental clinic, Ophthalmology clinics, traditional healers and the likes may not have expected to report. Then Simple random sampling will be applied to select participating health facilities from each sub cities using lists of private health facilities. Furthermore, the health workers were

selected by choosing the Officer In Charge (OIC) of data/reporting and When not feasible, the questionnaire is administered to the matron/manager or available health workers.

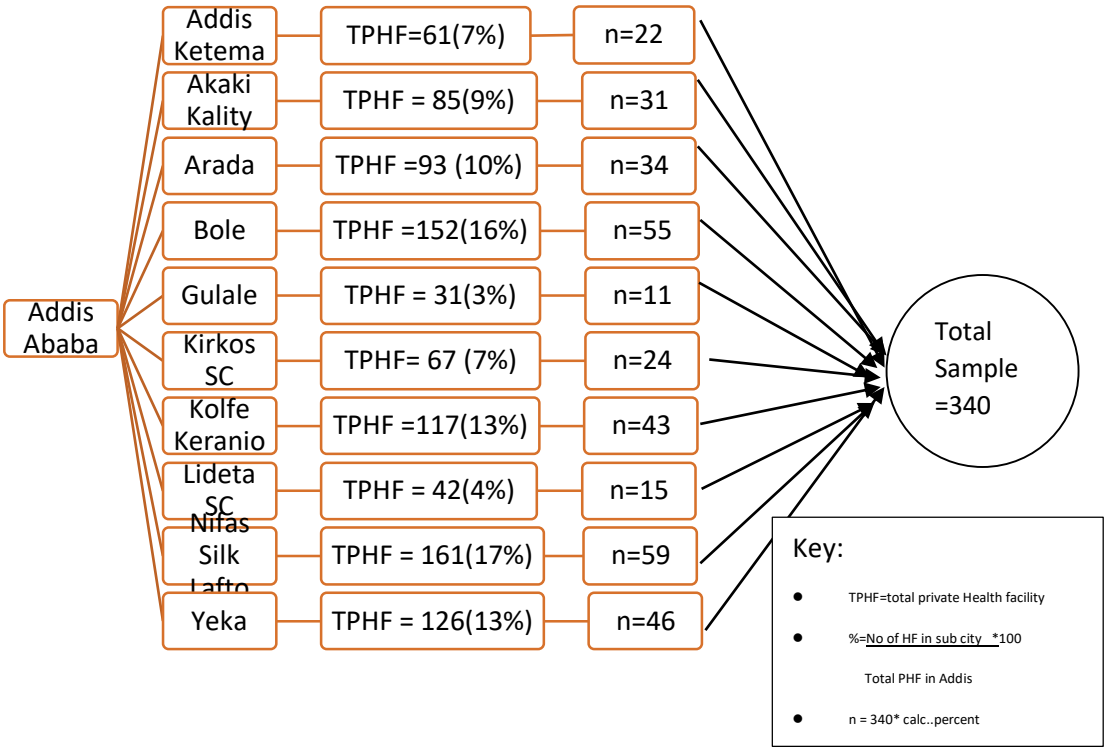


Figure 39 :Diagrammatic representation of sampling technique of Addis Ababa,2019

Data collection techniques

Data will be collected using structured questionnaire adopted from different tested studies and customized according to our objectives. Interviewer-administered data collection technique was used at each health facility to collect data on H/F characteristics, training, supervision etc from Surveillance focal person in selected health facilities. In the case of absence of assigned focal person matron or medical director will be interviewed. In addition to this to know the completeness of reporting over the past 24 Epi week (six month) retrospective document review will be conducted.

Data analysis and Processing

The Collected data will be checked for completeness and inconsistencies. Then will be coded and entered into Epi Info Version 7.1.1 and Exported to excel. Data from excel will be imported to SPSS version 23 software and recoded. The entered data were cleaned and edited before subsequent analysis. Bivariate and multiple logistic regression analyses were done to identify the relationship between the independent variables. The sets of independent variables that have p-value equals to or less than 0.2 in the bivariate

logistic regression analysis will be re-entered into multiple logistic regressions analysis. aOR, 95% CI, P values will be calculated for each independent variable. All statistical tests will be two sided and significant associations will be declared at p-value less than 0.05.

Study Variables

Dependent variables

- Proportion of reports sent to next level with in the last 24wks

Independent variables

- Availability of report format
- Types of Health facility
- Having training on PHEM
- Knowledge of respondent
- Attitudes of respondents towards existing surveillance system
- Availability of assigned Surveillance focal person

Operational Definition

- Comprehensive health service ……. Health facilities those are giving health services including under surveillance disease.
- Report completeness……. proportion of reports of under surveillance disease sent to next level within 24 weeks.
- Speciality clinic…. Health facilities those are providing specific health services other than under surveillance disease (e.g. Dental, ophthalmology, Psychiatry, Physiotherapy….)

Dissemination of Finding

The Finding of this assessment will be communicated to Addis Ababa Regional Health Bureau Public Health Research and Emergency Management Directorate, Addis Ababa University SPH, Field epidemiology department, and other stake holder as necessary. In addition, the result of this study will be published, presented on scientific conferences when opportunities and funds are available.

Ethical Clearance

After Ethical review committee of Addis Ababa university review and provide permission letter this proposal will be submitted to Addis Ababa Regional research department and will be evaluated. After ethical clearance is given by ethical review committee, formal letters will be written for respective Health facilities. At the period of data collection Informal consent will be obtained verbally from each participant before interview. No personal identification such as Name will be taken and confidentially will be kept through data collection.

Table 29 :Scheudule of Epi project of Addis Ababa city Admenstratiiobn ,2019

s/n	Tasks	Responsible body	Time frame											
			May				June				July			
			Weeks				Weeks				Weeks			
			1	2	3	4	1	2	3	4	1	2	3	4
1.	Proposal writing	Investigator												
2.	Ethical clearance	AA research department												
3.	Data collection	Investigator, Data Collectors												
4.	Data analysis	Investigator												
5.	Writing up Finding	Investigator												
6.	Submission of final Version of Finding	Investigator												

Table 30: Budget break down

Items	Titles	Quantity (Q)	Rate by Birr (R)	Date of duration (D)	Required birr =Q*R*D	Remark
Man power	Data collectors	10	300	5	15,000	
	Supervisor	2	300	5	3,000	
	Principal investigator	1	300	10	3,000	

Stationary	Questionnaire print	800	5	1	4,000	
	Pen (Bic)	13	10	1	130	
	Pencil	13	5	1	65	
	Eraser	13	5	1	65	
	Note book	13	15	1	195	
	Binder/bag	13	150	1	1,950	
	A4 size papers	3	200	1	600	
Total	Sub-total				28,005	
	Contingency 10%				2800.5	
	Grand total				30,806	

8.1.5 Reference

1. Ethiopian Health and Nutrition Research Institute Public Health Emergency Management Centre, February 2012
2. Centers for Disease Control and Prevention (CDC). Updated Guidelines for Evaluating Public Health Surveillance Systems. Recommendations from the Guidelines Working Group. MMWR, July 27, 2001; 50 (RR-13)
3. Evaluation of the integrated disease surveillance and response system for infectious diseases control in northern Ghana, 2015
4. Integrated Disease Surveillance and Response AFENET Pre-Conference Workshop, November 17, 2013
5. Federal Democratic Republic of Ethiopia Public Health Emergency Management, Guidelines for Ethiopia. Ethiopian Health and Nutrition Research Institute Public Health Emergency Management Centre, February 2012, Addis Ababa, Ethiopia

6. Addis Ababa City Administration Public Health emergency management, Epidemiological weekly bulletin week 1-week 6.
7. M. D. Dairo et. Al, Logistic challenges and prospects in Disease surveillance and reporting in two Southwestern states in Nigeria, 2010

9 Chapter ix additional outputs

9.1 Public health emergency management weekly bulletin

WEEK 47 (19/11-25/11/2018) BULLETIN, ADDIS ABABA, 2018

Week 47/2018 high Lights

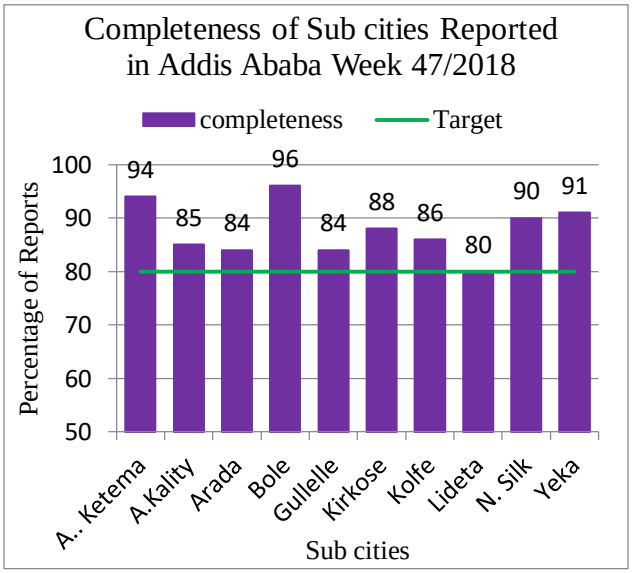
- From 19- 25 November/2018 (Epidemiological week 47/2018) 898 health facilities from ten sub-cities provided valid surveillance data.
- A total of 23 Rabies exposure cases were reported.
- A total of 7818 patient consultations were reported in this week.
- Twenty perinatal and one maternal death were reported.
- AWD: Screening of passengers is being conducted at Bole International Airport (BIA).

I.Leading causes of morbidity in this week

- Typhoid Fever (42.1%), Epidemic Typhus (41.4%), suspected malaria (5.4%) scabies (4.9%) and dysentery (3.8%) remain the leading causes of morbidity representing a total of 97.6% of the total consultations. Severe Acute

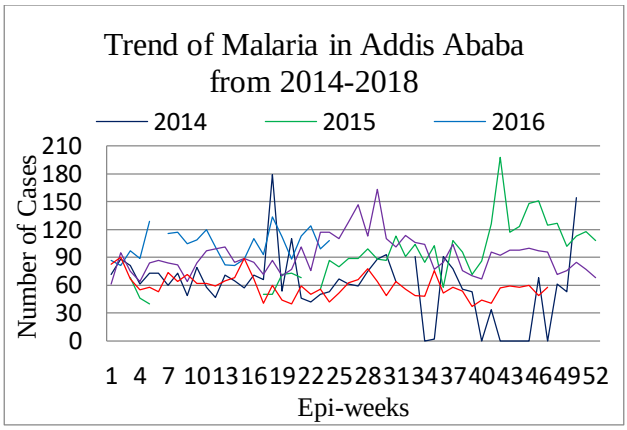
Malnutrition represented 0.6% of the total morbidity.

- Among the immediately reportable diseases Rabies exposure cases represented 0.4% of the total morbidity in the reporting week.
- Over all 90.2% (898/996) of health facilities provided surveillance data for this epidemic week. The reporting rate of the sub-cities along with the target is shown below.

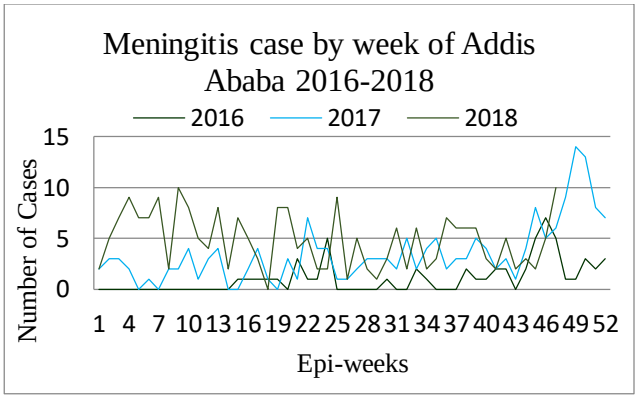


II.Diseases and Condition/Event

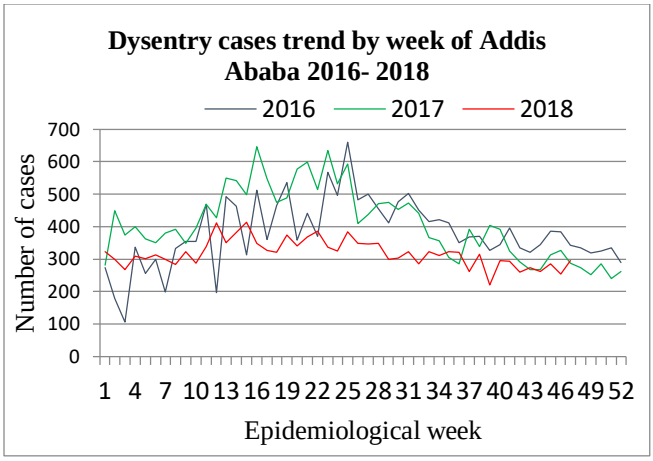
Malaria: A total of 58 confirmed cases with no death were reported higher than the previous week in number. More cases (60.3%) were due to *Plasmodium Vivax* and the rest were due to *P. falciparum*. Higher numbers of cases were reported from Bole, Akaki Kality and Nefas Silk sub-cities which reported 25.9%, 24.1% and 13.8% of the total cases each respectively.



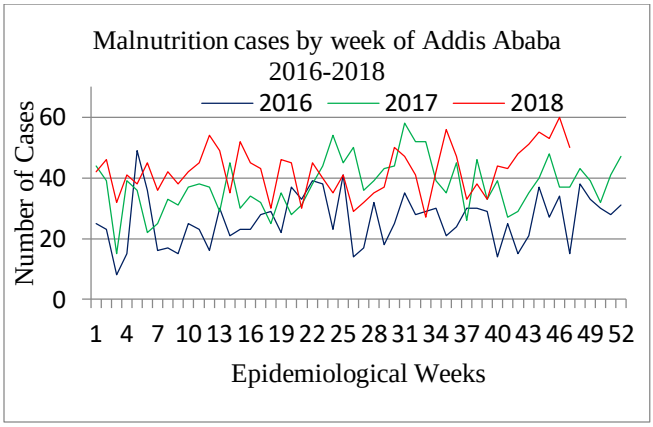
Meningococcal Meningitis: Ten cases with no death were reported in this week. The cases were reported from Menilik II (2), Alert (2), Tikur Anbessa (2), St Paul's Hospitals (2), Tirunesh Beijing and Kirkose Sub city Woreda 2. The cases show an increment with double times comparing to the previous week.



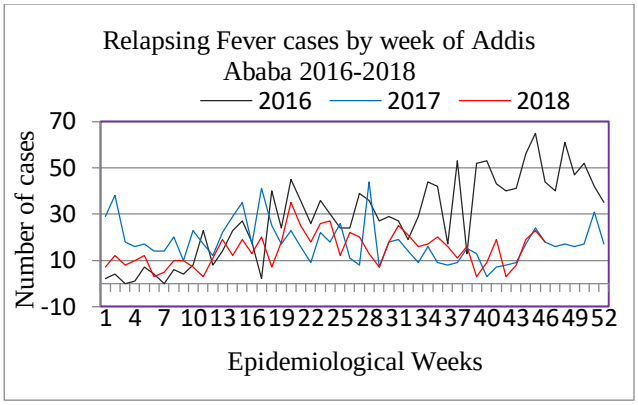
Dysentery: In this epidemic week a total of 295 cases with no death were reported. More than half of the cases (51.5%) were reported from Bole (21.7%), Kolfe (16.6%) and Nefas Silk Lafto (13.2%) Sub-cities. Comparing to the previous week the cases are increased by 16.6%. Three year's trend of Dysentery is shown in the following figure.



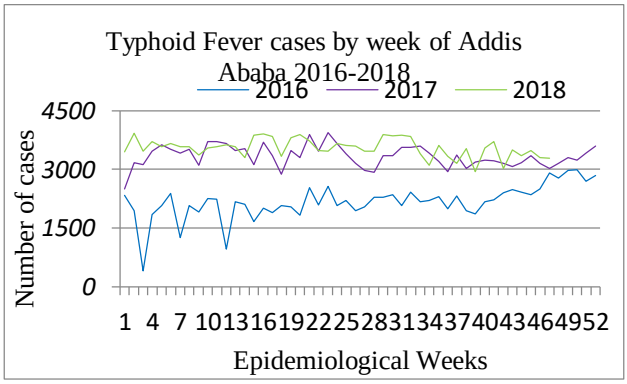
Severe Acute Malnutrition (SAM): This week 50 SAM cases were reported. There was no death reported due to this health condition. There is 16.7% decreased of cases comparing with the previous week. Three year's trend of SAM is shown in the following figure.



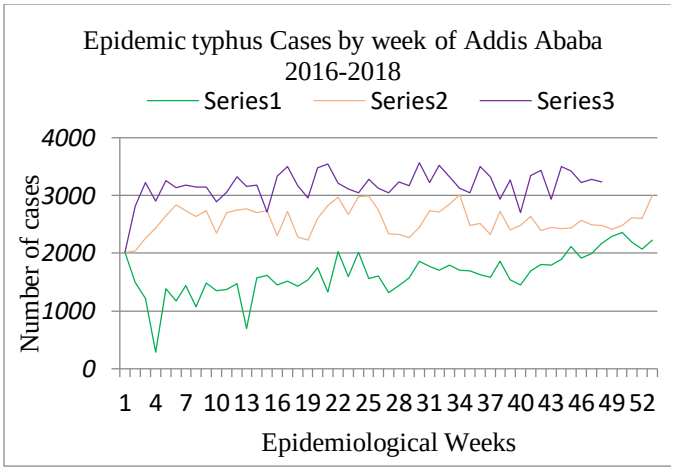
Relapsing Fever: Nineteen cases with no death were reported. There was no significant difference of cases comparing with the previous week as shown in the figure.



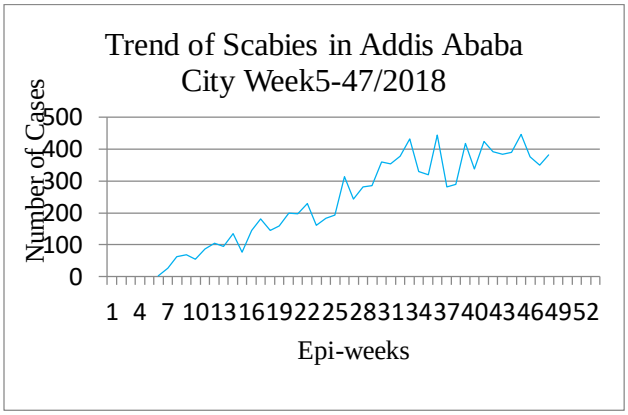
Typhoid Fever: A total of 3291 cases were reported in this week. No death was reported due to this disease. More of cases (58.2%) were reported from Kolfe Keraniyo (16%), Bole (14.6%), Yeka (15.4%) and Nefas Silk Lafto (12.2%) sub-cities. Cases were decreased by 0.4% compared with the previous week.



Epidemic Typhus: This week 3234 3284 cases with no death were reported. 57.2% of cases were reported from Kolfe Keraniyo (17%), Bole (13.9%), Yeka (12.6%) and Nefas Silk Lafto (13.7%) sub-cities reported higher number of cases. In this week cases have decreased by 1.5% compared to last week's report.

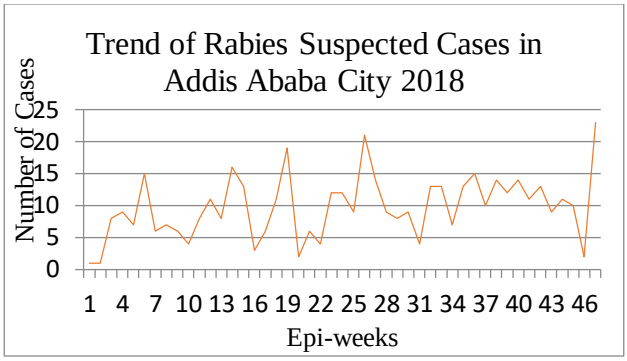


Scabies: A total of 349 cases with no death were reported in this week. Majority (53.9%) of cases were reported from Kolfe (28.1%), Bole (9.2%), Yeka (8.9%), and Arada (7.7%) Sub-cities. There is decrement of cases by 16.1% compared to previous week's report.



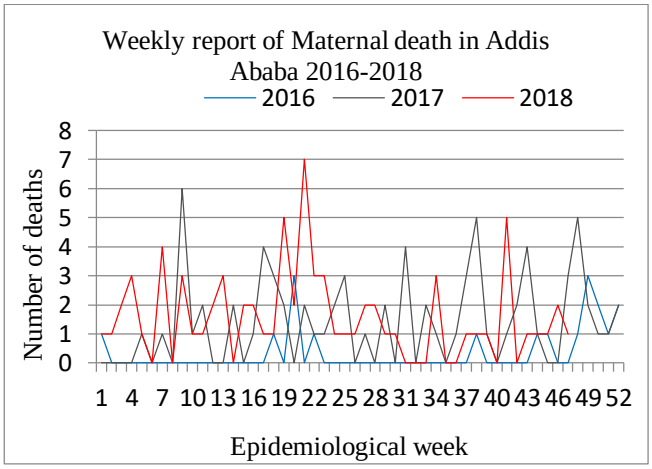
No Measles and AFP suspected cases were reported

Rabies Exposed Cases: Twenty-three rabies exposed cases with no death were reported. This week's report is much higher than the previous week.

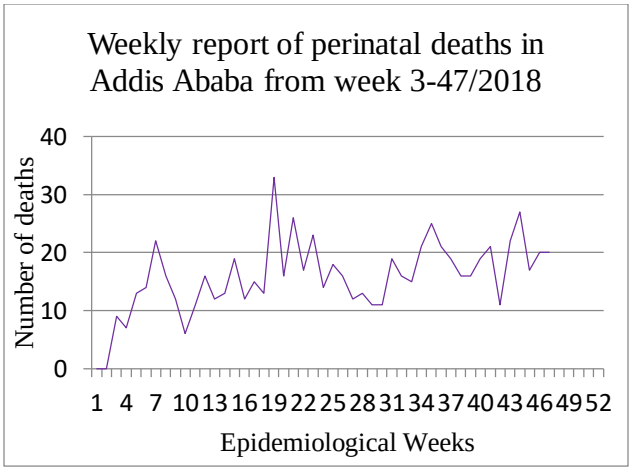


Death

Maternal Death: One maternal death was reported from Ras Desta Damtew Hospital in this week.



Perinatal Death: Twenty deaths were reported in this week. Most of the deaths were reported from Menilik II (1), Black Lion (4), Yekatit 12(6) and Gandhi Memorial (9) Hospital.



Reports from hospitals

Different types of cases including perinatal and maternal death were reported from governmental hospitals. Tirunesh Beijing hospital reported a single death due to relapsing fever. All hospitals were reporting during the appropriate time.

Hospitals	Meningitis	Typhoid	SAM	Rabies	Scabies	Mater Death	Per Death	RF	Total
ALERT	2	0	0	0	0	0	0	0	**2**
Gandhi	0	0	0	0	0	0	9	0	**9**
Menilik II	2	0	0	0	0	0	1	0	**3**
Ras Desta	0	0	0	0	0	1	0	1	**2**
St Paul's	2	0	5	0	0	0	0	0	**7**
St. Peter	0	31	5	0	14	0	0	0	**50**
Black Lion	0	0	0	0	2	0	4	0	**6**
T. Beijing	1	1	2	0	0	0	0	0	**4**
Yekatit 12	0	0	4	0	0	0	6	0	**10**
Zewuditu	0	0	2	0	4	0	0	0	**6**
Total	**7**	**32**	**18**	**0**	**20**	**1**	**20**	**1**	**99**

Conclusion

Weekly and immediately reportable diseases are reported completeness is assessed and all sub cities succeeded minimum standard.

Some reports like

Severe Acute Malnutrition: A total of 50 new SAM cases with no death were reported.

New Event: One maternal and twenty perinatal deaths were reported in this week.

Immediately reportable diseases: Twenty- three rabies suspected cases were reported which is much more than the previous weeks.

Recommendations

- Lideta, Arada and Gullelle Sub-cities should improve their completeness.
- Regional PHEM should follow these sub-cities and identify the gaps how the completeness is improved.
- Health facilities should give attention to highly reported diseases and improve diagnosis skill

Acknowledgements

- All sub-city and woreda PHEM officers
- All surveillance focal persons
- Health extension workers who sent zero report
- EPHI

For correspondence Addis Ababa city Administration Health Bureau EFETP resident

Contact Address

Roman Mengistu

Cell Phone: +251-911-429-379

Email:- romkib2010@gmail.com

Supervisor:

1. Daniel Awraris

   Cell Phone: +251-966-389-132

   Email: dawraris@gamail.com

2. Metiku Seid

   Cell Phone: +251-911-989-261

Email: mtkmw2004@gmail.com

9.2 Training and Conference attended

During our residency I have attended three training entitled:

- NCD Epidemiology which was organized by Addis Ababa university in collaboration with Marthin Luther University November 26-30, 2018 at Addis Ababa University School of Public Health
- Study Work Shop which was organized by FMoH in collaboration with CDC from December 4-12, 2018 at Bishoftu
- MPDSR training which was organized by Addis Ababa City Administration Health Bureau, Public Health Emergency, management from March 28-30, 2019 at Adama

In addition, I have attended the second EFETP annual conference which was held in EPHI in June 2018.

9.3 Training Provided

In our Residency Period along with Addis Ababa City Administration Health Bureau PHEM officers, I have provided training for Sub city and woreda Rapid Response Teams for around 150 officers in three round.

9.4 Public health emergency management participated

In 2018 there were many internally displaced populations in Ethiopia due to political insecurities. Among this the displacement happened in Burayu was the one which I was attended in. During this, we wear working on disease surveillance, assessing for any health events and providing health education.

In addition to this, since mid of 2018 there were a lot of Ethiopian returnees from abroad. Among them, because there where AWD outbreak in the place they have been living, we were working on screening at Bole international airport. Other than AWD screening we was also screening any foreigners either from DRC or those who have transit travel through DRC for EVD.

10 Annexes:

Annex 0-1 Scabies outbreak Investigation Questionnaire

Annex 0-1 Rabies Human Exposure assessment Questionnaire

An Investigation of human exposure to rabies December, 2018.

A questionnaire to be filled to investigate human exposure to rabies in woreda ten Yeka sub city, December, 2018.

No.	Question	Coding Classification
1.1	Respondent ID	_____
1.2	Address of the respondent	Sub city_____ Woreda_____ Ketena_____
1.3	Sex	1.Male 2 .Female
1.4	Age	_____Years
1.5	Marital status	1. Single 2. Married 3. Widowed 4. Divorced
1.6	Educational status	1. Illiterate 2. Primary school 3. Secondary 4. College &University
1.7	Ethnicity	1. Amhara 4. Tigre 3. Oromo 5. Gurage 6. Somali 6. Others
1.8	Occupation	1. Student 2. laborer 3. House wife 4. Merchant 5.kuraliyo worker 6.Other(specify)
1.9	Do you have animals in your house ?	1.Yes 2. No
1.10	If yes, Number of animal found in house?	Dog__ cat _____ cattle_____
1.11	Have you exposed to rabid animals.	1. yes 2.no
1.12	If yes, Whom it belongs to?	1.Street 2.Owners
1.13	Date of Bite	mm/dd/yy _____

1.14	Date of seen at health facility	mm/dd/yy_____
1.15	Type of exposing animal	1. Dog 2.cat 3. Cattle 4. Equine
1.16	Site of exposure	1. Head/face/neck 2. Upper torso 3. Lower torso 4. Arms 5. Hand 6.leg 7.foot
1.17	Circumstance of exposure	1. Provoked 2. Unprovoked 3. Unknown
1.18	Treatment given	1. Wound care 2. TAT given 3. PEP vaccine 4.advise
Knowledge towards Rabies		
1.19	Have you ever heard about Rabies?	1. Yes 2. No
1.20	If Yes what is your source of information?	1.Media announcement 2.Awarness creation 3.Health extension workers 4.Exposure/ experience
1.21	Can rabies affect human?	1. Yes 2. No
1.22	Which animal are affected by rabies?	1. Dog 2. Cat 3. Cattle 4. Sheep 5. All
1.23	Do you know possible means of rabies transmission	1. Yes 2. No
1.24	If yes how?	1.Animal to animal 2.Animal to human 3.Human to human
1.25	What is the Possible mode of transmission?	1.Bieng bitten by rabies 2.splash of infected saliva on wound site 3.splash on mucous membrane
1.26	Do you know the Sign and symptoms of rabies?	1. Yes 2. No
1.27	If yes, what are the symptoms?	1. Salivation 2. paralysis 3. aggressiveness 4. fear of water 5. Lethargy 6. Change in vocalization 7. No signs of disease 8. other_____
1.28	Do you vaccinate your dog?	1. Yes 2. No
1.29	What do you think is best method of controlling Rabies?	1. Mass vaccination against rabies 2. Destroying stray dogs

		3. There should be alternative that creator is not against 4. Developing proclamation stating number of dogs reared 5. Other _____
1.30	Do you have dog /or other animal ?	1.Yes 2.No
1.31	Dog and other animal size.	1. Dog_____ 2.other animal_____
1.32	What do you usually do if your dog becomes rabid?	1. I treat myself 2. Consult vet 3. Consult HEW 4. Consult traditional healer 5. Just wait its death 6. Other _____
1.33	Why do you rear your dog?	1. Guard 2. Salon aesthetic 3. I like dogs 4. Others _____
1.34	What is husbandry system of your dogs?	1. Confined in gage 2. released at night in the compound 3. Released at weekend freely in the village 4. Roam freely and come home at night 5. Freely leaves in the salon as aesthetic 6.Other _____

Annex 0-1 Data collection instrument (Questionnaire) For Surveillance data analysis

1. Is there a typhoid fever case based report in weekly base Yes ____ No ____

2. Was the report regular? Yes ___ No ____ I don't know ____

3. What level of cases will be reported per facility in the sub city _____?

4. Name of the facility if health center. _____

5. The facility is owned by. Gov't _____ NGO ___ Private /Factory clinic____

6. Where was the cases address? _____

7. What was the week /month/year of reporting? _____

8. What was the sex distribution of cases reported per week per facility?

Total _____ M _____ F_____

9. Age classification of cases in facilities per week _____

10. What was the reporting unit _____?

11. Was the case managed properly? Yes _____ No____

12. Outcome of cases improved _____Died_____

12. Was sensitization training given to health professionals? Yes_____ No_____

13. If yes to question number 12. How & for ho much

_____

14. What other activities was done concerning Typhoid fever to tackle the problem?

Annex 0-1: Questionnaire for Measles case-based surveillance system evaluation

No.	Question	Coding Classification
1. Background Information		
1.1	Region	Addis Ababa
1.2	Zone/Sub-city	Bole
1.3	Woreda	
1.4	Name of Health Facility	
1.5	Respondent Name:	
1.6	Catchment total Population	_____
1.7	Date of data collection	
2. Case Detection and Registration		
2.1	Is there national manual/guide line for surveillance at your office?	1.Yes 2. No
2.2	Do you have **Measles** 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 **yes** did you register rumor and did verification?	1. Yes 2. No
3**. Case confirmation**		
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
4. Reporting		
4.1	Did you send Measles surveillance data to the next level?	1.Yes 2. No
4.2	Did you know national time dead line report for immediately and weekly reportable disease?	1.Yes 2. No

4.3	If answer for 4.2 is **Yes**, 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
5. Data analysis and interpretation		
5.1	Have you trained on Measles surveillance system?	1.Yes 2. No
5.2	Do you have computer?	1.Yes 2. No
5.3	Is it functional?	1.Yes 2. No
5.4	Do you have computer skill?	1.Yes 2. No
5.5	Did you analyze Measles surveillance data?	1.Yes 2. No
5.6	Did you use computer to analyze Measles surveillance data?	1.Yes 2. No
5.7	If answer for 5.6 is **yes**, 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 **denominator** 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?	1. Yes 2. No
5.12	If answer for 5.11 is **yes**, what is it? (Ask 2 priority disease)	_____case _____% increase
5.13	How often did you analyze collected data? (Daily, weekly, monthly, Quarterly, as needed_____)	_____
6. Outbreak investigation		
6.1	Is there suspected outbreak of Measles in the last 6months? (**Obs**. Report and take copies if possible)	1.Yes 2. No
6.2	If answer for 6.1 is **Yes,** has your Woreda/HC investigated the outbreak?	1.Yes 2. No
7. Epidemic preparedness		
7.1	Did your Woreda/HC have written plan for Epidemic preparedness and response?	1.Yes 2. No

7.2	Did your Woreda/HC have 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
8.Responses and Controls		
8.1	Has your Woreda/HC have implemented prevention and control measures based on local data for Measles? **(at least for 1 disease)**	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's/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
9. Feedback		
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 feedback?	1.Oral 2. Written
9.3	If answer for 9.1 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
10. Training		
10.1	Did you take training on Measles surveillance within the last year?	1.Yes 2. No
10.2	How many staffs were trained?	_____
11. Supervision		
11.1	Did you conduct supervision in the last 6 months?	1.Yes 2. No
11.2	If answer for 11.1 is **yes,** 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

Surveillance Attribute		
12. Completeness		
12.1	Number of sites expected to report and reported in the last 1month respectively	Exp. Reported ____ ____
12.2	Are all Measles cases in the last one month from registry was reported?	1.Yes 2. No
12.3	Number of Measles & RF cases from registry and report format in the last 1 month respectively	_____ _____ _____ _____
13. Timeliness		
13.1	Is the surveillance data Send/come on time?	1.Yes 2. No
13.2	Percentages of HF submit their report on time?	_____
14. Usefulness		
14.1	Did the suspected outbreaks were detected early by the surveillance system?	1.Yes 2. No
14.2	Did the response initiate in a timely manner?	1.Yes 2. No
14.3	Did any epidemiological investigation conduct?	1.Yes 2. No
14.4	For what purposes do you use the surveillance data? (E.g. early warning and routine program monitoring)	_____
15. Simplicity of the system		
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?	_____
16. Acceptability		
16.1	Did you believe the surveillance is important for public health intervention?	1.Yes 2. No
16.2	Did you accept the Measles surveillance system?	1.Yes 2. No
16.3	Do you think the reporting agents accept and well engaged to Measles and RF 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 send their report using the current and appropriate surveillance reporting format?	1.Yes 2. No
17. Flexibility		
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 will be difficult to implement?	1.Yes 2. No
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
18. Data quality		
18.1	Are all reported forms Complete?	1.Yes 2. No
18.2	Is the recorded data clear to read and understand?	1.Yes 2. No
19. Representativeness		
19.1	Was the surveillance system enabled to follow the health and health related events in the whole community?	1.Yes 2. No
20. Stability		
20.1	Was any new restructuring affecting the procedures & 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

Annex 0-1 : Data collection tools Health profile Assessment

Part one

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

   1.1. The name, how and why_____

   1.2. How was the district formed_____?

   1.3. Any other historical aspect_____

2. **Geography and Climate (From woreda Administrator)**

   2.1. Area of the district(KM^2)?

   2.2. Woreda Boundaries

   - South ----------?
   - North ----------?
   - West ----------?
   - East ----------?

   2.3. Altitude _____?

   2.4. Latitude_____?

   2.5. Average Annual rain fall?

   2.6. Average Annual temp?

   2.7. Land bodies?

   2.8. Water bodies?

3. **Population & population Structures (From woreda Administrator)**

   3.1. Demographic information (From woreda Administrator)

   - Total Population size----------?
   - Total number of Kebeles/Ketenas----------?
   - Male _____?
   - Female _____?
   - Urban _____?
   - Rural_____?
   - Sex ratio _____?
   - Age structure: - percentage of children < 1yrs ____<5yrs _____< 15 yrs. -------
   - Women child bearing age(15-49yrs)?
   - Percentage of pregnant women?
   - Dependency ratio (under 18 + above 65)?

3.2. Religion

- Orthodox_____ (------- %)
- Catholic_____ (------- %)
- Protestant_____ (------ %)
- Muslim_____ (_____ %)
- Others_____ (_____ %)

- Wolayeta---------(------- %)
- Tigre---------- (-------- %)
- Oromo----------(-------- %)
- Amhara---------- (-------%)
- Gurage---------- (------ %)
- Other---------- (-------- %)

3.3. Ethnic groups/language

3.4. Marital status

- Single ---------- (_____%)
- Married---------- (_____ %)
- Widowed---------- (_____ %)
- Separate ---------- (_____%)

4. Population Distribution

Population distribution by Kebele/Ketena in woreda 09

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

Population distribution by age in woreda -09 administration, Bole sub city, Addis Ababa, 2010 EFY

Age group	Male	Female	Total	Percent (%)
0-4				
5-9				
10-14				
15-19				
20-24				
25-29				
30-34				
35-39				
40-44				
45-49				
50-54				
55-59				
60-64				
+69				

5. Educational coverage

Educational coverage in Bole Sub city, Woreda 09, 2010 EFY

S/No	Type of School	Number School	Owners of school		Number of student			No of Teachers by their title			
			P	G	M	F	Total	Diplo	Degree	Master and above	Total
1.	KG										
2.	Primary										
3.	Secondary.										
4.	Tertiary.										
5.	College										
6.	University										
	Total										

6. Socio economic conditions

6.1. Employment

- Number of people employed_____
- Number of people un employed_____
- Ratio of Employed to un employed_____
- Number of factories in woreda----------

6.2. Main source of income

- Agriculture _____ Civil servant _____ Others (specify)_____
- Yearly income per house hold_____
- Average income per capita _____

Communication and Utilities

- How many of the health facilities have access to transportation_____ (%)?
- Telecommunication_____ (%)
- Electric power_____ (%)

Health sector expenditure and financing resource

From Government

- Annual woreda budget ----------
- Annual budget Allocated to health sector ----------
- Total per capital health expenditure ----------
- Annual budget allocation increment percent comparing to the previous year (%)_____

From internal ----------

Funds from NGOs

Total ----------Purpose_____

Water supply

- Total safe water coverage of woreda ---------- (------ %)
- Safe water supply coverage by Keble ----------
- Kebeles getting safe water ---------- (--- -----%)

Part Two

Health System

General Information

- The general health system structure of the woreda (flow chart)

- Is there health management team (HMT) at woreda level? Yes/No

  ---

- If yes, describe the HMT 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

Number of Health Facility

Types of health facility which is found in woreda -09 of Bole sub city, Addis Ababa regional state, 2010EFY

S/N	Type		Number		Remark
			Governmental	Private	
1	Hospital				
2	Health Center				
3	Pharmacy				
4	Drug stores				
5	Diagnostic laboratory				
6	Clinics	Small			
		Medium			
		Higher/specialty			
Total					

Top 10 causes of Morbidity, and Mortality

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

Top ten causes of deaths (mortality)

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

Vital. statistics

S/n	Vital statistics		2010
	Infant Mortality Rate (IMR) (total <1 yr. deaths	Pop	
		Death	
		%	
		Pop	

	Child Mortality Rate (this year's total <15 yrs. deaths)	Death	
		%	
	Crude Birth Rate	Pop	
		Birth	
		%	
	Crude Death Rate (total deaths)	Pop. size	
		Death	
		%	
	Maternal Mortality Rate (total maternal deaths)	Pop	
		Death	
		%	

Health Human resource

S/no	Type	Number		Total	Ratio
1	Physicians	M	F		
2	Health officer				
3	Laboratory technician/technologist				
4	Pharmacy technician/pharmacist				
5	Nurse				
6	Midwife				
7	Radiologists				
8	Sanitarian				
9	HEWS				
10	Other health workers				
11	Supportive staffs.				

MCH service

ANC, FP and delivery Service

Maternal Health service in Bole sub city, woreda 09, 2017/2018

S/no	Description.	2010	Remark

1.	ANC FIST		
2.	ANC 4TH		
3.	Total Delivery		
4.	Delivery attended by skilled BA		
5.	Delivery attended TBA		
6.	PMTCT		
7.	Option B+		
8.	PNC		
9.	Contraceptive short term		
10.	Contraceptive long term		
11.	Natural method		

EPI Coverage

Immunization service Bole sub city woreda 09, 2017/2018

S/no	Description.	2010	Remark
	BCG		
	MEASELES		
	OPV O		
	PENTA 1		
	PENTA 3		
	ROTA		
	PCV1		
	PCV 3		
	FULLY VACCINATED		
	TT2+ PW		
	TT2+ NPW		

2.1. Environmental sanitation

- Latrine coverage ---------- (%)
- Number of house hold with latrine----------.

- Solid waste management----------

- Liquid waste management ----------

Prevalence of TB/Leprosy

TB/Leprosy in Bole Sub city Woreda 09, 2017/2018

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

HIV/AIDS

HIV/AIDS treatment and prevention status in Bole Sub city, Woreda 09, 2010 EFY

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

Disaster situation in the Woreda 09

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

- YES (specify) _____
- No_____

Any recent disease outbreak/other public health emergency

- Yes (specify) _____
- No_____

✓ If yes cases_____ and deaths_____

✓ If yes control method taken----------

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

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

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

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

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

Annex 0-1: Questionnaire for Assessment of Factors Affecting Reporting Completeness of Disease Under Surveillance Among Private Health Facilities in Addis Ababa, Ethiopia, 2019

Part I Demographic information

1. Age of respondent……...
2. Sex of Respondent
    a. Male
    b. Female
3. Responsibility
    a. Nurse
    b. HO
    c. MD
    d. Other specify
4. Types of hiring
    a. Contract
    b. Permanent
5. Work Experience…….
6. Types of health facility
    a. Lower
    b. Medium
    c. Higher
    d. Speciality clinic
    e. General hospital
7. Is there assigned Surveillance focal person in Health facility?
    a. Yes
    b. No
8. What types of services are being provided for the patient in your clinic or hospital?
    a. Outpatient services
    b. Inpatient services
    c. Both inpatient & outpatient
9. Is there patient registration book in your clinic/Hospital?
    a. Yes
    b. No

Part II Disease reporting related Information

10. Are there reporting formats for both immediately disease available?
    a. Yes
    b. No
11. Are there reporting format for weekly reportable disease available?
    a. Yes
    b. No
12. Did you Aware of the disease reporting formats?
    a. Yes
    b. No
13. How many times you received supportive supervisions from Woreda/Higher level PHEM officer with in the last six months?
    a. Once
    b. Twice
    c. Three and Above
    d. Never supervised
14. Do you feel that you receive adequate Support from Woreda PHEM office or higher?
    a. Yes
    b. No
15. Which method you use to report disease under surveillance?
    a. By phone call/SMS
    b. By Email
    c. By paper
    d. Fax
    e. Other
16. What problem you observed with the reporting system that has to be improved?
    a. It takes time to fill the format
    b. No well-organized system of reporting
    c. Disease under surveillance is not clearly known
    d. Reporting period is too frequent
17. Have you Trained/ retrained in the last 2 years on reportable disease?
    a. Yes
    b. No

18. Have you reported all notifiable disease regularly and timely in the past weeks? (Count reporting format and count……/24)
    a. Yes
    b. No
19. If no, what is the reason of not reporting regularly and timely?
    a. My facility not involved
    b. Forms not supplied to us
    c. No training/incentives

Part III Knowledge of respondent about surveillance

20. What are the two reporting Modalities of disease under surveillance in Ethiopia?

    a. …….. o Correct
    b. …….. o Incorrect

21. What are diseases under surveillance in Ethiopia? (>75 = correct, <75 = incorrect)

Immediately reportable disease	Weekly reportable

22. When you/your facility are expected to report disease under surveillance (weekly reportable disease)?
    a. Monday
    b. Tuesday
    c. Wednesday
    d. One of the days in the week

e. Other (specify)----------

23. When you/your facility are/is expected to report immediately reportable disease after diagnosed?

a. Within 30min
b. Within 1hr
c. Within One day
d. Within two day
e. Other (specify…….)

Part iii attitude

24. Reporting immediately reportable disease one week later after it has been identified causes public health problem?

a. Strongly disagree
b. Disagree
c. Neutral
d. Agree
e. Strongly agree

25. Reporting selective disease at daily based or weekly based helps us in preventing disease outbreak?

a. Strongly disagree
b. Disagree
c. Neutral
d. Agree
e. Strongly agree

26. The existing surveillance system is help full to track public health important disease?

a. Strongly disagree
b. DisagreeNeutral
c. Agree
d. Strongly agree