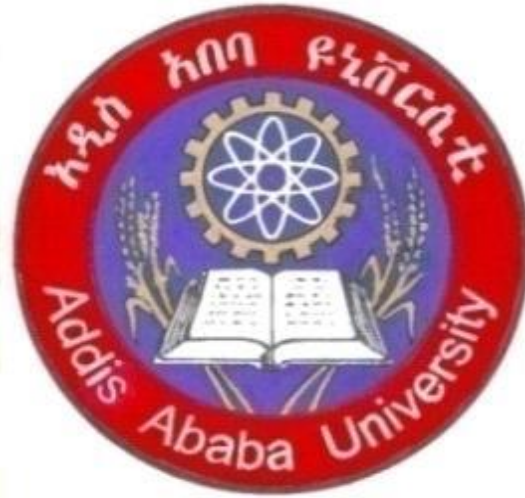


**Addis Ababa University College of Health Science School of  
Public Health**



**Ethiopian Field Epidemiology and Laboratory Training  
Programme (FELTP)**

**Compiled Body of Work in Field Epidemiology**

**BY**

**HABTMAU TILAHUN**

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

**June 2019**

**Addis Ababa, Ethiopia**

**Addis Ababa University**  
**College of Health Sciences**  
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**Health in Field Epidemiology**

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**June 2019**

**Addis Ababa, Ethiopia**

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**Approval by Examining Board**

_____	_____
Chairman, School Graduate Committee	
_____	_____
Advisor	
_____	_____
Examiner	
_____	_____
Examiner	

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## List of abbreviations and acronyms

AAU	Addis Ababa University
AFI	Acute Febrile Illnes
ANC	Antenatal care
An. funestus	Anopheles funestus
An. nili	Anopheles nili
An. pharenaesis	Anopheles pharenaesis
AOR	Adjusted odds ratio
ART	Antiretroviral Therapy
ASAR	Age specific attack rate
AWD	Acute watery Diarrhea
BCG	Bacille Calmette-Guerin
BCC	Behavioral Change Communication
BPR	Business Process Reengineering
CBN	Community Based Nutrition
CL	Confidence level
COR	Crude odds ratio
CSA	Central Statstics Agency
Dia.Lab	Diagnostic Laboratory
Deg.	Degree
Dip	Diploma
E.C	Ehiopian Calender
EFETP	Ethiopian Field Epidemiology Training Program
EFY	Ethiopian Fiscal Year
EOC	Emergency Operations Center
EPHI	Ethiopian Public Health Institute
EPI	Expanded Programme for Immunization

FP	Family Planning
GTP	Growth and Transformation Plan
HC	Health Center
HEWs	Health Extension Workers
HF	Health facilities
HIV/AIDS	Human Immune virus/acquired immune deficiency syndrome
HH	House hold
HIT	Health Information Technology
HN	Haemagglutinin, Neuraminidase
HO	Health Officer
HP	Health Post
HPAI	Highly Pathogenic Avian Influenza
HSDP	Health Sector Development Plan
IDP	Internally Displaced Population
IEC	Information Education and Communication
IHR	International Health Regulations
ILI	Influenza like Illness
IMS	Information Management System
IP	Intestinal Parasite
IR	Incidence Rate
IRS	Indoor Residual Spray
ITN	Insecticide Treated Nets
KG	Kinder Garten
Lab.	Laboratory
LLIN	Long lasting Insecticide nets
MACEPA	Malaria Control and Elimination Partnership in Africa
MAM	Moderate Acute Malnutrition
MCH	Maternal and Child health

MCP	Malaria Control Programme
MDG	Millenium Development Goal
MoH	Ministry of Health
MUAC	Mid Upper Arm Circumference
MCP	Malaria Control Programme
NDRMC	National Disater and Risk management Commisison
NFI	Non food Items
NGO	Nongovernmental Organization
NNT	Neonatal Tetanus
NPW	Nonpregnant Women
NSP	National Strategic Plan
OPD	Outpatient Department
OPV	Oral polio virus
OR	Odds ratio
OTP	Outreach therapeutic Programme
PCV	Pneumococcal Conjugate Vaccine
PHC	Primary Health Care
PHEM	Public Health Emergency Management
PITC	Provider Initiated Testing and Counseling
PLW	Pregnant and Lactating Mother
PLWHA	People Living with AIDS
PMTCT	Prevention of Mother to child Transmission
PNC	Post natal Care
Pop.	Population
PR	Prevalence Rate
PSNP	Productive safety net Programme
PTB	Pulmonary Tuberculosis
PTR	Pupil to teacher ratio
PW	Pregnant Women

RDT	Rapid Diagnostic Test
RHB	Regional Health Bureau
RRT	Rapid Response Team
RV	Rota Virus
Rx	Treatment
SAM	Severe Acute Malnutrition
SARI	Severe Acute Respiratory Infection
SC	Stabilizing Center
SIAs	Supplementary Immunization Activities
SPH	School of Public Health
SNNPR	South Nations, Nationalities and People Region
SPSS	Statistical package for social sciences
SUFI	Scale Up for Impact
TB	Tuberculosis
TBA	Traditional Birth Attendant
TSF	Targeted Supplementary Feeding
TSFP	Targeted Supplementary Feeding Programme
TT	Tetanus Toxoid
TT2+	Tetanus Toxoid 2 and above
TTBA	Trained Traditional Birth Attendant
TVET	Technical and vocational Education and Training
U5	Under five children
UAP	Universal Access Programme
UNICEF	United Nations International Children's Emergency Fund
URTI	Upper Respiratory Tract Infection
USAID	United States Agency for International

	Deveelopment
UTI	Urinary Tract Infection
VCT	Voluntary Counseling and Testing
VZV	Varicella Zoster Virus
WaSH	Water sanitation and Hygiene
WFP	World Food Programme
WHO	World Health Organization
ZHD	Zonal Health Department

## EXECUTIVE SUMMARY

This document contains a two years Field Epidemiology Training Program outputs which is equivalent with thesis to be submitted to graduate School of Public Health for fulfillment of masters degree in Field Epidemiology. It includes reports of diseases outbreak investigations, public health surveillance data analysis, surveillance system evaluation, narrative summary of disaster situation report, manuscript, abstracts, and training reports.

**Chapter One:** Contains disease outbreak investigations. I have conducted two outbreak investigations. The first outbreak investigation was conducted using unmatched case control study design. The investigation report contains abstract, introduction, methods, discussions, conclusion, recommendations and references separately. The second outbreak investigation was conducted on suspected Chicken pox outbreak in Yirga chefe town. It is descriptive outbreak investigation and response among two internally displaced population sites. It contains introduction, objective, methods, results, discussion, conclusion, recommendations and references separately.

**Chapter Two:** contains report of surveillance data analysis which was conducted on Analysis of Influenza of five years. Five years data (2013 to 2017) was used in the analysis. The objective of this study was to describe Influenza like illness cases distribution by person, place, and time to recommend possible solutions based on the findings.

**Chapter Three:** Addresses Malaria surveillance system evaluation in Bahir dar zuria district of Amhara regional state. This chapter clearly presents the purpose and objectives of the malaria surveillance and its progress towards achieving its objectives. The surveillance system attributes: simplicity, flexibility, stability, acceptability, representativeness, timeliness, data quality, and sensitivity were also assessed in this chapter.

**Chapter Four:** Contains report of assessment of Health Profile data description of Burie zuria district in West Gojjam zone of Amhara regional state. In this chapter health and health related data of the woreda were evidently presented which is indicative for prioritizing public health problems in the woreda.

**Chapter Five:** Contains Scientific Manuscript for Peer reviewed Journals. It's on five years surveillance data of Influenza in shiro meda health center sentinel site.

**Chapter Six:** Contains the abstract on Influenza surveillance data in Shiro meda health center sentinel site from year 2013 to 2017, abstract on outbreak investigation of Measles in Dgehabour

city of Somali region in March 2019 and outbreak investigation of suspected chicken pox in Yirga chefe town in August 2018.

**Chapter Seven:** Contains the disaster situation report of Gedeo zone in SNNP region. It describes the disaster situation of internally displaced Population from East and West Guji zones of Oromia regional state. It has its own introduction, objective, method, result, discussion and recommendations separately.

**Chapter Eight:** Contains the project proposal to conduct an assessment on Knowledge, Attitude and practice towards use of Insecticide treated bednets in Burie zuria district of west gojjam zone of Amhara regional stae. It has separate introduction, objectives, and methods.

**Chapter Nine:** Contains the training report of Rapid response team (RRT) in four woredas of Gedeo zone of SNNP region in August 2018.

# CHAPTER I- OUTBREK INVESTIGATIONS

## 1.1 Measles Outbreak Investigation of Degahabour city, Somali region, March 2019

### Abstract

**Introduction:** Measles is an acute, highly contagious viral disease caused by measles virus. It is characterized by small red dots appearing on the surface of the skin, irritation of the eyes (especially on exposure to light), coughing, and a runny nose. About 12 days after first exposure, the fever, sneezing, and runny nose will appear. Coughing and swelling of the neck glands often follow. It is transmitted primarily by respiratory droplets or airborne spray to mucous membranes in the upper respiratory tract or the conjunctiva. The risk factors for measles virus infection include: infants who lose passive antibody before the age of routine immunization, children with vitamin A deficiency and immunodeficiency due to HIV or AIDS, leukemia, alkylating agents, or corticosteroid therapy, regardless of immunization status and children who travel to areas where measles is endemic or contact with travelers to endemic areas. Malnourished and young children are at higher risk of developing complications and mortality from measles infection. An estimated 10 million cases and 164,000 deaths from measles occur worldwide each year. This outbreak investigation was conducted to describe the magnitude of the outbreak and assess the most likely risk factors for the occurrence of this outbreak.

**Method:** We conducted unmatched case control (1:2) with 30 cases and 60 controls in Degahabour city of Somali regional state between 16<sup>th</sup> and 23<sup>rd</sup> March 2019 to investigate this outbreak. we administered interviewer administered questionnaire which contains sociodemographic characteristics and risk factors to investigate this outbreak and laboratory investigation was done to confirm this outbreak. Data was collected using interviewer administered structured questionnaire. Active case search in the community and patient charts were reviewed. Line listing of cases was also implemented. Data was entered in Microsoft excel and SPSS and descriptive and analytic analysis was done. Results displayed using narration, tables and charts.

**Results:** A total of 166 cases with zero case fatality rate were reported. Out of those cases, 117 (70%) were males. The age of the patients ranges from seven months to 40 years. The overall

attack rate was 32.5 per 100,000 population in the city. Most of the cases, (97%) were not vaccinated against measles. Vaccination status (AOR, 45.5, 95%, CI:5.62-368.42) and knowledge on measles transmission (AOR, 4.34, 95%,CI:1.33-14.17) were risk factors identified to contract measles in this outbreak.

**Conclusion:** In this outbreak majority of the cases were males and being unvaccinated and did not knowing the transmission methods of measles were independently associated to contract measles in this outbreak. Strengthening the routine immunization activities is recommended to prevent future outbreaks in the area.

**Key words:** Measles, Outbreak, Investigation, case control, Degahabour, Somali region

## **Introduction**

Measles is an acute, highly contagious viral disease caused by measles virus. It is characterized by small red dots appearing on the surface of the skin, irritation of the eyes (especially on exposure to light), coughing, and a runny nose. About 12 days after first exposure, the fever, sneezing, and runny nose appear. Coughing and swelling of the neck glands often follow. Four days later, red spots appear on the face or neck and then on the trunk and limbs. In two or three days the rash subsides and the fever falls. It is transmitted primarily by respiratory droplets or airborne spray to mucous membranes in the upper respiratory tract or the conjunctiva. The risk factors for measles virus infection include: infants who lose passive antibody before the age of routine immunization, children with vitamin A deficiency and immunodeficiency due to HIV or AIDS, leukemia, alkylating agents, or corticosteroid therapy, regardless of immunization status and children who travel to areas where measles is endemic or contact with travelers to endemic areas. Malnourished and young children are at higher risk of developing complications and mortality from measles infection (2).

Measles remains a common disease and major contributor to child-mortality worldwide and kills approximately 1-3 of every 1000 infected individuals, even in developed countries. An estimated 10 million cases and 164,000 deaths from measles occur worldwide each year (3). After an effective measles vaccine was introduced in 1963, the incidence of measles decreased significantly. While global measles deaths have decreased by 84 percent worldwide in recent years from 550,100 deaths in 2000 to 89,780 in 2016 measles is still common in many developing countries, particularly in parts of Africa and Asia. An estimated 7 million people were affected by measles in 2016. The overwhelming majority (more than 95%) of measles deaths occur in countries with low per capita incomes and weak health infrastructures. The measles vaccine has been in use since the 1960s. It is safe, effective and inexpensive. WHO recommends immunization for all susceptible children and adults for whom measles vaccination is not contraindicated (4).

Recognizing the burden of measles infection, remarkable prevention and control intervention have been undertaken in Ethiopia. Improving routine vaccination coverage, providing a second opportunity for measles vaccination through supplementary immunization activities (SIAs), improving measles-case management, and establishing case-based measles surveillance are

among the core activities implementing regarding prevention and control of measles in the country. Regardless of the quality of cold chain national vaccination coverage was improved from 8.0% in 1990 to 82.4% in 2010, this is far short of the 95% needed to prevent outbreaks (5). Ethiopia launched measles vaccine second dose vaccination into the routine immunization programme in the second year of life. However, measles outbreaks have been documenting at different parts of the country every year.

## **Objectives**

### **General Objective**

To describe the magnitude of the outbreak and assess risk factors for the occurrence of this outbreak between 16 and 23 March 2019

**Specific Objectives:** Specific objectives were

- ✓ To describe in person, place, and time of the reported cases outbreak in the area
- ✓ To assess risk factors for the occurrence of this outbreak in the area

## **Methods and materials**

### **Study area**

Degahabour city is one of the city administrations in Jarar zone of Somali region. It is found 791 Kms away from Addis (Capital of Ethiopia) and 166 Kms away from Jijiga the regional capital East. The average temperature of the city is estimated to be 30 degree centigrade. The city has a total of 10 kebele (lowest administrative level in Ethiopia) administrations. The city is the capital of Jarar zonal administration. The total population of the city is estimated to be 51,027, of which 25,003 are males and the remaining 26,024 are females. The city is bordered by fafan zone in the North, Korah and warder zones in the South and East and by Fik zone in the West. There is one general hospital and one health center giving health service delivery in the city. The administrative measles coverage of the city is to be 55% as reported by the city health office. We received a notification from Somali regional state health bureau PHEM process owner to investigate this outbreak and a team composed of Epidemiologist and PHEM officer from regional health bureau deployed to the area to investigate the outbreak.

## **Data collection**

A structured questionnaire was used to collect data from case patients and controls. Line listing of reported cases and active case search was also conducted to find cases from house to house in the community. Patient charts were also reviewed for treatments given. A total of 90 participants (30 case patients and 60 controls) were enrolled in the study. Verbal consent was obtained to participate in the study from the participants prior to the interview.

## **Case definitions used**

**A suspected measles case:** was defined as a person with fever, generalized maculo-papular rash and at least one of the following: cough, coryza, or conjunctivitis (3).

**Confirmed measles case:** If a suspected case which has laboratory results indicating infection (measles IgM positive or isolation of a measles virus) is said to be confirmed measles case (3).

**A control** in this study was a person with no signs and symptoms of measles. We interviewed two controls for every case of measles. we used hospital controls for hospital cases and community controls for community cases.

**Epidemiologically-linked case:** Is a suspected case, which has contact with laboratory confirmed case or another epidemiologically-confirmed case (3).

**Measles outbreak:** If three or more confirmed cases of measles within defined geographic area like Kebele or Woreda, in one month period is reported, measles outbreak is declared (3).

**Laboratory Investigations:** A total of five blood samples were collected from patients and sent to EPHI National measles and polio laboratory, and all of the samples collected were positive for Measles Igm test. Other cases were treated as epidemiologically linked with confirmed cases.

## **Study Design**

Descriptive as well unmatched case control (1:2) study design was implemented to collect the data.

## **Laboratory methods**

Five blood samples were collected from patients to confirm the outbreak. measles Igm test was done at EPHI national laboratory and all five samples were positive for measles Igm test.

## **Study period**

The study was conducted from 16 to 23 March 2019 in Degahabour city, Jarar zone of Somali regional state.

### Data analysis

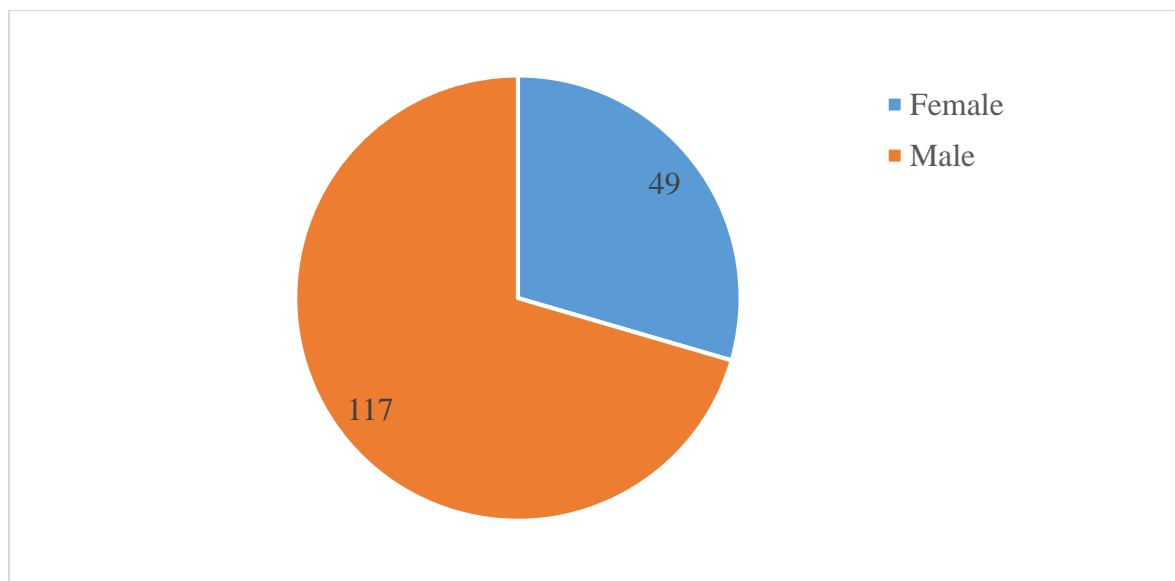
The collected data were entered to excel sheet checked for consistency and completeness then exported to SPSS version 23 for analysis. Basic analysis was done by person, place and time. We computed bivariate and multivariate logistic regression were done and results were displayed by AOR, at 95% CL, and p-value <0.05.

### Results

#### Descriptive

##### Person:

A total of 166 measles cases with zero case fatality rate were reported from Degahabour city of Somali region from February 2<sup>nd</sup> to March 17<sup>th</sup> 2019. Out of the total reported cases, 117 (70.48%) were males and the remaining, 49 (29.52%) were females. The overall attack rate was 0.32 for the city. The attack rate among males were 0.46% and 0.18% for females. Out of the total reported cases majority (74.6%) of them were treated as inpatient cases at Degahabour general Hospital and the remaining 25.4% were treated as an outpatient cases.



*Figure 1 Number of reported Measles cases by sex in Degahabour city, March 2019*

With regard to age group, the most affected age group was 1 to 4 with attack rate of .65%. The age of the cases ranges between between 7 months and 40 years the median age was 20.29 years.

*Table 1 Attack rate of measles cases by age group in Degahabour city, Somali region, March 2019*

Age Group	Population	Number of cases	ASAR
<1	7511	15	0.20
01-04	6755	44	0.65
05-14	14211	23	0.16
15-29	19798	73	0.37
30+	2752	11	0.40
<b>Total</b>	<b>51,027</b>	<b>166</b>	<b>0.33</b>

Out of the total reported cases, most of them did not have vaccination history previously. Only 3% of the cases had vaccinated for measles and the remaining **97%** had no vaccination history based on the analysis done on the line list.

**Place:**

A total of **nine** kebeles were affected with the outbreak. Out of the total reported cases most of them were reported from Kebele 07 followed by Kebele 03. The first case was reported from Kebele 07 on February 2 2019 who had travel history to Gode city of Shebele zone, which is one of the measles affected area in the region. Kebele 03 is with the highest attack rate (AR) followed by Kebele 07 and 06.

**Time:**

The first case was supposed to be reported on February 2 2019, who had a travel history to Gode city of Somali region which is one of the measles affected areas in Somali region.

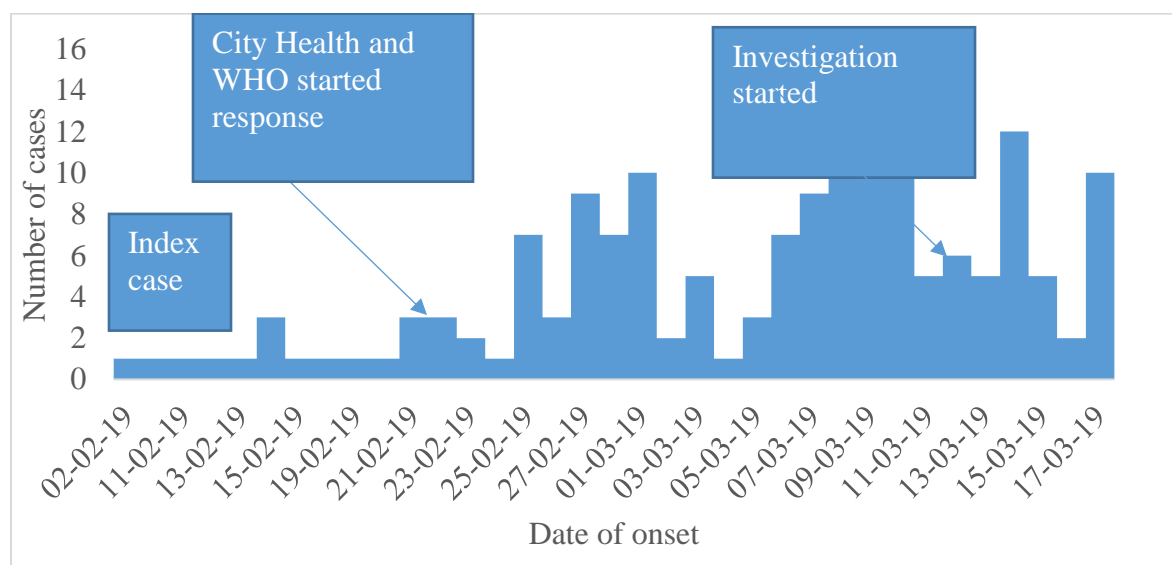


Figure 2 Epi curve of measles cases in Degahabour city, Somali region by date of onset of rash, March 2019

### Laboratory results:

A total of five blood samples were collected by laboratory personnel from degahabour hospital and the samples sent to EPHI in which the cold chain of the samples maintained.

### Risk factors

On independent bivariate logistic regression being unvaccinated and did not know the transmission modes of measles were significantly associated to contract measles in this outbreak with p- value of <0.05 and confidence interval of 95% (Table 3).

Table 2 Bivariatare analysis of different exposures Degahabour city, March 2019

Variables				
Know transmission modes of measles	Cases, N=30(33.3%)	Control, N=60(66.7%)	OR(CI,95%)	P-value
Yes	8(26.6%)	44(73.3%)		
No	22(73.4%)	16(26.6%)	7.56(2.8-20.73)	0.000*
Vaccination status				
Yes	1(3.3%)	19(31.6%)		

No	29(96.7%)	41(68.4%)	62.57(7.92-494.12)	0.000*
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\*-Variables associated to contract measles

On multivariate logistic regression using SPSS, being unvaccinated against measles and didn't know the transmission modes of measles were significantly associated to contract measles in this outbreak with p-value<0.05 with confidence level of 95%.

Table 3 Identified risk factors for contracting measles in Degahabour city, Somali region, March 2019

Variables					
Know transmission modes of measles	Cases, N=30(33.3%)	Control, N=60(66.7%)	COR(CI,95%)	AOR	P-value
Yes	8(26.6%)	44(73.3%)			
No	22(73.4%)	16(26.6%)	7.56(2.8-20.73)	4.34(1.33-14.17)	0.015*
Vaccination status					
Yes		1(3.3%) 19(31.6%)			
No	29(96.7%)	41(68.4%)	62.57(7.92-494.12)	45.5(5.62-368.42)	0.000*

\*-Factors associated to contract measles with p-value less than 0.05 and CI level of 95%

## Discussions

In this outbreak the most affected age group was 1 to 4 years which is common from previous experiences. In another study conducted in 2016 in Jarar zone of Somali region the commonest age group affected was under one year population with an attack rate of 127.1 per 10,000 population (1). In another study conducted in Kebridahar district of Somali region between March and April 2016, the most commonly affected age group was 5 to 14 in this study males were more affected than females, which is also supported by another study in Guji zone of Oromia region in 2015 (8). The area had also experienced similar measles outbreaks in the

preceding years (2016) with risk factors to be being unvaccinated which may reveal that the outbreak is happening in cyclic nature (1). In this outbreak males were more affected than females, which is supported by another study conducted this area in 2016 (1).

In this outbreak most of the reported cases (97%) were unvaccinated. In another study conducted in Guji zone of Oromia region in March 2015 reported also around 74% of reported cases were not vaccinated against measles (8). It also supported by a study in conducted in Jarar zone of Somali region in 2016, which revealed 86.2% of the reported cases were unvaccinated against measles (1). The investigation revealed that being unvaccinated is the major risk factor for the occurrence of measles outbreak in the area.

Measles outbreak is happening from year to year in this area, being the Measles immunization coverage the city reported to be 55%. The most likely cause of this outbreak is being unvaccinated as described in descriptive part most of the reported cases (97%) were not vaccinated against measles as well in analytic part, vaccination status was significantly associated with contracting measles (OR: 45.5, CI: 5.62-368.42). In the same case control study conducted in Kebridahar district of Somali regional state in 2016 showed that 61% of the reported cases were not vaccinated against measles (7). Those unvaccinated children are 45.5 times at risk to develop measles compared to their counter parts, this finding is also comparable with a study conducted in Kebridahar district of Somali regional state in 2016 (7). This finding is also supported by another study conducted in Zimbabwe of Zaka district in 2010 which revealed that, those who didn't have vaccination history were 12.46 times were at risk to develop measles compared to vaccinated children (9). Evidences suggest that measles transmission can be interrupted at the herd immunity level of 93-95% (6). Thus, improving the immunization coverage of the area is recommended to prevent future outbreak occurrences. The City health office in collaboration with regional health bureau and other stakeholders should work in strengthening the routine immunization practice in the area.

In this study, those who don't have knowledge about the transmission methods of measles are 4.34 more times at risk to contract measles compared to their counter parts. Similar study conducted in somali in West guji zone of Oromia region also revealed the same finding in 2014 (8).

### **Interventions taken**

As part of the response in parallel with the investigation the following activities were undertaken in collaboration with RHB, Zonal health department and city health office.

- Management of cases
- Active case search of cases from house to house and health education
- Training of health workers on surveillance and case management
- Training of kebele volunteers
- Daily coordination meeting with regional, zonal and city administration health office representatives and NGOs

### **Conclusions**

In this outbreak males are more affected compared to females

The most affected age group in this outbreak was 1 to 4 years

Being unvaccinated and knowledge on the transmission of measles were independently associated with this outbreak occurrence

### **Recommendations**

- ✓ City health office in collaboration with RHB and other partners should conduct vaccination campaign
- ✓ City health office in collaboration with RHB should strengthen the routine immunization of the area
- ✓ The city health office should be strengthened in terms of early detection of cases and isolation of cases for easy control and prevention of cases
- ✓ The city health office should work towards raising the awareness of the community about the diseases and importance of vaccinating a child against measles

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## 1.2 Suspected chicken pox outbreak investigation and response in Yirga chefe town, SNNPR, Descriptive study, August 2018

### Abstract

**Introduction:** Chicken pox or varicella is an acute viral infectious disease of childhood caused by varicella-zoster virus. Humans are the only known hosts for this virus. The major route of transmission is airborne, however, transmissions via aerosols or direct contact with blister fluid have also been reported. The primary infection presents as fever and exanthematous rash. Clinically apparent infection usually provides lifelong immunity. The disease is usually acute and self-limiting but occasionally can lead to secondary infections like pneumonia, encephalitis, and secondary bacterial infections. Varicella is vaccine preventable disease. An estimated 4.2 million cases and 4200 deaths occur annually worldwide. This outbreak investigation was conducted to describe chicken pox cases in terms of person, place and time from 6<sup>th</sup> to 18<sup>th</sup> August 2018 in Yirga chefe town of Southern, nations, nationalities and people region, Ethiopia.

**Methods:** We conducted a descriptive study in the Yirga cheffe town. We line listed all reported cases which contains sociodemographic characteristics of patients and signs and symptoms. The line listed data were analyzed with person, place and time. We have also visited the reporting IDP sites during investigation. All reported cases got supportive treatment with mobile clinics.

**Results:** A total of 25 suspected cases of chicken pox were reported between 6<sup>th</sup> and 18<sup>th</sup> of August 2018 from Yirga cheffe town IDP sites. Among reported cases 96% were reported from two IDP sites and one case was from the community. Out of the total reported cases 14(56%) were males while the remaining 11 (44%) were females with regard to sex and 88% of the total reported cases were children under the age of fifteen.

**Conclusion:** The most affected age group in this outbreak was under the age of fifteen. Males were more affected than females in this outbreak. Unavailability and not introduction of chicken pox vaccine in our country might be a risk factor for the occurrence of this outbreak. Collective sites might be favorable condition for the transmission of this outbreak.

**Recommendations:** Strengthening routine surveillance in the IDP sites is recommended to early detect and control future outbreaks in the area. Ministry of Health of Ethiopia shall consider the

introduction of chicken pox vaccine in the country. Ministry of Health should prepare guidelines and manuals for response of future outbreaks.

**Key words:** Chicken pox, outbreak, Yirga cheffe, investigation

## **Introduction**

Chicken pox or varicella is an acute infectious disease of childhood caused by varicella-zoster virus (VZV), belonging to the family Herpesviridae (1). Human beings are the only known hosts of this virus (2). The primary infection presents as fever and exanthematous rash but can affect almost any organ of the body (3). The incubation period usually ranges between 7 and 23 days (mean-2 weeks). The major route of transmission is airborne, however, transmissions via aerosols or direct contact with the blister fluid have also been reported. The disease is highly contagious with an attack rate of >85% after exposure. A clinically apparent infection usually provides lifelong immunity. The disease is usually acute and self-limiting but occasionally can lead to complications such as encephalitis, pneumonia, and secondary bacterial infections. Development of herpes zoster due to reactivation of latent varicella infection may be seen due to long-term consequences (4). Individuals remain contagious until all lesions have crusted over. Following infection, the virus remains latent in nerve cells and may be reactivated causing a secondary infection - herpes zoster, commonly referred to as “shingles”. This generally occurs in adults aged >50 years or in the immunocompromised and is associated with a painful rash that may result in permanent nerve damage. Varicella can be prevented by immunization and multiple vaccine formulations of the live attenuated vaccine, based on the Oka VZV strain, have been available since 1974. Varicella vaccines are available as a single antigen and in combination with measles, mumps and rubella vaccine (9). Treatment is symptomatic relief of symptoms. As a protective measure, those infected are usually required to stay at home while they are infectious. Keeping nails short and wearing gloves may prevent scratching and reduce the risk of secondary infections. The estimated global burden of disease-specific mortality caused by varicella is considerably lower than that due to other major infectious diseases such as measles, pertussis, rotavirus, or invasive pneumococcal disease (14).

Based on conservative estimates, the global annual varicella disease burden would include 4.2 million severe complications leading to hospitalization and 4200 deaths. Despite the routine use

of measles and pertussis vaccination, the age-standardized death rates (per 100 000 cases) in 2010 was 0.1. In the pre-vaccine era in high-income developed countries, case fatality rates for varicella were approximately 3 per 100 000 cases compared to 1–3 per 1000 cases for measles. Nevertheless, as other vaccine-preventable diseases are controlled, varicella may represent a considerable preventable disease burden in the population, with significant health-care and societal costs. Factors which influence the severity of disease and outcomes in populations include the proportion of cases among infants, pregnant women and other adults, the prevalence of immunocompromising conditions including HIV infection, and the extent of access to care and appropriate treatment. In otherwise healthy children, varicella is usually self-limiting (11). Two doses of vaccine are recommended for children the first dose at 12 to 15 months of age and the second dose at 4 to 6 years of age, with catch-up vaccination for all persons without evidence of immunity to varicella and for one-dose vaccine recipients (13).

## **Objectives**

### **General**

To describe the magnitude of the outbreak and to support in response and control activities in Yirga chefe town internally displaced people sites in August 2018

### **Specific objectives**

- ✓ To describe the reported cases in person
- ✓ To describe reported cases in place
- ✓ To describe reported cases in time and
- ✓ To support in reponse activities in August 2018

### **Methods**

We conducted descriptive study in the affected area. Line listing of cases and active case search in the collecting sites was implemented. Cases were treated in mobile clinics and Yirga chefe hospital. The study was conducted between 06<sup>th</sup> and 18<sup>th</sup> August 2018. Data was entered to Microsoft excel 2013 and analyzed by person, place and time. We calculated attack rates for the total reporting sites. Visit of reporting IDP sites in collaboration with woreda surveillance officer

and WHO surveillance focal was also implemented. Daily follow up of reported cases was also in place.

### **Case definitions used**

**Suspected case:** An illness with acute onset of diffuse (generalized) maculopapulovesicular rash without other apparent causes. Cases who met the above case definition between 6<sup>th</sup> and 18<sup>th</sup> August 2018 were included in the study.

**Confirmed:** A case that is laboratory confirmed (by PCR or isolation of the Virus) or that meets the clinical case definition and is epidemiologically linked to a confirmed or a probable case (13).

**Chicken pox outbreak:** Occurrence of  $\geq 5$  confirmed cases of chicken pox cases that are related in place and epidemiologically (13).

### **Results**

#### **Person:**

A total of 25 suspected cases of chicken pox were reported starting from August 06 to 18 2018 from Yirga chefe town IDP sites. Out of the total reported cases, 11 (44%) were females and the remaining 14 (56%) were males by sex. 24 (96%) cases were reported from two IDP sites and one case was reported from the host community. Most of the reported cases (88%) were under the age of fifteen. The overall attack rate for the two IDP sites in the town was 63.2 per 100,000 population. The first suspected case was reported from Semaritian IDP site during supervision for other IDP activities.

#### **Place:**

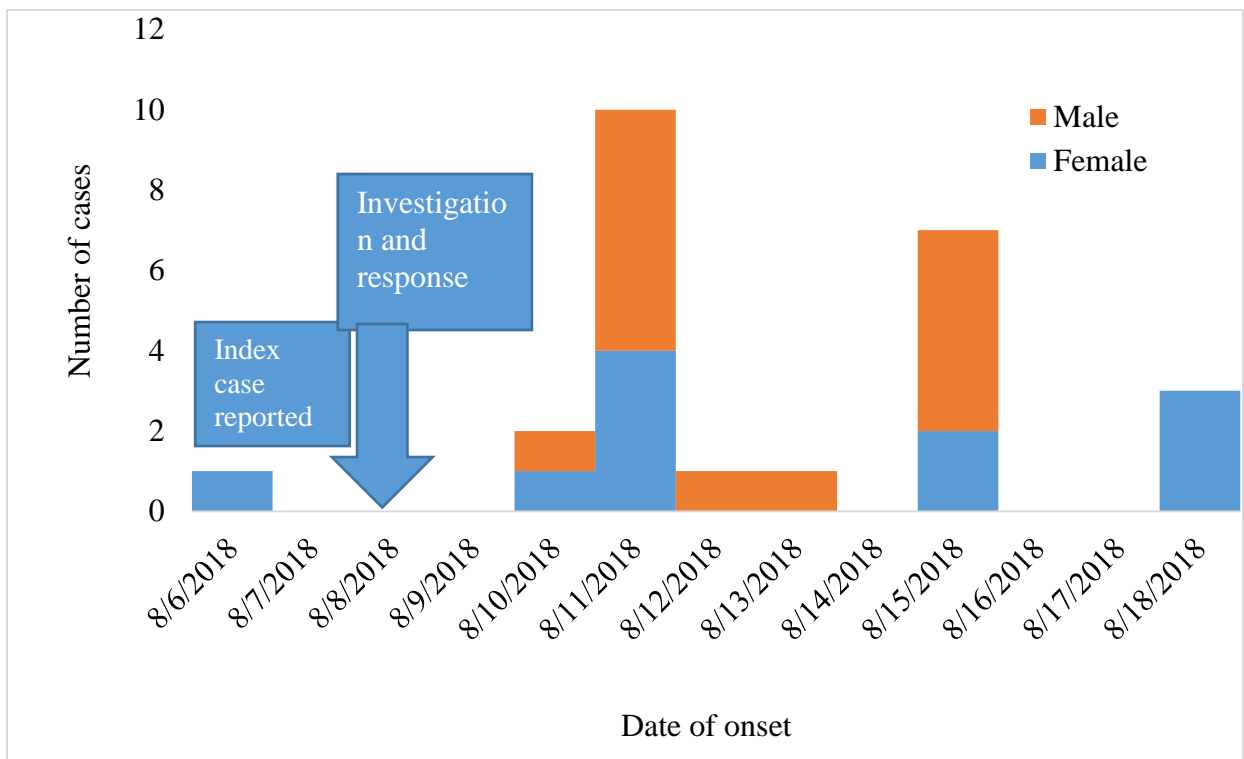
All of cases reported from Yirga cheffe town. 24 (96%) of cases were reported from two IDP sites. Of those IDP sites 13 (52%) were from Semaritian site, in which the first case was identified followed by Worabi IDP site in yirga chefe town with the report of 11 cases.

#### **Signs and symptoms**

All of the reported patients presented with maculopapular vesicular rash and 92% of the reported cases had reported a history of fever.

**Time:**

Cases were reported starting from August 06 to 18, 2018. Cases were identified during supervision in the IDP sites. The first case was reported from Semaritian IDP site. This case was reported on daily coordination meeting with zonal health department and other NGOs. The highest number of cases were reported on 11<sup>th</sup> August 2018.



*Figure 3 Epicurve for suspected chicken pox cases in Yirga chefe town IDP sites, August 2018*

**Discussion**

This outbreak was reported from in internally displaced population sites in Yirga chefe town between 6<sup>th</sup> and 18<sup>th</sup> 2018 with zero death, since chicken pox is airborne diseases internally displaced sites, schools and camps are favorable conditions for the easy spread of the disease. Similar outbreaks of chicken pox outbreaks has happened in United States in 2017 in a state of Minnesota with a report of 390 cases, in which most of most of the cases were unvaccinated

against chicken pox (6). In our country chicken pox, vaccination is not introduced yet, thus being unvaccinated might be one risk factor for the occurrence of this outbreak. A systematic review conducted in 13 African countries for chicken pox cases between 1974 and 2015 revealed that chicken pox cases are being reported in Africa (7).

In this outbreak the most of the cases, 22 (88%) were children under the age of Fifteen, it is supported by in a study conducted in India in Muzaffarpur district in Bihar in 10 blocks between Jan 2016 and Feb 7 2016, which identified a total of 234 cases and 2 deaths were reported, in this study the most affected age group was between 1 and 14 which shows the commonest age group to be affected is under fifteen (7). In another study in Guinea Bissau in 2005 reported that the most affected age group was 1 to 4 in the country (12). Varicella primarily affects children, with approximately 90% of cases occurring before the age of 15 years (10). The most common clinical manifestation during this outbreak were rash and fever. All (100%) of the reported cases were presented with maculopapular rash and 23 (92%) of the reported cases were presented with fever. This finding is also supported by a study conducted in India in 2016 which revealed 100% of the reported cases and 88% reported cases were presented with rash and fever respectively (8). Majority (54%) of the reported cases were males in this outbreak, which is similar with a study conducted in India which revealed most of the reported cases were males in Mushahri and Meenapur districts (8). In this outbreak, all of the reported cases were treated symptomatically in mobile clinics with no complications and deaths, this might be due to early detection and treatment of cases. Thus, Prompt identification, investigation, and control of varicella outbreaks are important in controlling and responding such outbreaks in the future. The season this outbreak occurred was relatively cold season in Ethiopia which favors the transmission of the disease easily, chicken pox more likely to occur in cooler seasons in tropical regions (5).

### **Challenges**

Unavailability of guidelines for chicken pox outbreak reponse in Ethiopia and no local literatures to compare this finding was also another challenge.

### **Conclusions**

Most of the cases were reported from two internally displaced population collection sites

Most of the cases were children under the age of fifteen and majority of the reported cases were males

Chicken pox is still a public health problem in the area

### **Recommendations**

District health office strengthen routine surveillance system in the IDP sites for early detection and treatment for future outbreaks is essential

Ministry of shall consider including chicken pox vaccine under routine immunization schedule

Ministry of health of Ethiopia should prepare guidelines and manuals to detect and respond outbreaks like this in the future.

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## CHAPTER II-SURVEILLANCE DATA ANALYSIS

### 2.1 Five years surveillance data analysis on Influenza like Illness in Shiro meda health center, 2013 to 2017

#### Abstract

**Background:** Influenza is a respiratory illness caused by influenza virus that can spread very easily from person to person. World Health Organization (WHO) estimates 3 – 5 million cases of severe illness and about 250,000 –500,000 deaths every year around the world due to a seasonal influenza epidemic. In Ethiopia, influenza sentinel surveillance has been launched in 2008 with one ILI sentinel site (Shiromeda Health Center) and one SARI sentinel site (Yekatit 12 Hospital). This data analysis was conducted aiming to describe the five years ILI/SARI surveillance data from Shiro Meda Health Center in terms of Person, Place and Time to give possible recommendations based on the findings.

**Methods:** Five years data, 2013 to 2017 of Shiro Meda Health Center Influenza sentinel site was officially requested and received from Public Health Emergency Management center of Ethiopian Public Health Institute. Data cleaning and analysis was conducted using Microsoft Office Excel 2013. Graphs and tables were used to display results. Cases were described by sex and age group.

**Results:** A total of 1,489 ILI/SARI cases were tested for Influenza Viruses. Among all tested samples tested, 448 (30.08%) were positive for Influenza. Among all positive Influenza cases 303 (64.4%) were Influenza A and the remaining 147(32.81%) were Influenza B. Of the total Influenza A positive cases, 213 (70.29%) were seasonal (A/H3) and 90 (29.7%) were subtyped Swine H1 (Pandemic H1N1). Age Group 15-44 were the most affected age group from the site comprising 49.69% of the total reported cases. Females are more affected than males in this site. Gullele sub-city reported 1,468 (98.58%) cases.

**Conclusion:** Influenza A is predominantly circulating in the site. Age Group 15-44 is the mostly affected age group in the site and Gullele sub-city is the highest reporting sub-city in Addis Ababa.

The data has some limitations including missing some important variables and elements, which are very crucial for better analysis and interpretation. Regular feedback and supervision is

recommended for the Sentinel site to improve the quality of data for better interpretations and actions.

**Key words:** Influenza, sentinel site, data, analysis, Shiro meda, Ethiopia

## **Introduction**

### **Background**

Influenza is a respiratory illness caused by influenza virus that can spread very easily from person to person. The virus is spread through the air by the exchange of fluid droplets from the mouth or nose of one person to another person due to sneezing and coughing. The manifestations of illness (fever, cough, sore throat) caused by the influenza virus are usually mild to moderate but for some it could be severe, leading to hospitalization and even death. The influenza virus circulates around the world and undergoes continuous evolution by antigenic drift which causes annual epidemics. In rare instances the virus may change completely called ‘antigenic shift’, and result in the emergence of novel influenza viruses. The ILI (Influenza like Illness) and SARI (Severe acute respiratory Infection) surveillance system is aimed to monitor trends in respiratory illnesses and to understand the burden and epidemiology of influenza viruses and other respiratory pathogens. Establishing a good surveillance system will set the foundation to monitor other factors including the social and climatic factors that influence community transmission and help with planning for intervention and preventative measures(1).

There are 3 types of seasonal influenza viruses, types A, B, and C. Influenza type A viruses are further classified into subtypes according to the combinations of 2 different proteins, the haemagglutinin (H) and the neuraminidase (N), located on the surface of the virus. The subtypes of influenza A viruses currently circulating among humans are influenza A (H1N1) and A (H3N2) subtypes. The circulating influenza A (H1N1) is also written as A (H1N1) pdm09 as it caused the pandemic in 2009 and subsequently replaced the seasonal influenza A (H1N1) virus which had circulated prior to 2009. Only influenza type A viruses are known to have caused pandemics. Circulating influenza B viruses can be divided into 2 main groups (lineages), referred to as B/Yamagata and B/Victoria lineages. Influenza B viruses are not classified into subtypes (1).

Influenza A and B viruses circulate and cause outbreaks and epidemics. Due to this reason, relevant strains of influenza A and B viruses are included in seasonal influenza vaccines. Influenza type C virus is detected much less frequently and usually causes mild infections, thus presents less significant public health implications (5). World Health Organization (WHO) estimates 3–5 million cases of severe illness and about 250,000–500,000 deaths every year around the world due to a seasonal influenza epidemic (5).

According to global status of influenza in 2010, 12 cases of swine influenza in Ethiopia were reported (2). Ministry of Health (MoH), Ethiopian Public Health Institute and CDC-Ethiopia jointly conducted a national workshop on influenza surveillance systems, functions and its operational components in such a way that able to implement influenza surveillance in different regions (3). In March 2016, a total of 13 patients complaining of Influenza-like Illness (ILI) or Severe Acute Respiratory Infections (SARI) were reported with throat swab samples from pre-designed influenza sentinel sites. Among them four were tested positive for Influenza A H1N1 2009 pandemic and three were positive for seasonal influenza A (H3N2). Starting from October 2015, the positivity rate of Pandemic Influenza H1N1 is increasing. In Ethiopia, currently there are confirmed cases with no death associated with the condition. The virus has been detected on February 4, in different hospitals. However, sources in the Ministry of Health say the subtype of the influenza detected in Addis Ababa is less dangerous than others and Ethiopia has testing and treating capabilities. Test samples are sent to the Center for Disease Control (CDC) of United States for further investigation as a matter precaution (4).

In Ethiopia, influenza sentinel surveillance has been launched in 2008 with one ILI sentinel site (Shiromeda Health Center) and one SARI sentinel site (Yekatit 12 Hospital). Furthermore, additional two ILI sentinel sites (Akaki Kality and Kolfe health Centers) are added in 2010. Subsequently, in 2013 SARI sentinel sites were established in four mega regional state capitals (Mekelle, Bahir dar, Adama and Hawassa). Currently there are three ILI and Five SARI sentinel sites providing both weekly aggregated data and throat swab samples. Some baseline data has been generated in all eight sentinel sites, namely Shiromeda Health Center, Yekatit 12 Hospital, Kolfe Health Center, Akaki Health Center, Adama Hospital, Adare Hospital, Felegehiwot Hospital and Mekelle Hospital. But more efforts are needed to better understand the

epidemiology and strains of influenza in the country. Presently, sentinel sites are located in Addis Ababa, Amhara, Tigray, Oromia and SNNP regions which are selected using a criteria developed to assess the convenience and feasibility of sites. Health Centers are regarded as ILI sites where as Hospitals are SARI sites (Yekatit 12 Hospital, Adama Hospital, Adare Hospital, Felegehiwot Hospital and Mekelle Hospital). Epidemiological data and clinical specimens are collected on the sentinel sites and the virological investigation is done nationally in the National Influenza Laboratory located in Ethiopian Public Health Institute. Shiro Meda Health Center is one of the three influenza surveillance sites of ILI since 20008. Since then, this site is dominant source of both epidemiological and virological data.

## **Rationale**

Ongoing analysis of surveillance data is important for detecting outbreaks and unexpected increases or decreases in disease occurrence, monitoring disease trends, and evaluating the effectiveness of disease control programs and policies. Even though influenza sentinel surveillance has been implementing in Ethiopia since September 2008, regular dissemination of surveillance data reports to health care providers at sentinel sites, public health officials, policy makers and any other concerned body had limitation. Regular data analysis and timely providing feedback will inform and motivate health care providers, guide public health intervention, allow monitoring of influenza season, identify population at risk, clearly make out trends of influenza and influenza strains circulating in the country. In Ethiopia seasonality and trends of influenza strains did not well characterized yet, hence timely data analysis is paramount important to follow the situation of influenza and undertake appropriate interventions. Moreover, the analysis conducted to identify problems encountered during data collection, filling reporting formats and figured out missed important variables that kindly used to take corrective actions. Regular data analysis and timely feedback could inform and motivate health care providers at ground level to produce high quality of data.

## **Objectives**

### **General Objective**

To describe the distribution Influenza like Illness data of shiro meda health center and types circulating in the site from Year 2013 to 2017

## **Specific Objectives**

- ✓ To describe the surveillance data in terms of place
- ✓ To describe the surveillance data in terms of person
- ✓ To assess the trend of Influenza like illness in the site
- ✓ To determine the types of influenza viruses circulating in the site

## **Methods and Materials**

Five years of surveillance data (2013 to 2017) from shiro meda health center was used. Data was officially requested and received from public health emergency management center of Ethiopian Public Health Institute. Data cleaning was conducted prior to analysis. Finally data analysis was done using Microsoft Office Excel 2013. Tables and graphs were used to display the results.

### **Study period**

The study period was Influenza like illness data from year 2013 to 2017.

### **Case definitions**

#### **Influenza like Illness (ILI)**

A person, child or adult with Sudden onset of fever  $> 38$  oC and Cough or sore throat in the absence of other diagnoses (17).

#### **Severe Acute Respiratory Infection (SARI)**

Any severely ill person presenting with manifestations of acute lower respiratory infection with history of fever or measured fever ( $\geq 38$ oC) and cough or sore throat and shortness of breath, or difficulty of breathing with or without Clinical or radiographic findings of pneumonia or any person who died of an unexplained respiratory illness (17).

A **confirmed** case of influenza is a case that meets the clinical case definition and is laboratory confirmed (laboratory results must be positive for influenza virus) (17).

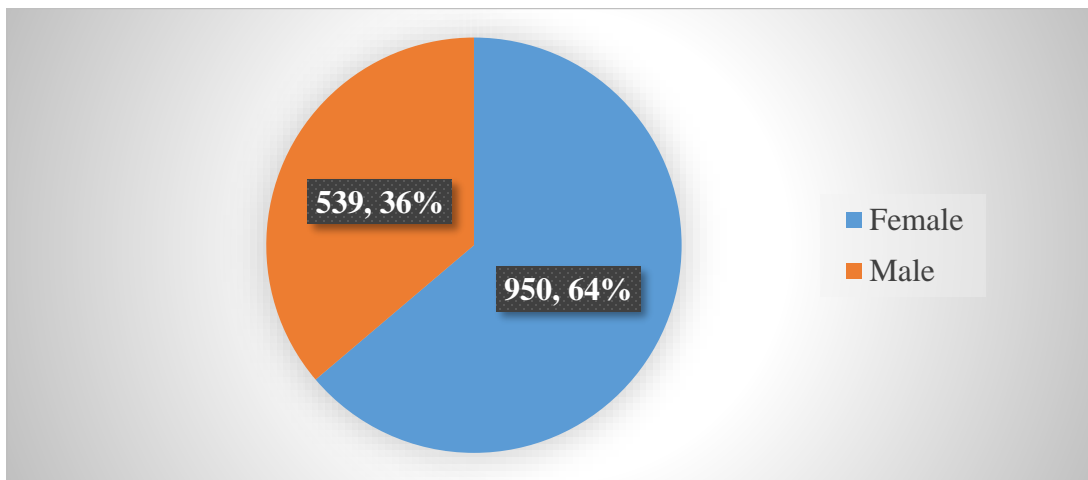
## **Results**

Based on the above cases definitions, between the year 2013 and 2017 a total of 1,489 ILI and SARI cases with no death were reported from Shiro Meda Health Center Influenza sentinel

surveillance site. All cases were reported from Addis Ababa city. The incidence rate for the last five years (figure 10) shows decreasing trend.

All cases were reported from Addis Ababa city and more than 98% cases were from Gullele Sub city. This might be due to sentinel site is found under Gullele sub-city catchment area.

Out of the total reported cases, 950 (64%) were Females and the remaining 539 (36%) cases were Males by sex. From the total reported cases 1,463 cases were treated as an outpatient and 16 cases were treated as inpatient cases but for the remaining 10 cases admission status was not mentioned in the surveillance data.



*Figure 4 Influenza Like illness cases in shiro meda Influenza Like illness in shiro meda health center by sex, from year 2013 to 2017, February 2018*

*Table 4 Influenza like illness in shiro meda health center and attack rate per 100,000 populationn from year 2013 to 2017, February 2018*

<b>Year</b>	<b>Population</b>	<b>Number of cases reported for the year</b>	<b>IR per 100,000</b>
<b>2013</b>	3,101,896	499	16.1
<b>2014</b>	3,194,999	489	15.3
<b>2015</b>	3,273,001	335	10.2
<b>2016</b>	3,352,000	59	1.8

<b>2017</b>	3,433,999	107	3.1
<b>Total</b>	<b>16,355,895</b>	<b>1,489</b>	<b>47</b>

Table 5 Incidence of Influenza like illness in Gullele subcity from year 2013 to 2017,

Year	Sub-city	Total Population for the year	Number of cases for the year	Incidence Rate per 100,000 population
2013	Gullele	302,890	494	163.1
2014	Gullele	309,251	480	155.2
2015	Gullele	315,745	333	105.5
2016	Gullele	327,426	55	16.8
2017	Gullele	335,434	106	31.6
<b>Total</b>		<b>1,590,746</b>	<b>1,468</b>	<b>92.3</b>

February 2018

Almost half of the cases were with the Age group of 15-44 comprising 49.69% of the total reported cases followed by Age Group 5-14 (32.43%).

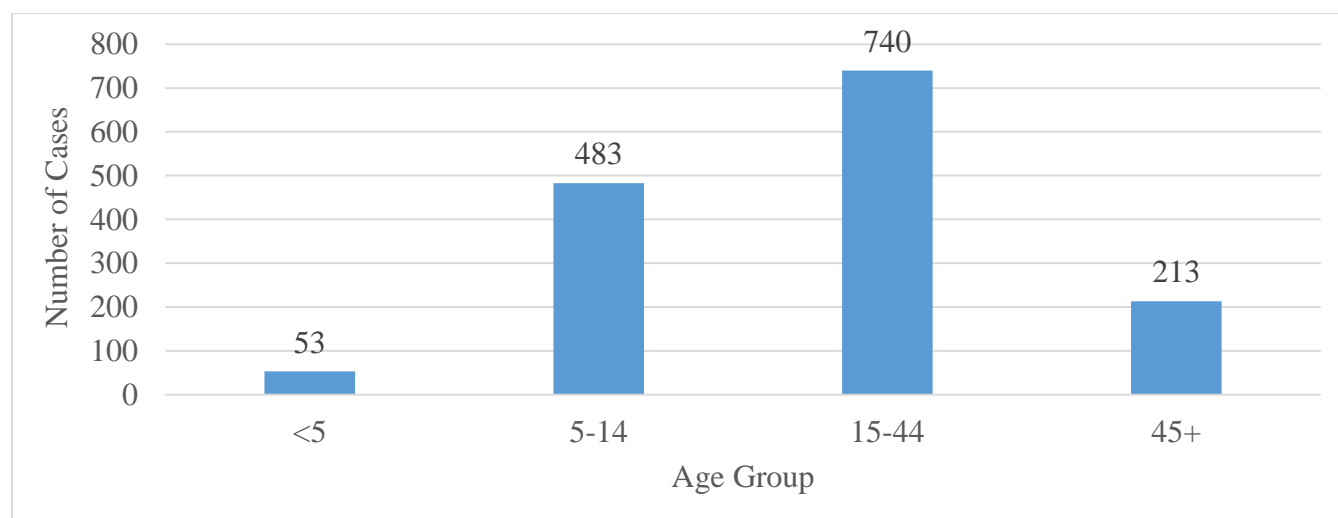


Figure 5 Influenza like illness cases in shiro meda health center by age group, from year 2013 to 2017, February 2018

When we look at the trend of ILI and SARI cases in the site it started to decrease since 2014. The figure below shows the attack rate of ILI in Addis Ababa city per year per 100,000 population for the last five years (2013 to 2017).

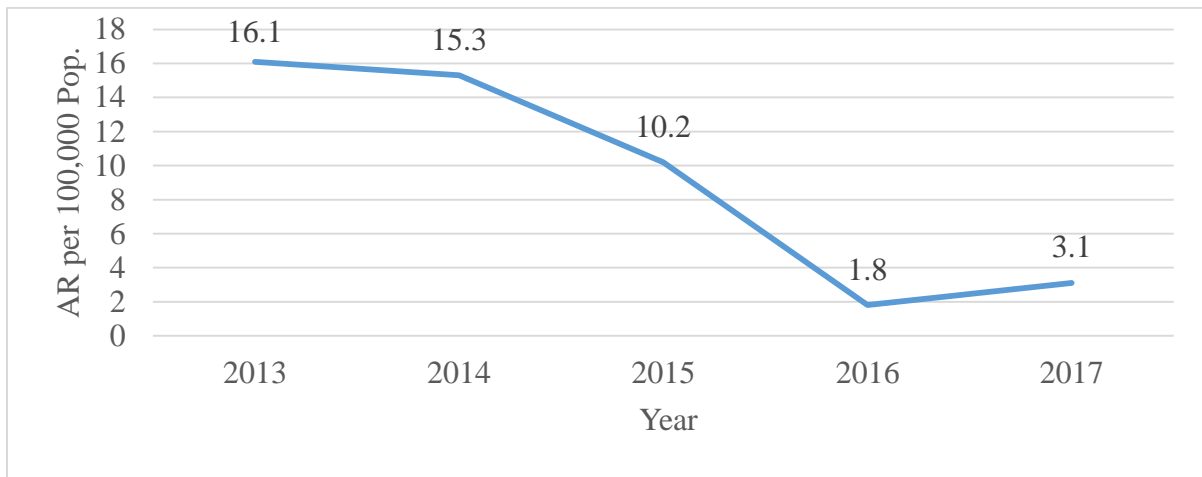


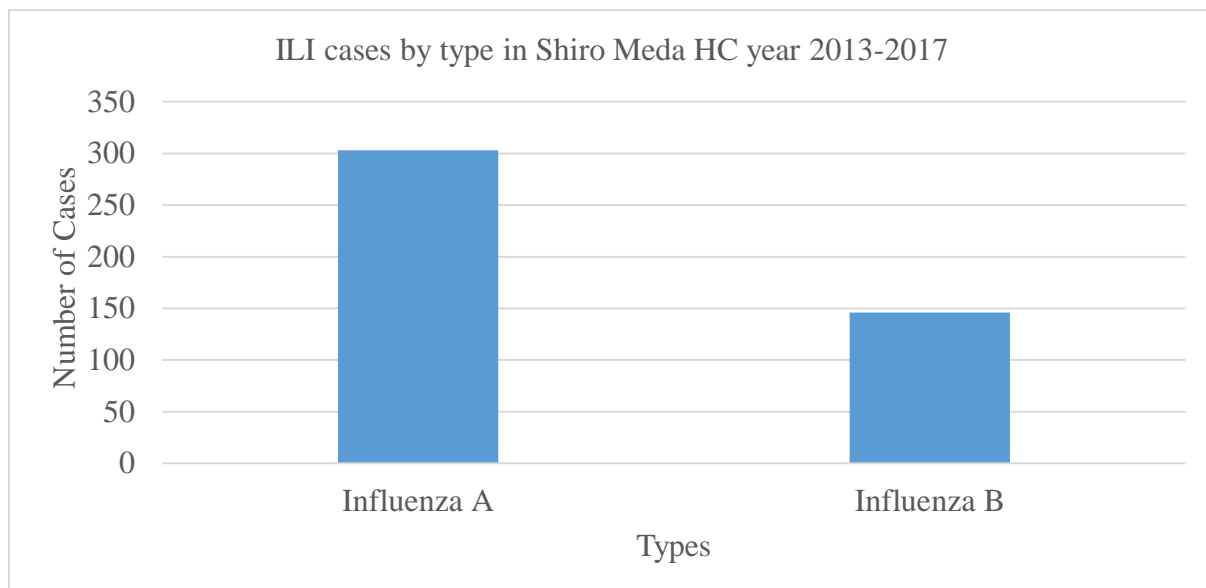
Figure 6 Trend of Influenza like illness cases in shiro meda health center from year 2013 to 2017, February 2018

During the last five years in Shiro Meda Health Center, from the total, 1,475(99.05%) reported cases were ILI cases and the remaining and 2 were classified as SARI cases. Out of the total tested cases 448 were positive for the Influenza.

*Table 6 Influenza like illness cases by status of positivity in shiro meda health center year 2013 to 2017, February 2018*

Status	Frequency	Percentage
Positive	448	30.31%
Negative	1022	69.14%
Intermediate	7	0.55%
<b>Total</b>	<b>1478</b>	<b>100%</b>

Out of the total ILI Cases reported from the site 303 (20.54%) were Influenza A and 146 (9.89%) were Influenza B.



*Figure 7 Influenza like illness cases in shiro meda health center by type from year 2013 to 2017, February 2018*

The trends for the last five years in both Influenza A and B shows decrement in the Shiro meda health center.

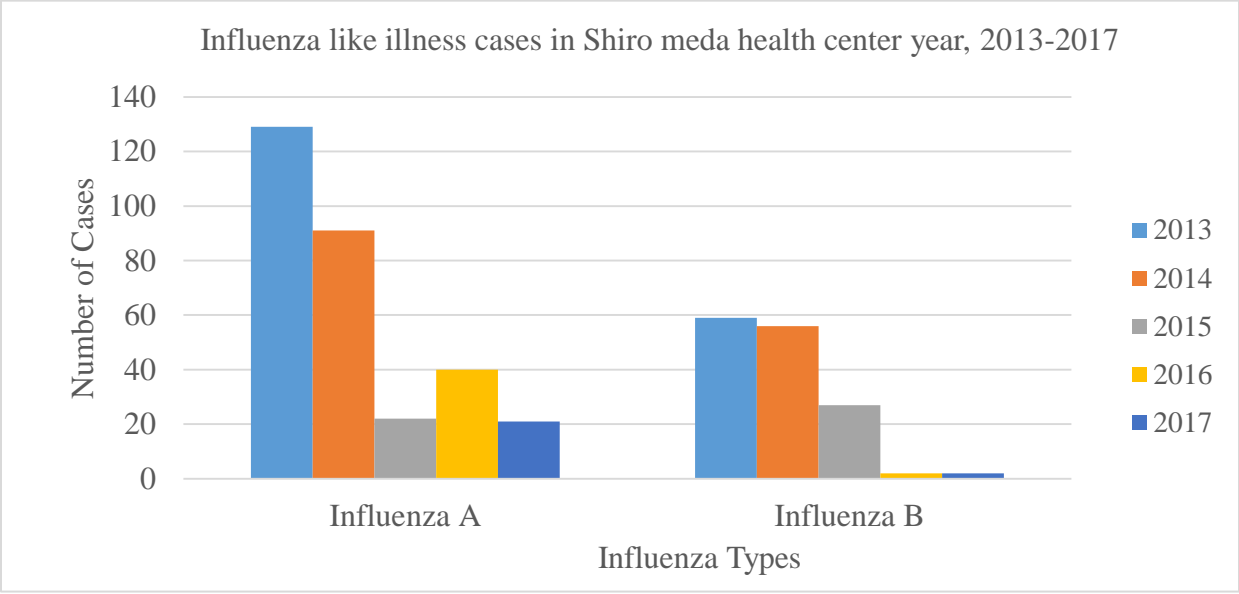


Figure 8 Trends of Influenza like illness in shiro meda health center by type from year 2013 to 2017, February 2018

Out of those were positive for Influenza A 70.29% were seasonal (A/H3) and the rest were Swine H1 (Pandemic H1N1).

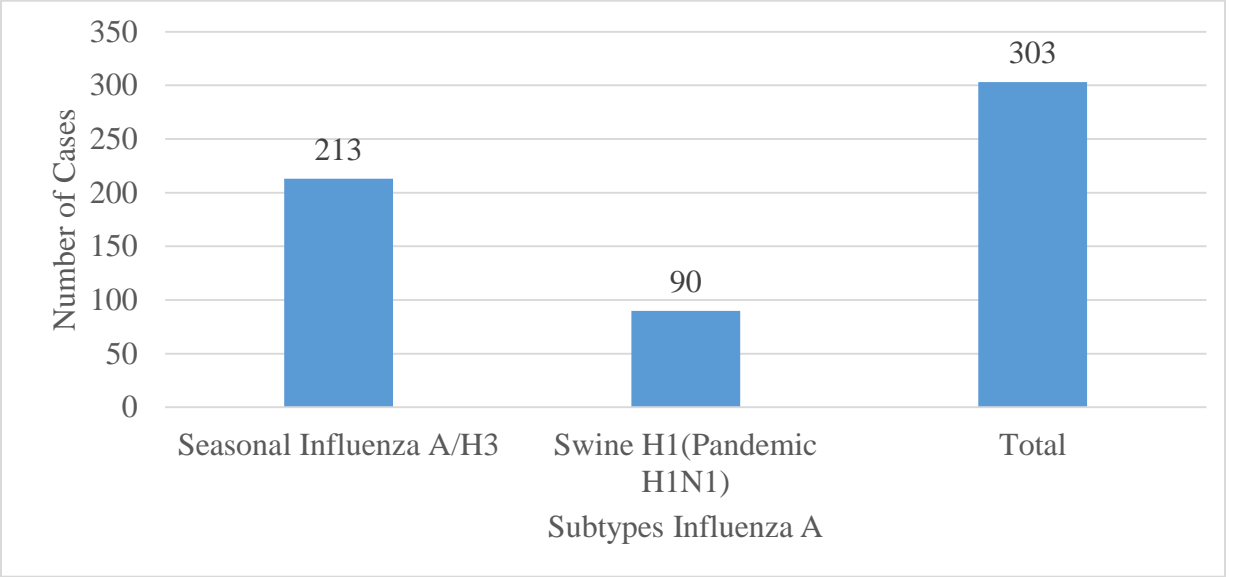


Figure 9 Influenza A subtypes in Shiro meda health center from year 2013 to 2017, February 2018

The number of cases tend to increase in March and November in 2013 and in November in 2014 and no visible seasonality is observed during the year 2015 through 2017.



## Discussion

This data analysis uncovered that through 2013 to 2017 Influenza A and B are circulating in Shiro Meda Health Center Influenza Sentinel site. Compared to Influenza B, Influenza A is predominantly circulating in this Health Center (64.4% versus 33.6%), which is not consistent with a study done in Ethiopia between 2008 and 2011 which was 86.6% versus 13.4% (9). This might be due to that, in this study cases from a single sentinel site (Shiro Meda HC) was enrolled and the study between 2008 and 2012 was done on sites all over the country. Similarly influenza A is mainly circulating in Kenya than influenza B (69% versus 31%) in a research done in 2012 (10). In another study done in South Africa from year 2009-2012, of those Tested positive cases 37% were Influenza A (12). Study conducted in Thailand in 2001 also shows that influenza A is by and large occurred than influenza B (69.8% versus 30.2%) (11). This result is also comparable with the research done in West Africa between 2010 and 2012 which showed that, out of the total tested cases 62.8% were Influenza A and the remaining 37.2% were positive for Influenza B (13).

Most of the cases were reported from Gullele sub city hence the sentinel site is found under this sub city and it is also similar with another study done in Ethiopia in 2012 of which around 70% of cases were from this sub city (10).

The positivity rate for this site ranges between 27.65% and 32.35% (CI: 0.2765, 0.3235), which is higher compared to another study conducted in Ethiopia in 2012 which was 13.3%. This difference might be improvements in laboratory facilities, the difference in sample sizes and the sites enrolled in 2012 were all ILI/SARI sentinel sites all over the country (9).

This study also revealed the most affected are females are most affected than males (64% versus 46%) but according to WHO report conducted in July 2010 named sex, gender and Influenza concluded that Influenza infection is not associated with sex preferences or it is difficult to associate Influenza infection with sex (18). Thus, more study is required to ascertain if there is any relation in sex difference and influenza infection.

This study revealed that the Age Group 15-44 is mostly affected compared to others which is in contrast with a study done in Ethiopia in 2012 which revealed that the most affected Age Group is 0-4 (9). In a study done in Kenya 80% of the cases were in the Age Group of 0-4 which is also

in contrast to this study, in this study a single site is used and the study in Kenya covered all over the country, so this might be the reason for discrepancies in the results (10).

Family studies conducted in Houston and Seattle demonstrated that high rates of infection in school-age children and the importance of schoolchildren as vehicles of infection within families (14, 15). Additionally the study conducted in Peru on influenza from 2006-2008 revealed that the prevalence of influenza A and B viruses were significantly higher in ILI patients older than 5 years of age (16).

The data have some limitations. Some of the important variables were missed which are used to determine population at risk (sex and age), distribution of cases by geographic land (kebele, woreda and zone). Out of the total reported cases, 7 have missing sub-city, 944 cases were not classified as either ILI or SARI cases and out of the total tested cases 11 cases had missing Status regarding positivity or Negativity.

### **Conclusion**

Based on this study finding Influenza A (64.4%) is the most circulating type the site and from Influenza A subgroups seasonal Influenza (A/H3) is the dominant one. Gullele sub-city (98.58%) is the most affected sub-city. In this data analysis adults are the most affected. The trend of Influenza like illness during the last five years is decreasing. Sentinel surveillance is conducted to generate high quality data, however, the data produced by this influenza sentinel surveillance site was found to be under expected quality missing important characteristics and variables of patients.

### **Recommendations**

- ✓ Continuous data analysis and feedback to sentinel sites should to be conducted on regular basis so as to improve quality of sentinel surveillance site data quality
- ✓ Missing descriptive characteristics of a patient variables should be documented properly to analyze and characterize patient's characters
- ✓ Types and subtypes of Influenza should be documented properly in order to identify which types and subtypes circulating in the sentinel site

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## CHAPTER III-SURVEILLANCE SYSTEM EVALUATION

### 3.1 Surveillance system Evaluation of Malaria in Bahir dar zuria woreda, March 2018

#### Abstract

**Introduction:** Public health surveillance is the ongoing, systematic collection, analysis, interpretation, and dissemination of data regarding a health-related event for use in public health action to reduce morbidity and mortality and to improve health. Data disseminated by a public health surveillance system can be used for immediate public health action, program planning and evaluation. In Ethiopia 21 diseases (14 are immediately reportable whereas 7 are weekly reportable) are selected to be included into the routine surveillance based on their outbreak potential and public health importance. Malaria is one of those the 21 nationally notifiable diseases. The objective of this evaluation is to assess key attributes of malaria surveillance system and to evaluate the performance of surveillance system of Bahir dar Zuria Woreda in line with its objectives, and suggest recommendations based on the gaps identified for the improvement of the surveillance system in the Woreda.

**Methods and materials:** The study was conducted in Bahir dar zuria woreda of Amhara regional state from February 22 to March 8, 2018. A total of 14 sites (Woreda health office, 5 health centers, and 8 health posts) were included in the evaluation. A structured questionnaire was used to collect data from health facilities and interview of surveillance focals and HEWs and secondary data review was implemented during data collection.

**Results:** All assessed health facilities have clinical register book and case definition posted for malaria. All assessed health posts have RDTs to confirm suspected malaria cases and health centers use microscope to confirm malaria cases but Robit health center complained the absence of laboratory personnel for more than a month. The reporting rate of reporting sites for the past three months is 100%. Paper based reports and mobile phone are the channels used during report from HFs to woreda and zone. A total of 930 microscope and RDT confirmed cases of malaria are reported from the woreda in 2009 E.C, of which 508 (54%) are *P. falciparum* and the remaining 422(46%) are *P. vivax* cases. The reporting time from Health posts to Health Centers

is every Sunday, and the time frame for health centers to report to the Woreda health office is every Monday until midday. The Woreda Health office analyses the weekly data for reporting as well as for intervention purposes by PHEM officers. The Woreda malaria surveillance officer revealed that there were a regular supervision from Zonal officers every quarter and they have received verbal and written feedbacks from higher officials. The Woreda health office is equipped with electricity, motor cycle, desktop computer, and printer which are being used for communication and data management and analysis. The system is financially supported by the Regional Health Bureau and one NGO, MACEPA (Malaria Control and Elimination Partnership in Africa) in the region. The reporting timeliness rate in the woreda was reported to be 100%.

**Conclusion:** The surveillance system in the woreda is on the right track meeting its objectives. The surveillance system in the woreda is easy, acceptable, flexible and simple to understand by health workers and able to detect if outbreaks happened. Preparedness for Emergencies is in place in at woreda level but not at health facility level.

**Key words:** Surveillance, System, Evaluation, Attribute, Bahir dar zuria

## **Introduction**

Public health surveillance is the ongoing, systematic collection, analysis, interpretation, and dissemination of data regarding a health-related event for use in public health action to reduce morbidity and mortality and to improve health (1, 2). Data disseminated by a public health surveillance system can be used for immediate public health action, program planning and evaluation (2).

Early detection of changes in disease incidence and distribution indicating an incipient epidemic or health problem provides opportunity for early and more effective intervention, measuring trends and patterns of disease to set priorities assist in planning, implementation and evaluation of health interventions and to describe basic epidemiology and natural history of a disease to develop a hypothesis about causation which can be tested with epidemiologic studies (3).

A communicable disease surveillance system serves two key functions; early warning of potential threats to public health and programme monitoring functions which may be disease specific or multi-disease in nature. The early warning functions of surveillance are fundamental for national, regional and global health security. The programme monitoring function of surveillance of communicable diseases encompasses a variety of goals such as eradication or elimination.

Surveillance systems also serve to monitor trends of endemic diseases, progress towards disease control objectives, and to provide information which may be used to evaluate the impact of disease prevention and control programmes (1). The purpose of evaluating public health surveillance systems is to ensure that problems of public health importance are being monitored efficiently and effectively (2).

In Ethiopia 21 diseases (14 are immediately reportable whereas 7 are weekly reportable) are selected to be included into the routine surveillance based on their outbreak potential and public health importance. Malaria is one of those the 21 nationally notifiable diseases (4).

Malaria surveillance has become a very critical element of all malaria programmes particularly routine malaria surveillance data is useful for assessing incidence and trends over time, and in stratification for targeting of malaria control (6). To realistically embark on the road towards malaria control and elimination as well as to facilitate for rational deployment of interventions, timely and up to date provision of accurate malaria surveillance data is necessary (7-9).

The capacity of malaria surveillance systems to provide accurate information on the distribution of and trends in malaria varies widely across the globe. It is influenced by the extent to which patients seek treatment, whether patients use public sector health facilities, the proportion of patients that receive a diagnostic test, and the completeness of recording and reporting systems (10).

Improved surveillance for malaria cases and deaths helps ministries of health to determine which areas and/or a population group are most affected and enables countries to monitor changing disease patterns. Strong malaria surveillance systems also help countries design effective health interventions and evaluate the impact of their malaria control programmes (11).

Malaria is the leading cause of morbidity and mortality in the world and continues to be a major global threat to health, social and economic development (14-16). Globally, an estimated 3.4 billion people are at risk of being infected with malaria and developing disease in 2012, and 1.2 billion are at high risk (17, 18). Each year, there are an estimated 300-500 million clinical cases. In 2013, there are 97 countries and territories with ongoing malaria transmission, and 7 countries in the prevention of reintroduction phase, making a total of 104 countries and territories in which malaria is presently considered endemic (17).

Malaria is ranked as the leading communicable disease in Ethiopia, accounting for about 30% of the overall Disability Adjusted Life Years lost (19). Approximately 75% of Ethiopia's landmass is malaria-endemic; areas of disease are primarily associated with altitude and rainfall (17-19) with about 68% of the total population living in areas at risk of malaria (19, 12, 20). There are four major eco-epidemiological malaria transmission strata in Ethiopia: 1) malaria-free highland areas above 2,500-meter altitude; 2) highland fringe areas between 1,500 and 2,500 meters (affected by frequent epidemics); 3) lowland areas below 1,500 meters (seasonal pattern of transmission); and stable malaria areas (year-round transmission; limited to the western lowlands and river basins)

(11).

*Plasmodium falciparum* and *Plasmodium vivax* are the two predominant malaria parasites, distributed all over the country and accounting for 60%-70% and 30%-40% of malaria cases, respectively. Reports indicate that clinical malaria accounts for 10%-40% of all out patient

consultations, with corresponding proportional morbidity among children under 5 years in age being 10%-20% (12).

To reduce the overall burden of morbidity and mortality due to malaria in Ethiopia, a comprehensive approach to vector control, early diagnosis and prompt treatment and surveillance, prevention and rapid management of malaria epidemics when and where it occurs are being implemented by incorporating in the country health sector development program since 1999 (13).

Bahir Dar Zuria Woreda is one of the Woredas in the Amhara regional state and listed as one of Malaria reporting Woredas in the region. Hence, this evaluation was conducted to evaluate the attributes, purposes, functionality and gaps of malaria surveillance system in the woreda.

### **Rationale**

Public health surveillance systems should be evaluated periodically to assure the effectiveness and efficiency of the systems. Malaria surveillance system evaluation was conducted in the Woreda to determine the efficiency and effectiveness of the surveillance system in picking up and responding to public health problems in the district so that actions could be implemented to improve the gaps.

## **Objectives**

### **General Objective**

The objective of this evaluation is to assess key attributes of malaria surveillance system and to evaluate the performance of surveillance system of Bahir dar Zuria Woreda in line with its objectives, from February 22 to March 8 2018

### **Specific Objectives**

- ✓ To assess the attributes of malaria surveillance system of the district
- ✓ To assess the performance of the surveillance system in the woreda in line with the set objectives

## **Methods and materials**

### **Study area and population**

The study was conducted in Amhara regional state West Gojam zone, Bahir dar Zuria woreda, which is 560 Kilometers away from Addis Ababa, capital of Ethiopia, North West. The Woreda's capital is Bahir dar city which is the capital for the region as well. It is composed of 32 administrative Kebeles of which all are rural.

The total population of the Woreda, which is estimated to be 227,617, of which 116,085 (51%) are males and the remaining 111,532 (49%) are females, of which all are rural dwellers.

### **Sampling procedure and study units**

The Woreda Health office and health facilities under the woreda Health office were the study units. A total of 14 sites were included in the study. The woreda health office, 5 Health Centers (Yinesa, Kinbaba, Andasa, Robit and Wegelsa Health centers) and 8 Health Posts (Yinesa, Sebatamit, Kinbaba, Andasa, Yibab, Wegelesa, Wendata and Wey beyign Health Posts) were included in this evaluation. Health centers were selected based on their accessibility to road. At least one Health post under the catchment of each selected Health center was included based on their accessibility to road and data collection.

### **Study period**

The study was conducted from February 22 to March 8 2018 in Bahir dar zuria woreda of Amhara regional state.

### **Data collection and Analysis**

Data was collected using a semi structured questionnaire. Malaria Surveillance officer in the Woreda Health office, surveillance officers in the Health centers and Health Extension workers in visited Health posts were interviewed accordingly. Additionally, secondary data in the woreda health office, Health centers and Health posts were reviewed to assess the attributes and functionality of the surveillance system in the Woreda. Updated Center for Disease Control and prevention guideline for surveillance system evaluation was used as a reference.

### **Results**

#### **Operational definitions<sup>3</sup>**

**Simplicity:** The simplicity of a public health surveillance system refers to both its structure and ease of operation as a surveillance system.

**Flexibility:** Is the ability of the system to adapt to changing needs such as incorporating of a new disease, leave out less important diseases, change reporting frequency, change or modify data source, the collection of additional data, and change in case definition.

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

**Acceptability:** Is a reflection of and the willingness of surveillance staff to implement the system, and the end users of the data to accept and use the data generated by the system.

**Sensitivity:** Sensitivity is the capacity of the system to detect the highest proportion of true cases.

**Representativeness:** Is the ability of the system to accurately describe the occurrence of a health related event by place and person over time in a given population.

**Specificity:** Refers to the proportion of persons without the disease that are considered by the surveillance system as not having the disease.

**Timeliness:** Is the ability of the system to trigger appropriate action in time.

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

**Usefulness:** Refers to the relevance of the system in terms of feeding information for action.

**Completeness:** Proportion of all expected data reports that were submitted to public health surveillance.

**Case/outbreak confirmation:** Refers to the epidemiological and laboratory capacity for confirmation of suspected outbreak.

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

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

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

**Case definition:** is a set of criteria used to decide if a person has a particular disease, or if the case can be considered for reporting and investigation.

**Standard case definition:** is a case definition that is agreed upon to be used by everyone within the country. Standard case definition can be classified as confirmed, probable, and possible or suspected.

**Semi-structured questionnaire:** Questionnaire which contains both close ended and open ended questions.

## **Availability of national surveillance manual, register book and standard case definition**

### **Case detection and registration**

All assessed health facilities have surveillance manual, clinical register book and standard case definitions posted for malaria in outpatient departments.

### **Case confirmation**

Whenever suspected malaria cases came to health facilities Health workers collect blood sample for confirmation. All assessed health posts and health centers have RDT to confirm suspected cases of malaria. Assessed health centers are equipped with microscope and RDT for the confirmation of malaria cases but one of the assessed Health centers (Robit HC) complained the absence of laboratory technician in the Health center for more than a month.

### **Data reporting**

Malaria is one of the weekly reportable diseases in Ethiopia. The reporting rate from all reporting sites for the last 3 months (12 weeks) was 100%. In this Woreda malaria is reported using different channels from lower to the next level (health post to regional health bureau). It's reported using paper from Health posts and Health Centers to Woreda health office and from Woreda to Zone, and Region through email, wired phone or mobile phone. Shortage of reporting formats were not reported in all assessed health facilities and Woreda health office. Health workers at health facilities use different communication channels are used in the Woreda as paper based, email, wired phone and mobile.

- ✓ From health post to Health center via paper based
- ✓ From Health center to Woreda via paper based and mobile phone
- ✓ From Woreda Health office to Zone via email, wired phone and mobile

A total of 930 confirmed malaria cases with no death were reported in the Woreda in the year 2016/17, of which 508 (54%) were *P.falciparum* and the remaining 422(46%) are *P.vivax* cases.

All visited Health facilities have surveillance manual, register book and all health facilities posted case definitions for malaria. Out of all reported confirmed cases 438 (47.1%) were confirmed by RDT and the remaining 492 (52.9%) were confirmed by Microscopy.

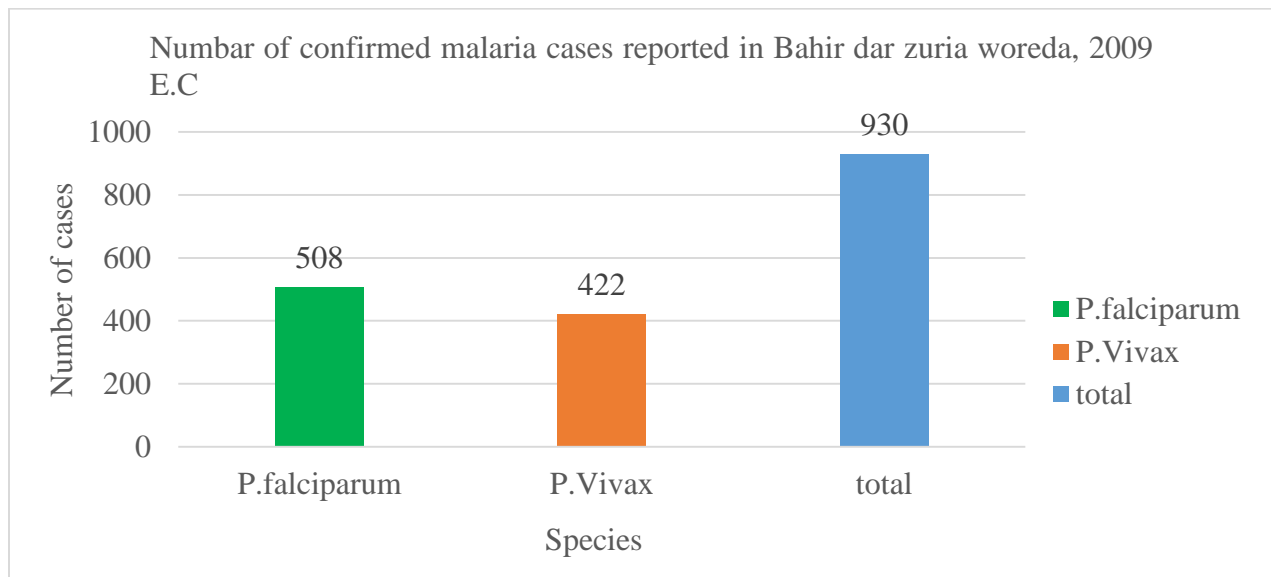


Figure 10 Number of confirmed malaria cases in Bahir dar zuria district 2016/17, March 2018

### Reporting time

The reporting time frame from Health facilities to Woreda/Zone/Region/Federal ranges from Sunday to Tuesday. The reporting time from Health posts to Health Centers is every Sunday, and the time frame for health centers to report to the Woreda health office is every Monday until midday.

All assessed facility surveillance focal persons and Health Extension Workers in the Health posts responded that they use mobile phone to communicate Woreda/zonal PHEM officers during public health emergencies.

### Data analysis

In all visited health facilities and Woreda health office, there was assigned responsible person for data analysis. The Woreda Health office analyses the weekly data for reporting as well as for intervention purposes. In the assessed Health centers data analysis made on weekly basis by PHEM officers, for the purpose of reporting, as well the Health Extension Workers at the Health Post level analyses data for reporting purpose only. In all visited sites malaria monitoring charts are available.

### Epidemic preparedness

The Woreda Health office has emergency preparedness plan and Rapid Response team, composed of different professionals (surveillance officer, nurse, lab technologist and pharmacist) but lacking scheduled meeting regularly and the Woreda health office revealed that it has a budget for emergency responses. All the assessed health facilities don't have preparedness plans for Emergencies.

There was no recent malaria outbreak in the Woreda reported but there was cholera outbreak which was investigated by stakeholders from MoH, Regional Health Bureau and Woreda PHEM officers. Outbreak investigation checklist is available in the Woreda Health office.

## **Supervision and feedback**

Feedback is an important function of all surveillance systems and the way of encouraging, an individual or staffs working in the surveillance system. Appropriate feedback can be maintained through supervisory visits. The Woreda malaria surveillance officer revealed that there were a regular supervision from Zonal officers every quarter and they have received verbal and written feedbacks from higher officials. All (100%) of the interviewed Health center surveillance focal persons and HEWs also responded that they had received oral and written feedbacks regularly from zonal and woreda officers. There was no reported challenges during feedbacks and supervisions. All interviewed HEWs and Health center surveillance focal persons responded that they took short term trainings on disease under surveillance organized by the regional Health Bureau and Woreda health office.

## **Resources used to operate the surveillance system**

The Woreda health office is equipped with electricity, motor cycle, desktop computer, and printer which are being used for communication, data management and analysis. Telephone service is available in the Woreda. Information education and communication materials like posters, megaphone, and flip charts are available but there no Generator and screen projector in the Woreda Health office. The system is financially supported by the Regional Health Bureau and one NGO, MACEPA (Malaria Control and Elimination Partnership in Africa) in the region.

## **Surveillance System attributes**

**Usefulness:** Usefulness of malaria surveillance system was assessed by asking if the current surveillance system can help to determine the magnitude of the disease and detect outbreaks of malaria in the Woreda. The Woreda Health office and all assessed health facilities responded that the current malaria surveillance system in the Woreda is helping in determining the magnitude of the disease, to observe interventions and disease trends and can detect outbreaks if happened.

**Simplicity:** The Woreda Health office and all assessed health facilities responded that the current cases definition is being used is easy to understand by all level health professionals. In all assessed sites the average time required to record data is 10 -15 minutes.

**Flexibility:** All sites (100%) assessed responded that the formats currently being used are easy to use for newly occurring health events, to add new variables and to integrate with other systems.

**Data quality:** The quality of surveillance data was assessed by whether the reporting formats clear and easy to fill and whether data collectors trained and supervised regularly. All sites reported that the formats currently being used are easy and clear to fill by data collectors. The data collectors are regularly supervised and trained. No blanks were observed on observed reports.

**Acceptability:** This attribute was assessed by asking whether reporting agents accept and well engaged to the surveillance activities. All reporting sites (Health centers and health posts) are being engaged in the surveillance activities actively.

**Representativeness:** Representativeness of the surveillance system was assessed by Health service coverage of the Woreda and health seeking behavior of the community. There are 9 health centers and 32 health posts in the Woreda providing health services in the district and according to the woreda health office report, the Woreda's health service coverage is 91%. The health seeking behavior of the Woreda population is good. This is was explained by Woreda officers and health personnel's from Health centers and Health posts is due to Health insurance Agency ("Tena Medehin" in Amharic) is under practice in the Woreda. The surveillance system enabled to follow health and health related events of the whole community.

**Timeliness:** The reporting timeliness rate of the Woreda in 2009 Ethiopian fiscal year was 100%.

**Sensitivity:** The malaria surveillance system is sensitive since it enabled to detect malaria cases coming from the community.

**Predictive value positive:** Is the ability of the surveillance to sytem to detect the true malaria cases in the araea. The predictive value of this surveillance system is 52.9%. It is calculated by using the malaria cases detected by microscopy and rapid diagnostic test.

**Stability:** All sites responded that the new BPR did not affect the procedures of surveillance activities of this disease. Lack of resource did not affect the current surveillance activities and there is assigned PHEM focal person in assessed health centers and health posts.

**Weaknesses and challenges:** No critical challenges and gaps were raised by respondents but less concern from responsible bodies for malaria and improper use Insecticide treated bed nets (ITNs) by the community are some of the challenges raised by surveillance officers.

## **Discussions**

Surveillance is a systematic collection, analysis, and interpretation of health and health related data. The use of this data is to monitor health problems for public health action. The main aim of the surveillance system is to detect outbreaks before causing any damage to the public.

The overall malaria Surveillance system in the Woreda is in a good track towards achieving its objectives. Availability of reporting materials forms in the woreda health office and Health facilities is not an issue. The surveillance system is stable and acceptable by stakeholders which is an indicative of the system working well in the Woreda. The reviewed secondary data revealed that the data collected through this surveillance system is with good quality showing no blank reports found in the formats.

The reporting timeliness rate of the Woreda was 100% which is above the minimum requirement of WHO and national minimum standard (80%) (4). This is an important indicator to detect any disease outbreak and for prompt response. Timely reports will give timely information which helps to predict future outbreaks and trends of diseases occurrence in an area and the woreda should continue this momentum in the future.

The surveillance system of malaria in this Woreda was easy to understand which was demonstrated by all interviewed health professionals responded that, they understand the case definitions of malaria. Time required to do laboratory investigation for malaria is reported to be within 10 to 15 minutes range. Basic logistics like desktop computer and printer are available in the woreda Health office for the facilitation of surveillance activities. But the Woreda health office is not equipped with Generator, which is a basic need in the cases of interruptions of power, thus the responsible body shall equip the Woreda health office with generator for better performance of surveillance activities in the Woreda Health office.

Analyzing and interpreting public health surveillance data are the links between the design and operation of a surveillance system and the use of data from the system to implement public health action and disease control program. Surveillance data analysis and interpretation is a

crucial part that guides responses to public health emergencies. The analysis provides key information for taking prompt public health actions (4). This evaluation revealed that data is analyzed at woreda level only and assessed Health facilities (HCs and HPs) use surveillance data for report purposes only. Analyzing and interpreting surveillance data should be of primary importance in predicting and identifying which population group and area is most affected with the disease which can help in planning control and prevention mechanisms (21). Thus, Health facilities should start analyzing local surveillance data in terms of person, place and time beyond using the data for report purpose only.

The Woreda health office had Emergency preparedness plan but all visited health facilities didn't have preparedness plan at the health facility level, thus all health facilities shall have Emergency preparedness plan in cases of Emergencies. "Tena Medihin" strategy is a good practice observed in the woreda, which can improve the health seeking behavior of the population as well the early treatment practice of the people.

## **Conclusion**

The surveillance system in the woreda is on the right track on its objectives. The surveillance system in the woreda is easy, acceptable, flexible and simple to understand by health workers and able to detect if outbreaks happened. Preparedness for Emergencies is in place in at woreda level but not at health facility level. The data is not being analyzed by person, place and time at health facility level. HEWs and Malaria surveillance focal persons at Health centers shall start using and analyzing local surveillance data.

## Recommendations

The Woreda shall have Epidemic Preparedness plan at all Health facilities

Health Extension Workers and Health Center malaria surveillance focal persons should analyze weekly data in terms of person, place and time beyond for reporting purposes

The responsible official should give desirable concern for malaria since it is one of the diseases targeted for elimination in Ethiopia

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## CHAPTER IV-HEALTH PROFILE DESCRIPTION

### 4.1 Health profile Description of Burie Zuria woreda, Amhara region, February 2018

#### Abstract

**Introduction:** Health profile is a quantitative and qualitative description of the health of citizens and the factors which influence their health. The data in a profile reflects the health of a given community from many different angles. It identifies problems, proposes areas for improvement and stimulates action. Health profile provides a lively, scientifically-based account of health in the district/Woreda; it can stimulate public interest and political commitment; and it can identify targets for the future and monitor progress towards them. Profiles include both indicators and health-related measures with an analysis of the information. They identify in writing and graphs health problems and their potential solutions. This study was conducted to assess and describe health and health related condition of Bure Zuria Woreda and to identify problems for priority setting.

**Methods:** A cross-sectional descriptive study design was implemented to collect data from different sector offices using structured questionnaire. Collected data was entered and analyzed using Microsoft excel 2013. Results were displayed by narration, graphs and tables.

**Results:** Bure Zuria Woreda is found in West Gojam zone of Amhara region. It's organized in **nineteen** rural kebeles and one town administration. The total population of the Woreda is estimated to be 128,494, of which 64,590 (49.7%) are males and the remaining 65,584 (50.3%) are females making the sex ratio of the Woreda almost one to one. Cultivation agriculture is the mainstay of economy in the woreda, of which Bekolo, sindie and chilies (Berebere) are the leading crops produced. There are a total of 54 primary, secondary and preparatory schools in the woreda. There are a total of 32 governmental and private health facilities in the woreda of which 5 are health centers, 20 are health posts, 4 small private clinics and 3 drug stores. Health institutions to population ratio is comparable to the standard. Safe water coverage for the woreda is 71%. The MMR in the woreda is estimated to be 131 per 100,000 live births. 1<sup>st</sup> and 4<sup>th</sup> ANC visit coverage for the woreda in 2009 E.C is 105% and 101% respectively. In 2009 EFY Vaccination coverage for BCG, OPV3, Penta 3, Measles and TT2+ in pregnant women were

74.72%, 79.42%, 79.42% 76.77% and 58.76% respectively. A total of deliveries 3049(70.5%) are attended by skilled birth attendants. Malaria due to plasmodium falciparum, AFI (Acute Febrile Illness), trauma are among the top ten leading causes of outpatient visit among adults (above five years of old). Acute watery diarrhea (AWD) with total cases of 211 and one death was a recent outbreak in the woreda.

**Conclusion:** Even if the ITNs distribution coverage of the Woreda is reported to be 100% AFI and malaria were the leading causes of OPD visit during the year 2009 E.C. Safe water coverage discrepancies among kebeles is high. Health Institution and Health professional to population ratio is comparable with the standard. Tetanus toxoid coverage in non-pregnant women (0.16%) and in general child bearing age women (12.89%) is low.

**Key words:** Health profile, Burie zuria, West gojjam, Amhara region

## **Introduction**

Health profile is a quantitative and qualitative description of the health of citizens and the factors which influence their health. The data in a profile reflects the health of a given community from many different angles. It identifies problems, proposes areas for improvement and stimulates action. Health profile provides a lively, scientifically-based account of health in the district/Woreda; it can stimulate public interest and political commitment; and it can identify targets for the future and monitor progress towards them. Profiles include both indicators and health-related measures with an analysis of the information. They identify in writing and graphs health problems and their potential solutions (1).

A profile can help in many ways: the collaboration which is needed to produce it can help cement alliances for health; the information it contains can highlight health problems and bring partners together to find solutions; and presentation of the profile can stimulate public and media interest and improve general understanding of health issues.

A good profile describes a city/district and the factors affecting its citizens' health in a way that they will instantly recognize, and sets out proposal for change that will generate enthusiasm and energy. It should provide a focus for both community involvement and political support. It is very vital for prioritizing prominent health and health related problems of the community at any level (1).

A health profile is not a one-off document. A series of profiles should be planned for publication at regular intervals. Ideally they should be produced annually, but where resources are limited a two year cycle may be more appropriate. Regular publication enables target for progress to be set, the implementation of recommendations to be monitored, and achievements measured and recorded (1).

It is basic for planning and for appropriate intervention; and is an entry point for operational research. Stake holders of health and health related issues will access evidence based information from well compiled health profile. However in low income countries like our country, such organized information especially at Woreda level is usually not available if so, not complete and comprehensive.

The city/District health profile can then form the basis of a city/district health plan that sets out strategies and programs of intervention to improve the health of the population (2).

## **Rationale**

Health profile assessment is a way to gain a snapshot of a community's current assets and needs by examining and recording community strengths, challenges, and resources. However in low income countries like Ethiopia such information especially at district level is usually not complete and comprehensive. Therefore, an assessment of current health profile of a Woreda is important to provide a way for a coalition to get a better understanding of the community's health and what the current needs may be. Therefore, this study was conducted to generate health and health related information which can help Bure Zuria Woreda and other stakeholders to improve the general public health of the community.

## **Objectives**

### **General Objective**

To assess and describe health and health related information of Bure Zuria Woreda and to identify problems for priority setting from February 23 to March 2 2018

### **Specific Objectives**

- ✓ To describe health and health related indicators of the Woreda
- ✓ To assess the Health and health related problems of the Woreda
- ✓ To assess the Health infrastructures of the Woreda

## **Methods**

### **Study design**

Descriptive cross sectional study design using structured questionnaire was used to collect data from different sector offices Bure zuria district from February 23 to March 2 2018.

### **Study period**

Study was conducted from February 23 March to 2 2018 in Bure Zuria Woreda Health Office, and other sector offices.

### **Data collection and analysis**

Data was collected using a semi-structured questionnaire from Woreda Health Office, Water and Energy Bureau, Education Bureau, Culture and Tourism Bureau and woreda's Budget and Plan

Bureau. Secondary data review and interview of focal persons were conducted. After data was collected, it was entered and analyzed using Microsoft Excel office 2013.

## **Results**

### **Historical background**

No information was found on the exact date for the establishment of the Woreda, Legend says that the name “Bure” was given by someone many years back who was living around the Woreda. The man lost his ox and found it around a flat field grazing grass and the color of his ox was locally called “Bure” which means strip in color. Onwards then the name of the town called “Bure”.

Many historical places and churches are found in the Woreda, among those these are the list of some Churches (Lomit Medhanialem, Jib Gedel Michael, Gulm Medhanialem) Archeological (Tulu Jelesi found in Qotabo Kebele), Protected Jungles, (Wenber kab, Gantamen, Gind Weres).

### **Geography, Climate and Location**

Bure town, the capital of Bure Zuria Woreda is found 411 Kilo meters away North West of Addis Ababa, capital of Ethiopia. It's found 148 Kilo meters from Bahir dar the capital of the Regional state South. The Woreda is bordered with Sekela Woreda in the North, East Welega Zone of Oromia region in the South, Jabitena Woreda in the East, and by Womberma Woreda of West Gojam zone in the West. The altitude the Woreda is within the range of 700 and 2350 meters above sea level. The Woreda covers a surface area of 72,023 Hectars and the annual rainfall of the Woreda ranges between 1,000 and 1,500 milli meters with annual average temperature of 21 degree centigrade. 77.3% of the Woreda's climate is “Weynadega” and 21.7% is “Qolla” and the rest 1% of the Woreda is supposed to be Dega (Highland). Out of the total surface area of the Woreda 29,629 Hectare is used for cultivation purepose.

### **Political Administration**

The Woreda is organized in 20 Kebeles, of which 19 are rural and 1 is Town Administration. The population of the Woreda is estimated to be 128,494, of which 64,590(49.7%) are males and the remaining 65,584 (50.3%) are females making the sex ratio of the Woreda almost one to one.

The estimated average number of people per House hold in the woreda are six. There were 3,072 live births in 2009 EFY in the Woreda which makes the crude birth rate 23.9 per 1,000 population. Regarding the religious composition, 99% of the residents are followers of Ethiopian Orthodox Cristian and 1% are followers of others. 87% of the population speaks Amharic and the remaining 13% speaks Affan Oromo as their mother tongue since woreda is bordering with Oromia region. The official working language of the Woreda is Amharic.

*Table 7 Population of Bure zuria district by Kebele and sex, 2017/18, February 2018*

<b>S. no</b>	<b>Name of kebele</b>	<b>Total population</b>	<b>Male</b>	<b>Female</b>
1.	Weyni Durbete	8749	4331	4418
2.	Arbsi menkesawit	5549	2747	2802
3.	Agni fereda	8688	4301	4387
4.	Jib Gedel	6872	3377	3445
5.	Weynema Embaye	8816	4364	4452
6.	Shaqua	7707	3815	3892
7.	Tiyatiya	4871	2431	2440
8.	Denbun	7746	3834	3912
9.	Alefa	5918	2929	2989
10.	Wadra gindiba	5683	2813	2870
11.	Adela Agata	3783	1873	1910
12.	Gulm Denjin	10305	5101	5204
13.	Zalma	7407	3666	3741
14.	Pezel	2319	1148	1171
15.	Ser tekez	5204	2576	2628
16.	Ziyew shewl	5118	2533	2585
17.	Fetam somtom	6165	4042	4123
18.	Gedam lijamor	4001	1980	2021
19.	Boqo	3262	1615	1647

20.	Quch Town	10331	5114	5217
<b>Total</b>		<b>128,494</b>	<b>64,590</b>	<b>65,584</b>

Source: Bure Zuria Woreda Health Office 2010 E.C

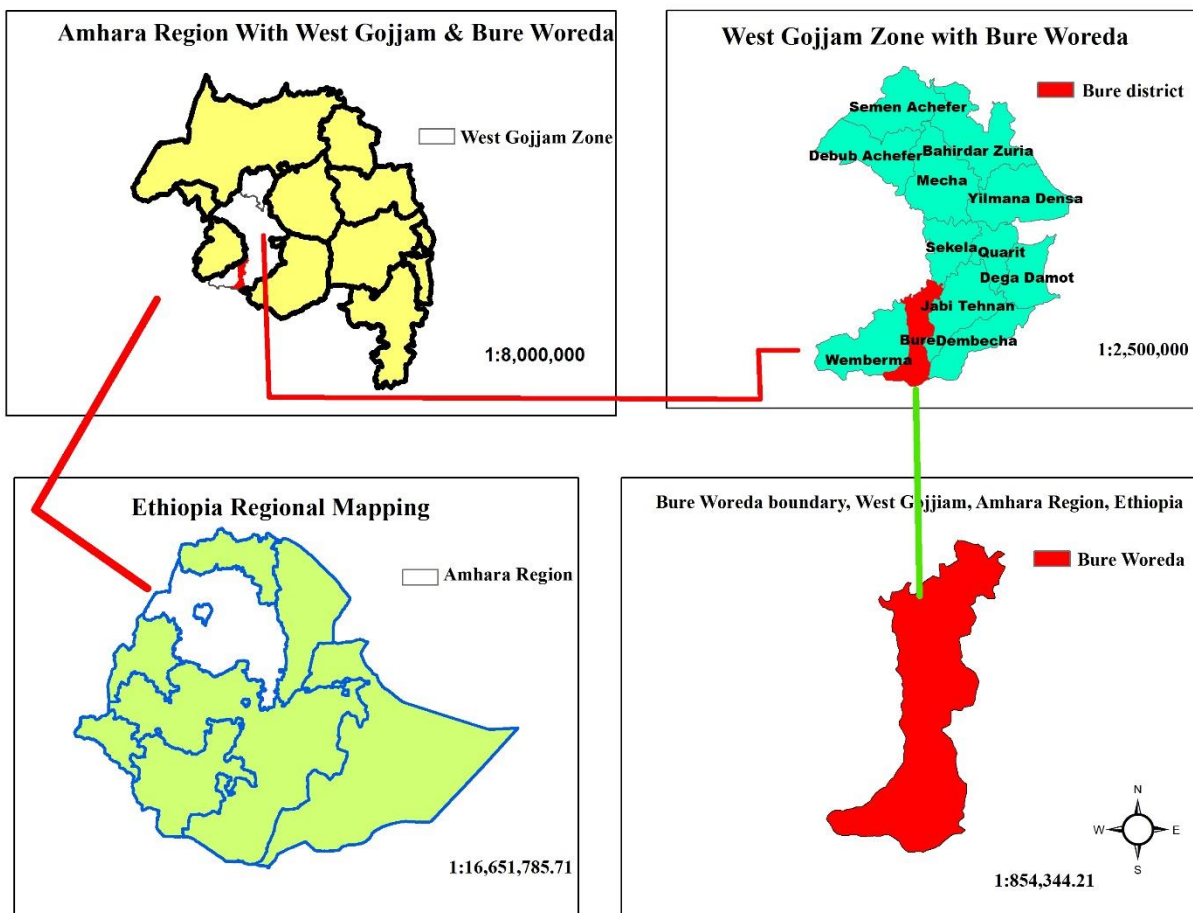


Figure 11 Administrative map of Bure zuria district, west gojjam zone, Amhara region, February 2018

### Economy

The main economic stay of the Woreda is agriculture, of which crop cultivation is the major one. Bokolo, teff, Sinda and Berbere are the main crops cultivated in the area. In addition, livestock rearing in line with crop cultivation (cattle, sheep and goat, equines, poultry) and their products are the other mainstays of economy in the Woreda.

## Education and School Health

Education is the key and essential determinant factor in the development of society and the people of one country. Educated people play indispensable role in poverty reduction and improvement of the life of the community. So, primary education for all was one of the Millennium Development Goal (MDG) of Ethiopia.

In Bure Zuria Woreda there are a total of 54 government schools facilitating teaching learning process, of which 51 are primary, 2 are Secondary and 1 is Preparatory school. There are a total of 914 teachers in the Woreda, of which 723 are Primary, 123 Secondary and the remaining 68 are Preparatory School teachers. A total of 30,716 students enrolled in 2010 E.C in the Woreda. These figures gave us Pupil to Teacher Ratio (PTR) of 39:1(27,817/723) and 24:1(2,899/123) for Primary and Secondary schools respectively. All schools in the Woreda have anti HIV clubs. Unfortunately there is no KG, TVET or any private college in the Woreda.

*Table 8 Number of schools teachers and students in Bure zuria district, Amhara region, 2017/18, February 2018*

S.no	School	Number of schools	Number of teachers	Number of students		Total
				Male	Female	
1	Primary	51	723	14,276	13,541	27,817
2	Secondary	2	123	1,134	1,210	2,344
3	Preparatory	1	68	311	244	555
<b>Total</b>		<b>54</b>	<b>914</b>	<b>15,721</b>	<b>14,995</b>	<b>30,716</b>

*Source: Bure Zuria Woreda Education Bureau 2010 E.C*

## Facilities

Facilities like transportation and electricity play a key role in the development and improvement of life style of a community. Concerning to this woreda, Bure town, the Woreda's capital is linked to regional capital Bahir dar and Addis Ababa with first class road (Asphalt). All the Health facilities in the Woreda (Health Posts and Health Centers) are linked to Woreda's capital Bure with gravel road (Pista). In the Woreda 11 (55%) of the total kebeles have access to electricity and mobile phone. From the total 20 health posts in the Woreda, 3 (15%) of them have

power supply. Quchi is the only town in the Woreda to have 4 functioning banks (Commercial Bank of Ethiopia, Abay Bank, Abyssinia Bank and United Bank) and the town has 24 hours power supply.

### **Water, Hygiene and Environmental Conditions**

Safe drinking water is one of the basic necessities for human beings. However, billions of people in the world have not access to it today. Of this, significant number of the population is from the developing countries. Particularly women and children are the most vulnerable segments of the society. Worldwide and in Ethiopia significant number of children are dying each day because of lack of safe drinking water and appropriate sanitation and hygiene.

To improve this situation, the international community adopted the Millennium Development Goal (MDG) and committed to reduce by half the proportion of people without sustainable access to safe water and basic sanitation by 2015. In 2005 the government of Ethiopia has ratified Universal Access Program (UAP) that enables to provide safe water to all citizens of the nation. In addition, the first Growth and Transformation Plan (GTP-1) covering the period from 2011 to 2015 was also endorsed in 2010 and it is under implementation now.

Safe water coverage in Bure Zuria Woreda is 71%. Gedam Lijamor Kebele is with the lowest coverage (12.2%) in the Woreda in the year 2017/18. The main source of water in the Woreda is ground water. 20,919(76%) of Households in the Woreda have access to latrine and utilization rate is reported to be 100%.

*Table 9 Safe water coverage in Bure zuria dstrict, 2010 E.C(2017/18)*

<b>S.No</b>	<b>Name of Kebele</b>	<b>Safe water coverage in percentage (%)</b>
1	Weyni Durbete	93.8
2	Arbsi menkesawit	99
3	Agni fereda	118.3
4	Jib Gedel	162.8
5	Weynema Embaye	161.7
6	Shaqua	168.6

7	Tiyatita	119
8	Denbun	97.7
9	Alefa	117.9
10	Wadra gindiba	157.3
11	Adela Agata	153.4
12	Gulm Denjin	94.2
13	Zalma	62.1
14	Pezel	112.7
15	Ser tekez	63.3
16	Ziyew shewl	105.4
17	Fetam somtom	60.8
18	Gedam lijamor	12.2
19	Boqo	65.1
20	Quch Town	95.9

*Source: Bure Zuria Woreda Water and Energy Bureau 2010 E.C (2017/18)*

## 5.6 Health Service Institutions

Better health is a key to individual happiness and a country's development. This, however, is not often within reach of the typical Ethiopian. The recently implemented Business Process Reengineering (BPR) of the health sector has introduced a three-tier health care delivery system: level one is a Woreda/District health system comprised of a primary hospital (to cover 60,000-100,000 people), health centers (1/15,000-25,000 population) and their satellite Health Posts (1/3,000-5,000 population) connected to each other by a referral system. The health service coverage of this Woreda is 100%. There are a total of 32 Health Institutions (5 Health Centers, 20 Health Posts, 4 lower private clinics and 3 drug stores) and there is also one Health post under construction in Bure Zuria Woreda.

*Table 10 Number of Health facilities in Bure zuria district, Amhara region, 2017/18, February 2018*

Type of Health Facility	Number	Remark
Hospital	0	

Health Center	5	
Health Post	20	
Private Clinic	4	
Drug store	3	
<b>Total</b>	<b>32</b>	

Source: Bure Zuria Woreda Health Office 2017/18(2010E.C)

### Health Facility to population ratio

Table 11 Health facilities to population ratio in Bure zuria district, Amhara region, 2017/18, February 2018

Type of Facility	Number	HF to population ratio	Standard
Hospital	0	0:128,494	1:100,000
Health Center	5	1:25,699	1:25,000
Health Post	20	1:6,425	1:5,000

### Health Personnel in the Woreda

There are a total of 156 Health professionals including Health Extension Workers in the Woreda composed of Health officers, Nurses, Midwives, Pharmacists and others.

Table 12 Number of health professionals with their discipline in Bure zuria district, Amhara region, 2017/18, February 2018

Profession	Level	Number	All types total
Health Officer	All are Deg.	21	<b>21</b>
Nurse	Dip.	38	<b>42</b>
	Deg.	6	
Midwife	Dip.	12	<b>16</b>
	Deg.	4	
Pharmacy	Dip.	8	<b>8</b>

Technician			
Lab. Technologist		5	<b>5</b>
Enva. Health		4	<b>4</b>
HIT		6	<b>6</b>
Health Education		1	<b>1</b>
HEWs		51	<b>51</b>
<b>Total</b>		<b>156</b>	<b>156</b>

*Deg.-degree*

*HEWs-Health Extension workers*

*HIT-Health information technologist*

*Source: Bure Zuria Woreda Health Office 2010 E.C (2017/18)*

Regarding health professionals to population ratio compared to the standard the number of Health officers, nurses and HEWs are met, but the number of midwives is a little bit behind compared to the standard.

*Table 13 Health professionals to population ratio in Bure zuria district, Amhara region 2017/18, February 2018*

<b>Profession</b>	<b>Number</b>	<b>Professional to population ratio</b>	<b>Standard</b>
Health officer(Public Health)	21	1:6,119	1:10,000
Nurse	42	1:3,060	1:5,000
Midwife	16	1:8,031	1:5,000
Health Extension worker	51	1:2,520	1:2,500(2 per kebele)

### **Morbidity and Mortality**

Acute Febrile Illness, Malaria due to Plasmodium falciparum and the likes were among the top ten causes of morbidity among adults in the district. Diarrhea and acute upper respiratory

infections were the leading cause of morbidity and OPD visit among under five children in Bure Zuria Woreda in the year 2016/17.

*Table 14 Top ten causes of OPD visit in Bure zuria district, Amhara region, 2017/18, February 2018*

<b>Adult (above 5)</b>	<b>Pediatrics (under 5)</b>
AFI	Diarrhea non bloody
Malaria(PF)	AURI
Trauma	Pneumonia
Unspecified parasitic infection	AFI
Dyspepsia	Skin and subcutaneous tissue infection
Skin and subcutaneous infections	Unspecified parasitic infection
Malaria(PV)	Unspecified disease of eye
AURI	Trauma
Pneumonia	Malaria(PV)
Disease of musculoskeletal system	Diarrhea with dehydration

*PF-Plasmodium falciparum*

*PV-Plasmodium vivax*

*AURI-Acute upper respiratory infection*

*AFI-Acute febrile illness*

*Source: Bure Zuria Woreda Health office, 2017/18*

### **Health Budget Allocation**

The annual budget allocation for Health for EFY 2010 is ETB 3,634,659 with a 10% increment from last year's budget.

## Maternal and Child Health

Proper care during pregnancy, delivery and after delivery is important for the health of both the mother and the baby. In the year 2009 E.C a total of 4,561 and 4,400 mothers have got first and fourth ANC visits respectively.

Family planning refers to a conscious effort by a couple to limit or space the number of children they have through the use of contraceptive methods. Modern methods can be classified as short or long acting methods.

A total of 28,204 women of reproductive age group are using short and long acting family planning methods in the Woreda. Out of these most of them 19,438(68.9%) are using short acting methods and the remaining 9,000 (31.1%) are using long acting methods.

*Table 15 Maternal health service coverage in Bure zuria district, Amhara region, 2017/18, February 2018*

S.no	Maternal service	Plan (Eligible)	Achievement
1	Family Planning	25,959	28,204(108%)
2	1st ANC	4,324	4561(105%)
3	4th ANC	4,324	4400(101%)
4	Deliveries in Health Institutions	4,324	3049(70.5%)
5	PMTCT	4,324	3049(70.5%)
6	PNC	4,324	3431(79%)
7	Deliveries attended by HEWs	431	19(4.4%)

*Source: Bure Zuria Woreda Health office 2010 E.C (2017/18)*

## Vaccination coverage in the woreda

In 2009 EFY administrative Vaccination coverage for BCG, OPV3, Penta 3, Measles and TT2+ in pregnant women were 74.72%, 79.42%, 79.42% 76.77% and 58.76% respectively.

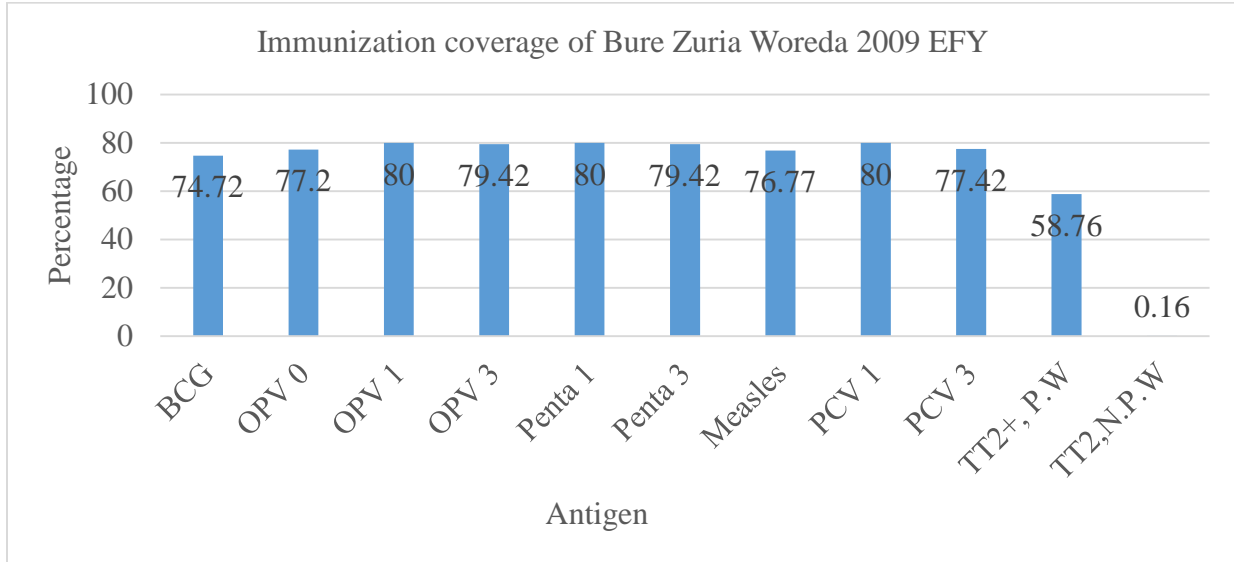


Figure 12 Vaccination coverage of Bure zuria district in 2017/18, February 2018

## Endemic diseases in the woreda

### Malaria

Bure Zuria woreda is one of the Malarious Woredas in the region. As indicated earlier malaria is one of the top causes of morbidity in the woreda. All kebeles in the woreda are at risk for malaria. The ITN coverage for the Woreda is 100% and a total of 17 Kebeles covered with IRS. For the fiscal year of 2009 E.C a total of 14,839 people were tested for malaria and 3,646 cases of malaria are confirmed cases for malaria either by RDT/Microscopy. Of which from the total confirmed malaria cases, 2,104 (57.7%) were due to plasmodium falciparum and the remaining 1,542(42.3%) were due to plasmodium vivax species.

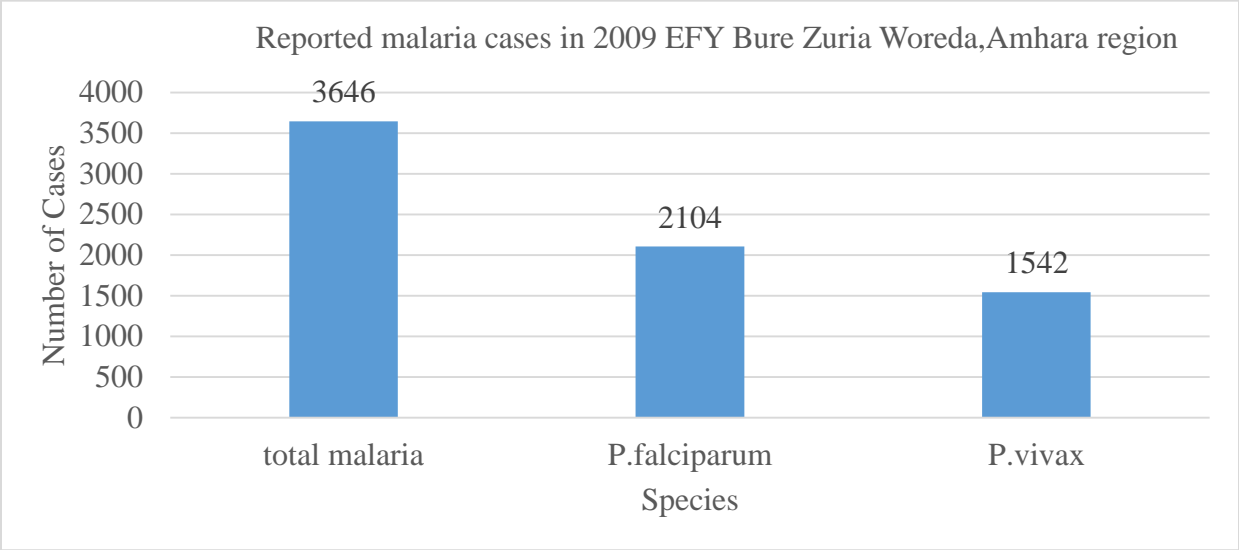
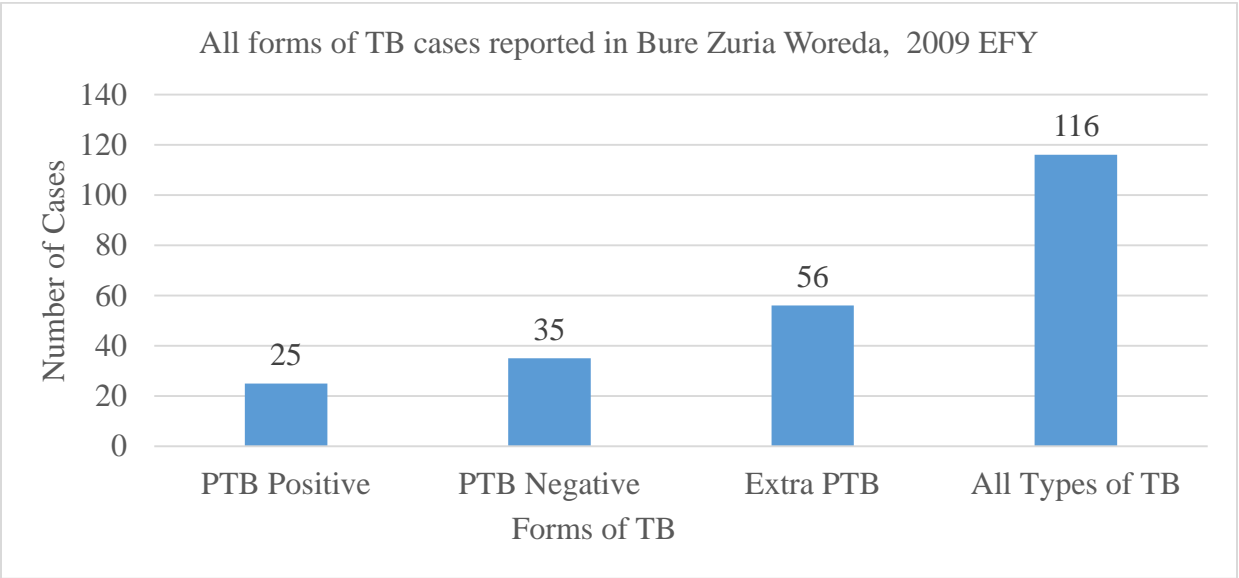


Figure 13 Number of malaria cases reported in Bure zuria district 2016/17, February 2018

**TB/Leprosy cases in the woreda**

A total of 116 all forms TB were reported for the 2009 in Bure Zuria Woreda. Among those 25(21.5%) were PTB positive, 35 (30.2%) were PTB negative and the rest 56 (48.3%) Extra Pulmonary Tuberculosis cases. The TB detection rate and TB cure rate in the Woreda were 43.6% and 94.4% respectively. Among those enrolled for treatment of TB there was one TB defaulter case. All TB patients were screened for HIV. There were no Leprosy cases reported from the woreda in 2009 E.C.



*Figure 14 Number of Tuberculosis cases reported in Bure zuria district in 2016/17, February 2018*

### **HIV/AIDS and Malnutrition**

The prevalence of HIV in Bure Zuria Woreda for the year is 0.23% which is low compared to the national prevalence according to EDHS (Ethiopian Demographic and Health Survey) 2016 which is 1.2%. A total of 6,539 people were screened for HIV for year 2009 E.C in Bure Zuria Woreda. Out of those, 1,014(15.5%) were by VCT, and the remaining 5,525(84.5%) were by PITC. A total of 3,049 pregnant mothers have got PMTCT services (prevention from Mother to Child) service in the year 2009 E.C. There were a total 294 people on ART in the Woreda. Health education in Health facilities and schools, economic support for PLWA are some of HIV preventive activities in undergoing the Woreda. There are a total of 20 OTP sites in the Woreda and there were a total of 42 admissions for year 2009 E.C.

## Public Health Emergency Management (PHEM)

In order to combat with the challenges that are ever growing, the way working processes are organized and its capacities should also be changed. Based on this fact the health sector has identified Public Health Emergency Management (PHEM) as one of the core processes to be reengineered. 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. PHEM is the process of anticipating, preventing, preparing for, detecting, responding to, controlling and recovering from consequences of public health threats in order that health and economic impacts are minimized. According to this reengineering there are 21 priority diseases (14 are immediately reportable and 7 are weekly reportable) under surveillance Ethiopia. In this Woreda, a total of 3,646 malaria, 311 Dysentery and 22 SAM cases were reported in 2009 EFY. Table 19 shows the number of reported cases/deaths under PHEM surveillance in the year 2009 E.C.

*Table 16 Number of reported cases and deaths Number of cases and deaths of reportable diseases in Bure zuria district, Amhara region, 2017/18, February 2018*

Immediately reportable			Weekly reportable		
Diseases/event	Number of cases	Deaths	Diseases	Number of cases	Deaths
Rabies	4	0	Dysentery	311	0
AWD	2	0	SAM	22	0
Measles	7	0	Relapsing fever	1	0
Polio(Acute flaccid paralysis)	1	0	Typhoid fever	33	0
Maternal death		4			
Drancunculiasis	0		Typhus	0	0
Avian Influenza Human	0	0			

Influenza					
Pandemic influenza A	0	0			
Anthrax	0	0			
Small pox	0	0			
Viral Hemorrhagic fever	0	0			
NNT	0	0	Meningococcal meningitis	0	0
Yellow fever	0	0			

*Source: Bure zuria health office, 2010E.C (2017/18)*

### **Disaster situation in the Woreda**

There was no man made or natural disaster happened in the Woreda for the last one year but there was Acute Water Diarrhea outbreak between September and November 2010 E.C (2017), in which a total of 211 cases and 1 death reported making the CFR (Case Fatality Rate) 0.47% which is within the range of recommended national standard (<1%). Prevention and control activities during the outbreak undertaken were Health Education for the community, water treatment chemical distribution, case management, house hold disinfection and mass social mobilization campaign using mobile vans.

### **Discussion**

Socio demographic characteristics of a population are very crucial for better planning and public health interventions as well dynamic overtime, so the Woreda should update and monitor the changes in demography of the population.

Health institution and Health professional to population ratio is comparable with the needed standard except the number of midwives which are a little bit behind and absence of Hospital in the Woreda.

Pupil to teacher ratio is 39:1 and 24:1 in Primary and secondary schools in the Woreda which is much better than the standard set by Ministry of Education of Ethiopia in 2010 even if quality of education does not only depend on lower Pupil to Teacher ratio, which is 50:1 in primary and 40:1 in secondary schools (3).

Facilities like Power supply and safe water supply are essential elements in the improvement of quality of health service delivery in health facilities. In Burie Zuria Woreda Only 3 out of 5 Health Centers, 2 out of 20 Health posts have power supply, which can minimize the quality of services provided in health facilities.

Infant and child mortality rates are basic indicators of a country's socioeconomic situation and quality of life. Unfortunately there were no data record obtained regarding infant mortality rate child mortality rate in the Woreda which is an indicative of poor data handling and recording.

Non bloody diarrhea is the leading cause of outpatient visit in under five children, so the Woreda shall improve safe water supply, hygiene and sanitation conditions that might be the cause for the occurrence of this disease. Even if the distribution of Insecticide treated bed nets in the Woreda is 100%, Malaria due to *P. falciparum* is the top leading cause of morbidity among adults and children in the Woreda. This may imply that prevention and control activities in the Woreda like IRS, ITN distribution and strictly following the proper utilization of ITNs among residents are crucial.

Universal immunization of children against six common vaccine-preventable diseases, namely tuberculosis, diphtheria, whooping cough (pertussis), tetanus, polio, and measles, is crucial to reducing infant and child mortality. Other childhood vaccines given in Ethiopia protect against hepatitis B, and *Haemophilus influenzae* type b (Hib). The government of Ethiopia introduced the pneumococcal conjugate vaccine (PCV 13) and monovalent human rotavirus vaccine (RV1) into the national's infant immunization programme in November 2011 and October 2012, respectively (4).

Improvement in Maternal Health is enshrined as one of the essential prerequisites for development and for poverty reduction. Tetanus toxoid injections are given during pregnancy to prevent neonatal tetanus, a major cause of early infant deaths in many developing countries,

often due to failure to observe hygienic procedures during delivery. In this Woreda the overall TT coverage is low as compared to national coverage revealed by DHS 2016 which is 49% (7).

Family planning reduces mortality and morbidity due to pregnancy and child birth. Family planning saves lives of women and children as well as improves the quality of life for all. It is one of the best investments that can be made to ensure the health and well-being of women, children, and communities. Family planning has great role in significant reduction of maternal mortality by reducing exposure to unintended pregnancy and unsafe abortion in developing countries where the majority of maternal deaths occur. In this Woreda the family planning coverage for the year 2009 EFY is 101% which higher than the expected eligible population, this achievement might be due to under planning at the beginning of the year. On the other hand this figure does not show the overall coverage FP (Family Planning) in the Woreda rather it only shows the annual plan performance of the Woreda Health Bureau, so the Woreda shall asses the overall prevalence of contraceptive among those eligible women of reproductive age group. Based on the EDHS 2016 of Ethiopia the overall contraceptive prevalence of among married women is 36% (7).

Ethiopia ranks third in Africa and eighth among the 22 highest tuberculosis (TB) burdened countries in the world. The prevalence of all forms of TB is estimated at 261 per 100 000 population, leading to an annual mortality rate of 64 per 100 000 population (5). In this Woreda the estimated prevalence of all forms of TB is 91 per 100,000 population. Response to Public Health Emergencies shows how capable of the Woreda's Public Health Emergency Management system is. This Woreda showed response to recent AWD outbreak with 0.47% mortality rate which is within acceptable national standard mortality rate (<1%) and the Woreda should maintain this momentum for the future outbreaks (8).

### **Identified health problems in the district**

- ✓ Malaria and acute febrile illness leading cause of morbidity
- ✓ Improper documentation of basic indicators like child mortality and infant mortality
- ✓ Low coverage of TT vaccine coverage in the area
- ✓ Improper utilization of ITNs by the community

### **Conclusions**

Data handling and documentation of basic indicators in the Woreda is poor. AFI and Malaria are among the top public health problems in the Woreda. Even if the ITNs coverage in the Woreda is 100% it needs close monitoring and follow up on the proper utilization of it is needed because it does not guarantee every House hold in the community is properly utilizing it. Pupil to teacher ratio is good as compared to the national standard. Safe water coverage discrepancies among kebeles is high. Health Institution and Health professional to population ratio is comparable with the standard. Tetanus toxoid coverage in non-pregnant women (0.16%) and in general child bearing age women (12.89%) is low. The overall contraceptive prevalence rate among the eligible reproductive age group women (15-49) should be calculated.

### **Recommendations**

Infant mortality rate, Child mortality rate, and Crude death rate are the basic and fundamental indicators of the general health status of the Woreda or district. So, this Woreda shall have documents of these basic indicators for better public health planning and interventions. A population should be classified socio demographically since it is crucial for implementing public health actions and interventions. Facilities like water and power supply are essential in delivering health services for the community. The Woreda should equip unequipped Health facilities with basic infrastructures. The Woreda water Bureau should strive its best to attain proportional safe water coverage for all Kebeles. The woreda health office not only monitor and document only the annual plan and performance of contraceptive prevalence and TT vaccine coverage in the woreda but also monitor the overall prevalence among those who are eligible.

The Woreda Education Bureau should try at least to have a TVET college in the woreda.

The Woreda Health office should monitor the proper utilization of ITNs in each House hold because proper utilization can minimize morbidity and mortality due to malaria.

Health Education and awareness creation should be done in child bearing age women to increase the overall coverage of TT vaccine in the Woreda.

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## CHAPTER V-SCIENTIFIC MANUSCRIPT

### 5.1 Surveillance Data Analysis on Influenza like Illness in Shiro Meda Health Center sentinel site, 2013 to 2017, Addis Ababa, Ethiopia, 2018

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#### Abstract

**Introduction:** Influenza is a respiratory illness caused by influenza virus that can spread very easily from person to person. The virus is spread through the air by the exchange of fluid droplets from the mouth or nose of one person to another person due to sneezing and coughing. The manifestations of illness (fever, cough, sore throat) caused by the influenza virus are usually mild to moderate but for some it could be severe, leading to hospitalization and even death. In Ethiopia, influenza sentinel surveillance has been launched in 2008 with one ILI sentinel site (Shiromeda Health Center) and one SARI sentinel site (Yekatit 12 Hosp). Ongoing analysis of surveillance data is important for detecting outbreaks and unexpected increases or decreases in disease occurrence, monitoring disease trends, and evaluating the effectiveness of disease control programs and policies. This study was conducted to characterize Influenza like illness cases in person, place and time, determine the positivity rate of the site and put possible recommendations based on the findings.

**Methods:** We reviewed five years (2013 to 2017) data of Shiro meda health center Influenza sentinel site. Data was cleaned prior to analysis. Descriptive data analysis by person, place and time was done using Microsoft excel 2013. Incidence rate was calculated using number of cases reported per year per 100,000 population. Result was displayed using graphs and tables.

**Results:** a total of 1489 cases of ILI/SARI were reported from Shiro meda health center for the last five years, of which 950 (64%) are females and the remaining 539 (46%) are males. Out of the total reported cases 98% were from Gullele sub-city. The most affected Age group were 15-44 (49%) followed by 5-14 (32%). The positivity rate of the site was 30.31%. Of those positive

cases for Influenza, 20% were Influenza type A and the remaining were Influenza type B. some important characteristics of patients were missing during data analysis.

**Conclusion:** Almost all of the cases were reported from Gullele sub-city of Addis Ababa city. the most affected age group were 15-44 followed by 5-14. Influenza type A and B are circulating in Shiro meda health center sentinel site. Regular data analysis and supervision is required to improve the quality of data produced in the sentinel site.

**Key word:** Influenza, sentinel site, analysis, Shiro meda health center, Ethiopia

## **Introduction**

Influenza is a respiratory illness caused by influenza virus that can spread very easily from person to person. The virus is spread through the air by the exchange of fluid droplets from the mouth or nose of one person to another person due to sneezing and coughing. The manifestations of illness (fever, cough, sore throat) caused by the influenza virus are usually mild to moderate but for some it could be severe, leading to hospitalization and even death. The influenza virus circulates around the world and undergoes continuous evolution by antigenic drift which causes annual epidemics. In rare instances the virus may change completely called ‘antigenic shift’, and result in the emergence of novel influenza viruses (1).

There are 3 types of seasonal influenza viruses, types A, B, and C. Influenza type A viruses are further classified into subtypes according to the combinations of 2 different proteins, the haemagglutinin (H) and the neuraminidase (N), located on the surface of the virus. The subtypes of influenza A viruses currently circulating among humans are influenza A (H1N1) and A (H3N2) subtypes. The circulating influenza A (H1N1) is also written as A (H1N1) pdm09 as it caused the pandemic in 2009 and subsequently replaced the seasonal influenza A (H1N1) virus which had circulated prior to 2009. Only influenza type A viruses are known to have caused pandemics. Circulating influenza B viruses can be divided into 2 main groups (lineages), referred to as B/Yamagata and B/Victoria lineages. Influenza B viruses are not classified into subtypes (1).

In Ethiopia, influenza sentinel surveillance has been launched in 2008 with one ILI sentinel site (Shiromeda Health Center) and one SARI sentinel site (Yekatit 12 Hospital). Furthermore,

additional two ILI sentinel sites (Akaki Kality and Kolfe health Centers) are added in 2010. Subsequently, in 2013 SARI sentinel sites were established in four mega regional state capitals. Currently there are three ILI and Five SARI sentinel sites providing both weekly aggregated and throat swab samples. Some baseline data has been generated in all eight sentinel sites, namely Shiromeda Health Center, Yekatit 12 Hospital, Kolfe Health Center, Akaki Health Center, Adama Hospital, Adare Hospital, Felegehiwot Hosapital and Mekelle Hospital. Ongoing analysis of surveillance data is important for detecting outbreaks and unexpected increases or decreases in disease occurrence, monitoring disease trends, and evaluating the effectiveness of disease control programs and policies. The study was conducted to characterize ILI patients in terms of place person and time, the trend of cases over time and determine the positivity rate of ILI cases in shiro meda health center.

## **Methods and Materials**

Five years data (2013-2017) of Shiro meda health center sentinel site was received and compiled from Public Health Emergency Management center of Ethiopian Public Health Institute. The data was cleaned prior to analysis. After cleaning, the data was analyzed using Micro soft excel 2013. Attack rates per year were calculated using number of cases per year divided by total population for the respective year multiplied by 100,000. Tables and graphs were used to display results. The analysis period was from 1<sup>st</sup> to 15<sup>th</sup> February 2018.

## **Case definitions**

### **Influenza like Illness (ILI)**

A person, child or adult with Sudden onset of fever  $> 38$  oC and Cough or sore throat in the absence of other diagnoses.

### **Severe Acute Respiratory Infection (SARI)**

Any severely ill person presenting with manifestations of acute lower respiratory infection with history of fever or measured fever ( $\geq 38$ oC) and cough or sore throat and shortness of breath, or difficulty of breathing with or without Clinical or radiographic findings of pneumonia or any person who died of an unexplained respiratory illness.

## **Results**

A total of 1,486 ILI cases reported from Shiro Meda health center from 2013 to 2017. All of them were reported from Addis Ababa city. Out of all reported cases, 1,468 (98%) cases were from Gullele sub-city.

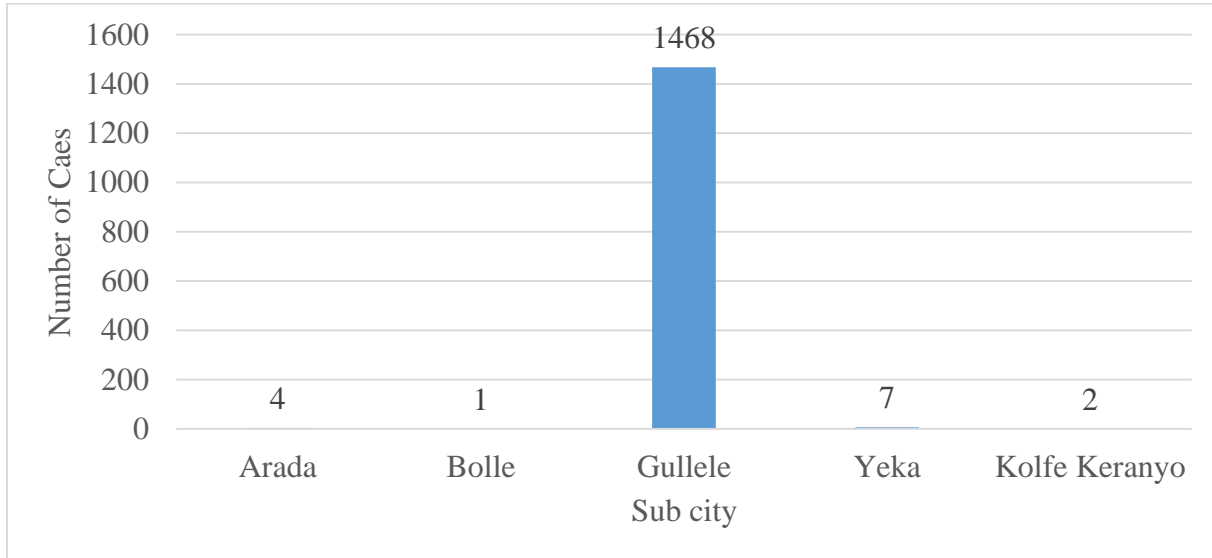


Figure 15 ILI cases by in shiro meda HC by subcity 2013 to 2017, February 2018

Out of the total reported cases, 950 (64%) were females and the remaining 539 (46%) were males.

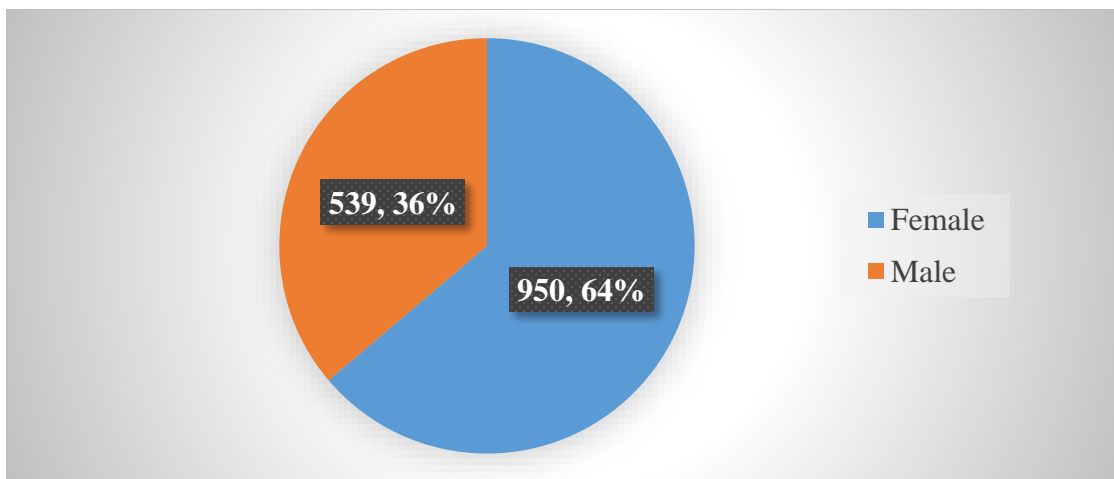


Figure 16 ILI cases by sex in shiro meda HC 2013 to 2017, February 2018

Age group 15-44 comprises 49.69% of the total reported cases followed by 5-14 age group which is 32.43%.

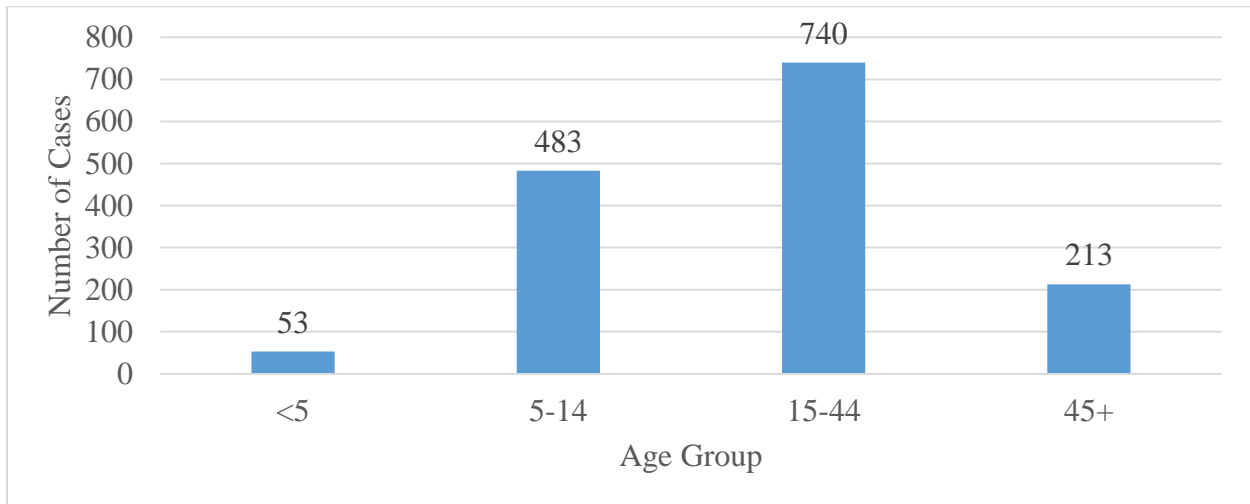


Figure 17 Influenza like illness cases by Age group in shiro meda HC 2013 to 2017, February 2018

The trend of cases over the last five years looks decreasing. The figure below shows the attack rate of ILI cases in Addis Ababa city for the last five years per year per 100,000 populations.

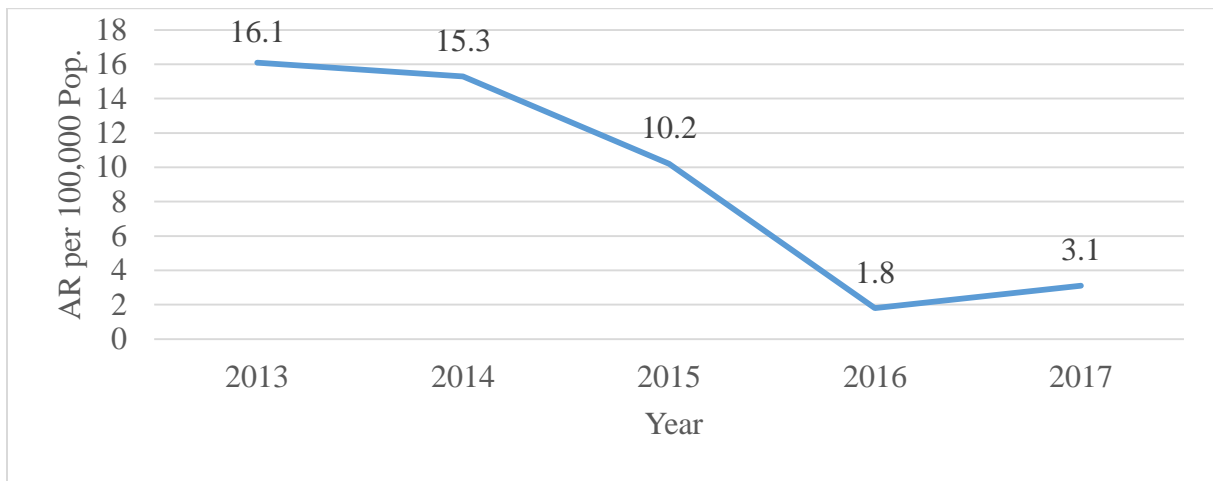


Figure 18 trends of Influenza like illness cases per 100,000 population in shiro meda HC 2013 to 2017, February 2018

Out of the total reported cases 448 (30.31%) cases tested positive for Influenza virus. The following table shows the positivity status of reported cases in Shiro meda Health center from year 2013 to 2017.

*Table 17 Positivity status of ILI cases in shiro meda health center, 2013 to 2017, February 2018*

<b>Status</b>	<b>Frequency</b>	<b>Percentage</b>
Positive	448	30.31%
Negative	1022	69.14%
Intermediate	7	.55%
<b>Total</b>	<b>1478</b>	<b>100%</b>

## **Discussion**

Most of the cases were reported from Gullele sub city hence the sentinel site is found under this sub city and it is also similar with another study done in Ethiopia in 2012 of which around 70% of cases were from this sub city (2). This study revealed that the Age Group 15-44 is mostly affected compared to others which is in contrast with a study done in Ethiopia in 2012 which revealed that the most affected Age Group is 0-4 (2). In a study done in Kenya in 2012 80% of the cases were in the Age Group of 0-4 which is also in contrast to this study. In this study a single site is used and the study in Kenya covered all over the country, so this might be the reason for discrepancies in the results(3). Family studies conducted in Houston and Seattle also demonstrated that high rates of infection in school-age children and the importance of schoolchildren as vehicles of infection within families (6, 8). Additionally the study conducted in Peru on influenza from 2006-2008 revealed that the prevalence of influenza A and B viruses were significantly higher in ILI patients older than 5 years of age (7). This data analysis uncovered that through years 2013 to 2017 Influenza A and B are circulating in Shiro Meda Health Center Influenza Sentinel site. Compared to Influenza B, Influenza A is predominantly circulating in this Health Center (64.4% versus 33.6%), which is not consistent with a study done in Ethiopia between 2008 and 2011 which was 86.6% versus 13.4% (2). This might be due to, in this study cases from a single sentinel site (Shiro Meda HC) was enrolled and the study between

2008 and 2012 was done on sites all over the city. Similarly influenza A is mainly circulating in Kenya than influenza B (69% versus 31%) in a research done in 2012 (3). In another study done in South Africa from year 2009-2012, of those Tested positive cases for Influenza, 37% were Influenza A (5). Study conducted in Thailand in 2001 also shows that influenza A is by and large occurred than influenza B (69.8% versus 30.2%) (3). This result is also comparable with the research done in West Africa between 2010 and 2012 which showed that, out of the total tested cases 62.8% were Influenza A and the remaining 37.2% were positive for Influenza B (9). Based on this study finding Influenza A (64.4%) is the most circulating type the site and from Influenza A subgroups seasonal Influenza (A/H3) is the dominant one. Gullele sub-city (98.58%) is the most affected sub-city. The Age Group 15-44(49.69%) is the mostly affected Age Group in the site. The site misses some important variables of a patient, making the data under expected quality. Continuous feedback and supervision should be conducted regularly to improve the quality of data produced by the site. Documentation of important characteristics of patients should be improved.

**Consents for Publication:**

Not applicable for this article as there is no individual images, or videos or information is included.

**Availability of data:**

The data used to prepare this article is available on the corresponding author up on reasonable request.

**Competing interest**

All authors declared that they have no competing interest.

**Funding:**

No separate budget line was allocated for this activity.

**Authors' contribution:**

HT proposed and designed the analysis, carried out data cleaning, categorizing, analysis and write-up of the manuscript. All authors have participated in the interpretation of findings and review of the manuscript.

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## 5.2 Suspected Chicken pox outbreak investigation and response in Yirga chefe town, Ethiopia, August 2018

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### Abstract

**Introduction:** Chicken pox or varicella is an acute viral infectious disease of childhood caused by varicella-zoster virus. Humans are the only known hosts for this virus. The major route of transmission is airborne, however, transmissions via aerosols or direct contact with blister fluid have also been reported. The primary infection presents as fever and exanthematous rash. Clinically apparent infection usually provides lifelong immunity. The disease is usually acute and self-limiting but occasionally can lead to secondary infections like pneumonia, encephalitis, and secondary bacterial infections. Varicella is vaccine preventable disease. An estimated 4.2 million cases and 4200 deaths occur annually worldwide. This outbreak investigation was conducted to describe chicken pox cases in terms of person, place and time from 6 to 11 August 2018.

**Methods:** We conducted a descriptive study in the Yirga cheffe town. We line listed all reported cases which contains sociodemographic characteristics of patients and signs and symptoms. The line listed data were analyzed with person, place and time. We have also visited the reporting internally displaced population (IDP) sites during investigation. Cases were treated symptomatically in mobile clinics.

**Results:** A total of 25 suspected cases of chicken pox were reported between 6<sup>th</sup> and 11<sup>th</sup> of August 2018 from Yirga cheffe town IDP sites. Among reported cases 96% were reported from two IDP sites and one case was from the community. Out of the total reported cases 14(56%) were males while the remaining 11 (44%) were females with regard to sex. 88% of the total reported cases were children under the age of fifteen.

**Conclusion:** The most affected age group in this outbreak was under the age of fifteen. Males were more affected than females in this outbreak. Unavailability not introduction of chicken pox vaccine in our country might be a risk for the occurrence of this outbreak.

**Recommendations:** Strengthening routine surveillance in the IDP sites is recommended. Ministry of Health of Ethiopia shall consider the introduction of chicken pox vaccine in the country. Ministry of Health should prepare guidelines and manuals for response of outbreaks.

**Key words:** Chicken pox, outbreak, Yirga cheffe, investigation, internally displaced population

## **Introduction**

Chicken pox or varicella is an acute infectious disease of childhood caused by varicella-zoster virus (VZV), belonging to the family Herpesviridae (1). Human beings are the only known hosts of this virus (2). The primary infection presents as fever and exanthematous rash but can affect almost any organ of the body (3). The incubation period usually ranges between 7 and 23 days (mean 2 weeks). The major route of transmission is airborne, however, transmissions via aerosols or direct contact with the blister fluid have also been reported. The disease is highly contagious with an attack rate of >85% after exposure. A clinically apparent infection usually provides lifelong immunity. The disease is usually acute and self-limiting but occasionally can lead to complications such as encephalitis, pneumonia, and secondary bacterial infections. Development of herpes zoster due to reactivation of latent varicella infection may be seen due to long-term consequences (4). Individuals remain contagious until all lesions have crusted over. Following infection, the virus remains latent in nerve cells and may be reactivated causing a secondary infection - herpes zoster, commonly referred to as “shingles”. This generally occurs in adults aged >50 years or in the immunocompromised and is associated with a painful rash that may result in permanent nerve damage. Varicella can be prevented by immunization and multiple vaccine formulations of the live attenuated vaccine, based on the Oka VZV strain, have been available since 1974. Varicella vaccines are available as a single antigen and in combination with measles, mumps and rubella vaccine (8). Treatment is symptomatic relief of symptoms. As a protective measure, those infected are usually required to stay at home while they are infectious. Keeping nails short and wearing gloves may prevent scratching and reduce the risk of secondary infections. The estimated global burden of disease-specific mortality caused by varicella is considerably lower than that due to other major infectious diseases such as measles, pertussis, rotavirus, or invasive pneumococcal disease (13).

Based on conservative estimates, the global annual varicella disease burden would include 4.2 million severe complications leading to hospitalization and 4200 deaths. Despite the routine use of measles and pertussis vaccination, the age-standardized death rates (per 100 000 cases) in 2010 was 0.1. In the pre-vaccine era in high-income developed countries, case fatality rates for varicella were approximately 3 per 100 000 cases compared to 1–3 per 1000 cases for measles. Nevertheless, as other vaccine-preventable diseases are controlled, varicella may represent a considerable preventable disease burden in the population, with significant health-care and societal costs. Factors which influence the severity of disease and outcomes in populations include the proportion of cases among infants, pregnant women and other adults, the prevalence of immunocompromising conditions including HIV infection, and the extent of access to care and appropriate treatment. In otherwise healthy children, varicella is usually self-limiting (10). Two doses of vaccine are recommended for children the first dose at 12 to 15 months of age and the second dose at 4 to 6 years of age, with catch-up vaccination for all persons without evidence of immunity to varicella and for one-dose vaccine recipients (12). This outbreak investigation was conducted to describe the magnitude of this outbreak in the area.

**Methods:** We conducted descriptive investigation of suspected chicken pox outbreak investigation in Yirga chefe town in two IDP sites from 6<sup>th</sup> to 18 August 2018. We line listed all reported cases. Analysis was done micro soft excel and results were displayed by graphs and charts.

### **Case definitions used**

**Suspected case:** An illness with acute onset of diffuse (generalized) maculopapulovesicular rash without other apparent causes. Cases who met the above case definition between 6<sup>th</sup> and 18<sup>th</sup> August 2018 were included in this study.

**Confirmed:** A case that is laboratory confirmed (by PCR or isolation of the Virus) or that meets the clinical case definition and is epidemiologically linked to a confirmed or a probable case.

**Chicken pox outbreak:** Occurrence of  $\geq 5$  confirmed cases of chicken pox cases that are related in place and epidemiologically.

**Results:** A total of 25 suspected chicken pox cases with zero death were reported from 6<sup>th</sup> to 18<sup>th</sup> August 2018 in Yirga chefe town from two IDP sites. Out of total reported cases, 14 (56%) were males and the remaining 11(44%) were females. 88% of the total reported cases were children under the age of fifteen. The overall attack rate for the two IDP sites in the town was 63.2 per 100,000 population.

From the total reported cases 13(52%) were reported from Semaritian IDP site, 11(44%) from Worabi site and the remaining one case was reported from the community. All of the cases were presented with rash and 92% presented with fever. Cases were reported between 6<sup>th</sup> and 18<sup>th</sup> of August 2018. The first case was reported from Semaritian site. All of the cases were treated symptomatically in mobile clinics.

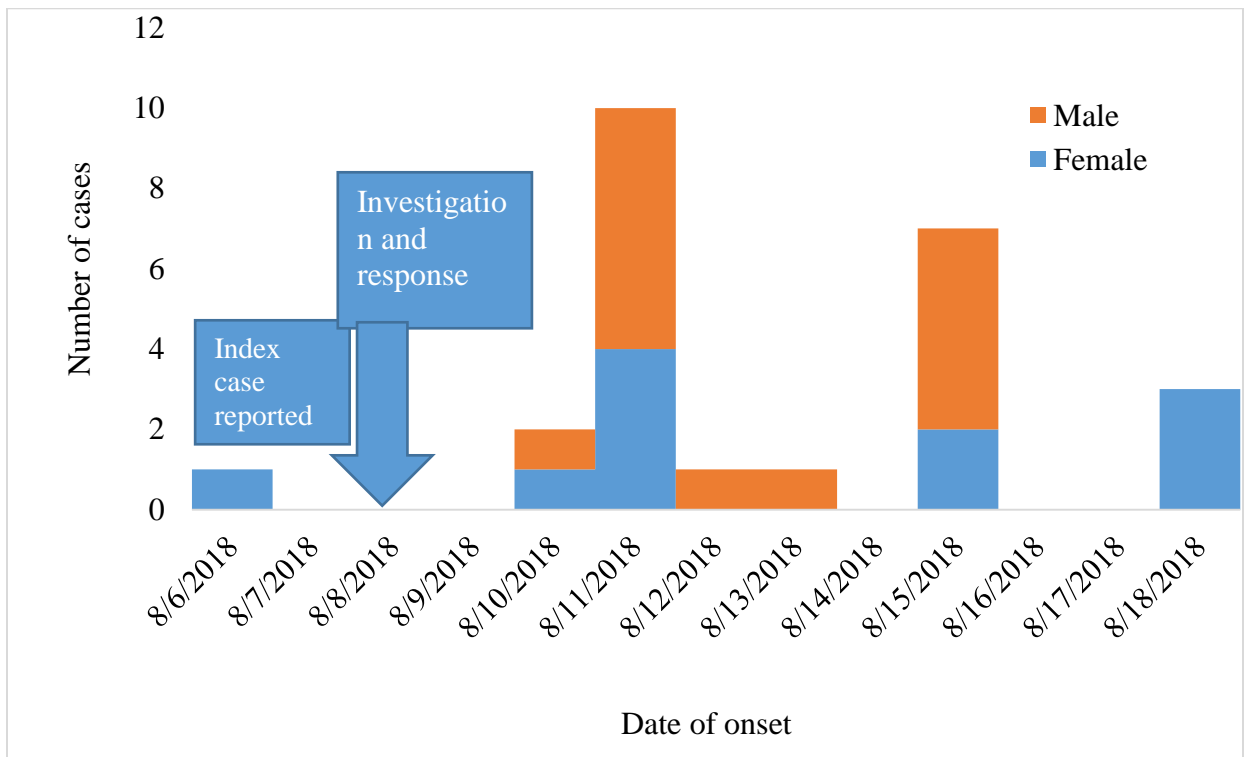


Figure 19 Epicurve of suspected chicken pox cases by date of onset of rash in Yirga chefe town, August 2018

**Discussion**

This outbreak was reported from in internally displaced population sites in Yirga chefe town between 6<sup>th</sup> and 18<sup>th</sup> 2018 with zero death. Since chicken pox is airborne diseases internally displaced sites, schools and camps are favorable conditions for the easy spread of the disease. Similar outbreaks of chicken pox outbreaks has happened in United States in 2017 in a state of Minnesota reported 390 cases most of most of the cases were unvaccinated against chicken pox (6). In our country chicken pox vaccination is not introduced yet, thus being unvaccinated might be one risk factor for the occurrence of this outbreak. A systematic review conducted in 13 African countries for chicken pox cases between 1974 and 2015 revealed that chicken pox cases are being reported in Africa (7).

In this outbreak the most of the cases, 22 (88%) were children under the age of Fifteen, it is supported by in a study conducted in India in Muzaffarpur district in Bihar in 10 blocks between Jan 2016 and Feb 7 2016, which identified a total of 234 cases and 2 deaths were reported, in this study the most affected age group was age group 1 to 14 which shows the commonest age group to be affected is under fifteen (7). In another study in Guinea Bissau in 2005 reported that the most affected age group was 1 to 4 in the country (11). Varicella primarily affects children, with approximately 90% of cases occurring before the age of 15 years (9). The most common clinical manifestation during this outbreak were rash and fever. All (100%) of the reported cases were presented with maculopapular rash and 23 (92%) of the reported cases were presented with fever. This study is also supported by a study conducted in India in 2016 which revealed 100% of the reported cases and 88% reported cases were presented with rash and fever respectively (7). Majority (54%) of the reported cases were males in this outbreak, which is similar with a study conducted in India which revealed most of the reported cases were males in Mushahri and Meenapur districts (7). In this outbreak, all of the reported cases were treated symptomatically in mobile clinics with no complications and deaths, this might be due to early detection and treatment of cases. Thus, Prompt identification, investigation, and control of varicella outbreaks are important in controlling and responding such outbreaks in the future. The season this outbreak occurred was relatively cold season in Ethiopia which favors the transmission of the disease easily, chicken pox more likely to occur in cooler seasons in tropical regions (5).

Most of reported cases in this outbreak were from two IDP sites and majority of the reported cases were males. All of the cases presented with rash and most of the cases were presented with rash. Most of the reported cases were under the age of fifteen. The woreda health office should strengthen routine surveillance since camps and schools are favorable conditions for the occurrence of such outbreaks and Ministry of health should consider incorporating chicken pox vaccine in routine immunization schedule.

**Consents for Publication:**

Not applicable for this article as there is no individual images, or videos or information is included.

**Availability of data:**

The data used to prepare this article is available on the corresponding author up on reasonable request.

**Competing interest:**

All authors declared that they have no competing interest.

**Funding:**

No separate budget line was allocated for this activity.

**Authors' contribution:**

HT proposed and designed the analysis, carried out data cleaning, analysis and write-up of the manuscript. All authors have participated in the interpretation of findings and review of the manuscript.

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## CHAPTER VI-ABSTRACTS FOR SCIENTIFIC PRESENTATION

### 6.1 Surveillance Data Analysis on Influenza like Illness in Shiro Meda Health Center sentinel site, 2013 to 2017, Addis Ababa, Ethiopia, 2018

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**Introduction:** Influenza is a respiratory illness caused by influenza virus that can spread very easily from person to person. The virus is spread through the air by the exchange of fluid droplets from the mouth or nose of one person to another person due to sneezing and coughing. The manifestations of illness (fever, cough, sore throat) caused by the influenza virus are usually mild to moderate but for some it could be severe, leading to hospitalization and even death. In Ethiopia, influenza sentinel surveillance has been launched in 2008 with one ILI sentinel site (Shiromeda Health Center) and one SARI sentinel site (Yekatit 12 Hosp). Ongoing analysis of surveillance data is important for detecting outbreaks and unexpected increases or decreases in disease occurrence, monitoring disease trends, and evaluating the effectiveness of disease control programs and policies. This study was conducted to characterize ILI cases in person, place and time, determine the positivity rate of the site and put possible recommendations based on the findings.

**Methods:** We reviewed five years (2013 to 2017) data of Shiro meda health center Influenza sentinel site. Data was cleaned prior to analysis. Descriptive data analysis by person, place and time was done using Microsoft excel 2013. Incidence rate was calculated using number of cases reported per year per 100,000 populations. Result was displayed using graphs and tables.

**Results:** a total of 1489 cases of ILI/SARI were reported from Shiro meda health center for the last five years, of which 950 (64%) are females and the remaining 539 (46%) are males. Out of the total reported cases 98% were from Gullele sub-city. The most affected Age group were 15-44(49%) followed by 5-14(32%). The positivity rate of the site was 30.31%. Of those positive cases for Influenza 20% was Influenza type A and the remaining were Influenza type B. some important characteristics of patients are missing.

**Conclusion:** Almost all of the cases were reported from Gullele sub-city of Addis Ababa city. the most affected age group were 15-44 followed by 5-14. Influenza type A and B are circulating in Shiro meda health center sentinel site. Regular data analysis and supervision is required to improve the quality of data produced in the sentinel site.

**Key word:** Influenza, sentinel site, data analysis, Shiro meda health center, Ethiopia

## 6.2 Measles Outbreak Investigation of Degahabour city, Somali region, March 2019

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### Abstract

**Introduction:** Measles is an acute, highly contagious viral disease caused by measles virus. It is characterized by small red dots appearing on the surface of the skin, irritation of the eyes (especially on exposure to light), coughing, and a runny nose. About 12 days after first exposure, the fever, sneezing, and runny nose appear. Coughing and swelling of the neck glands often follow. It is transmitted primarily by respiratory droplets or airborne spray to mucous membranes in the upper respiratory tract or the conjunctiva. The risk factors for measles virus infection include: infants who lose passive antibody before the age of routine immunization, children with vitamin A deficiency and immunodeficiency due to HIV or AIDS, leukemia, alkylating agents, or corticosteroid therapy, regardless of immunization status and children who travel to areas where measles is endemic or contact with travelers to endemic areas. Malnourished and young children are at higher risk of developing complications and mortality from measles infection. This outbreak investigation was conducted to describe the magnitude and assess the most likely risk factors for the occurrence of this outbreak.

**Methods:** We conducted unmatched 1: 2 case control study in Degahabour city of Somali regional state. We interviewed a total of 90 participants. Data was collected using interviewer administered structured questionnaire. Active case search in the community and patient charts review was conducted. Line listing of reported cases was also implemented. Data was

entered in Microsoft excel and SPSS and descriptive and analytic analysis was done. Results were displayed using tables and charts.

**Results:** A total of 166 cases with zero death were reported starting from February 2 to March 17 2019. Out of those cases, 117 (70%) were males and the remaining 49 (30%) were females. The overall attack rate was 32.5 per 100000 population in the city. Most of the cases, (97%) were not vaccinated against measles. being unvaccinated (AOR, 45.5, CI:5.62-368.42) and knowledge on measles transmission (AOR, 5.33, CI:1.33-14.17) were independently associated to contract measles in this outbreak compared to their counter parts.

**Conclusion:** Being unvaccinated and did not knowledge the transmission methods were independently associated to contract measles. Strengthening the routine immunization activities is recommended to prevent future outbreaks in the area.

**Key words:** Measles, Outbreak, Degahabour, Investigation

### 6.3 Suspected chicken pox outbreak investigation and response in Yirga chefe town, SNNPR, Descriptive study, August 2018

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#### Abstract

**Introduction:** Chicken pox or varicella is an acute viral infectious disease of childhood caused by varicella-zoster virus. Humans are the only known hosts for this virus. The major route of transmission is airborne, however, transmissions via aerosols or direct contact with blister fluid have also been reported. The primary infection presents as fever and exanthematous rash. Clinically apparent infection usually provides lifelong immunity. The disease is usually acute and self-limiting but occasionally can lead to secondary infections like pneumonia, encephalitis, and secondary bacterial infections. Varicella is vaccine preventable disease. An estimated 4.2 million cases and 4200 deaths occur annually worldwide. This outbreak investigation was conducted to describe chicken pox cases in terms of person, place and time from 6 to 11 August 2018.

**Methods:** We conducted a descriptive study in the Yirga cheffe town. We line listed all reported cases which contains sociodemographic characteristics of patients and signs and symptoms. The line listed data were analyzed with person, place and time. We have visited the reporting IDP sites during investigation. Cases were treated symptomatically in mobile clinics.

**Results:** A total of 25 suspected cases of chicken pox were reported between 6<sup>th</sup> and 11<sup>th</sup> of August 2018 from Yirga cheffe town IDP sites. Among reported cases 96% were reported from two IDP sites and one case was from the community. Out of the total reported cases 14(56%) were males while the remaining 11 (44%) were females with regard to sex. 22(88%) of the total reported cases were children under the age of fifteen.

**Conclusion:** The most affected age group in this outbreak was under the age of fifteen. Males were more affected than females in this outbreak. Unavailability not introduction of chicken pox vaccine in our country might be a risk for the occurrence of this outbreak.

**Recommendation:** Strengthening routine surveillance in the IDP sites is recommended. MoH shall consider the vaccine in the country. MoH should prepare guidelines and manuals for response of outbreaks.

**Key words:** Chicken pox, outbreak, Yirga cheffe, investigation, internally displaced population

## CHAPTER VII- DISASTER SITUATION RESPONSE REPORT

### 7.1 Disaster response and Risk Management among internally displaced population in SNNPR, Gedeo Zone, August 2018

#### Abstract

**Introduction:** Internally displaced people have not crossed a border to find safety, they stay with their home country. Gedeo Zone is one of the 15 Zonal administration divisions of Southern Nations, Nationalities and Peoples Regional State (SNNPR). Currently, the zone has one referral hospital, three district hospitals 35 health centers, 147 health posts, and 12 private and four NGO clinics. The zone is affected with IDPs from Oromia Region of East and West Guji Zones.

**Methods:** A community based descriptive cross-sectional study design was implemented to assess health and health related needs of the displaced community. The data were collected from key informants from IDPs collective sites and concerned government officials and by site visit. The data was analyzed by micro soft excel 2016 and presented by narrations, tables and graphs.

**Results:** A total of 126,507 households, 863,296 population, were displaced from West and East Guji Zones of Oromia Region to Gedeo Zone of SNNPR due to conflict. Nineteen temporary clinics and one temporary health center were established, additionally eight mobile health and nutrition teams were deployed to give health services for IDPs. A total of 127,428 cases were treated. Of those, intestinal parasites (23,310 cases) is the leading cause of morbidity among IDPs followed by pneumonia (21,793 cases) and diarrheal diseases (20,827 cases). A total of 150,685 and 86,267 six months to five years were screened for malnutrition among Host and IDP community respectively. A total of 51,104 and 41,989 pregnant and lactating mothers were screened for under nutrition among IDPs and host community. The ratio of latrine seat to displaced population was one latrine seat for 738 individuals and also the ratio of water supply per day per person was less than one liter of water per person per day. A total 549,710 children of host community and 271,845 children of IDPs were vaccinated for measles during vaccination campaign.

**Conclusion:** The major causes of morbidity among displaced population were diarrheal diseases and which might be related to hygiene and sanitation conditions in the area. The coverage of

latrine and safe water supply for displaced populations were also below the recommended standard.

**Key words:** Internally displaced population, Gedeo

## **Introduction**

Internally displaced people have not crossed a border to find safety, they stay with their home country. Gedeo Zone is one of the 15 Zonal administration divisions of Southern Nations, Nationalities and Peoples Regional State (SNNPR). The zone is located in the Southern part of the region and 365 km far from Addis Ababa, the capital city of Ethiopia and 96 km from Hawassa city, the capital of the South Nation Nationality and People Regional (SNNPR). The Zone is bordered by Guji Zones of Oromia regional state in the South and West, Sidama Zone of SNNP region in the North and Guji Zone of Oromia regional state in the East. The zone covers a total area of 5,890.2 sq km and organized in six woredas, two town administrations, and 133 rural and 17 urban kebeles.

The highest population density woreda (Wonago Woreda) in the country is found in this zone. Based on the Central Statistical Agency (CSA, 2007) report, the 2010 EFY projected total population of the zone is 1,138,429 of whom 557,830 are men and 580,598 are women (1). The estimated crude population density of the zone is 185 persons per sq km. Geographical location of the zone is found between 50° 84' - 6° 43' N latitudes and 38° 08' - 38° 44' E longitudes.

Currently, the zone has one referral hospital, three district hospitals 35 health centers, 147 health posts, and 12 private and four NGO clinics.

Relatively little is known about the extent and nature of conflict-induced internal displacement in the region. In the last three years number of small-scale conflicts and displacement situations resulted in the region. Areas bordering Oromia Region especially Gedeo, Sidama, and Segen zones affected with conflict induced displacements. Currently Gedeo Zone severely affected with conflict induced displacement than ever existed displacement in the Zone. The IDPs are from Oromia Region of East and West Guji Zones. These displaced community currently settled at Gedeb, Kochere, Yirgachefe, Wonago, Bulle and Dilla Zuria Woredas and Yirgachefe and Dilla town administrations.

## **Objectives**

### **General objective**

To assess health and health related risks and respond accordingly among internally displaced population found in Gedeo Zone, SNNPR, August 2018

### **Specific objectives**

- To determine the health and health related needs of displaced population
- To predict the possible disease outbreak and prepare for it based on the situational analysis
- To ensure provision of appropriate health care for displaced community
- To support in response activities in the area

### **Methods**

#### **Study area and period**

The IDPs risk assessment and response activities were performed in six Woredas (Wonago ,Kochere, Gedeb, Yirga chefe, Bulle and Dilla zuria) and two town administrations (Dilla and Yirga chefe) of Gedeo Zone, Southeren nations ,nationalities and people region, South East Ethiopia. This assessment and response was conducted from June to August 2018.

#### **Study design**

A community based descriptive cross-sectional study design was implemented to assess health and health related conditions of the displaced community.

#### **Data collection tool and procedure**

The data were collected from key informants from each IDP sites and concerned government officials including woreda health office and zonal health department through unstructured questionnaire.

Site visit/observation was also one of the data collection methods used to determine the environmental condition of the IDP sites and to ensure the existence of health care services in the settlement sites.

#### **Data analysis and presentation of report**

The quantitative data collected from IDPs were entered to and analyzed by Micro soft excel 2016, while the data from key informant interview was presented thematically. The report was presented by narrations, tables and graphs.

## Results

### General IDPs situation

A total of 126,507 households (HHs), 863,296 individuals, were displaced from West and East Guji Zones of Oromia Region to Gedeo Zone of SNNPR due to conflict. Of those internally displaced population (IDPs) 435,595 (50.1%) were males, 117,934 (13.7%) were children under five years of age and 45,332 (5.3%) were pregnant and lactating women (PLW). The displaced population were settled in 78 collective sites as well as living mixed in the host community of six Woredas and two town administrations of Gedeo zone. Wonago Woreda was the only woreda which has no any IDP settlement site, all the displaced population were living mixed with in the host community.

*Table 18: Distribution of IDP by Woreda and sex in Gedeo zone, SNNPR, August 2018*

Woreda Name	Number of IDP sites	Number of HH	Number of IDPs	Male (%)	Female (%)	U5 Children (%)	PLW (%)
Bulle	10	8,795	56,483	27,983(49.5)	28,500(50.5)	9,528(16.9)	5,836(10.3)
Dilla Town	3	9,789	62,511	32,005(51.2)	305,069(48.8)	9,687(15.5)	2,317(3.7)
Dilla Zuria	1	3,044	20,325	10,012(49.3)	10,313(50.7)	3,505(17.2)	1,626(8)
Gedeb	33	48,914	377,167	189,240(50.2)	187927(49.8)	41680(11.1)	20,024(5.3)
Kochere	19	17,795	103,263	50,982(49.4)	52,281(50.6)	9,753(9.4)	5,513(5.3)

Wonago	0	5,043	28,402	14,807(52.1)	13,595(47.9)	9,173(32.3)	2,726(9.6)
Y/chefe Town	4	8,186	39,538	20472(51.8)	19,066(48.2)	7,218(18.3)	1,215(3.1)
Y/chefe W	8	24,941	175,580	90,094(51.3)	85,486(48.7)	27,390(15.6)	60,75(3.5)
<b>Total</b>	<b>78</b>	<b>126,507</b>	<b>863,269</b>	<b>435,5959(50.5)</b>	<b>427,684(49.5)</b>	<b>117,934(13.7)</b>	<b>453,32(5.3)</b>

### Health facilities

There were 35 health centers, three primary hospitals and one referral hospital in all Woredas of Gedeo Zone. Two health centers (one in Gedeb Woreda and one in Kochere Woreda) and four health posts (two in kochere Woreda, one in Gedeb Woreda and one in Yirga chefe Woreda) were destroyed due to the conflict. Nineteen temporary clinics and one temporary health center were constructed in all Woredas, additionally eight mobile health and nutrition teams were deployed to give health service for the displaced population.

*Table 19 Distribution of existing and newly established health facilities for IDP response, Gedeo Zone, August 2018*

Woreda/Town	Number of temporary Clinics established	Number of existing Health Centers	Number of temporary Health Centers established	Number of existing Primary Hospitals
Bulle	1	5	0	1
Dilla T	3	1	0	0
Dilla Zuria	1	5	0	0
Gedeb	1	5	1	1
Kochere	2	6	0	0
Wonago	0	5	0	0
Y/chefe T	3	1	0	1

Y/chefe W	8	7	0	0
<b>Total</b>	<b>19</b>	<b>35</b>	<b>1</b>	<b>3</b>

### Case management

Case management services were being given continuously in all existing and temporary established health facilities by health professionals mobilized from different health facilities in the zone and 244 health professionals who were deployed from different zones of SNNPR Health Bureau.

A total of 127,428 cases of IDPs were treated. Of those, intestinal parasites (23,310 cases) was the leading cause of morbidity among IDPs followed by pneumonia (21,793 cases) and diarrheal diseases (20,827 cases). Among chronic diseases 42 TB cases and 39 hypertension cases were identified and started their treatment.

*Table 20 Distribution of top ten diseases by woreda in Gedeo Zone IDPs of SNNPR, August 2018*

Woreda Name	IP	Pneumonia	Diarrheal disease	AFI	Scabies	URTI	Typhoid	Dyspepsia	Conjunctivities	UTI
Bulle	3,244	2,019	1,374	1,059	230	39	0	564	437	757
Dilla T	4,378	3,129	2,644	3,938	405	2,235	0	1,185	341	538
Dilla Zuria	606	576	348	77	366	35	0	17	51	26
Gedeb	5,371	7,546	8,906	3,257	1,918	1202	922	613	1,096	462
Kochere	1,348	746	984	1,105	1,043	528	405	159	215	224
Wonago	428	1,206	70	578	395	391	720	101	33	170
Y/chefe T	1,743	1,333	777	817	673	258	177	137	179	319
Y/chefe W	6,192	5,238	5,724	4,973	3,505	1,936	2923	965	1,386	398
<b>Total</b>	<b>23,310</b>	<b>21,793</b>	<b>20,827</b>	<b>15,804</b>	<b>8,535</b>	<b>6,624</b>	<b>5,147</b>	<b>3,741</b>	<b>3,738</b>	<b>2,894</b>

## **Surveillance**

Routine surveillance system like weekly report of weekly reportable disease/events and immediately notification of immediately reportable diseases/events were in place. 25 cases of chicken pox were reported from Yirgachefe town with no death from August 6<sup>th</sup> to 18<sup>th</sup> 2018. All of reported cases were treated by Mobile clinics. Of the total reported cases, 14 (56%) were males and the remaining 11 (44%) were females by sex and 22 (88%) of the cases were children below the age of fifteen. Of those cases, 24 (96%) were reported among IDPs and the remaining one case was reported from the host community. All immediately reportable diseases/conditions were tracked on daily basis and in addition to those cases meningitis and chicken pox were included under the daily tracked diseases. The surveillance structure has a focal person at IDP site level, cluster focal person at health center/hospital level, PHEM officers at woreda level and zonal level.

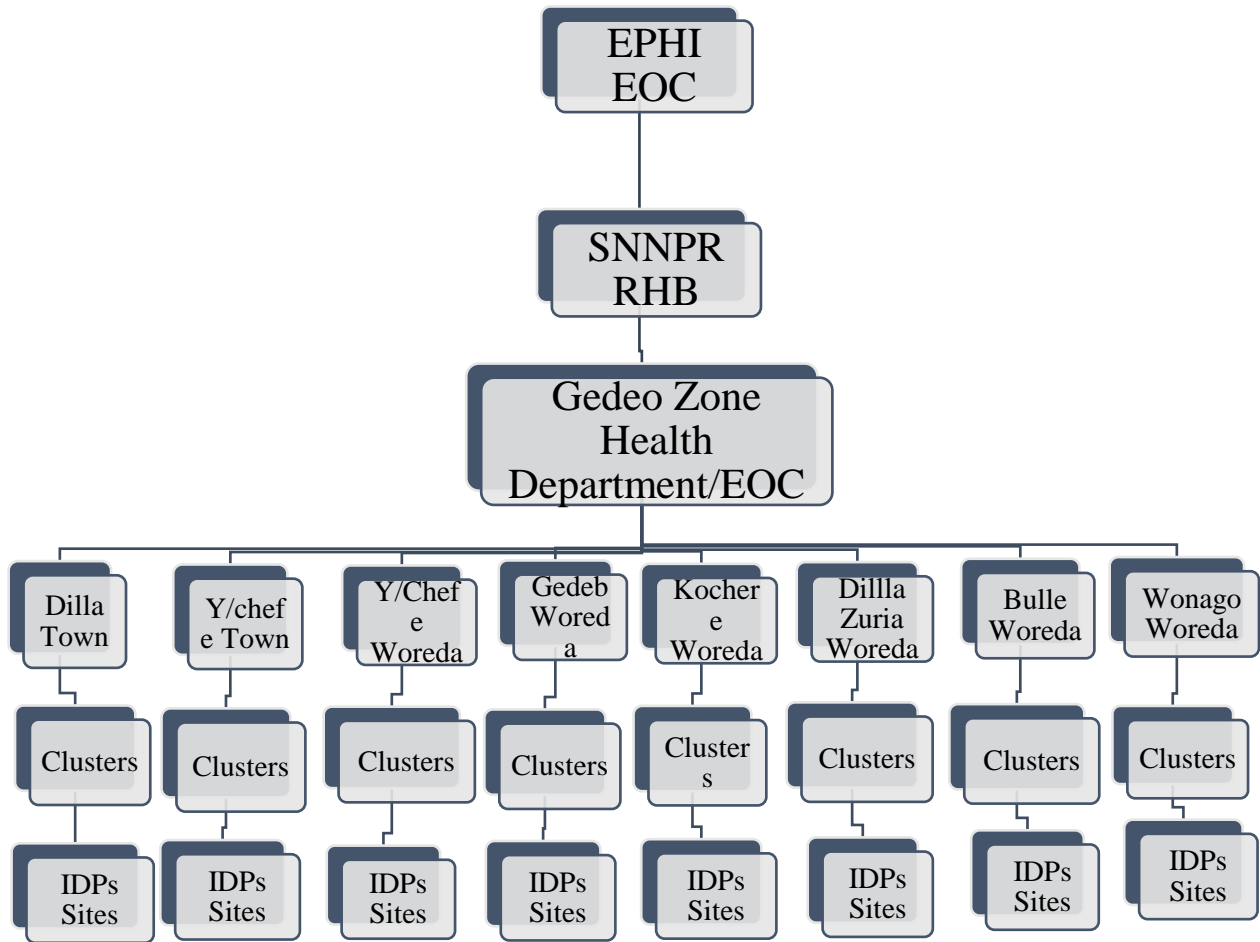


Figure 20: Information Management System (IMS) structure of Gedeo Zone, SNNPR IDPs response, August 2018

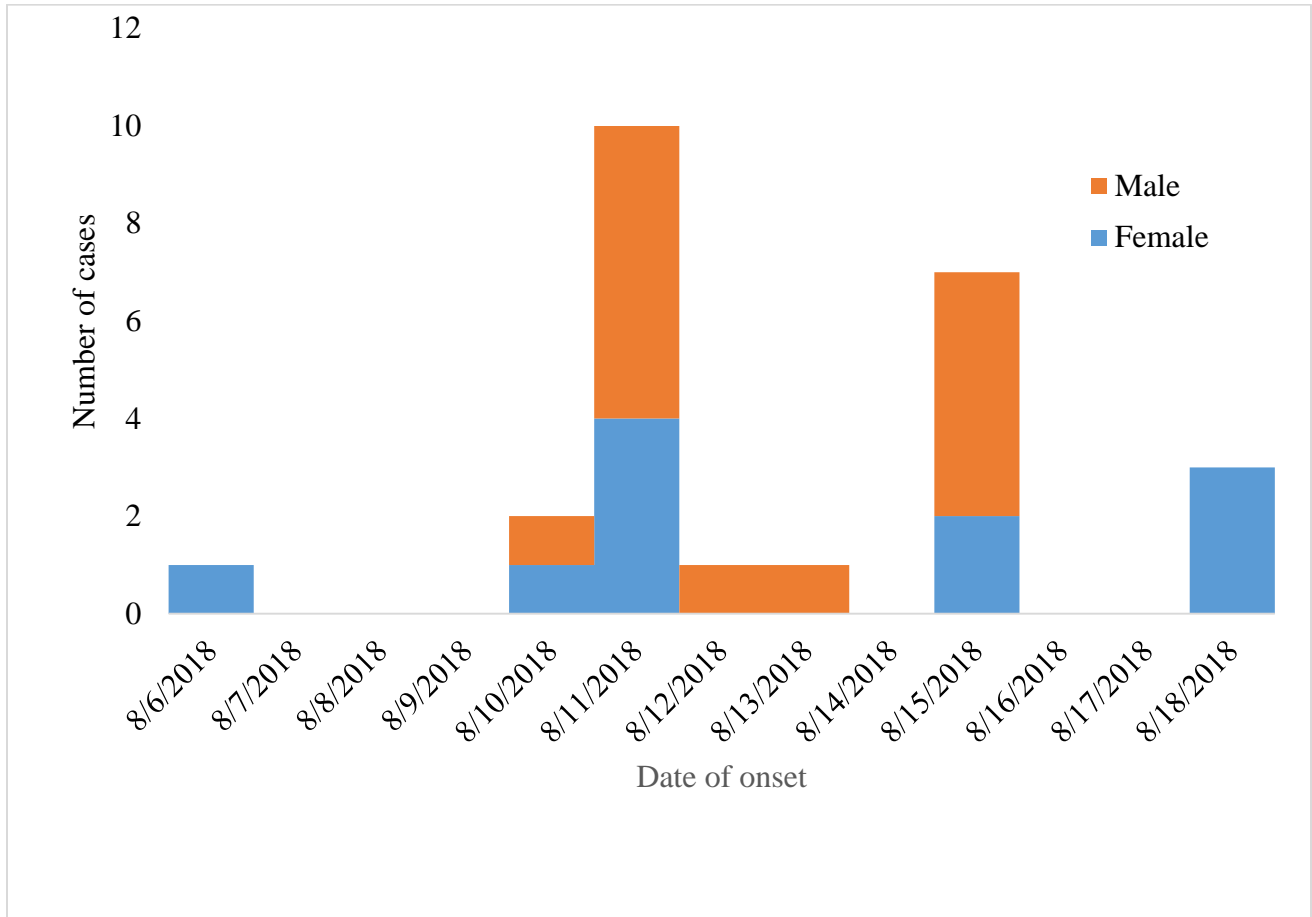


Figure 21: Distribution of chicken pox cases by date of onset and sex in Yirga chefe town, Gedeo zone, SNNPR, August 2018

## Nutrition

### General food distribution

Food distribution were done by national disaster risk management commission of Ethiopia in collaboration with World Vision and world food program (WFP). The distribution includes oil, maize flour and wheat flour. Additionally, non-food items (NFI) like kitchen set, blanket and mattress were distributed for IDPs.

### Nutritional screening

Nutritional screening was done in all IDPs as well as host communities of the whole Woredas of Gedeo Zone. A total of 150,685 and 86,267 children six months to five years of age in host

community and IDP respectively and 51,104 and 41,989 pregnant and lactating mothers among host and IDP community respectively were screened for malnutrition.

*Table 21: nutritional screening result for children under five years of age and PLW by woreda among host communities Gedeo zone SNNPR, August 2018*

<b>Woreda name</b>	<b>Number of children screened</b>	<b>Number of children with MAM (%)</b>	<b>Number of children with SAM (%)</b>	<b>Number of PLW screened</b>	<b>Number of PLW with MUAC &lt;23 cm (%)</b>
Bule	11,326	1,416 (12.5)	313 (2.8)	4,601	2,202 (47.9)
Dilla Town	12,567	88 (0.70)	20 (0.2)	3,065	88 (2.9)
Dilla Zuria	16,513	2,079 (12.6)	39 (0.2)	2,595	994 (38.3)
Gedeb	22,300	2,211 (9.9)	234 (1)	13,263	5,081 (38.3)
Kochore	21,528	1,434 (6.7)	127 (0.6)	8,119	2,404 (29.6)
Wonago	23,659	2,672 (11.3)	278 (1.2)	6,604	2,069 (31.3)
Y/cheff woreda	39,865	9,591 (24.1)	508 (1.3)	11,168	4,404 (39.4)
Yirgachefe TA	2,927	534 (18.2)	28 (1)	1,689	505 (29.9)
<b>Total</b>	<b>150,685</b>	<b>20,025 (13.3)</b>	<b>1,547 (1)</b>	<b>51,104</b>	<b>17,747 (34.7)</b>

*Table 22: Nutritional screening result for children under five years of age and PLW by woreda among Gedeo zone IDPs, SNNPR, August 2018*

<b>Woreda Name</b>	<b>Number of children screened</b>	<b>Number of children with MAM (%)</b>	<b>Number of children with SAM (%)</b>	<b>Number of PLW screened</b>	<b>Number of PLW with MUAC &lt;23 cm (%)</b>
Bule	5,984	1,353 (22.6)	204 (3.4)	3,694	1847 (50)
Dilla Town	7,978	309 (3.9)	64 (0.8)	1,867	121 (6.5)
Dilla Zuria	3,593	735 (20.5)	13 (0.4)	698	301 (43.1)
Gedeb	28,435	2927 (10.3)	441 (1.6)	20,965	7536 (35.9)

Kochore	10,479	844 (8.1)	73 (0.7)	3,464	372 (10.7)
Wonago	7,377	1,312 (17.8)	88 (1.2)	3,016	980 (32.5)
Y/cheff woreda	18,794	7340 (39.1)	500 (2.7)	6,501	3384 (52.1)
Yirgachefe TA	3,733	408 (10.9)	50 (1.3)	1,784	781 (43.8)
<b>Total</b>	<b>86,373</b>	<b>15,228 (17.6)</b>	<b>1,433 (1.7)</b>	<b>41,989</b>	<b>15,322 (36.5)</b>

### Selective food distribution (Targeted supplementary feeding, TSFP)

Targeted supplementary feeding was provided to children six month to five years of age, pregnant and lactating women (PLW) with support of World food program and peoples with chronic disease based on the screening result. This program was run by NDRMC (National Disaster and Risk management commission) and Gedeo Zone health Department with the World Food Program (WFP).

### Water supply, hygiene and sanitation (WaSH)

Mass chlorination of all water schemes found in Gedeo Zone was performed. Water tracking for IDPs settlement sites were done by using seven water trackers. The ratio of a latrine seat to displaced population was one latrine seat for 738 individuals and also the ratio of water supply per day per person was less than one litter of water per person per day.

*Table 23: Distribution of WaSH supplies and facilities distributed for IDPs response in Gedeoa zone SNNPR, August 2018*

Woreda Name	Existing Latrine(total number of seat)	Number of latrines constructed(total number of seat)	Number of existing rotos/tankers available	Number of rototankers distributed	Number of water trucks available	Number of soaps distributed	Number of water guard/chemicals distributed
Bulle	11(22)	22(67)	4	11	1	37,867	1,000

Dilla T	16	21(167)	6	10	1	111389	81,848
Dilla Zuria	1 (3)	4(10)	1	9	1	385,948	345,948
Gedeb	27(54)	42(415)	13	44	1	507,426	62,600
Kochere	22(44)	66(117)	3	35	1	151,305	2,131,132
Wonago	0	0	0	1	0	22,092	19,950
Y/chefe T	5(19)	5(19)	0	1	1	24,350	303,000
Y/chefe W	12(59)	56(159)	6	15	1	217,343	139,900
<b>Total</b>	<b>94(217)</b>	<b>216(954)</b>	<b>33</b>	<b>126</b>	<b>7</b>	<b>1,457,720</b>	<b>3,085,378</b>

### **Social mobilization and Health Education**

Social mobilization and health education were the basic part of IDPs response. FMoH, UNICEF, USAID (transform PHC), ZHD and other partners were the main actors of this response activities. A total of 2700 posters, (1,500 for scabies and 1200 for AWD), and 17,500 brochures, (12,000 for scabies and 5,500 for AWD) were distributed to IDP community.

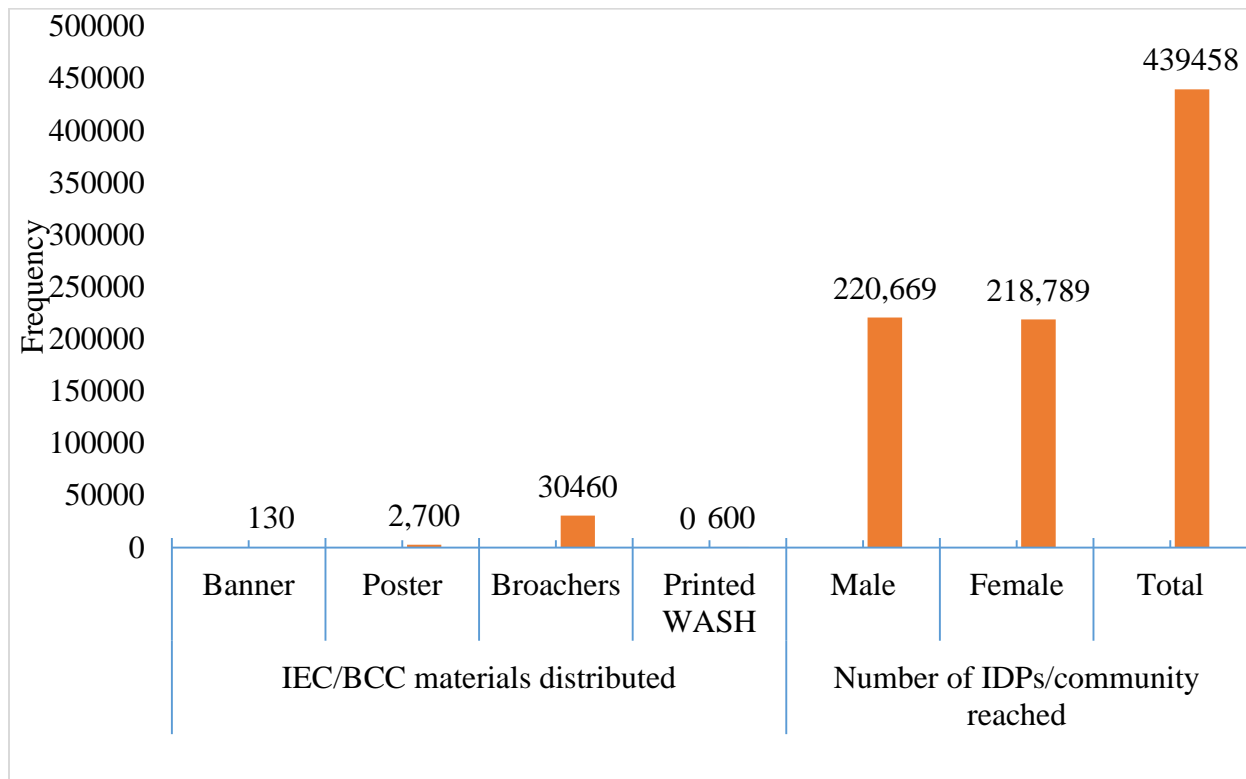


Figure 22: Distribution of IEC/BCC materials distributed to IDPs and of individuals addressed by social mobilization in Gedeo zone, SNNPR, August 2018

### Immunization activities

Diseases outbreaks are inevitable in displaced population and refugee camps and will be the worst if happened. As part of disease prevention activities, immunization activities were conducted among IDPs and hosting community. To prevent this, Measles immunization campaign targeted for 6 months to 15 years children was performed for both IDPs and host communities in Gedeo Zone from 4<sup>th</sup> August to 10<sup>th</sup> August 2018. A total of 549,710 children in host community and 271,845 children in IDP community were addressed by the vaccination campaign. Deworming and vitamin A supplementation was also given in integration with the Measles immunization campaign. Some Woredas in the host community (Bulle and Yirga chefe) achieved more than hundred percent, this was due to under planning by health officials in the micro plan. Some woredas (Yirga chefe town, kochere and Gedeb) as well achieved below the standard target, this was also due to overplanning of target population during micro plan.

Table 24: coverage of measles immunization campaign by woreda for IDPs and host community in Gedeo zone, SNNPR, August 2018

Woreda name	Total target children of IDPs	Total Vaccinated IDPs	Coverage for IDPs (%)	Total target children of host community	Total Vaccinated host community	Coverage for host community (%)
Bulle	21,545	24,468	113.6	65,862	69,713	105.8
Dilla Town	29,380	28,557	97.2	42,833	41,541	97.0
Dilla Zuria	9,554	8,149	85.3	60,925	60,249	98.9
Gedeb	170,817	90,800	53.2	89,057	85,287	95.8
Kocho re	49,135	31,326	63.8	82,090	84,596	103.1
Wonago	19,355	19,444	100.5	73,449	74,488	101.4
Yirgac hefe Town	23,708	10,633	44.9	10,948	12,114	110.7
Yirgac hefe woreda	62,935	58,468	92.9	122,761	121,722	99.2
<b>Zonal</b>	<b>386,428</b>	<b>271,845</b>	<b>70.3</b>	<b>547,924</b>	<b>549,710</b>	<b>100.3</b>

## Discussion

There was a total of 36 health centers, including one temporary health center and three primary hospitals which have been serving for both host community and IDPs. When the total population to health facility ratio is computed shows, 36 health centers for 2,029,065 people (1 Health Center to 56,363 individuals) and three primary hospitals for 2,029,065 people (1 primary hospital to 676,355 individuals), but WHO recommends that 1 Health Center can serve for 25,000 to 40,000 individuals and 1 primary hospital can serve for 60,000 to 100,000 individuals in order to maintain the quality of health care (2). Similarly, only 19 temporary clinics, which can serve as a Health Post level, were established for 863,269 individuals (i.e 1 for 45,436 individuals), which did not

fulfill FMOH standard of one Health post for 3,000 to 5,000 individuals (3).

Among all cases treated in IDPs, intestinal parasite case (23,310 cases) is the leading cause of morbidity among IDPs followed by pneumonia (21,793 cases) and diarrheal diseases (20,827 cases), which may indicate deterioration of hygiene and sanitation practices in IDP sites as well as either shortage of WaSH supplies including water supply or poor knowledge and practice of hygiene and sanitation by the community.

The ratio of one sit of latrine to displaced population is a sit for 738 individuals and also the ratio of water supply per day per person is less than one liter of water per person per day, which is less than WHO standard as well FMOH recommendation of one sit of latrine for 20 individuals and 20 to 30 liters of safe water supply per person per day (4).

The measles vaccination coverage shows that Bule, Wonago and Kochere Woredas, Yirgachefe Town and also zonal coverage in host community and Bule and Woonago Woredas in IDPs were above 100%, which may be due to under estimation of the target population. All woredas achieved above 95% coverage, which is the minimum required standard, in host community where as Dilla Zuria, Gedeb, Kochore, Yirgachefe Woredas and Yirgachefe Town as well as at Zonal level the coverage is below 95% among IDPs, which may be due to over estimation of target population, mobility of IDPs during the campaign or IDPs may be vaccinated as a host community especially those IDPs found in the host community.

## **Conclusion**

The health service coverage of Gedeo Zone is below the minimum standard for the displaced population

The major causes of morbidity among displaced population were diarrheal diseases and which may be related to hygiene and sanitation conditions. The coverage of latrine and safe water supply for displaced populations were also below the recommended standard

Measles vaccination coverage were above the minimum requirement in all woredas as well as at zonal level for the host community but the coverage was below this minimum requirement among four Woredas and one town administration as well as at zonal level

## **Recommendations**

- RHB and zonala health department should improve the quality of health care being given in the IDP sites by allocating additional work force in the arae
- Water hygiene and sanitation standards should be improved in the araea.
- Active surveillance should be maintained in all IDP sites and Woreda health offices collective centers to identify any diseases outbreaks or any other public health emergencies as early as possible
- Regular monitoring of response activities and inventory of supplies is necessary to prevent stock out of any supply in case of Emergencies at all levels
- Rehabilitation plan for returnees should be developed by Zonal health department and other stakeholders as early as possible

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## CHAPTER VIII- PROPOSAL FOR EPIDEMIOLOGIC RESEARCH

### 8.1 Knowledge, Attitude and Practice towards Insecticide treated bed nets use in Bure zuria district, community based cross-sectional study, June 2019

#### Executive Summary

**Introduction:** Malaria is an infectious vector borne disease caused by four common species of the protozoan parasites of the genus Plasmodium. Plasmodium falciparum, Plasmodium vivax, Plasmodium ovalae and Plasmodium malariae. It's one of the leading causes of morbidity and mortality in the world especially in sub-Saharan countries including Ethiopia P. falciparum is the most deadly form and predominantly occurring followed by P. vivax. Malaria is one of the major causes of morbidity and mortality in tropical and subtropical countries. It is acutely manifested by nonspecific symptoms such as lack of a sense of well-being, headache, and fatigue, and abdominal discomfort, muscle aches followed by classic malarial paroxysms of spiking fever, chills, and rigors. Malaria is mainly seasonal with unstable transmission in the highland fringe areas and of relatively longer transmission duration in lowland areas, river basins and valleys. The challenge now is maintaining the existing high LLIN coverage and increasing utilization rates. Further, targeting IRS based on an epidemiologically sound, affordable and sustainable approach continues to be a challenge. Thus, this assessment will be conducted to assess the knowledge, attitude and practice of Burie zuria district residents towards insecticide treated bednets in July 2019.

**Methods:** Community based cross sectional survey will be conducted using a structured questionnaire. Households in the woreda will be a study units. Kebeles will be selected based on their malaria case load. Data will be collected by trained health workers from local health facilities. The collected data will be entered to Excel and descriptive analysis will be done. The study will be conducted in July 2019.

**Budget:** The total budget required for this survey will be 28,000 Ethiopian birr including per diem for principal investigator, data collectors, driver and for fuel costs.

## Introduction

Malaria is an infectious vector borne disease caused by four common species of the protozoan parasites of the genus *Plasmodium*. *Plasmodium falciparum*, *Plasmodium vivax*, *Plasmodium ovalae* and *Plasmodium malariae*. *P. falciparum* is the most deadly form and predominantly occurring followed by *P. vivax*. Malaria is one of the major causes of morbidity and mortality in tropical and subtropical countries. Malaria parasites are transmitted to humans by the bite of infected female anopheles mosquitoes that inoculates spindle shaped sporozoites into the human bloodstream. Malaria is a very common cause of fever in tropical countries. It is acutely manifested by nonspecific symptoms such as lack of a sense of well-being, headache, and fatigue, and abdominal discomfort, muscle aches followed by classic malarial paroxysms of spiking fever, chills, and rigors.

Globally, an estimated 3.3 billion people are at risk of being infected with malaria and developing disease, 1.2 billion of which being at high risk. According to the latest estimates, globally, 198 million cases and 584,000 deaths of malaria occurred in 2013 alone. The burden is heaviest in the WHO African region, accounting an estimated 90% of all malaria cases and deaths (3). It is not only cause of suffering and death, but also the cause of many socioeconomic problems.

Approximately 52 million people (68%) live in malaria risk areas in Ethiopia, primarily at altitudes below 2,000 meters. Malaria is mainly seasonal with unstable transmission in the highland fringe areas and of relatively longer transmission duration in lowland areas, river basins and valleys. Historically, there have been an estimated 10 million clinical malaria cases annually. Since 2006, however, cases have reduced substantially. On average, 60%-70% of malaria cases have been due to *P. falciparum*, with the remainder caused by *P. vivax*. *Anopheles arabiensis* is the main malaria vector; *An. pharoensis*, *An. funestus* and *An. nili* play a role as secondary vectors (1).

Ethiopia is also one of the most malaria epidemic-prone countries in Africa. Rates of morbidity and mortality increase dramatically (i.e. 3-5 fold) during epidemics. Since 2005, Ethiopia has scaled-up one of the largest and most ambitious malaria control programs in Africa, designed to support the country's Health Sector Development Plan (HSDP), the NSP and the national child survival strategy, in order to reduce under-five mortality rates by two thirds by 2015. Ethiopia's

malaria control program is currently shifting from the Scale Up for Impact (SUFU) phase to consolidating and refining malaria reduction interventions, through integrated programming for impact. This will involve gradually moving from scaling-up for impact to programming (integrated within the overall health system) for sustainable and equitable long-term impact. The challenge now is maintaining the existing high LLIN coverage and increasing utilization rates. Further, targeting IRS based on an epidemiologically sound, affordable and sustainable approach continues to be a challenge (1).

The national Malaria Control Program (MCP) of Ethiopia developed a strategic plan to reduce the burden of the disease by 25% in the year 2005 and by 50% in the year 2010. To meet the above mentioned goal, early diagnosis and effective treatment, selective vector control and epidemic prevention and control has been the main focus in the country (2).

### **Statement of the problem**

According to the latest *World malaria report*, released in November 2018, there were 219 million cases of malaria in 2017, up from 217 million cases in 2016. The estimated number of malaria deaths stood at 435, 000 in 2017. The WHO African Region continues to carry a disproportionately high share of the global malaria burden. In 2017, the region was home to 92% of malaria cases and 93% of malaria deaths. In 2017, five countries accounted for nearly half of all malaria cases worldwide: Nigeria (25%), the Democratic Republic of the Congo (11%), Mozambique (5%), India (4%) and Uganda (4%). In areas with high transmission of malaria, children under 5 are particularly susceptible to infection, illness and death; more than two thirds (70%) of all malaria deaths occur in this age group. The number of under-5 malaria deaths has declined from 440 000 in 2010 to 285 000 in 2016. However, malaria remains a major killer of children under five years age, taking the life of a child every two minutes. In 2017, nearly half of the world's population was at risk of malaria. Most malaria cases and deaths occur in sub-Saharan Africa. However, the WHO regions of South-East Asia, Eastern Mediterranean, Western Pacific, and the Americas are also at risk. In 2017, 90 countries and areas had ongoing malaria transmission (4).

Some population groups are at considerably higher risk of contracting malaria, and developing severe disease, than others. These include infants, children under 5 years of age, pregnant women

and patients with HIV/AIDS, as well as non-immune migrants, mobile populations and travelers. National malaria control programmes need to take special measures to protect these population groups from malaria infection, taking into consideration their specific circumstances (4).

Thus, malaria is one of the top leading cause of morbidity in the woreda. In our health profile assessment in the woreda, we are interested to assess the knowledge, attitude and practice of Insecticide treated bed Nets (ITNs) in the community.

### **Literature Review**

According to World Health Organizations, world malaria report, an estimated 219 million cases and of malaria occurred worldwide in 2017, WHO African region bearing 92% (200 million cases) of the total reported cases followed by WHO South-East Asia Region (5%) and WHO Eastern Mediterranean Region (2%) (4).

Malaria is a big public health problem in in the world especially in the sub-Saharan African countries including Ethiopia. It's one of the top ten leading causes of OPD visit in health facilities. Sleeping under an insecticide-treated net (ITN) can reduce contact between mosquitoes and humans by providing both a physical barrier and an insecticidal effect. In 2017, about half of all people at risk of malaria in Africa were protected by an insecticide-treated net, compared to 29% in 2010. However, ITN coverage increased only marginally in the period 2015 to 2017 (5). A research done in Dilla town of SNNPR between October and December 2014 revealed that the prevalence of malaria in the area is around 16% (6). In another study conducted in Kola temebein of Tigray region on knowledge and attitude of use of ITNs 82% the respondents claimed that use of ITNs can protect from the bite of anopheles mosquito and only 1.09% responded that use of ITNs protect from the disease malaria. In a study conducted in Areka town southern Ethiopia in January 2015, 75% of the respondents reported that they sleep under insecticide treated bed nets (7). In another study conducted in Adis zemen Hospital in Northwest Ethiopia the overall utilization of ITN among pregnant women was reported 70.8%. In a study conducted in Kola diba town of north Gondar zone showed that 91.9% utilization rate of Insecticide treated bed nets. But enough surveys and researches did not done with regard to use and attitude of the community towards the use of Insecticide treated bed nets in our country.

Thus, this survey will show the rate of utilization of ITNs in the area and will be an input for other researches and studies in the future.

## **Objectives**

### **General**

To assess the knowledge, attitude and practice towards Insecticide Treated bed nets among the residents of Bure zuria district in July 2019

### **Specific Objectives**

- To assess the knowledge towards ITNs use in prevention of malaria among residents
- To assess the attitude towards using ITNs among residents
- To assess the practice of using ITNS among residents

## **Methods and materials**

### **Study Area**

Bure zuria district is one of the Woredas in west Gojjam zone of Amhara regional state, found 411 kms away from the capital Addis North west and 148 kms away from Bahir dar south, capital of the region. The Woreda is bounded by Jabitena woreda in East, Womberma woreda in the West, Sekela woreda in the North and by East Wollega zone of Oromia region in the South. The woreda is one of the malaria endemic Woredas in the region.

### **Study Design sampling**

Community based cross-sectional study design will be implemented. Purposive sampling and systematic sampling technique will be employed to select households. First five Kebeles will be selected based on their malaria burden among the woreda and report from the Woreda. Out of those selected kebeles, households will be selected using systematic random sampling. Sample size will be total of 422 house holds calculated using single proportion formula including 10% nonresponse rate. Structured questionnaire will be used to collect the data, Household heads (mother or father) or child more than of 18 will be interviewed to collect the data. Two health works per kebele from health centers will collect the data. Orientation will be given to data collectors how to collect data prior to data collection. The objective of the study will be explained for the household heads and oral consent will be obtained prior to the interview. Collected data will be entered to Excel 2013 and descriptive analysis will be done.

$N = z^2(p \cdot (1-p)) / d^2$  Confidence level=95%,  $d=0.05$ ,  $z=1.96$ ,  $p=0.5$ ,  $q=0.5$

$N = (1.96)^2(0.5 \cdot 0.5) / (0.05)^2$

$N = 384 + 10\%$  non response rate

$N = 422$

Where,

$N$ =sample size

$p$ = sample proportion

$z$ =critical value at 95% confidence level

### **Source Population**

Our source population will be all the households of Bure zuria district.

### **Study Population**

The study population will be all sampled households selected based on the inclusion criteria.

### **Inclusion Criteria**

Those households agreed to participate in the survey will be included in the study.

### **Exclusion Criteria**

- ✓ Those households who refused to participate in the study
- ✓ Closed households or no household heads (child older than 18 years old) will be excluded from the study

### **Variables**

#### **Independent variables**

#### **Sociodemographic variables**

- ✓ Sex of the respondent
- ✓ Age

- ✓ Educational level
- ✓ Occupation
- ✓ Marital status and
- ✓ Religion of the respondent

**Dependent variables**

- ✓ Knowledge on the preventability of malaria
- ✓ Knowledge on who is at risk for malaria
- ✓ Attitude towards the use of Inseticide treated bed nets
- ✓ Frequency of use insecticide treated bed nets

*Table 25 work plan for cross sectional survey on KAP towards ITN use in Bure zuria district, Amhara region March 2019*

<b>S. number</b>	<b>Activity</b>	<b>Timeline</b>
1	Proposal writing and submission	March 2019
2	Training of data collectors	June 2019
3	Data collection	July 2019
4	Data cleaning and entry	August 2019
5	Data analysis	September 2019
6	First draft thesis	October 2019
7	Finalize thesis and submission	November 2019

*Table 26 Budget break down to conduct cross sectional survey in Bure zuria district , Amhara region March 2019*

<b>S. number</b>	<b>Activity</b>	<b>Number/frequency</b>	<b>Cost per individual/Item (ETB)</b>	<b>Number of days</b>	<b>Total</b>
1	Data collectors Perdiem	2	300	15	9,000
2	Driver Perdiem	1	300	15	4,500
3	Principal investigator Perdiem	1	300	15	4,500
4	For fuel	1	10,000	15	10,000
<b>Total</b>					<b>28,000</b>

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## **CHAPTER IX- ADDITIONAL OUTPUT**

### **9.1 TRAINING ON RAPID RESPONSE TEAM FOR GEDEO ZONE HEALTH CARE WORKERS, YIRGA CHFE TOWN, AUGUST 2018**

#### **Introduction**

A Public Health Emergency is a sudden and usually unforeseen event that calls for immediate measures to minimize its adverse consequences in human life and public infrastructures and systems.

The appropriate investigation of a suspected public health emergency of concern and its risks require specialized skills from different fields. Some of the special skills would include, case and source identification, case-patient management, laboratory support, logistics management and communication and community mobilization. Furthermore, knowledge of the local situation and good communication skills are essential elements. The composition of the Rapid Response Teams (RRTs) should include appropriate professional mix needed for a response of a specific public health emergency. Understanding the local situation or having local representative in the RRT facilitate a sufficient geographical coverage and collaboration of the communities in complying with the potential control intervention. Communication with other relevant stakeholders should be maintained at all time for logistic support and enforcement of control interventions.

The establishment of multi-disciplinary Rapid Response Team at every level (National, Regional, Zonal, Woreda and health facility) and making functional at any time is one of the key roles of Public Health Emergency Management to address outbreaks or emergencies for early detection, confirmation and response, so that the public health, social, political, economic consequences due to outbreaks or emergencies could be minimized. As a signatory for the International Health Regulation (IHR 2005), Ethiopia has to strengthen eight core capacities of IHR 2005; early case detection and response is one of its and which mainly connected with establishing and having functional RRTs at all levels.

#### **Objective of the training**

The objective of this RRT training was to orient briefly health workers and Woreda Health officers on the basics of Rapid Response Team

### **Specific objectives**

- To orient the health workers the need for the establishment of RRT
- To orient the health workers on the roles and responsibilities of RRT members
- To strengthen the ongoing surveillance system in the Woredas
- To refresh the Health workers on early outbreak notification and response
- To refresh the health workers on Outbreak investigation and response

### **Result**

A total of 134 participants were trained in **two** rounds at Yirga Chefe town between July and August 2018 from Four Woredas (Gedeb, Kochere Yirga chefe and Wonago) of Gedeo zone, who will be working in diseases surveillance and detection in the woredas. The contents of the training were brief introduction to Public Health Emergency Management and Surveillance including priorities of our country, steps of outbreak investigation and response, Timeliness and channels of reporting from Health facilities to Ministry of health and precautions.

## Annexes

*Annexe 1 Measles outbreak investigation checklist in Degahabour city, Somali region, March 2019*

### **Measles outbreak Investigation Checklist, Degahabour city, March 2019**

#### **Identifying Information:**

Respondent Status: a. Case b. Control

Respondent: a. Case/control b. Mother/father c. Other care giver

Date of data collection\_\_\_\_/\_\_\_\_/\_\_\_\_

Region\_\_\_\_\_ Zone\_\_\_\_\_ Woreda\_\_\_\_\_ Kebele \_\_\_\_\_

#### **A. Socio-demographic Characteristics**

1. Sex: a. Male b. Female
2. Age: Years\_\_\_\_\_ Months\_\_\_\_\_
3. Occupation: a. farmer b. house wife c. not applicable d. student e. employee f. merchant g. daily laborer h. other (specify)\_\_\_\_\_
4. Religion of the respondent/family: a. orthodox b. Muslim c. protestant d. other
5. Occupation of the parents: a. farmer b. merchant c. unemployed d. daily laborer e. other (specify)\_\_\_\_\_
6. Educational level: a. illiterate b. able to read and write c. elementary school e. secondary school f. above secondary g. under school age
7. Educational level of the mother/care giver a. illiterate b. able to read and write c. elementary school d. secondary school f. above secondary
8. Marital status a. under age b. single c. married d. divorced e. widowed
9. Marital status of the mother/care giver a. widowed b. divorced
10. What is your family size? \_\_\_\_\_

#### **B. Clinical history of the disease (for cases):**

1. What was/were the symptoms: a. rash b. fever c. cough d. coryza e. conjunctivitis f. loss of appetite g. other\_\_\_\_\_

2. Any complications (if Yes circle): a. pneumonia b. corneal ulceration c. blindness  
d. convulsion e. otitis media f. diarrhea
3. Date of onset of rash: \_\_\_\_/\_\_\_\_/\_\_\_\_
4. Duration of rash\_\_\_\_\_
5. Date seen at health facility\_\_\_\_/\_\_\_\_/\_\_\_\_
6. Duration of illness before visiting health facility\_\_\_\_\_
7. Did she/he take treatment? a. Yes b. No
8. If yes, treatment given a. ORS b. antibiotics c. Vitamin A d. eye ointment  
d. paracetamol e. supplementary food
9. If no, why? a. treatment not available b. health worker not available c. other  
specify\_\_\_\_\_
10. Did the patient recovered after treatment, a. Yes b. No
11. If Yes, a. fully recovered b. partially

**C. Risk factors and knowledge of the disease**

1. Have you (your child) been vaccinated ever for measles a. Yes b. No c. unknown  
d. not applicable
2. Is there vaccination card? a. Yes b. No
3. If Yes, last date of vaccination, date of last vaccination \_\_\_\_/\_\_\_\_/\_\_\_\_
4. Number of doses received a. one b. two and above
5. Age at first vaccination. a. at nine months of age b. at 1 year of age c. I don't  
remember
6. If not vaccinated, why? a. I don't know it is important b. I was not available  
during the campaign c. vaccination is forbidden in my religion d. other\_\_\_\_\_
7. Is there any one sick in your house with such symptoms? a. Yes b. No
8. If yes, how many? \_\_\_\_\_
9. Did you have travel history to areas with such type of cases for the last 7-18 days  
before onset of symptoms? a. Yes b. No
10. If yes, where a. school b. relatives c. neighbor d. market e.  
other\_\_\_\_\_
11. Did you contact with a person with measles symptoms within the last 2- 3 weeks? a.  
Yes b. No

12. Did you have any contact history with someone else four days before and after rash onset? a. Yes b. No
13. If yes, with whom a. neighbor b. relative c. school d. other\_\_\_\_\_
14. House condition a. Ventilated b. Not ventilated
15. Estimated area of the House\_\_\_\_\_
16. Distance from Health center: a. <5 kms b. >5kms
17. Do you know the transmission modes of measles? a. Yes b. No
18. If yes, what are they? a. by air droplets b. by eating together c. by handshake d. other\_\_\_\_\_
19. Nutritional status of the patient a. normal b. moderately malnourished c. severely malnourished
20. Where you (your family) go first when you get sick? A. Health facility b. Traditional healer c. tsebel/mosque d. I make dua/tselot e. I stay at home
21. How do you think people get measles? A. contact from ill person b. from God c. bad attitude of people
22. Who do you think is affected by the disease? a. children less than 5 years b. children less than 18 years of age c. all people
23. How do you think measles can be treated a. by modern medicine b. by traditional medicine c. by tsebel/dua d. staying at home e. other\_\_\_\_\_
24. Do you think measles is preventable disease? a. Yes b. No
25. If yes, how it can be prevented? a. by vaccination b. by avoiding contact with ill person c. other\_\_\_\_\_
26. What do you think is the age for measles vaccination? a. 6 months b. 9 months' c. 1 year d. I don't know

**Data collection tool for Malaria Surveillance System Evaluation, Bahir dar zuria Woreda, Amhara Region, March 2018**

**I. Woreda level questionnaire**

1. Region \_\_\_\_\_ Zone \_\_\_\_\_ Woreda \_\_\_\_\_
  2. Health facility: \_\_\_\_\_ Date: \_\_\_\_\_ Interviewer: \_\_\_\_\_
  3. Respondent: \_\_\_\_\_ Position: \_\_\_\_\_
- Total pop. \_\_\_\_\_ Male \_\_\_\_\_ Female \_\_\_\_\_
- Rural pop. \_\_\_\_\_ urban pop. \_\_\_\_\_
- Total Kebeles \_\_\_\_\_ Urban \_\_\_\_\_ Rural \_\_\_\_\_
- Hosp. \_\_\_\_\_ H.Cs \_\_\_\_\_ H.Ps \_\_\_\_\_ All types of private clinics \_\_\_\_\_
- Total pop. At risk for Malaria \_\_\_\_\_

**1. Availability of a national surveillance manual**

- a. Is there national manual for surveillance at this site? 1. Yes 2.No 3.Unknown

**2. Case detection and registration**

1. Percent of health facilities that have a clinical register: \_\_\_\_\_ (\_\_\_\_ %) \_\_\_\_
2. Percent of health facilities that correctly register cases filling of the clinical register during the previous 30 days: \_\_\_\_\_ (\_\_\_\_ %)
3. Do you have a standard case definition for malaria? 1. Yes 2.No 3.Unknown

**3. Case confirmation**

1. Do you have RDT to test Malaria at this facility? 1. Yes 2.No 3.Unknown
2. Do you have functional microscope to test for Malaria at this facility 1. Yes 2.No 3.Unknown
3. Do you have Gemisa reagent to stain plasmodium species? 1. Yes 2.No 3.Unknown
4. Do you have oil immersion at this facility? 1. Yes 2.No 3.Unknown
5. Which communication material did you have?
6.  E-mail  Wired phone  Mobile  Radio  Fax  Other-----
7. Did you have address of Zonal/Woreda PHEM officers?  Yes  No
8. How frequently are you communicating with the Zonal/Woreda PHEM officers on emergencies and other daily activities?

- Daily  Weekly  Every 2 week  Monthly  Quarterly  Every 6 month
- Yearly  Others-----

9. When are you expected to send weekly report to the Zonal/Woreda PHEM unit?

- Monday  Tuesday  Wednesday  Thursday  Friday  Saturday  Sunday
- I don't know exactly

10. How is your facility communicating the Zonal/Woreda PHEM officers in case of immediately reportable diseases?  By e-mail  By phone  By fax  Regular weekly report

11.  Others-----

12. Did you send summary or short report to the administrative /program leaders or other responsible organs on planning, prevention and control activities addressing Important issues at community level that have arisen through the surveillance system?  Yes  No

13. If answer for Q 12 is yes, to whom did you send? -----

14. If you faced any problems on communication and reporting, list them-----

15. Mention the alternative solutions that you take to tackle the problems you mentioned above?  
-----

16. Have you lacked appropriate surveillance forms and records at any time during the last 6 months (rumor log book, epidemic reporting, weekly, case based, investigation) Yes/ No/ Unknown /Not applicable

17. Percent of sites that reported each reporting period to the next higher level during the past 3 months

18. Number of reports in the last 3 months compared to expected number

19. Obs. Weekly: /12 times the number of sites Obs. immediately: /-- times the number of sites on time (use national guidelines)

20. Obs. Number of weekly reports submitted on time:-\_\_\_\_\_/12 times the number of sites

21. Obs. Number of immediately reports submitted on time: \_\_\_\_/-- times the number of sites

22. How do you report to higher level?

Mail\_\_\_ Fax \_\_ Telephone \_\_\_ Radio \_\_\_ Electronic\_\_\_ other \_\_

23. Strengthening reporting, how can reporting be improved? \_\_\_\_\_

#### 4. Data analysis

1. Is there assigned focal person for surveillance activities? Yes/ No

2. If No for Q 1 how do you do surveillance activities? \_\_\_\_\_

3. If answer for Q 1 is yes did he/she train on surveillance system? a) when-----? b) Topic-----? c) For how long? -----
4. Did you have computer on your office? Yes / No
5. Did you have computer on your department (PHEM unit)? Yes /No
6. What is your data entry and compilation instrument?  Manual  Computer  other \_\_\_\_\_
7. Did you have computer skill on  Ms Word  Ms excel  MS power point  Epi-info?
8. Did you analyze data of the surveillance system? Yes /No
9. If answer for Q 8 is “Yes”, did you describe data by  time  place  person
10. Did you have denominators for data analysis? Yes/No, if “yes” ----- Total population ---  
----- Male----- Female----- U5
11. Please indicate the frequency of your data analysis.
- a. Weekly b. every two week c. Monthly d. Quarterly e. Every 6 month f. annually  
g. No regular time
12. Did you notify the results of your analysis to the higher level PHEM? Yes /No
13. If answer for Q 12 is No, what is the reason?
- a. Lack of knowledge b. Shortage of time c. less attention given d. Shortage of materials  
e. Analysis is not familiar f. Negligence  Other-----
14. Did you perform trend analysis (Observe the presence of line graph of cases by time?)
1. Yes 2. No 3. Unknown 4. Not applicable
15. Do you have an action threshold for any of the Country priority diseases? 1. Yes 2. No  
3. Unknown /Not applicable
16. If yes for Q 15, what is it (Ask for at least 2 priority diseases)? \_\_\_\_cases \_\_\_ % increase  
\_\_\_rate

### **5. Epidemic preparedness**

1. Did you have plan for epidemic preparedness and response? 1. Yes 2. No
2. Did you have emergency stocks of drugs and supplies? 1. Yes 2. No
3. If answer for Q 2 is ‘No’, how did you control epidemics? \_\_\_\_\_
4. Had you experienced shortage of drugs, vaccines and supplies in 2009 EFY? 1. Yes 2. No 3. I don’t know
5. Did you establish epidemic management committee? 1. Yes 2. No 3. Not Applicable

6. Did the epidemic management committee have regularly scheduled meeting time? 1. Yes 2. No

7. Did you establish Rapid response team? 1. Yes 2. No 3. Not Applicable

8. Did the Rapid response team have regularly scheduled meeting time during epidemics? 1. Yes. 2. No

9. Did you have case management protocol for epidemic prone diseases? 1. Yes 2. No

10. Was there a budget for epidemic response? 1. Yes 2. No

11. Any Challenges on epidemic response and preparedness in 2009 EFY? -----  
-----  
-----

### **6. Epidemic response**

a. is there any outbreak occurred in your area in 2009 EFY? Yes/ No

b. If yes for Q “a”, how many of them were investigated in 2009 EFY? \_\_\_\_\_

c. Did you have outbreak investigation check list? 1. Yes 2. No

2. If answer for Q “a” is No, how did you know possible factors for the outbreak? -----

a. Has the health facility implemented prevention and control measures based on local data for at least one epidemic prone disease? 1. Yes 2. No 3. Unknown

b. Did they achieved acceptable case fatality rates (e.g. <1% for Cholera) during the most recent outbreak

c. Observe that the health facility achieved an acceptable case fatality rate for most recent outbreak

1. Yes 2. No 3. Unknown

### **7. Supervision and Feedback**

1. Were you supervised by higher level (regional, zonal or Woreda) officers in 2009 EFY? 1. Yes 2. No (observe at least one feedback report)

2. If answer for Q “1” is yes, how many times in 2009 EFY? -----

3. Had you received feedback from higher level supervisors in 2009 EFY? 1. Yes 2. No

4. If answer for Q “3” is yes, how many feedbacks did you receive in 2009 EFY? -----

5. Had you faced any challenge on supervision and feedback in 2009 EFY? 1. Yes 2. No

6. If answer for “5” is yes a) list the challenges.--- b) list the measures that you take to tackle the challenges.-----

7. How many meetings has this health facility conducted with the community members in the past six months? \_\_\_\_\_

8. Observe the minutes or report of at least 1 meeting between the health facility team and the community members within the six months 1. Yes 2. No 3. Unknown

9. Resources

**Logistics**

Electricity\_\_Bicycles\_\_Motor cycles\_\_\_\_Vehicles

**1. Data management**

Stationery\_\_Calculator\_\_Computer\_\_Software\_\_Printer

**2. Communication**

Tel. service \_\_Fax \_\_Radio call \_\_ Computer with modem

**3. Information education and communication materials**

Posters\_\_Megaphone\_\_Flipcharts or Image box\_\_TV set\_\_Generator\_\_Screen

Projector (Movie) \_\_Other:

**8. Questionnaire for Attributes and level of Usefulness:**

1. Total population under surveillance\_\_\_\_\_

2. What is the incidence / Prevalence of Malaria in your area/region?

Malaria: cases \_\_\_\_\_ Deaths \_\_\_\_\_

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

1. Does the surveillance system help?

2. To detect outbreaks of these selected priority diseases early? 1. Yes\_\_\_ 2.No\_\_\_

3. To estimate the magnitude of morbidity and mortality related to these diseases, including identification of factors associated with these diseases? 1. Yes\_\_\_\_\_ 2.No\_\_\_\_\_

4. To permit assessment of the effect of prevention and control programs? 1. Yes\_\_\_\_\_ 2.No\_\_\_\_\_

5. To observe (confirm): interventions and diseases trends analyzed 1. Available\_\_\_ 2.Not available\_\_\_

**10. Describe Each System Attributes:**

**A. Simplicity:**

1. Is the case definition of the priority diseases (malaria) easy for case detection by all level health professionals? 1. Yes\_\_\_\_\_ 2. No\_\_\_\_\_

2. Does the surveillance system help to record and report data on time?

3. Do you feel that additional data collected on a case are time consuming? 1. Yes\_ 2. No\_

4. How long it takes to fill the format? 1. Less than five minute 2.10-15minuts 3.Greater than15 minutes

5. How long does it take to have laboratory confirmation of Malaria? 1. Less than five minute 2.10-5minuts 3. Greater than15 minutes

**B. Flexibility:**

1. Can the current reporting formats be used for other newly occurring health event (disease) without much difficulty? 1. Yes\_\_ 2.No\_\_\_

2. Do you think that any change in the existing procedure of case detection, reporting, and formats will be difficult to implement? 1. Yes\_\_\_ 2.No \_\_\_

3. Is the system easy to add new variables? 1. Yes 2. No

5. Is the surveillance system easy to integrate with other systems? 1. Yes 2. No

**C. Data Quality:** (Completeness of the reporting forms and validity of the recorded data)

1. Are the data collection formats for these priority diseases clear and easy to fill for all the data collectors/ reporting sites? 1. Yes 2.No

2. Are the reporting site / data collectors trained/ supervised regularly? 1. Yes 2. No

Observe: Review the last months report of these diseases

3. Average number of unknown or blank responses to variables in each of the reported forms

\_\_\_\_\_

4. Percent of reports which are complete (that is with no blank or unknown responses) from the total reports \_\_\_\_\_

5. Percent of Woredas that send report of each week in 2009 EFY. -----

6. Total weekly reports received from Woredas/Hospitals (including late reports, from July 2016 May 2017)

**D. Acceptability:**

a. Do you think all the reporting agents accept and well engaged to the surveillance activities? 1. Yes 2. No

b. If yes, how many are active participants (of the expected total)? \_\_\_\_\_

c. If No, what is the reason for their poor participation in the surveillance activity?

d. Lack of understanding of the relevance of the data to be collected

e. No feedback or recognition given by the higher bodies for their contribution; i.e. no dissemination of the analyzed data back to reporting facilities

f. Reporting formats are difficult to understand

g. Report formats are time consuming

h. Were all the health professionals aware about the surveillance system? Yes/No (if yes how they aware) \_\_\_\_\_

**E. Representativeness:**

1. 1. What is the health service coverage of the district/ zone/ region? \_\_\_\_\_ (#) \_\_\_\_\_ %

2. 2. Do you think, the populations under surveillance have good health seeking behavior for these diseases? 1. Yes 2. No

3. 3. Who do you think is well represented by the surveillance data? The Whole/The urban/ the rural and what is the reason?

4. 4. Was the surveillance system enabled to follow the health and health related events in the whole community? 1. Yes 2. No

5. 5. If answer for Q 12 is no, who do you think is well benefited by the surveillance system? 1. Urban 2. Rural 3. Both

6. 6. If yes for Q 12, do you think that rural and urban communities are equally benefited in surveillance system? 1. Yes 2. No, if no why \_\_\_\_\_

**F. Timeliness:**

a. Timeliness of reporting in the past one year (by HF)

1. on time----- 2. Late\_\_\_\_\_

b. Percent of Woredas that report on time. -----

c. Percent of HF that report on time. -----

**G. Stability:**

a. do you think the current surveillance system would be affected by new changes (BPR)? 1. Yes

2. No

b. Was there lack of resources that interrupt the surveillance system? 1. Yes 2. No

c. Was there any time /condition in which the surveillance is not fully operating? 1. Yes 2. No

d. is there a surveillance officer or focal person (PHEM unit)? Yes/No Number \_\_\_\_\_

**H. Strength and Weakness**

1. How do you work with other departments and other sectors? \_\_\_\_\_

2. What are the strengths of your surveillance system? \_\_\_\_\_

3. What are the weaknesses of your surveillance system? \_\_\_\_\_

## II. Health Center level Questionnaire

Assessment team: ----- Type of health facility: -----

Date: ----- District: -----

Interviewer: ----- Region: -----

Respondent: ----- Position: -----

Name of health facility: ----- Surveillance system: -----

Total pop. \_\_\_\_\_ Male \_\_\_\_\_ Female \_\_\_\_\_

Rural pop. \_\_\_\_\_ urban pop. \_\_\_\_\_

Total Kebeles \_\_\_\_\_ Urban \_\_\_\_\_ Rural \_\_\_\_\_

Total pop. At risk for Malaria \_\_\_\_\_

### 1. National surveillance Manual

Is there national manual for malaria surveillance at this site? 1. Yes 2.No 3.Unknown

**2. Case detection and registration**

a. Is there a clinical register book health facility? 1. Yes 2.No 3.Unknown

b. Do you have standard case definition for malaria? 1. Yes 2.No 3.Unknown

**3. Data reporting**

a. Have you faced lack of appropriate surveillance forms at any time during the last 6 months?

1. Yes 2.No 3.Unknown

3. Percent of sites that accurately reported cases from the registry into the summary report to go to higher level? \_\_\_\_\_

4. Percent of sites that reported each reporting period to the next higher level during the past 3 months-----

5. Number of reports in the last 3 months compared to expected number

Observe Weekly: ----- Observe Immediately: -----

6. Percent of HF that have means for reporting to next level by e-mail, telephone, fax or radio?\_\_\_\_\_

7. How do you report?

1. Mail 2.Fax 3. Telephone 4. Radio 5. Electronic 6.Others (specify):\_\_\_\_\_

**4. Data analysis**

1. Performing trend analysis observed line graph of cases by time 1. Yes 2.No 3.Unknown

## 5. Epidemic preparedness

1. Did you have plan for epidemic preparedness and response? 1. Yes 2. No
2. Did you have emergency stocks of drugs and supplies? 1. Yes 2. No
3. If answer for Q 2 is 'No', how did you control epidemics? \_\_\_\_\_
4. Had you experienced shortage of drugs, vaccines and supplies in 2009 EFY? 1. Yes 2. No 3. I don't know
5. Did you establish epidemic management committee? 1. Yes 2. No 3. Not Applicable
6. Did the epidemic management committee have regularly scheduled meeting time? 1. Yes 2. No
7. Did you establish Rapid response team? 1. Yes 2. No 3. Not Applicable
8. Did the Rapid response team have regularly scheduled meeting time during epidemics? 1. Yes. 2. No
9. Did you have case management protocol for epidemic prone diseases? 1. Yes 2. No
10. Was there a budget for epidemic response? 1. Yes 2. No

## 6. Epidemic response

1. Has the health facility implemented prevention and control measures based on local data for at least one epidemic prone disease? 1. Yes 2.No 3.Unknown

## 7. Feedback and supervision

1. How many feedback bulletins or reports has the health facility received in the last year?
2. How many meetings has this health facility conducted with the community members in the past six months? \_\_\_\_\_
3. How many times have you been supervised in the last 6 months? \_\_\_\_\_

## 8. Training

Have you been trained in disease surveillance and epidemic management?

1. Yes 2.No 3.Unknown

If yes, specify when, where, how long, by whom? \_\_\_\_\_

## 9. Resources

Percent of sites that have:

### Logistics

1. Electricity\_\_\_
2. Bicycles-----
3. Motor cycles-----
- 4.Vehicles-----

## **10. Data management**

1. Stationery 3. Computer
2. Calculator 4. Printer

## **Communications**

Telephone service----- 2. Radio call----- 3. Fax----- 4. Computers with modems

**10. Information education and communication materials (circle)**

1. Posters
2. Screen
3. Megaphone
4. Projector (Movie)
5. Flipcharts or Image box
6. Other (specify): \_\_\_\_\_

**11. Hygiene and sanitation materials (circle)**

1. Spray pump
2. Disinfectant

List protection materials \_\_\_\_\_

**12. Describe Each System Attributes:**

**A. Simplicity:**

Is the case definition of the priority diseases (malaria) easy for case detection by all level health professionals? 1. Yes 2. No

2. Does the surveillance system help to record and report data on time?

3. Do you feel that additional data collected on a case are time consuming? 1. Yes 2. No

4. How long it takes to fill the format? Less than five minute 2. 10-15minuts 3. Greater than15 minutes

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

1. Less than five minute
2. -10-15minuts
3. Greater than15 minutes

**B. Flexibility:**

1. Can the current reporting formats be used for other newly occurring health event (disease) without much difficulty? 1. Yes 2. No

2. Do you think that any change in the existing procedure of case detection, reporting, and formats will be difficult to implement? 1. Yes 2.No

3. Is the system easy to add new variables? 1. Yes 2. No

4. Is the surveillance system easy to integrate with other systems? 1. Yes 2. No

**C. Data Quality:** (Completeness of the reporting forms and validity of the recorded data)

1. Are the data collection formats for these priority diseases clear and easy to fill for all the data collectors/ reporting sites? 1. Yes 2. No

2. Are the reporting site / data collectors trained/ supervised regularly? 1. Yes 2. No

3. Observe: Review the last months report of these diseases

a. Average number of unknown or blank responses to variables in each of the reported forms \_\_\_\_\_

b. Percent of reports which are complete (that is with no blank or unknown responses) from the total reports \_\_\_\_\_

**D. Acceptability:**

a. Do you think all the reporting agents accept and well engaged to the surveillance activities? 1. Yes 2.No

b. If yes, how many are active participants (of the expected total)? \_\_\_\_\_

c. If No, what is the reason for their poor participation in the surveillance activity?

1. Lack of understanding of the relevance of the data to be collected

2. No feedback or recognition given by the higher bodies for their contribution; i.e. no dissemination of the analyzed data back to reporting facilities

3. Reporting formats are difficult to understand

4. Report formats are time consuming

5. Were all the health professionals aware about the surveillance system? Yes/No (if yes how they aware) \_\_\_\_\_

**E. Representativeness:**

1. What is the health service coverage of the district/ zone/ region? \_\_\_\_\_ (#) \_\_\_\_\_%

2. Do you think, the populations under surveillance have good health seeking behavior for these diseases? 1. Yes 2. No

3. Who do you think is well represented by the surveillance data? The urban/ the rural and what is the reason?

4. was the surveillance system enabled to follow the health and health related events in the whole community? 1. Yes 2. No

5. If answer for Q 12 is no, who do you think is well benefited by the surveillance system?

a. Urban 2, the rural 3. Both

6. If yes for Q 12, do you think that rural and urban communities are equally benefited in surveillance system? 1. Yes 2. No, if no why \_\_\_\_\_

**F. Timeliness:**

a. Timeliness of reporting in the past one year (by Zone and Woreda) on time----- 2. Late---

b. Percent of Woredas that report on time. -----

c. Percent of HF that report on time. -----

**G. Stability:**

a. do you think the current surveillance system will be affected by new changes (BPR)? 1. Yes 2. No

b. Was there lack of resources that interrupt the surveillance system? 1. Yes 2. No

c. Was there any time /condition in which the surveillance is not fully operating? 1. Yes 2. No

d. is there a surveillance officer or focal person (PHEM unit)? Yes/No Number \_\_\_\_\_

**Strength and Weakness**

1. How do you work with other departments and other sectors? \_\_\_\_\_

2. What are the strengths of your surveillance system? \_\_\_\_\_

3. What are the weaknesses of your surveillance system? \_\_\_\_\_

### III. Health Post Level Questionnaire

Assessment team: ----- Type of health facility: -----

Date: ----- District: -----

Interviewer: -----Region: -----

Respondent: ----- Position: -----

Name of health facility: ----- Surveillance system: -----

Total pop. \_\_\_\_\_ Male \_\_\_\_\_ Female \_\_\_\_\_

Rural pop. \_\_\_\_\_ urban pop. \_\_\_\_\_

Total Kebeles \_\_\_\_\_ Urban \_\_\_\_\_ Rural \_\_\_\_\_

1. Total pop. At risk for Malaria \_\_\_\_\_

### 2. National surveillance Manual

Is there national manual for malaria surveillance at this site? 1. Yes 2.No 3.Unknown

### 3. Case detection and registration

Is there a clinical register book health facility? 1. Yes 2.No 3.Unknown

Do you have standard case definition for malaria? 1. Yes 2.No 3.Unknown

### 4. Data reporting

1. Have you faced lack of appropriate surveillance forms at any time during the last 6 months?

2. 1. Yes 2.No 3.Unknown

3. Percent of sites that is accurately reported cases from the registry into the summary report to go to higher level? \_\_\_\_\_

4. Percent of sites that reported each reporting period to the next higher level during the past 3 months

5. Number of reports in the last 3 months compared to expected number

6. Observe Weekly:      Observe Immediately:

7. Percent of HF that have means for reporting to next level by e-mail, telephone, fax or radio? \_\_\_\_\_

8. How do you report?

1. Mail 2.Fax 3. Telephone 4. Radio 5. Electronic 6.Others (specify): \_\_\_\_\_

## **5. Data analysis**

1. Performing trend analysis observed line graph of cases by time 1. Yes 2.No 3.Unknown

## 6. Epidemic response

1. Has the health facility implemented prevention and control measures based on local data for at least one epidemic prone disease? 1. Yes 2.No 3.Unknown

### 8. Feedback and supervision

1. How many feedback bulletins or reports has the health facility received in the last year?

2. How many meetings has this health facility conducted with the community members in the past six months? \_\_\_\_\_

3. How many times have you been supervised in the last 6 months? \_\_\_\_\_

### 9. Training

Have you been trained in disease surveillance and epidemic management?

1. Yes 2.No 3.Unknown

If yes, specify when, where, how long, by whom? \_\_\_\_\_

### 10. Resources

Percent of sites that have:

#### Logistics

1. Electricity\_\_\_ 2. Bicycles----- 3. Motor cycles-----4.Vehicles-----

#### Data management

1. Stationery 3.Computer

2. Calculator 4. Printer

#### Communications

Telephone service----- 2.Radio call----- 3. Fax----- 4. Computers with modems

11. Information education and communication materials (circle)

1. Posters 2. Screen
3. Megaphone 4. Projector (Movie)
5. Flipcharts or Image box 6. Other (specify): \_\_\_\_\_

12. Hygiene and sanitation materials (circle)

1. Spray pump
2. Disinfectant

List protection materials \_\_\_\_\_

13. Describe Each System Attributes:

**Simplicity:**

Is the case definition of the priority diseases (malaria) easy for case detection by all level health professionals? 1. Yes 2. No

2. Does the surveillance system help to record and report data on time?

3. Do you feel that additional data collected on a case are time consuming? 1. Yes 2. No

4. How long it takes to fill the format? Less than five minute 2. 10-15minuts 3. Greater than15 minutes

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

1. Less than five minute 2. -10-15minuts 3. Greater than15 minutes

**Flexibility:**

1. Can the current reporting formats be used for other newly occurring health event (disease) without much difficulty? 1. Yes 2. No

2. Do you think that any change in the existing procedure of case detection, reporting, and formats will be difficult to implement? 1. Yes 2. No

3. Is the system easy to add new variables? 1. Yes 2. No

4. Is the surveillance system easy to integrate with other systems? 1. Yes 2. No

**Data Quality:** (Completeness of the reporting forms and validity of the recorded data)

1. Are the data collection formats for these priority diseases clear and easy to fill for all the data collectors/ reporting sites? 1. Yes 2. No

2. Are the reporting site / data collectors trained/ supervised regularly? 1. Yes 2. No

3. Observe: Review the last months report of these diseases

a. Average number of unknown or blank responses to variables in each of the reported forms \_\_\_\_\_

b. Percent of reports which are complete (that is with no blank or unknown responses) from the total reports \_\_\_\_\_

c. Percent of Woredas that send report of each week in 2009 EFY -----

**Acceptability:**

a. Do you think all the reporting agents accept and well engaged to the surveillance activities? 1.

Yes 2.No

b. If yes, how many are active participants (of the expected total)? \_\_\_\_\_

c. If No, what is the reason for their poor participation in the surveillance activity?

1. Lack of understanding of the relevance of the data to be collected

2. No feedback or recognition given by the higher bodies for their contribution; i.e. no dissemination of the analyzed data back to reporting facilities

3. Reporting formats are difficult to understand

4. Report formats are time consuming

5. Were all the health professionals aware about the surveillance system? Yes/No (if yes how they aware) \_\_\_\_\_

**Representativeness:**

1. What is the health service coverage of the district/ zone/ region? \_\_\_\_\_ (#) \_\_\_\_\_ %

2. Do you think, the populations under surveillance have good health seeking behavior for these diseases? 1. Yes 2. No

3. Who do you think is well represented by the surveillance data? The urban/ the rural and what is the reason?

4. was the surveillance system enabled to follow the health and health related events in the whole community? 1. Yes 2. No

5. If answer for Q 12 is no, who do you think is well benefited by the surveillance system?

a. Urban b. the rural c. Both

6. If yes for Q 12, do you think that rural and urban communities are equally benefited in surveillance system? 1. Yes 2. No, if no why \_\_\_\_\_

**Timeliness:**

a. When did you report weekly data to the Health center? a. Every Sunday b. Every Monday

**Stability:**

a. do you think the current surveillance system would be affected by new changes? 1. Yes 2. No

b. Was there lack of resources that interrupt the surveillance system? 1. Yes 2. No

c. Was there any time /condition in which the surveillance is not fully operating? 1. Yes 2. No

d. Is there a surveillance officer or focal person (PHEM unit)? Yes/No Number \_\_\_\_\_

**Strength and Weakness**

1. How do you work with other departments and other sectors? \_\_\_\_\_

2. What are the strengths of your surveillance system? \_\_\_\_\_

3. What are the weaknesses of your surveillance system? \_\_\_\_\_

**1. Historical aspects of the area. (Culture and Tourism Office)**

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

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

- Woreda map \_\_\_\_\_
- Location(distance from AA) \_\_\_\_\_ Direction \_\_\_\_\_
- Altitude \_\_\_\_\_
- Surface Area \_\_\_\_\_( \_\_\_\_\_% from the zone)
- Town \_\_\_\_\_ rural \_\_\_\_\_(land)
- Geographical coordinate
  - ✓ Latitude \_\_\_\_\_ Longitude \_\_\_\_\_
  - ✓ Annual rain fall(Max and min) \_\_\_\_\_ Annual temp(average) \_\_\_\_\_
  - ✓ Climatic zones \_\_\_\_\_ (Highland %) \_\_\_\_\_ (Midland %)  
\_\_\_\_\_ (Lowland %)
- Woreda boundaries
  - North \_\_\_\_\_ South \_\_\_\_\_ East \_\_\_\_\_ West \_\_\_\_\_

**3. Political and Administrative Organization**

- Total no. of kebeles:
  - Rural \_\_\_\_\_ Urban \_\_\_\_\_

**4. Population and Population structures**

**A. Demographic data**

- Total Population \_\_\_\_\_ Male \_\_\_\_\_ Female \_\_\_\_\_ Sex ratio \_\_\_\_\_
- Urban Total \_\_\_\_\_ Male \_\_\_\_\_ Female \_\_\_\_\_
- Rural Total \_\_\_\_\_ Male \_\_\_\_\_ Female \_\_\_\_\_

- Population < 1yrs\_\_\_\_\_ Population <5 yrs\_\_\_\_\_ Population < 15 years\_\_\_\_\_ Population >64 years\_\_\_\_\_ Women 15\_49 years of age\_\_\_\_\_
- Total population by kebele (each kebele pop)\_\_\_\_\_
- Average household size
- Annual population growth rate (%)
- Population pyramid by age and sex

### **B. Ethnic/language**

- Amharic\_\_\_\_\_ (\_\_\_\_ %), /Awi/Agew\_\_\_\_\_ (\_\_\_\_ %),
- Others\_\_\_\_\_ (\_\_\_\_ %)

### **C. Religion**

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

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

- **Main income sources**
  - ✓ Agriculture
    - Cultivated area\_\_\_\_\_
    - Grazing area\_\_\_\_\_
    - Cropping seasons\_\_\_\_\_
    - Land density\_\_\_\_\_
  - ✓ Livestock
  - ✓ Tourism
  - ✓ Trade
  - ✓ Other business

## **6. Education and school Health (Education Bureau)**

- **Number of educational institution**
  - ✓ K.G.\_\_\_\_\_
  - ✓ Primarily School\_\_\_\_\_
  - ✓ Secondary\_\_\_\_\_

- ✓ Preparatory\_\_\_\_\_
- ✓ College/ University\_\_\_\_\_
- ✓ TVET\_\_\_\_\_
- Total School Age Children (target) \_\_\_\_\_
  - ✓ Total Enrolment \_\_\_\_\_ Male\_\_\_\_\_ Female\_\_\_\_\_
  - ✓ School dropout in 6 months \_\_\_\_\_
  - ✓ If there is school dropout why \_\_\_\_\_
- Educational status of the community
  - ✓ Total Educated people\_\_\_\_\_
    - Male \_\_\_\_\_
    - Female \_\_\_\_\_
- School health activities:
  - ✓ Water supply: schools with water supply\_\_\_\_\_
  - ✓ Toilets: schools with functional latrines (Male& Female)\_\_\_\_\_
  - ✓ Schools with HIV/other Health clubs\_\_\_\_\_
- Number of teacher in the district\_\_\_\_\_ Male\_\_\_\_\_ Female\_\_\_\_\_

## 7. Facilities

### A. Transport, Telecommunication, Power supply, Water supply

- How many of the health posts have access to transportation\_\_\_\_\_ (\_\_\_\_\_%)  
 , Telecommunication\_\_\_\_\_ (\_\_\_\_\_%), Electric  
 power\_\_\_\_\_ (\_\_\_\_\_%), Water supply \_\_\_\_\_ (\_\_\_\_\_%)
- How many of the health centers have access to  
 transportation\_\_\_\_\_ (\_\_\_\_\_%),  
 Telecommunication\_\_\_\_\_ (\_\_\_\_\_%), Electric  
 power\_\_\_\_\_ (\_\_\_\_\_%), Water supply \_\_\_\_\_ (\_\_\_\_\_%)
- How many kebeles have access to transportation \_\_\_\_\_

### B. Telecommunication

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

**C. Post Office** \_\_\_\_\_

**D. Bank** \_\_\_\_\_

**E. Power supply**

- How many household get power supply \_\_\_\_\_?

**F. Water**

- Total safe water coverage \_\_\_\_\_ (\_\_\_ %)
- Safe water supply coverage by kebele \_\_\_\_\_
- Main source of water supply \_\_\_\_\_
- Kebeles getting safe water\_\_\_\_ (\_\_\_ %)
- Population getting safe water\_\_\_\_ (\_\_\_ %)
- Daily water consumption per day per person \_\_\_\_\_

**8. District Health system**

- 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 in detail (composition and function)  
 \_\_\_\_\_  
 \_\_\_\_\_
- Do you have NGOs working on health and health related issues? Yes/No
- List the NGOs and their work in related to health  
 \_\_\_\_\_  
 \_\_\_\_\_

**9. Vital Statistics and Health Indicators**

- Infant Mortality Rate (IMR) \_\_\_\_\_(total <1 yr deaths last yr\_\_\_\_\_)

- Child Mortality Rate \_\_\_\_\_ (this year's total <15 yr deaths \_\_\_\_\_)
- Crude Birth Rate \_\_\_\_\_
- Crude Death Rate \_\_\_\_\_ (total deaths 2009 yr \_\_\_\_\_)
- Maternal Mortality Rate \_\_\_\_\_ (2016/17 total maternal deaths \_\_\_\_\_)
- PMR \_\_\_\_\_ (The last year 2009 EFY)
- Total live Births \_\_\_\_\_ Total still births \_\_\_\_\_ Total neonatal deaths \_\_\_\_\_
- Contraceptive Prevalence rate \_\_\_\_\_ Contraceptive acceptance rate - \_\_\_\_\_
- ANC rate (how many of the total expected pregnancies attended 1st ANC) \_\_\_\_\_
- ANC rate (how many of the total expected pregnancies attended 4th ANC) \_\_\_\_\_
- Percentage of deliveries attended by skilled birth attendants \_\_\_\_\_
- Percentage of deliveries attended by HEWs \_\_\_\_\_
- Percentage of deliveries attended by TBA \_\_\_\_\_
- **Immunization Coverage (for children and Women);**
  - ✓ BCG \_\_\_\_\_ (\_\_\_ %).
  - ✓ OPV0 \_\_\_\_\_ (\_\_\_ %), OPV1 \_\_\_\_\_ (\_\_\_ %), OPV3 \_\_\_\_\_ (\_\_\_ %)
  - ✓ Penta1 \_\_\_\_\_ (\_\_\_ %), penta2 \_\_\_\_\_ (\_\_\_ %) penta3 \_\_\_\_\_ (\_\_\_ %)
  - ✓ Measles \_\_\_\_\_ (\_\_\_ %).
  - ✓ PCV--1 \_\_\_\_\_ (\_\_\_ %), PCV-2 \_\_\_\_\_ (\_\_\_ %), PCV-3 \_\_\_\_\_ (\_\_\_ %),
  - ✓ TT2+P.W \_\_\_\_\_ (\_\_\_ %),
  - ✓ TT2+ N.P.W \_\_\_\_\_ (\_\_\_ %)
  - ✓ TT coverage

## 10. Health Service

### A. Type and Number of Health Institution

Type		Number	Total No. of beds
Gov. Hospital			
Gov. Health center	Type A		
	Type B		
Private H.Fs (clinics/diag.	Clinics (all type )		

lab/drug stores)	Diag. Lab.		
	Drug store		
Gov. Health posts			
NGOs	H.Ps		
	H.Cs		
	Hospitals		
	Clinics		
Facilities under constrictions	HP		
	HC		
	Hospital		

- Health institution to pop ratio----- Hospital: Pop-----HC: Pop-----
- HP: Pop-----Health service coverage-----

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

Type	No.	Remark
Specialist		
G.P		
HO		
Nurses (Deg. and Dip.)		
Mid wife (Deg. and Dip.)		
Lab. (Deg. and Dip.)		
Pharmacy (Deg. and Dip.)		
Env. Health (Deg. and Dip.)		
HIT		
Health Education		
HEWs		
Others		

- Doctor: pop. Ratio\_\_\_\_Nurse: pop. Ratio\_\_\_\_

- Mid. Wife: pop. Ratio \_\_\_HEW: pop. ratio

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

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

Adult		Pediatrics/ < 5 years
1		
2		
3		
4		
5		
6		
7		
8		
9		
10		

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

Adult		Pediatrics/ <5 year
1		
2		
3		
4		
5		
6		
7		
8		
9		
10		

**D. Health budget allocation:**

- **Government**

- ✓ Annual budget allocated for the woreda(birr) \_\_\_\_\_
- ✓ Annual budget allocated for health or health institutions \_\_\_\_\_(\_\_\_\_%)
- ✓ Annual budget allocation increment percent comparing to the previous year\_\_\_\_%

- **Funds from NGO**

- ✓ Total \_\_\_\_\_ (purpose/programs)\_\_\_\_\_

**11. Community Health Services:**

- Status of services provided by community health workers namely

- ✓ No. of TBAs/TTBA\_\_\_\_\_ and their responsibility \_\_\_\_\_
- ✓ No. of CHWs/CHPs\_\_\_\_\_ and their responsibility \_\_\_\_\_
- ✓ Responsibility \_\_\_\_\_ of HEWs\_\_\_\_\_
- ✓ Others\_\_\_\_\_

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

- MCH (Delivery, ANC, PNC) \_\_\_\_\_
- FP (Methods, Contraceptive prevalence rate, Contraceptive acceptance rate \_\_\_\_\_)
- EPI(outreach service, cold chain, vaccine) \_\_\_\_\_
- Environmental Health & sanitation.
  - ✓ Latrine coverage\_\_\_\_\_ & utilization rate\_\_\_\_\_
  - ✓ Solid waste management\_\_\_\_\_
  - ✓ Liquid waste management \_\_\_\_\_
- **Endemic diseases;**
  - **Malaria:**
    - ✓ Total malarious kebeles\_\_\_\_\_ & Pop at risk\_\_\_\_\_
    - ✓ ITNs coverage (including current district)\_\_\_\_\_

- ✓ Is there IRS this year(No of kebeles)\_\_\_\_\_HH covered\_\_\_\_\_population covered\_\_\_\_\_
- ✓ Total cases/yr\_\_\_\_\_ deaths/yr\_\_\_\_\_,<5yr cases\_\_\_\_\_ deaths(<5)\_\_\_\_\_
- ✓ Malaria supplies (Coartem, RDT, etc) shortage \_\_\_\_\_
- ✓ Other issues\_\_\_\_\_
- **TB/Leprosy**
  - ✓ Total TB cases\_\_\_\_\_
  - ✓ PTB negative\_\_\_\_\_
  - ✓ PTB positive\_\_\_\_\_
  - ✓ Extra PTB \_\_\_\_\_
  - ✓ TB detection rate \_\_\_\_\_
  - ✓ TB Rx completion rate \_\_\_\_\_
  - ✓ TB cure rate \_\_\_\_\_
  - ✓ TB Rx success rate \_\_\_\_\_
  - ✓ TB defaulter\_\_\_\_\_
  - ✓ Death on TB Rx\_\_\_\_\_
  - ✓ Total TB patients screened for HIV\_\_\_\_\_
  - ✓ Total Leprosy cases\_\_\_\_\_ on Rx\_\_\_\_\_
- **HIV/AIDS;**
  - ✓ Total people screened for HIV (last one year)\_\_\_\_\_
  - ✓ VCT\_\_\_\_\_ PITC\_\_\_\_\_ PMTCT\_\_\_\_\_
  - ✓ HIV prevalence\_\_\_\_\_
  - ✓ HIV Incidence (new cases/yr)\_\_\_\_\_
  - ✓ Total PLWHA\_\_\_\_\_
  - ✓ On ART\_\_\_\_\_ on Pre-ART\_\_\_\_\_
  - ✓ Other HIV prevention activities\_\_\_\_\_
- **Nutrition (malnutrition related OTPs,SC,TSF,CBN and PSNP activities )/HO & Early warning**
  - ✓ Total OTP sites\_\_\_\_\_, total admissions to OTP/yr\_\_\_\_\_

- ✓ Total SC sites, \_\_\_\_\_, Newly opened/yr \_\_\_\_\_, total admissions to SC/yr \_\_\_\_\_
- ✓ Is there TSF (targeted supplementary feeding) program in the woreda \_\_\_\_\_
- ✓ CBN program \_\_\_\_\_ PSNP \_\_\_\_\_ other \_\_\_\_\_
- ✓ General food security condition \_\_\_\_\_

○ **Essential** **drugs** **(shortage):-**  
 \_\_\_\_\_  
 \_\_\_\_\_

**13. Disaster situation in the woreda**

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

**Knowledge, Attitude and Practice towards using Insecticide Treated bed nets, among Bure zuria district residents, July 2019**

Region\_\_\_\_\_

Zone\_\_\_\_\_

Woreda\_\_\_\_\_

Kebele\_\_\_\_\_

Name of respondent\_\_\_\_\_

**I. Socio demographic characteristics**

1. Age\_\_\_\_\_
2. Sex A. Male B. Female
3. Religion: A. Orthodox B. Muslim C. Protestant
4. Role in the house: A. House head B. Wife C. Child D. other
5. Occupation: A. Farmer B. merchant: C. employee D. House wife
6. Educational status A. illiterate B. able to read and write C. secondary D. tertiary
7. Size of the House hold. A. <5 B. >=5

## II. Knowledge questions

1. Do you know the transmission modes of Malaria? A. Yes B. No
2. If Yes, What are they? A. by bite of mosquito B. by contact. C .by shaking hand, by eating together
3. Do you know ITN (Agober)? a. Yes B. No
4. Do you know malaria can be prevented using ITN (Agober): A. Yes B. No C. I don't know
5. Who do you think is at risk for malaria? A. children and pregnant B. adults C. females
6. How often do you think Agober should be used? A. every day B. every other day c. Every week

### **III. Attitude questions**

1. Do you think using ITN at night can prevent malaria? A. Yes B. No
2. If yes, where did you have the information? A. radio B .television C .health care worker  
D. from neighbor
3. If No, why? A. I don't have the information B. I don't know it can prevent malaria
4. Who do you think should use Agober every night? A. all people B. only children C.  
only pregnant women

#### IV. Practice questions

1. Do you have ITN in your house? A. Yes B. No
2. If Yes, How many do you have? A. 1 B. 2 C. more than 2
3. If No, why don't you have?, A. government did not distribute, B. was expensive C. we didn't want to have
4. Observed number mounted of ITNs in the house A. 0 B. 1 C. 2 D. more than 2
5. Do you/your family sleep under ITNs/Agober? A. Yes B. No
6. If No, why, A. not important B. not available C. not needed
7. How often do your family sleep ITN in a week? A. every night, B. every other night C. Every week
8. Are there pregnant and under 5 children in your house? A. Yes B. No
9. If yes, do they sleep under ITNs/Agober? A. Yes B. No
10. If Yes how often, A. every day B. every other day C. every week
11. If No, why? A. I don't know it is important B. not needed for them C. Not available

*Annexes 5 Agenda and name of Participants in Rapid response team training in Yirga chefe town, August 2018*

S/N	Date	Topic	Time	Presenter	Facilitator
1	Day One	Registration and introduction	8:30 am - 9:00 am	Organizer	
		Opening remark	9:00 am - 9:15 am	Fikru Bedecha	
		RRT Overview and exercise	9:15 am - 4:15 am	Dr.Motti Edosa	
		<b>Tea break</b>	<b>10:15 am - 10:45 am</b>	<b>Organizer</b>	
		Overview of Surveillance	10:45 am - 11:15 am	Habtamu Tilahun	
		AWD	11:30am-12:30 am	Hbatamu T	
		<b>Lunch break</b>	<b>12:30 am - 2:00 pm</b>	<b>Participant</b>	
		Laboratory approach	2:00 pm - 3:00 pm	Mekdes	
		Case management and IPC	3:00 pm - 4:00 pm	Wadu Marshalo	
		WaSH and social mobilization	4;00 pm - 5:00 pm	Damtew	
2	Day Two	Outbreak investigation	8:30 am - 10:00 am	Dr.Motti E	
		<b>Tea break</b>	<b>10:00 am - 10:30 am</b>	<b>Organizer</b>	
		RRT Roles and responsibilities	10:30 am - 12:00 am	Habtamu T	
		<b>Lunch break</b>	<b>12:00 am-1:30 pm</b>	<b>Participant</b>	
		Coordination and reporting	1:30 pm - 2:30 pm	Wadu M	

*Annexes 6 List of participants in rapid response team training in Yirga chefe town, August 2018*

S.N	Name of Participant	Zone/Town	Woreda
1	Shambel Bedane	Gedeo	Gedeb
2	Mitiku Shiferaw	Gedeo	Gedeb
3	Biruktawit Eyob	Gedeo	Gedeb
4	Yoseph Tilahun	Gedeo	Gedeb
5	Haile Dido	Gedeo	Gedeb
6	Fikadu Shiferaw	Gedeo	Gedeb

7	Tenagne Tamire	Gedeo	Gedeb
8	Petros Alemu	Gedeo	Gedeb
9	Engida Alemu	Gedeo	Gedeb
10	Libona Minassie	Gedeo	Gedeb
11	Tilahun Tadesse	Gedeo	Gedeb
12	Zerihun Buchu	Gedeo	Gedeb
13	Tamirat Birhanu	Gedeo	Gedeb
14	Abrham Mengesha	Gedeo	Gedeb
15	Tesfaye Beyene	Gedeo	Gedeb
16	Abrham Feyissa	Gedeo	Gedeb
17	Amare Wodage	Gedeo	Gedeb
18	Gizaw Gobena	Gedeo	Gedeb
19	Eyasu Tadesse	Gedeo	Gedeb
20	Biniyam Mariam	Gedeo	Gedeb
21	Dereje Kifile	Gedeo	Gedeb
22	Abera Negesse	Gedeo	Gedeb
23	Daniel Birhanu	Gedeo	Gedeb
24	Kuba Legesse	Gedeo	Gedeb
25	Gezahegn Abera	Gedeo	Gedeb
26	Dereje Ayele	Gedeo	Gedeb
27	Ashebir Mekonen	Gedeo	Kochore
28	Mihretu Bogale	Gedeo	Kochore
29	Teku Jego	Gedeo	Kochore
30	Kasahun Bekele	Gedeo	Kochore
31	Tigist Alemu	Gedeo	Kochore
32	Taye Eyato	Gedeo	Kochore
33	Getachew Arega	Gedeo	Kochore
34	Mihretu Obse	Gedeo	Kochore
35	Tadele Alako	Gedeo	Kochore
36	Abebayehu Legesse	Gedeo	Kochore
37	Abiyot Eyato	Gedeo	Kochore

38	Birhanu Gobena	Gedeo	Kochore
39	Desalegn Shiferaw	Gedeo	Kochore
40	Negash Nigussie	Gedeo	Kochore
41	Admasu Worku	Gedeo	Kochore
42	Belay Ayele	Gedeo	Kochore
43	Zelalem Mamo	Gedeo	Kochore
44	Sisay Jebo	Gedeo	Kochore
45	Ashenafi Tadesse	Gedeo	Kochore
46	Kidist Berhanu	Gedeo	Kochore
47	Zewude Giorigis	Gedeo	Kochore
48	Serawit Tadesse	Gedeo	Kochore
49	Adanech Shiferaw	Gedeo	Kochore
50	Simon Guye	Gedeo	Kochore
51	Mesele Esayas	Gedeo	Kochore
52	Tesfaye Desalegn	Gedeo	Kochore
53	Digafe Ayele	Gedeo	Kochore
54	Tsegaye Ayele	Gedeo	Kochore
55	Regasa Kebede	Gedeo	Wonago
56	Tamirat Zeleke	Gedeo	Wonago
57	Samuel Negash	Gedeo	Wonago
58	Semayineh Bekele	Gedeo	Wonago
59	Yohannes Nado	Gedeo	Wonago
60	Kedanemihret Lemma	Gedeo	Wonago
61	Tofik Gebre	Gedeo	Wonago
62	Tadesse Yitayew	Gedeo	Wonago
63	Temesgen Mengistu	Gedeo	Wonago
64	Daniel Tamiru	Gedeo	Wonago
65	Tigist Mekuria	Gedeo	Wonago
66	Chernet Tilahun	Gedeo	Wonago
67	Wondimagegn Shiferaw	Gedeo	Wonago
68	Tesfaye Shiferaw	Gedeo	Wonago

69	Tariku Tetemke	Gedeo	Wonago
70	Mestawot Feyissa	Gedeo	Wonago
71	Amanuel Amanu	Gedeo	Wonago
72	Shambel Gebre	Gedeo	Wonago
73	Almaz Bekele	Gedeo	Wonago
74	Tamirat Jimjima	Gedeo	Wonago
75	Genet Jenbere	Gedeo	Wonago
76	Betri Jemal	Gedeo	Wonago
77	Segenet Bekele	Gedeo	Wonago
78	Abaynesh Kebede	Gedeo	Wonago
79	Bizunesh Ayele	Gedeo	Wonago
80	Kasahun Melese	Gedeo	Yirgacheffe
81	Yohannes Kefelegn	Gedeo	Yirgacheffe
82	Samuel Bari	Gedeo	Yirgacheffe
83	Alemu Noka	Gedeo	Yirgacheffe
84	Gebeyehu Boroji	Gedeo	Yirgacheffe
85	Negash Mengistu	Gedeo	Yirgacheffe
86	Tamirat Shibiru	Gedeo	Yirgacheffe
87	Melkamu Bati	Gedeo	Yirgacheffe
88	Gezahegn ulatu	Gedeo	Yirgacheffe
89	Misgun Tesfaye	Gedeo	Yirgacheffe
90	Legese Legide	Gedeo	Yirgacheffe
91	Zelege Deyasso	Gedeo	Yirgacheffe
92	Yohannes Mengesha	Gedeo	Yirgacheffe
93	Samuel Hirbe	Gedeo	Yirgacheffe
94	Belayneh Atara	Gedeo	Yirgacheffe
95	Tigistu Mengesha	Gedeo	Yirgacheffe
96	Zenebe Tesfaye	Gedeo	Yirgacheffe
97	Alemayehu Gutale	Gedeo	Yirgacheffe
98	Arega Ambaye	Gedeo	Yirgacheffe
99	Woinshet Maregn	Gedeo	Yirgacheffe

100	Ashenafi Tekebo	Gedeo	Yirgacheffe
101	Mesfin Shiferaw	Gedeo	Yirgacheffe
102	Melkamu Tadele	Gedeo	Yirgacheffe
103	Bekelech Bedecha	Gedeo	Yirgacheffe
104	Workalemaw Desalegn	Gedeo	Yirgacheffe
105	Alazar Elias	Gedeo	Yirgacheffe
106	Amare H/Mariam	Gedeo	Yirgacheffe
107	Abrham Ayele	Gedeo	Yirgacheffe
108	Hiwot Berhanu	Gedeo	Gedeb

*Anexes 7 Agenda of second round training on rapid response team training in Yirga chefe town, August 2018*

S/N	Date	Topic	Time	Presenter	Facilitator
1	Day One	Registration and introduction	8:30 am - 9:00 am	Organizer	Mesay
		Opening remark	9:00 am - 9:15 am	Wondayehu Birhanu	
		RRT Overview and exercise	9:15 am - 4:15 am	Habtamu Tilahun	
		Tea break	10:15 am - 10:45 am	Organizer	
		Overview of Surveillance	10:45 am - 11:15 am	Habtamu Tilahun	
		AWD	11:30am-12:30 am	Yeshitila Mogesie	
		Lunch break	12:30 am - 2:00 pm	Participant	
		Laboratory approach	2:00 pm - 3:00 pm	Mekdes	
		Casemanagement and IPC	3:00 pm - 4:00 pm	Wadu Marshalo	
		WaSH and social mobilization	4;00 pm - 5:00 pm	Jemal Hassen	
2	Day	Outbreak investigation	8:30 am - 10:00	Serawit Elias	

Two		am		
	Tea break	10:00 am - 10:30 am	Organizer	
	RRT Roles and responsibilities	10:30 am - 12:00 am	Habtamu T.	
	Lunch break	12:00 am-1:30 pm	Participant	
	Coordination and reporting	1:30 pm - 2:30 pm	Desalegn G/Endashaw	
	Demonstaration	2:30 pm - 3:00 pm	Tamirat T	

*Anexes 8 .List of Participants in rapid response team training in Yirga chefe town, August 2018*

S.No	Name of Participant	Zone/Town	Woreda	Health Facility	Profession	Phone Number
1	Hailu W/Mariam	Gedeo	wonago	Sokicha HC	C/nurse	925594452
2	Abraham Gumi	Gedeo	wonago	Kelcha HC	Lab tech	916507296
3	Andualem Alemaw	Gedeo	wonago	Kelcha HC	HO	924531673
4	Gedion Gebre	Gedeo	wonago	Kelcha HC	Bsc, Nurse	926952801
5	Zerihun Kebede	Gedeo	wonago	Sokicha HC	Pharmacy	921790658
6	Endashaw Tefera	Gedeo	wonago	Hassie HC	P H Nurse	916508331
7	Solomon Kasaye	Gedeo	wonago	Woreda Health Office	HO	911814294
8	Mamo Bire	Gedeo	wonago	Rassa HC	C/nurse	916801830
9	Zinaye Worku	Gedeo	wonago	Woreda Health Office	C/nurse	916403391
10	Bedilu Hailu	Gedeo	wonago	Mokonissa HC	Bsc, Nurse	916309787
11	Shebere Bogale	Gedeo	wonago	Mokonissa HC	C/nurse	910877146
12	Hirut Betru	Gedeo	wonago	Rassa HC	HO	913960081
13	Habtamu Tamiru	Gedeo	wonago	Wonago HC	Mid wife	916103953
14	Yanbel Kifle	Gedeo	wonago	Wonago HC	Lab tech	
15	Esmail Yimam	Gedeo	wonago	Hasse Haru HC	Lab tech	913870761

16	Bereket Aragaw	Gedeo	wonago	Hassie Haro HC	Environmental	916851396
17	Muluneh Binobesa	Gedeo	wonago	Wonago HC	Pharmacy	916327614
18	Tegene Muleta	Gedeo	wonago	Wonago HC	C/nurse	916110722
19	Mihretu Mekonnen	Gedeo	wonago	Woreda Health Office	Bsc, Nurse	913883770
20	Tamrat Jillo	Gedeo	wonago	Woreda Health Office	HO	913456145
21	Maru Jimjima	Gedeo	wonago	Woreda Health Office	Bsc, Nurse	916830705
22	Birhanu Worarssa	Gedeo	wonago	Woreda Health Office	Bsc, Nurse	925588149
23	Biruk Alemayehu	Gedeo	wonago	Sokicha HC	HO	916592426
24	Tariku Aseffa	Gedeo	wonago	Mokonissa HC	HO	927111535
25	Gezahegn Falade	Gedeo	wonago	Mokonissa HC		910321657
26	Woynishet Nigatu	Gedeo	wonago	Rassa HC	Bsc, Nurse	910665874