ADDIS ABABA UNIVERSITY, COLLEGE OF HEALTH SCIENCES, SCHOOL OF PUPLIC HEALTH, ETHIOPIAN FIELD EPIDEMIOLOGY TRAINING PROGRAM (EFETP)

COMPILED BODY OF WORK IN FIELD EPIDEMIOLOGY

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

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Addis Ababa, Ethiopia

ADDIS ABABA UNIVERSITY

College of Health Sciences, School of Public Health,

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List of Abbreviations

AAU----------Addis Ababa University

AFI----------Acute Febrile Illness

AFP----------Acute Flaccid Paralysis

AIDS: ----------Acquired Immune -Deficiency Syndrome

ANC: ----------Antenatal Care

ART: ----------Anti-Retroviral Therapy

AURTI----------Acute Upper Respiratory Tract Infection

AWD---------- ----------Acute Watery Diarrhea

BCG---------- Bacillus Calmette Guerin

BPR----------Business Process Reengineering

CBN----------Community Based Nutrition

CDC: ----------Center of Disease Control

CFR----------Case Fatality Rate

CHA: - ----------Community Health Agent

CHD: ----------Community Health Day

CHP: - ----------Community Health Promoter

DC----------Data Collector

EC: - ----------Ethiopian Calendar

EFETP: ----------Ethiopian Field Epidemiology Training Program

EIS---------- Epidemic Intelligence Service

EPHI---------- Ethiopian Public Health Institute

EPI----------Expanded Program of Imminization

EPRP----------Emergency Preparedness and Response Plan

FAO----------Food and Agriculture Organization

FP----------Family planning

FSSZ----------Finfinne Surrounding Special Zone

FMoH----------Federal Ministry of Health

GC: - ----------Gregorian Calendar

HC: ----------Health Center

HEW: ----------Health Extension worker

HF: ----------Health Facility

HHs: ----------House holds

HIV: - ----------Human Immunodeficiency Virus

HMIS: ----------Health Management Information System

HPs: ----------Health Posts

ICCM----------Integrated Community Care Management

IDD----------Iodine Deficiency Disorder

IDP----------Internal Displaced Population

IDSR----------Integrated Disease Surveillance and Response

IG----------Immune Globins

IHR----------International Health Regulation

IMR----------Infant Mortality Rate

IPD: ----------Inpatient Department

IRS----------Indoor residual Spray

ITN----------Insecticide Treated Net

KG----------Kinder Garten

MCH: ----------Maternal and Child Health

MDRTB----------Multi Drugs Resistant Tuber Clauses

MMR----------Maternal Mortality Rate

MMR vaccine----------Measles, Mumps and Rubella vaccine

MNT free—----------Measles, Neonatal Tetanus free

MUAC: ----------Mid Upper Arm Circumstance

NFI----------Non Food Items

NGO----------Non Government Organization

NNT----------Neonatal Tetanus

ODF----------Open defecation free

OPD—----------Out Patient Department

OPV----------Oral Polio Vaccine

ORHB----------Oromia Regional Health Bureau

OTP----------Out Therapeutic program

PHCU----------Primary Health Care Unit

PHEM----------Public Health Emergency Management

PICT----------Provider Initiated Counseling and Testing

PI----------Principal Investigator

PLWHA----------People Living With HIV/AIDS

PMTCT----------Prevention Mother to Child Transmission

PPV----------Positive Predictive Value

PSNP----------Productive Safety Net Program

RDT----------Rapid Diagnostic Test

SAM----------Severe Acute Malnutrion

SC----------Stabilizing Center

SPR----------Slide Positivity Rate

TB----------Tuberculosis

TTBA: ----------Trained Traditional Birth Attendant

TSF----------Targeted Supplementary Food

VCT----------Voluntary counseling and testing

WASH----------Water Sanitation and Hygiene

WDA----------Women Development army

WHO----------World Health Organization

Executive Summary

Despite many intervention activities undertaking prevention of communicable diseases remain a public health problem globally. The Ethiopian Government Policy gives more emphasis on prevention measures of communicable diseases. Many strategies and programs were also set to enhance disease prevention activities. Ethiopian Field Epidemiology Training Program, adapted from the United States Centers for Disease Control and Prevention (CDC) Epidemic Intelligence Service (EIS) is one of the programs focusing on capacity building of public health practitioners. The training enables trainers to conduct disease surveillance and implement prevention and control measures of prioritized diseases.

I stayed in the Addis Ababa University, School of Public Health- Field Epidemiology Training Program and at the Oromia Regional Health Bureau Field Base from October 2017 to June 2019. During my stay, I carried out two outbreak investigations, one surveillance data analysis, one surveillance system evaluation, one district health profile description, prepared two abstracts, one scientific manuscript for peer reviewed journals and one disaster situation analysis. I was also engaged in one epidemiological research proposal, one training and preparation of three weekly epidemiologic bulletins for this residency outputs. However, I included only one weekly bulletin in this Document.

We investigated two outbreaks (Measles and scabies) during this field base Residency. Additionally, we investigated also two outbreaks (Measles and food poising) which were not included in this Document. We did not include the two additional outbreaks due to similarity with previous measles investigation and food poising outbreak where I served as co-investigator with other staff. Descriptive and analytical epidemiology methods were used to describe magnitude of the diseases and identify risk factors associated with diseases.

A total of 34 measles cases were reported from Goro Woreda of Bale Zone, Oromia Region in 2018. We identified that low vaccine coverage, lack of awareness, lack of belief in modern medicine and poor cold chain management for measles outbreak in the woreda. We recommended increasing community awareness on vaccination, additional second dose of measles vaccine and proper cold chain management.

There were also scabies outbreaks in three Medresa/religious education sites of Ginnir Woreda, Bale Zone of Oromia Region that we investigated in February 2019. During this outbreak, a total of 102 scabies cases and no deaths were reported from January 2019 to February 2019. Lack of safe water, overcrowding, long duration contact and students movements from one Medresa to others might be attributed factors for scabies outbreak. We recommended provision of safe and adequate water, avoiding contact with someone with symptoms, active case search and early treatment and separate rooms for students/deresa.

Surveillance data analysis of Severe Acute Malnutrition (SAM) for consecutive four years (2006 – 2009 E.C) was conducted in Bale Zone of Oromia Region. The cases were increasing throughout those years especially during 2008 E.C due to ElNino with decreasing deaths. We identified that strong screening and case management contributed for the increasing number of cases and declining deaths.

I conducted surveillance system evaluation in Akaki Woreda, Finfinne Special Surrounding Zone of Oromia Region in 2018. During this evaluation, the overall surveillance system and selected disease (malaria) was assessed. The system was simple, flexible, useful, sensitive and complete but, not timely, stable and representative.

Health profile description was carried out in Sinana district, Bale Zone, Oromia Region from February to March 2018. Low coverage of infrastructures, high prevalence of communicable diseases such as diarrhea and acute upper respiratory infections and low maternal health services were noted.

I prepared scientific manuscript for peer reviewed journals on measles outbreak investigation and response in Goro Woreda, Bale Zone of Oromia Region.

Two abstracts were prepared for scientific conference submission; Measles Outbreak Investigation and Intervention in Goro Woreda of Bale Zone and Severe Acute Malnutrition (SAM) data analysis in Bale Zone, Oromia Region.

Disaster situation analysis was conducted at IDP sites in Begi woreda of West Wellega Zone, Oromia Region in July 2018 to assess situation, identify humanitarian needs and give public health intervention. Diarrhea and other communicable diseases were anticipated to be a major

public health concerns in Begi District. We identified shortage of food and non food items, drugs and medical equipment at zonal, Woreda and Health facilities levels.

Epidemiological research project proposal on assessment of sanitary condition of food and drinking establishments in Bishoftu Town, Oromia Region was prepared. Cross-sectional study will be used for this study. A total of 422 food and drinking establishments will be selected from total establishments based on stratification followed simple random sampling. Data on building, water, latrine and waste management facilities will be collected from owners where as data on knowledge and practice will be from food handlers. Water sample also will be taken from common source for bacteriological test. The rest activities of study other than proposal will be expected to be finished in the next year. The total estimated budget required for the study is 46,220.21 ETB.

Training was given to zonal and woreda PHEM focal persons from five Woredas and one town at Dambi Dollo Town of Kellem Wellega on Community based surveillance. Topic covered in this training were, establishing community based surveillance, role and responsibility of focal person, major indicators of early warning system, IDSR versus PHEM report ,standard and community case definition and monitor and evaluation. The evaluation training objectives was measured by reflection of idea and post test. Based on evaluation, the training was successful and meets its objectives. Additionally, I was participated on workshop on Non communicable diseases that held at Addis Ababa University with collaboration of School of Public Health and University of German.

I prepared weekly bulletin on PHEM report of Oromia Regional Health Bureau for WHO Epidemiologic week 51 of 2018. The health facilities report completeness and timeliness for that week was 88.2% and 86.8% respectively. Report completeness and timeliness were above the expected national level (80%). Suspected measles cases were increasing during week 51 of 2018.

CHAPTER ONE-

MEASLES OUTBREAK INVESTIGATION AND RESPONSE IN GORO WOREDA, BALE ZONE, OROMIA REGION

ABSTRACT

Background: Measles is a highly contagious respiratory tract infection caused by the Morbillivirus. The disease causes high morbidity and mortality worldwide. In December 2018, Goro District Health Office informed Bale Zone Health Office that there were suspected measles cases identified in W/Sayida and W/Hora Kebeles of the District. Hence, EFETP resident with other team members were deployed to endemic sites.

Objectives:- to confirm the outbreak, describe magnitude of the outbreak, identify risk factors associated with disease and take control measures.

Methodology: -We described cases and conducted unmatched 1:2 case-control study .We interviewed study participants using structured questionnaire and Epi info 7.1 and SPSS version 23 were used to enter and analyze data.

Results:-A total of 34 measles cases and no death were reported from Goro district. Of the total of 34 cases, 22 (64.7%) were males. Thirty two cases (94%) were not vaccinated. Less than five years ages were more affected with age specific attack rate of 13 per 1000 population. Having vaccinated for measles had protective effect (Odds Ratio: 0.1075, 95% CI: 0.0237-0.4872), Large family size (Odds Ratio: 1.4339, 95% CI: 1.3077-1.5601), knowledge on vaccine preventability of measles (Odds Ratio: 0.3600, 95% CI: 0.1442-0.8985), Poor ventilation (Odds Ratio: 2.8889, 95% CI: 1.1461-7.2818) and family education status (OR: 0.3462, 95% C.I: 0.1372-0.8725).

Conclusion& Recommendation:-Most cases were reported among less than five years and low vaccine coverage reported among measles cases. Low awareness level also identified as risk factors for measles transmission .We recommend District Health Office and health facilities to enhance the measles vaccine coverage and improve awareness on measles

Keywords: Measles, Outbreak, Case-Control, Goro Woreda, Bale, Ethiopia, 2018

1 Introduction

Measles is a highly contagious, serious human disease caused by a virus(**1**). It is caused by a virus in the paramyxovirus family, genus Morbillivirus and it is normally passed through direct contact and through air. Measles virus replicates in the nose and throat of an infected child or adult(**2**)**.** Then, when someone with measles coughs, sneezes or talks, infected droplets spray into the air, where other people can inhale them. The infected droplets may also land on a surface, where they remain active and contagious for several hours. You can contract the virus by putting your fingers in your mouth or nose or rubbing your eyes after touching the infected surface.

The incubation period of measles, from exposure to onset of symptoms ranges from 7 to 14 days (average, 10-12 days)(**3**). Patients are contagious from 1-2 days before the onset of symptoms. Healthy children are also contagious during the period from 3-5 days before the appearance of the rash to 4 days after the onset of rash. On the other hand, immunocompromised individuals can be contagious during the duration of the illness. The first sign of measles is usually a high fever (often >104 ^{oF} [40 ^{oC}]) and rash that typically lasts 4-7 days, cough, coryza, conjunctivitis and other symptoms for complicated cases.

Before widespread vaccination in 1980, measles was responsible for an estimated 2.6 million deaths worldwide each year(**4**)**.** Despite the availability of a safe and effective vaccine, measles remains one of the leading causes of death among young children around the world, according to the World Health Organization. Vaccination coverage levels of 90% or more might be required before a marked reduction in incidence is seen in younger infants through herd immunity. On the other hand, epidemics of measles occur when the number of susceptible individuals in a population reaches a critical threshold(**5**). A single dose of MMR vaccine induces measles immunity in about 95% of vaccines; however, due to measles extreme infectiousness and vaccine failures in case of poor vaccine management, 2 doses are recommended(**6**).

Measles outbreak occurs worldwide(**7**). In temperate zones, peak incidence occurs in late winter and early spring. In developing countries, case fatality rates average 3-5%, but can be as high as 10-30%. Measles is associated with long-term health problems(**8**)**.** These, include blindness, chronic lung disease, malnutrition (marasmic or kwashiorkor) and failure to thrive, and recurrent

infections. Furthermore, the risk of contracting other infections or dying remains high for several months after recovery from acute measles infection.

According to the study done in 2005 by FMOH and WHO on measles case fatality survey in Ethiopia indicated that there is still a high tendency not to seek treatment for measles and low belief in modern health services(**9**)**.** The most common reason (38%) for not visiting health facilities for measles cases in those areas where health facilities are relatively accessible were lack of belief in modern health services.

According to the study done in Ethiopia from2006-2016, the incidence of measles in Ethiopia was high and has remained above 5 per 1000,000(**10**)**.** This was above the target set for accelerated measles control less than 5 per 1000,000 or measles elimination target less than 1 per 1000,000. There were 66,719 confirmed cases, out of the 94,104 suspected measles cases reported between January 2006 and December 2016. In this study measles incidence increased from 20 cases per million total populations in 2006 to 194 cases per million in 2015 and declined to 49 per million in 2016.

According to the study done on epidemiology of laboratory confirmed measles virus cases in the southern nations of Ethiopia from 2007–2014, measles was a seasonal infection reaching a peak during January and February(**11**). In this area, measles continued as an important public health problem. The incidence of confirmed measles was found to be increasing from year to year mostly affecting children aged a month to 4 years. To reduce the incidence of measles, it is highly recommended to improve routine immunization, and conduct a wide age group campaign. Additional study is needed to better understand the age shift, and the knowledge, attitude and practices of the general population and health care professionals about measles infection and vaccination. As Ethiopia gets closer to measles elimination targets, it will be important to introduce genotyping to determine virus strains(**12**).

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(**13**).

According to the study conducted in June 2016 in South East Ethiopia, less awareness toward the disease and not fully immunizing children were potential cause for measles outbreak in Ethiopia(**14**). The morbidity and mortality due to measles has been reduced dramatically and many districts have become MNT-free(**15**).

In Oromia Region measles outbreak is still a main public health concern. During the period of 2018, measles epidemics were reported from different zones namely; Bale, East Hararge, East Wellega, etc (ORHB bulletin). Unpublished outbreak investigation report by Field Epidemiology Training Program Residents showed that the possible factors associated with the disease were low immunization coverage, malnutrition, poor cold chain management and community attitude toward measles control(**16**). About 731 confirmed and epidemiologically linked measles cases with 14 deaths were reported from different zones in 2018(**17**). In the last five years there were measles epidemics in Dawe kachen, Dawe Sarer Harana Buluk, Ginnir and Gololcha districts of Bale Zone(**18**).

On November 24, 2018, Goro Woreda Health Office informed Bale Zone Health Office that there were suspected measles cases identified in W/sayida and W/hora Kebeles of this Woreda. After having received this report from Zonal Health Office, organized team that consists of FETP residents was deployed to this Woreda and investigated the outbreak. Measles outbreak was not reported from Goro Woreda in the past five years.

This study was intended to confirm the existence of outbreak, describe magnitude of the disease, identify risk factors and take control measures.

1 Objectives

2.1 General objective

- To confirm the existence of measles outbreak, describe the magnitude of the disease, identify risk factors and take control measures in Goro Woreda, Bale Zone, Oromia Region

1.1 Specific objectives

- To confirm the existence of measles outbreak in the District
- To describe the magnitude of the disease by person, place and time in the District
- To identify risk factors and source of measles infection

2 Methodology

2.1 Case Definition

Standard case definition

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

Confirmed:- A suspected measles case that is investigated, including the collection of an adequate blood specimen (5ml), and has serological confirmation of recent measles virus infection (IgM positive).

Community case definition:- Any person with fever and rash started from face.

Operational case definition

A *case* was any person who resided in Goro District and developed any of the following symptoms; fever, lack of appetite, cough, coryza, red eyes, maculopapular rash or tested IgM positive between 24 November 2018 and 9 December 2018.

A *control* was any person who resided in the same community or village with cases in Goro District who did not have history of signs and symptoms of measles or tested IgM negative between 24 November 2018 and 9 December 2018.

Inclusion criteria

***Cases**:* Any residents of Goro District who tested positive for IgM or had symptoms of measles from 24 November 2018 to 9 December 2018.

***Controls**:* Any residents of measles affected Kebeles of Goro District during the study who was a neighbor to a case and who did not develop signs and symptoms of measles and agreed to participate was included.

Exclusion criteria

***Cases**:* Those who refused to participate

***Controls**:* Those who refused to participate as well as family members from the same house hold.

2.2 Study Area

Measles outbreak investigation and response was conducted in W/sayida and W/hora Kebeles, Goro Woreda, Bale Zone, Oromia Region. This area was under catchment of W/sayida PHCU.

2.3 Study Period

We conducted the study from 24 November -9December, 2018 in Goro Woreda, Bale Zone of Oromia Region

2.4 Study Design

We conducted un- matched case- control study

2.4.1 Descriptive Epidemiology

The previous five years and 1st quarter 2011 E.C of measles vaccine coverage of the District were reviewed and collected. Similarly, this data were collected from health facilities for data quality assurance. Magnitude of the disease was described by Kebeles, age, sex, date of onset, vaccination status and other variables

2.4.2 Analytical Epidemiology

We conducted 1:2 ratio un matched case-control study in Goro Woreda. Case-patients were those who were suspected to have measles by health facility workers before the study and active cases for suspected measles identified by investigation team at the community level. Controls were selected from family and neighbors. All cases and selected controls were interviewed with standard questionnaires adopted from CDC guide line. Different risk factors including vaccination status, contact history, housing condition, knowledge of the family on vaccination and nutritional status of children by MUAC were assessed in affected Kebeles.

2.5 Study Population

Total population of Goro Woreda was the study population of measles outbreak investigation.

2.6 Target population

During this outbreak investigation, all confirmed and suspected to have measles cases, deaths and selected unmatched community controls were target population of this study.

2.7 Data collection

We conducted assessment of environmental and individuals risk factors for selected cases and control households during this investigation. Those factors included vaccination status, nutritional status, family size, area of living house and ventilation status of the house, distance from health facilities, etc.

2.8 Data processing and Analyzing

Data were entered and summarized using Microsoft Excel. Analysis of different risk factors/exposures was done using Epi info version 7.1software and SPSS version 23.

2.9 Supportive Letter

Support letter was written from the Regional Health Bureau and Zonal Health Office. We obtained support and willingness to conduct the study from the Woreda Health Office. Objective of the investigation was communicated to study participants briefly. Then after, their oral consent and support was asked to participate in this study. Their confidentiality was assured.

2.10 Dissemination of results

Findings of this study in both soft and copies was communicated to the Oromia Regional Health Bureau, Bale Zone Health Department, Goro Woreda Health Office, Mentors, Coordinators and field supervisors.

3 Results

3.1 Geographic Area of the District

Goro District is one of 21 Woredas found in Bale Zone which is far away 60km from Zone and 490km from Addis Ababa in South East direction. It is bordered by Ginnir in North, Guradhamole and Barbare in South, Dawe Kachen in East and Sinana in the West. The climatic condition of the area is 36% highland, 46% midland and 18% lowland and average temperature

of 27^{oc}.The area of the district is Km^2 2243.75, with altitude range of 760m below sea level and 2800m above sea level.

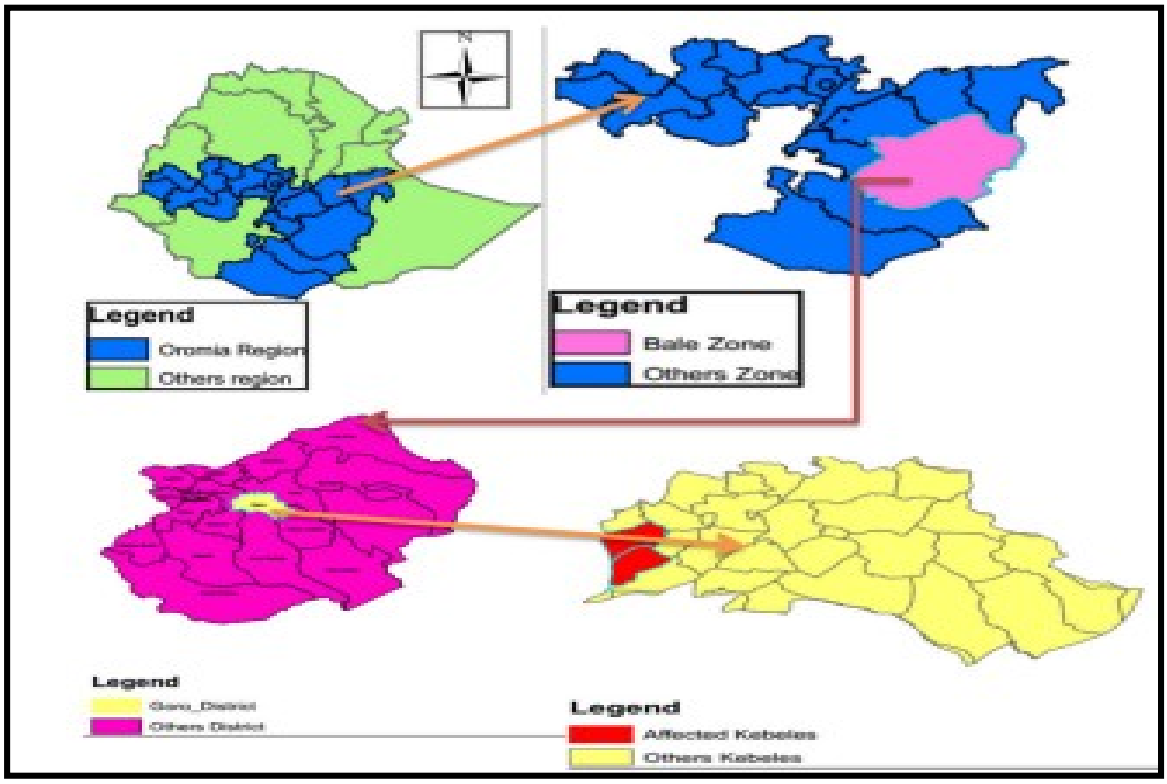

Figure 1: Map of Goro Woreda and its boundary, in Bale Zone of Oromia Region December, 2018

3.2 Socio-demographic characteristics of the study population

All households and study participants families staying in measles affected Kebeles were Oromo by ethnic group, Farmer by occupation and Muslim by religion.

3.3 Laboratory results

Five blood samples were collected and sent to the Central Laboratory for IgM confirmatory test. Of those sent samples, four of them were confirmed positive for measles IgM test. The rest 30 cases were epidemiologically linked with confirmed measles cases.

3.4 Descriptive Epidemiology

A total of 34 measles cases and no deaths were reported from 21/11/2018 to 04/12/2018 from W/sayida PHCU in Goro Woreda. Out of 34 cases, five cases were identified by active case

search. The overall incidence rate of the disease in the District per 10000 populations was 2.9 and the CFR was 0% in this Woreda. Out of 34 cases, 7 (20.6%) of them were admitted with measles complications, such as pneumonia and feeding problem. Of those affected Kebeles, the highest attack rate (23.7 per 10000 populations) was reported from W/sayida Kebele .The mean ages were 6.1 and 5.6 for cases and controls respectively. The index case with laboratory confirmed case in W/sayida Kebele specific area known as ''Dabaye.'' Her house was nearest to W/sayida HC which was less than 2km. She was 9 years old born from illiterate family. She didn't have any routine vaccination history. She took only polio vaccination during house to house visit during the polio campaign. Her family didn't believe in the use of vaccine and have negative attitude toward vaccination. She had history of contact with other students in the school and in the family. Those children who had contact with the index case in the family and at the school developed rash after she was seen at HC.

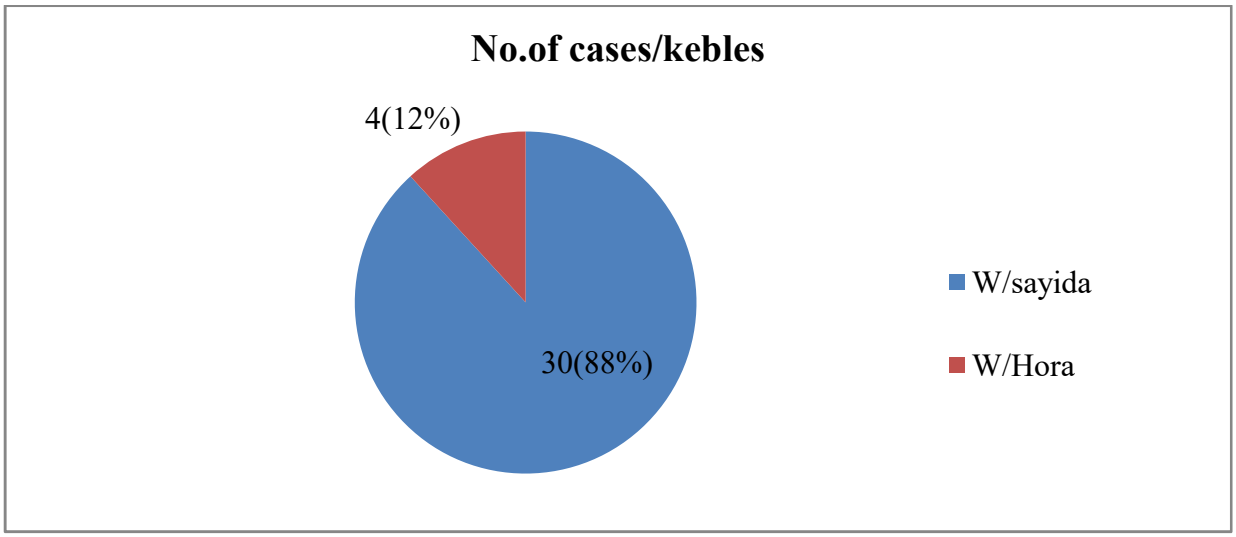

Figure 2:-Number of measles suspected cases by Kebeles in Goro Woreda, Bale Zone of Oromia, December, 2018

As above figure showed, about 30(88%) of cases were reported from W/sayida Kebele and the rest from W/hora Kebele. Of the total 29 Kebeles of the woreda, only two (6.9%) Kebeles were affected by this outbreak [Fig.2].

Less than five years ages were more affected 17(50%) of the total cases with attack rate of 13per 1000 populations. Twenty two (64.7%) of reported cases were males [Table1].

Table 1: Measles cases by Age and Sex category, Goro Woreda, Bale, Oromia, December 2018

Age categories	Sex		Total number of cases (%)
	Male (%)	Female (%)	
<5yrs	10(45.5)	7(58.3)	17(50)
5-14yrs	9(40.9)	5(41.7)	14(41)
15-24	2(9.1)	0(0)	2(6)
25-49yrs	1(4.5)	0(0)	1(3)
=/>50yrs	0(0)	0(0)	0(0)
Total	22(64.7)	12(35.3)	34(100)

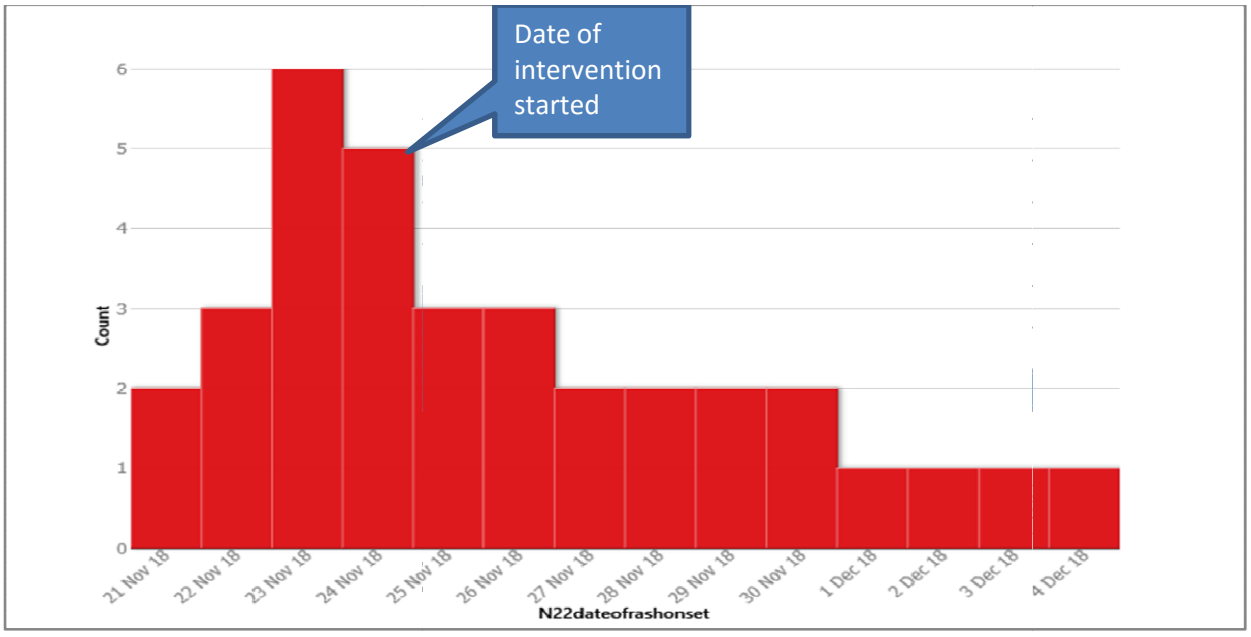

Figure 3: Date of onset of rash for measles outbreak in Goro Woreda, Bale Zone of Oromia Region, November, 2018

The above figure show that, date of onset started on 21November and ended on 4 December 2018 .On 21 November, two suspected cases seen at health facility were from one family within 4 hours apart. One of the two cases first seen at health center was probably the index case. On November 21, the index case was seen at W/sayida HC in the morning and her brother came in the afternoon with the same signs and symptoms. The outbreak reached peaks on 23 November of 2018 and gradually decreased till the end of the outbreak [Fig.3].

The previous five years and 1st quarter 2011 E.C of measles vaccine coverage of the District were reviewed and collected. Similarly, this data were collected from health facilities for data quality assurance. Among 102 study participants included in that study only 27(26%) had measles vaccination history. Previously there were two HEWs in W/sayida Kebele. Currently there is no HEWs in this Kebele. There was no electric power and also poor cold chain management in all Kebeles under catchment of W/sayida Primary Health Care Unit.

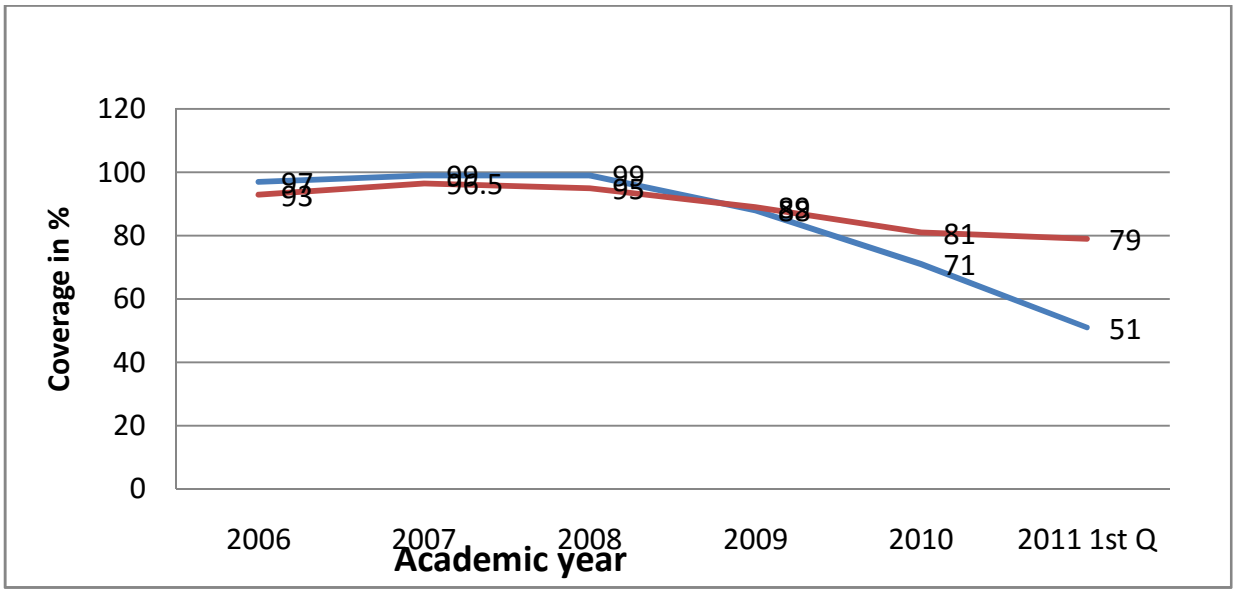

Figure 4:-Trends of measles vaccine coverage of Goro Woreda and W/sayida from 2006-1st quarter 2011 E.C, December 2018

The annual measles coverage of Goro Woreda during 2006, 2007, 2008, 2009, 2010 and 1st quarter 2011 E.C were 93%, 96.5% ,95%, 89%, 81% and 79% respectively. Measles vaccine coverage of W/sayida PHCU, in which current measles outbreak occurred during the last five years and 1st quarter of 2011E.C were97% , 99%. 99% , 88%, 71% and 51% respectively [Fig.4].

As table below indicated, 67(65.69%) of respondents had no awareness on vaccination, 21(20.59%) did not believe in the use of vaccine, 10(9.8%) were waiting for announcement and 4(3.92%) were absence during vaccination schedule [Table 2].

Table 2 :-The reason why the families did not vaccinate their children in Goro Woreda, Bale Zone, Oromia Region, December 2018

S.N	The reason why they did not vaccinate their children	Number of Respondent	%
1	Lack of awareness	67	65.69
2	Did not believe in the use vaccine	21	20.59
3	Waiting for announcement	10	9.80
4	Absence during vaccination schedule	4	3.92
5	Total	102	100.00

3.5 Environmental Assessment

Housing condition for ventilation, family size and estimated area of the house for interviewed case-patients and controls were compared. The mean of family size were 9.1 and 7.9 for cases and controls whereas mean of estimated area of house 22.3 and 23 respectively. According to below table 2.45m2 per individual for case and 2.91m2 per individual for control [Table 3].

Table 3:-Mean of Family size and estimated area of interviewed households members in meter square, in Goro Woreda, Bale zone, Oromia, December 2018

Case status	Family size			Estimated area of house in m2		
	Min	Max	Mean	Min	Max	Mean
Case	6	12	9.1	16	28	22.3
Control	4	12	7.9	16	32	23

3.6 Risk factors Assessments

We conducted 1:2 unmatched case control studies in Goro Woreda, Bale Zone of Oromia Region to assess risk factors for measles outbreak in the District. Thirty four cases and sixty eight controls were included in this study. Among participants, 66 of them were males. Significance of associated variables was assessed by bivariate and multivariate analysis. Age, sex, family education, family size, vaccination status, ventilation status of the house, contact history with someone in family, estimated area of the house and knowledge on measles vaccine preventability were analyzed and checked for association by bivariate analysis and finally, checked by multivariate analysis for those variables with P.Value<0.025. Having been vaccinated for measles had protective effect (Odds Ratio: 0.1075, 95% CI: 0.0237-0.4872).Family size (Odds Ratio: 1.4339, 95% CI: 1.7101-1.9625), knowledge on vaccine preventability of measles (Odds Ratio: 0.1091, 95% CI: 0.2419-0.9305),family educational status(OR:0.3462,95% CI:0.1372-.8725) and Poor ventilation (Odds Ratio: 3.7154, 95% CI: 8.5851-9.4923) were significantly associated with measles outbreak. Age, sex, estimated area of house and contact history were not associated with measles occurrence .Ethnic groups, religion, family occupation, distance from health center and malnutrition status were the same for all cases and controls. Hence has no any association [Table 4].

Table 4:-Multivariate logistic regression analysis for measles case control studies in Goro Woreda, Bale Zone, Oromia Region, December 2018

S.N	Variables		Cases (%)	Controls (%)	AOR	C.I at 95%	P.Value
1	Contact history with someone with measles symptoms	Yes	8(23.5)	6(8.8)			
		No	26(76.5)	62(91.2)	3.1250	1.1009-8.8704	0.7235
2	Family size	Min	6	4			
		Max	12	12	1.4339	1.3077-1.5601	**0.0031**
3	Vaccination status	Vaccinated	2(6)	25(36.8)			
					0.1075	0.0237-0.4872	**0.0047**
		Not vaccinated	32(94)	43(63.2)			
4	Housing condition	Ventilated	13(38.2)	42(61.8)			
		Not ventilated	21(61.8)	26(38.2)	2.8889	1.1461-7.2818	**0.0309**
5	Knowledge on vaccine preventability of measles	Yes	9(26.5)	38(55.9)			
		No	25(73.5)	30(44.1)	0.3600	0.1442-0.8985	**0.0030**
8	Family education status	Illiterate	23(67.6)	36(52.9)			
		Literate	11(32.4)	32(47.1)	0.3462	0.1372-0.8725	**0.0000**
9	Estimated area of house in meter square	Min	16	16			
		Max	28	32	0.9448	0.8835-1.0061	0.3525

3.7 Public Health Intervention

Active measles case search and management were conducted in affected areas of the woreda. Additionally, antibiotics and Vitamin A for measles treatment were mobilized from the Woreda Health Office. Tracing of vaccination status of children were conducted in all Kebeles. Woreda Health Office and Health center professionals were sensitized on measles case detection and

management. We conducted community mobilization and health education at three mosques as well as two elementary schools. Screening of children for malnutrition was done mainly in highly measles affected Kebeles.

4 Discussion

Several factors may contribute to the occurrence of measles outbreak in the affected woreda. Measles outbreak is expected and could frequently occur in areas with low measles immunization coverage and poor cold chain management, even with high vaccination coverage. The Woreda measles vaccination coverage of the last five years (2006 – 1st Q 2011 E.C) were 93%, 99% 95%, 89%, 81% and 79% respectively. Similarly, the measles vaccine coverage of five years (2006 – 1st Q 2011 E.C) of W/sayida PHCU were 97%, 96.5% 99%, 88%, 71% and 51% respectively. This shows that low vaccination coverage in the woreda resulted from poor community mobilization and absence of HEWs in the Kebele.

Out of total respondents 20.59% of them did not believe the use of vaccine. This was similar with the study done in 2005 by FMoH and WHO on measles case fatality survey in Ethiopia indicated that there is still a high tendency not to seek treatment for measles and low belief in modern health services(**19**).

Lack of vaccination, poor house ventilation, large family size, family education status and lack of knowledge on measles vaccine were significantly associated with measles. Additionally, absence of functional refrigerator in all Kebeles of the woreda may alter vaccine potency. This is similar with case-control study done in Dawe Serer, Dawe kachen and Harana Buluk woredas of Bale Zone in Oromia region showed that low vaccination coverage and non-functional cold storage likely contributed for measles outbreak occurrence in those areas(**20**).

The case fatality rate in this woreda was 0%. This is not similar with community-based study conducted in West Hararge Zone in Ethiopia following a measles outbreak in 2007 estimated that the case- fatality rate was 6.7%(**21**). Current WHO estimates of CFR for measles in endemic countries range between 0.05% - 6%(**20**). Our finding of case-fatality rate was out of this range. This may be due to no underlying malnutrition and strong case management in affected Kebeles.

Our study exhibited that poor ventilation of the case-patient's house significantly contributed for the outbreak. Additionally, in this woreda area of the house may support measles transmission in the family, since the mean of estimated house area of this District was 22.8m2 and the mean of family size was 8.17.This indicated that, 2.79 meter square for 1 person. This is not similar with WHO recommendation. WHO recommends 11 or more meter square floor space for 2 persons, 9-10 for 1.5 persons and 7-9 for 1 person(**22**).

Malnutrition, Family occupation, ethnic groups and religion had no any association according to this study, since they were similar for both cases and controls.

5 Conclusion

We confirmed the presence of measles outbreak in Goro Woreda of Bale Zone. The results of this investigation suggested that low measles vaccination coverage in the Woreda was the main contributing factor for the occurrence of the outbreak. During this outbreak, males and age less than five years children were more affected than other age groups. Poor ventilation and Low community awareness on vaccination service was also associated with the disease. Additionally, inadequate poor storage of vaccines and management may contribute for measles outbreak in the District. Since no malnutrition problems in the Woreda, the outbreak was easily controlled and few admission cases and no death were reported from the district.

The Woreda disease surveillance was poor as it can't identify measles vaccine defaulters and no HEWs in the Kebeles. All treated cases at outpatient and inpatient services recovered from their illness. This shows that the case management was good and intervention was undertaken timely. The activities performed by the team on community mobilization and providing key messages for the community to prevent and control measles outbreak was strong and effective.

6 Recommendation

1. Woreda Health Office should conduct mass campaign in all area of low vaccine coverage.
2. Woreda Health Office should assign HEWs in all Kebeles
3. Routine EPI and cold chain management should be improved in all health facilities in District
4. Health Workers should increase the community awareness on measles

5. Active surveillance activities of the woreda should be strengthened at all Kebeles

6. Oromia Regional Health Bureau should be provided the second dose of measles

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CHAPTER TWO

SCABIES OUTBREAK INVESTIGATION AND RESPONSE IN GINNIR WOREDA BALE ZONE OF OROMIA REGION, FEBRUARY 2019

ABSTRACT

Background: Scabies is a highly contagious skin condition caused by an infestation of the arthropods mites called *sarcoptes scabiei. It is the oldest human disease.* Itching mites are:- Eight-legged microscopic bug, burrows under the skin of humans and other animals to deposit eggs causing intense itching. In January 2019, Ginnir District Health Office informed Bale Zone Health Office that there were suspected scabies cases identified in Harawa Misra, Harawa 5 and Getara Kebeles of the District. Hence, EFETP resident with other team were deployed to outbreak sites.

Objectives:- to confirm the outbreak, describe magnitude of the outbreak, identify source of infection associated with disease and take control measures.

Methodology: -We conducted cross sectional study by interviewing study participants and environmental assessment using semi-structured questionnaires. Cases were identified clinically and linked epidemiologically. Epi info 7 and SPSS version 23 were used to enter and analyze.

Results:-A total of 102 scabies cases and no death were reported from three Medresa of Harawa Misra, Harawa 5 and Getara Kebeles of Ginnir District during the epidemic period. Of the total 102 cases, 101 (99%) were males. The prevalence of scabies in Harawa 5, Harawa Misra and Getara Medresa were 41.2%, 31.4% and 27.4% respectively. The specific attack rate of three Medresa of Harawa Misra, Harawa 5 and Getara were 371, 320 and 261/1000 populations. The mean age of study participants was 12.4 years.

Conclusion and Recommendation:-Overcrowding, contact with someone with disease for a long period, movement of students from one Medresa to other Medresa may contributing factors for existence of outbreak. Hence treatment of identified cases and avoid long duration of contact with infected people decrease transmission of the outbreak.

Keywords: Scabies Outbreak, Cross sectional study, In Medresa, Ginnir Woreda, Bale, Ethiopia, 2019

1 Introduction

Human scabies is one of the commonest dermatological parasitic infestations caused by *Sarcoptes scabiei var hominis* that accounting for a substantial proportion of skin disease in developing countries(**1**). The microscopic mite burrows into the skin and lays eggs, eventually triggering a host immune response that leads to intense itching and rash(**2**). The main Patients' complaint of scabies disease is nocturnal itch. The other clinical symptoms are, disseminated rash, excoriated, erythematous papules usually seen on the anterior trunk, elbow, forearms, skin folder, buttock, genital area, between fingers, anterior thigh, neck and waist(**3**).

The life cycle of *sarcoptes scabiei* is 4– 6 weeks(**4**) . Adult parasites die outside their human host within 24– 36 hours. Immature mites can survive 1 week. The mite and mite products (feces, eggs and dead parasites) generate an immediate or delayed (type IV) hypersensitivity reaction with scabies symptoms typically starting 3–6 weeks after primary infestation and 1–3 days after re-infestation. This hypersensitivity reaction is worse during night and rest to expand burrows under the skin of humans.

The adult female mite travels on the skin surface at the rate of about 1 inch per minute seeking a burrow site(**5**). After finding a suitable location, it burrows into superficial layers of the skin, forming a slightly elevated narrow tunnel where she deposits 2 to 3 eggs daily during her 4 to 6-week life span. The eggs progress through larval and nymphal stages to form adults in 10 to 17 days. The adults migrate to the skin surface and mate. The males die quickly, and the females penetrate the skin and repeat the cycle. The mite requires human skin to complete its life cycle and is unable to survive off the host at room temperature for more than 3 to 4 days. Transfer of the mite is usually from one person to another by direct skin-to-skin contact. It may also be transmitted through sexual contact, bathing a patient, applying body lotions for patients, back rubs, or any extensive hands-on contact and via clothing.

Several factors influence the extent of scabies transmission in the community or families, including the mite load and the required level of care of the source case, as well as the duration of the exposure period (**6**). Transmission of scabies is predominantly via skin-to-skin contact and transmission from bedding or clothes is rare in ordinary scabies, but can occur in crusted scabies

because of its tremendous mite burden. The risk of transmission increases with higher levels of population density, reflected by the high endemicity observed in communities living in poverty with associated crowded housing conditions, and by outbreaks in residential care facilities, prisons, schools, and refugee camps. Patients with underlying immunodeficiency from any cause, such as human immunodeficiency virus, human T-lymphotropic virus type 1 or corticosteroid treatment, or those with neurological conditions, are at an increased risk of crusted scabies(**7**).

Scabies has been estimated to affect approximately 300 million people worldwide each year and had an impact on everyday life caused by social withdrawal and due to feelings of shame, guilt and fear of rejection(**8**). Although its distribution is subject to a cycle of infection, with peaks and troughs of disease prevalence, this periodicity is often less obvious in poor communities(**9**). It can affect all age groups and both sexes, but the most vulnerable age groups are young children and the elderly in resource scarce communities who are especially susceptible to scabies as well as secondary complication of infestation.

Scabies is a common public health problem particularly, where there is social disruption, overcrowding and where personal hygiene is poor, immunosuppressant individual, poor nutritional status, homelessness and dementias are also risk factors(**10**). Children in developing countries are most susceptible to scabies, with an average prevalence of 5–10%(**11**). The highest incidence is in tropical climates, with rates of up to 25% overall and up to 50% in some communities in the South Pacific and northern Australia(**12**). The study conducted 2013 on Scabies community prevalence and mass drug administration in two Fijian villages revealed that the prevalence of scabies in school children and infants were 18% and 14% respectively(**12**).

In Ethiopia, scabies is also common especially during natural and manmade disasters, such as flooding, drought, civil war and conflict, poor water supply and sanitation and overcrowding living condition(**13**). For example according to the study done in Northern Ethiopia, Gondar Town, among “yekolo temari” revealed that 22.5% prevalence of scabies case was reported. Another study done in northern Ethiopia, revealed that, the prevalence of scabies in school children was 5.5%**(14, 15**).

According to scabies outbreak investigation case control study done 2017, in North Gondar Zone Dembiya District, the overall attack rate of scabies are 2% with zero case fatality was reported(**15**). This study also revealed that, poor hygiene, sharing of clothing, sleeping proximity with infected persons were associated with higher frequency of scabies disease. Another study done in East Badewacho District of Southern Ethiopia, revealed that, the mean age was 12 years and most affected age group was 5–14years and independent risk factors found to be statistically associated with scabies infestation were age less than 15years, family size greater than five members, bed sharing with scabies cases, and home being affected by flooding(**16**).

Generally, Oromia region outbreak reported in 2018 accounted for 90.6% from total national outbreak(**17**). Scabies outbreak is become a main public health problem in the region and added to priority surveillance reportable diseases in 2017(**18**). Total 173,833 scabies cases were reported to the region since 2017 to the first 4 weeks of WHO 2019(**19**). Out of these, 45032 cases were reported during 2018 and the first 4 weeks of WHO 2019. During the period of 2018/2019, scabies clinically diagnosed cases were reported from East Hararge, West Hararge, East Shoa, West Shoa, North Shoa, South West Shoa, Arsi, West Arsi, Bale, West Guji, East Wellega, West Wellega, H/G/Wellega, Kellem Wellega, Jimma and FSS Zones.

On January 23, 2018, Ginnir Woreda Health Office informed Bale Zone Health Office that there were suspected Scabies cases identified at three religious education sites called Medresa in Harawa misra, Harawa 5 and Getara Kebeles of that District. However, there were scabies cases in all Kebeles of Ginnir Woreda during our visit, but did not report and still neglected disease in this area. After having received this report from Zonal Health Office, organized team that consists of FETP residents was deployed to this woreda and investigated the outbreak. In that area there were no progress studies on scabies outbreak investigation and risk factors previously. This study was intended to confirm the existence of outbreak, describe magnitude of the disease, identify source of infection strength active case search and take control measures.

2 Objectives

2.1 General objective

- To confirm the existence of Scabies outbreak, describe the magnitude of the disease ,identify source of infection and take control measures in Ginnir Woreda, Bale Zone, Oromia Region

2.2 Specific objectives

- To confirm the existence of Scabies outbreak in the District
- To describe magnitude of the disease by person, place and time in the District
- To identify source of infection
- To strength active case search and control measures

3 Methodology

3.1 Case Definition

Confirmed case: -is an individual who was the residents of Ginnir Woreda of affected Medresa during the period of 25 January to 25 February and has skin scraping with identified mites, mite eggs or mite feces.

Probable case: -is an individual who was the residents of Ginnir Woreda of affected Medresa during the period of 25 January to 25 February with clinical symptoms of scabies (persistent pruritic rash).

Contact case: -is anyone with a close skin-to-skin contact with a case.

3.2 Study Area

We conducted Scabies outbreak investigation and response at three religious education sites/ Medresa/ in Ginnir Woreda, Bale Zone of Oromia Region. This area was under catchment of Harawa 2 and K/Magene PHCU. The District shares borders with Gololcha in North, Goro and Dawe kachen in South, Rayitu and Sawena in East and Sinana and Gasara in West.

3.3 Study Period

From 25 January -25 February2019 in Ginnir Woreda, Bale Zone of Oromia Region

3.4 Study Design

We conducted cross -sectional study

3.4.1 Descriptive Epidemiology

The District safe water coverage, Socio-economic status of the affected community was assessed. Magnitude of the disease was described by place, person and time.

3.5 Study Unit

Harawa Misra, Harawa 5 and Getara Medresa

3.6 Target population

All populations in three Medresa were target population of this study

3.7 Data collection

We conducted interviewed individuals in three Medresa using semi-structured questionnaires adopted from WHO guide line and also environmental assessment was done

3.8 Data processing and Analyzing

Data where entered and summarized using Epi info version 7 and Microsoft Excel.

3.9 Supportive letter

Support letter was written by Oromia Regional Health Bureau and Zonal Health Office. We obtained support and willingness to conduct the study from Woreda Health Office. Objective of the investigation was communicated to study participants briefly. Then after, their oral consent and support was asked to participate in this study. Their confidentiality was assured.

3.10 Dissemination of results

Findings of this study in both soft and copy were communicated to Addis Ababa University, the Oromia Regional Health Bureau, Bale Zone Health Department, Ginnir Woreda Health Office, Mentors and coordinators

4 Results

4.1 Geographic Area of the district and Socio-demographic characteristics

Ginnir District is one of 21 woreda found in Bale Zone with distance of 130km from Zone and 560km from Addis Ababa to South-East direction. The climatic condition of the district is 38% highland, 61% midland and 1% lowland and the area of the district is Km^2 2010.36.The District

shares borders with Gololcha in North, Goro and Dawe kachen in South, Rayitu and Sawena in East and Sinana and Gasara in West.

All study participants in scabies affected Medresa were Oromo by ethnic group, Muslim by religious and Student by occupation. One hundred (99%) of cases were single. Ustaz/their teacher and his wife as well as their two children were affected by scabies.

4.2 Laboratory results

No laboratory service and cases were diagnosed clinically where as the rest cases were epidemiologically linked.

4.3 Descriptive Epidemiology

A total of 102 scabies cases reported from three Medresa of Harawa misra, Harawa 5 and Getara Kebeles of Ginnir district during epidemic period. Among those cases, 28 were identified by active case research. Of the total of 102 cases, 101 (99%) were males. The mean age of those affected individuals was 12.4 years. One hundred one (99%) of cases were single where as one (1%) case was married and both husband and wife as well as their children were affected by scabies .According to Ginnir Woreda Water and Energy Office report, the District safe water coverage was 26% and no safe water coverage in all visited Kebeles affected by scabies.

Population at risk in three Medresa, Harawa misra, Harawa 5 and Getara were 113,100 and 108 respectively. The overall attack rate of scabies in three Medresa was 318/1000 populations. The specific attack rate of three Medresa of Harawa 5, Harawa misra and Getara were 371, 320 and 261/1000 populations [Table 5].

Table 5:-Attack rate of scabies per Medresa, Ginnir Woreda, Bale Zone of Oromia Region, February 2019

Medresa	Number of cases(%)	Population in each Medresa	Attack rate/1000
Harawa 5	42(41.2)	113	371
Harawa misra	32(31.4)	100	320
Getara	28(27.4)	108	261
Total	102(100)	321	318

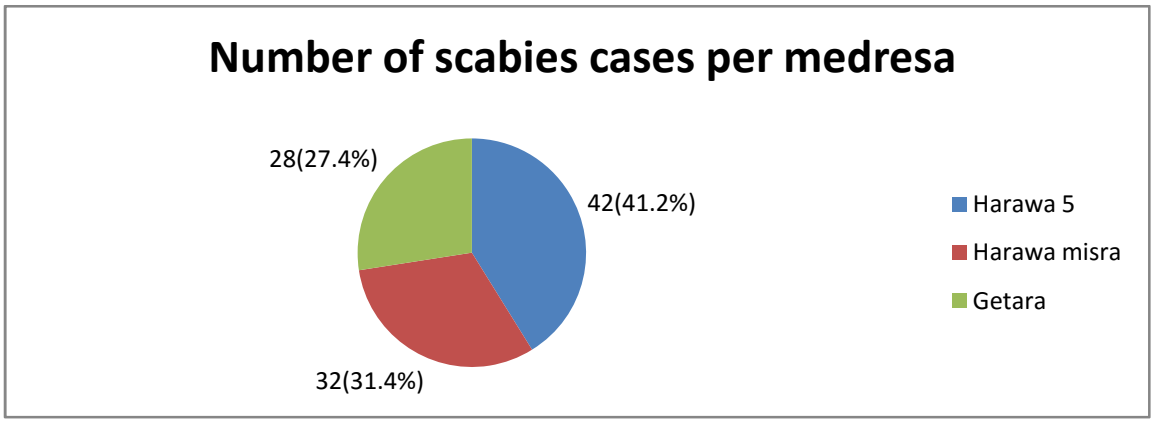

Figure 5:-Distribution of scabies cases by Medresa, in Ginnir Woreda, Bale Zone of Oromia Region, February 2019

As above figure shows, the prevalence of scabies in Harawa 5, Harawa misra and Getara Medresa were 41.2%, 31.4% and 27.4% respectively[Fig.5].

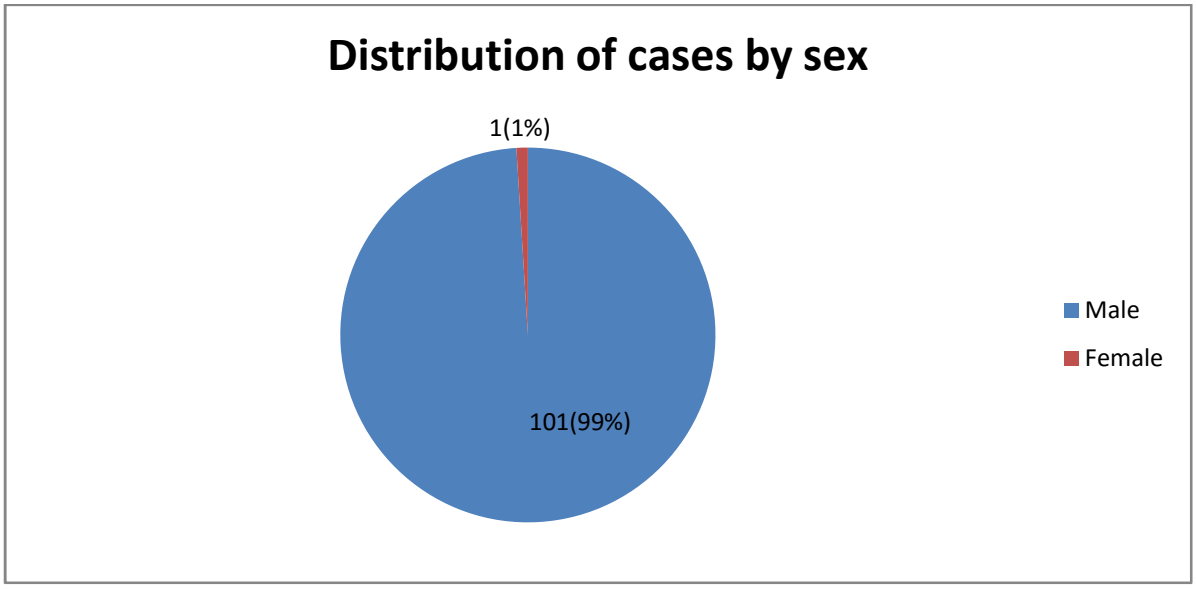

Figure 6:-Distribution of cases by sex in three Medresa, Ginnir Woreda, Bale Zone of Oromia Region, February 2019

As above figure shows, 101(99%) cases were males whereas 1(1%) case was female [Fig.6].

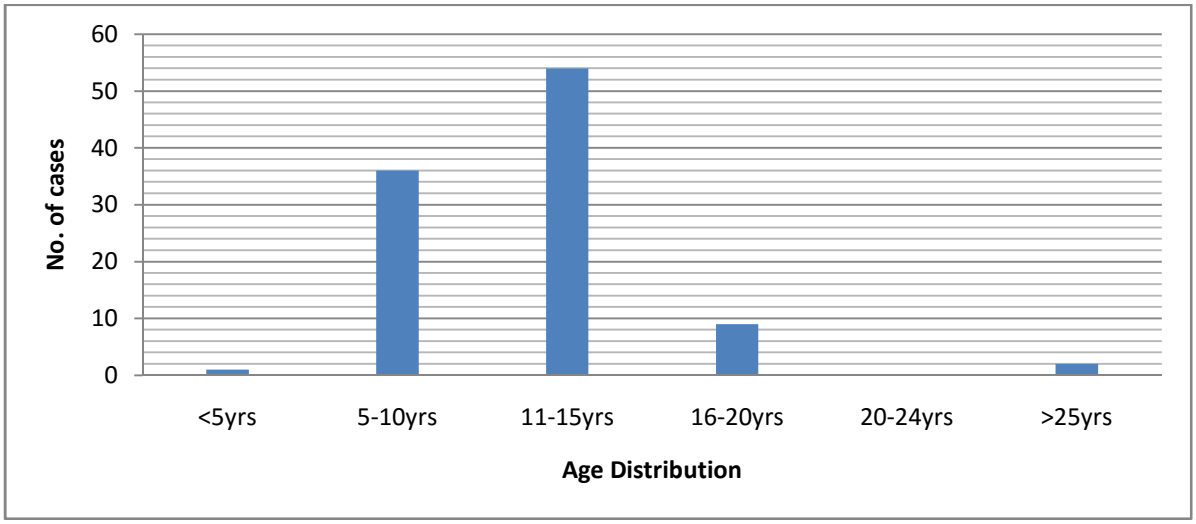

Figure 7:-Distribution of scabies cases by ages in Medresa, Ginnir Woreda, Bale Zone of Oromia Region, February 2019

As above figure shows, 54(52.9%) cases were between 11-15yrs followed by 36(35.3%) cases between 5-10yrs, 9(8.8%) cases between 16-20 yrs, 2(2%) cases were greater than 25yrs and 1(1%) case less than 5yrs [Fig.7].

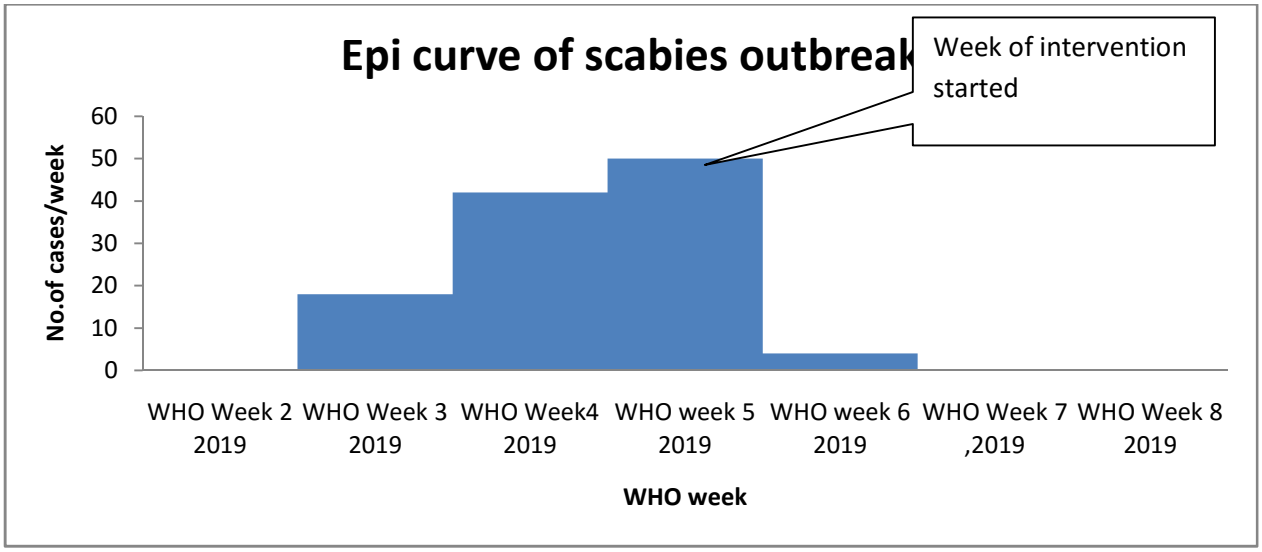

Figure 8:-WHO weeks of onset itching and rash among Medresa students of Ginnir Woreda, Bale Zone, Oromia Region ,February 2019

As above figure shows, suspected scabies outbreak reported in WHO Week 3, 2019 in Harawa 5 Medresa and disseminated to other Medresa. Outbreak reaches peaks in WHO Week 5, 2019 and

intervention initiated in WHO Week 5, 2019 due to late report. The outbreak ended in WHO Week 7, 2019 after mass treatment and all active cases were searched and treated [Fig.8]

As table below shows that out of 102 scabies cases, 83(81.4%) had only pruritic rash between fingers and forearms, 15(14.7%) cases had pruritic rash and itching between fingers, on forearms, elbow and thigh, 2(1.95%) cases pruritic rash with itching between the fingers and on the forearm, elbow, thigh, palm and buttock where as 2(1.95%) of cases had pruritic rash with itching between the fingers, on the forearm and genital area. Those patients affected in genital area were husband and wife. This man was religious teacher in Harawa 5 Medresa. His two children were also affected by the disease [Table 6].

Table 6:-Clinical manifestation and body parts affected by scabies among Medresa students in Ginnir Woreda, Bale Zone of Oromia Region, February 2019

Body parts of patients affected by scabies	Number	%
Pruritic rash with itching between the fingers and on the forearm only	83	81.4
Pruritic rash with itching between the fingers and on the forearm, elbow and thigh	15	14.7
Pruritic rash with itching between the fingers and on the forearm ,elbow ,thigh, palm and buttock	2	1.95
Pruritic rash with itching between the fingers, on the forearm and genital area	2	1.95
Total	102	100

Figure 9:-Clinical manifestation of Scabies case in Harawa 5 Medresa of Ginnir Woreda, Bale Zone ,Oromia Region, February 2019

The above figure was 16 years male patient affected by scabies from Getara Medresa with pruritic rash between the fingers and also suspected for super imposed bacterial infection [Fig.9].

4.4 Environmental Assessment

Assessment of housing conditions of three Medresa and their water source as well as crowding condition of the students were conducted. The living condition of religious students in three

Medresa was highly overcrowded with no adequate as well as clean and safe water in three visited Medresa of Ginnir Woreda.

4.5 Public Health Intervention

Active scabies case search and treatment were given for all affected individuals. Woreda Health Office and Health center professionals were sensitized on scabies case detection and management. We conducted community mobilization and health education delivered at three mosques and three elementary schools.

5 Discussion

Suspected scabies cases were clinically diagnosed as an outbreak in three Medresas found in Ginnir Woreda, namely:-Harawa 5, Harawa misra and Getara. The existence of outbreak might be due to overcrowding, lack of safe and clean water, long duration of contact and student movement from one Medresa to another.

Males' populations were more affected by scabies in three Medresas. This was because of all religious students have been learning in visited Medresa were males.

The highest attack rate was reported from Harawa 5 Medresa .This might be because of high populations in this Medresa.

The prevalence of scabies in Harawa 5, Harawa misra and Getara Medresa were 41.2%, 31.4% and 27.4% respectively. It was higher than study done on '**Kolo temari' and school children** in Northern Ethiopia, Gondar Town**(14, 15)**.

Age 10-15yrs were highly affected age groups than others, since the majority of students were in this age group. The mean age of students in this study was 12.4years.This is similar with study conducted in East Badewacho District of Southern Ethiopia with mean of age 12 years(**16**).

Late detection and treatment increase the chance of disease expansion. This was due to neglect of health workers and weak surveillance system of the District.

6 Conclusion

We identified suspected scabies outbreak clinically diagnosed in three Medresa of Ginnir woreda. Scabies cases were first reported from Harawa 5 Medresa and students were more affected in that Medresa. Males and Age 10-15yrs were highly affected. The cases were reached peaks in the District during WHO week 5.Active cases were searched and mass treatments was given in three affected Medresa. The surveillance system of the District was weak since it can't detect scabies outbreak as early and the majority of scabies cases were identified by active search during huge measles outbreak investigation and response in the District. Overcrowding, lack of safe and clean water, long duration of contact and student movement from one Medresa to another might be risk factors for existence of outbreak in Medresa.

7 Recommendation

1. Health workers should focus on early detection and treatment of scabies cases
2. Woreda Water and Energy Office should give attention for provision safe water in all public service institutes
3. Health education should be given to all Medresa on scabies prevention and control
4. Avoid contact with someone with scabies in order to minimize transmission
5. Separate room and cloths should to reduce contact
6. Contact tracing and treatment for other families
7. Partner treatment to avoid re-treatment
8. Zonal Health Office and Oromia Regional Health Bureau should supply anti scabies drugs
9. Woreda Health Office should report all hidden scabies cases in the community

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CHAPTER THREE

SURVEILLANCE DATA ANALYSIS ON SEVERE ACUTE MALNUTRITION IN BALE ZONE, OROMIA REGION, MARCH 2018

ABSTRACT

Background:- Malnutrition is a major public health problem in many developing countries. It is one of the main health problems facing women and children in Ethiopia. The country has the second highest rate of malnutrition in Sub-Saharan Africa. Ethiopia faces the four major forms of malnutrition: acute and chronic malnutrition, iron deficiency anemia, vitamin A deficiency, and iodine deficiency disorder. Malnutrition problems in Ethiopia occur due to inadequate food intake and illness. Inadequate food intake is a consequence of insufficient food available at house hold level and improper feeding practice.

Objectives:- To determine the pattern, trends and burden of malnutrition in the past four years in Bale Zone, Oromia Region.

Methodology: We conducted surveillance data analysis of the past four years for severe acute malnutrition in Bale Zone of Oromia region from February 25 to March 5/2018. Cross-sectional study was conducted by reviewing secondary data and interviewing all concerned bodies. Data were entered and analyzed by using Microsoft Office Excel 2007.

Result:- Bale Zone is one of densely populated zone of Oromia Region with total population of 1,839,415 and highly affected by severe acute mal nutrition due to climatic change and the majority of Woreda are lowland areas. During the last four years (2006-2009 E.C), 36,605 total cases were identified at OTP and SC programs. Among total admissions 89.3 % of them were treated at OTP and 10.7%% were treated at SC sites. SAM cases were become increasing for three consecutive years and finally slightly decreased in2009. The proportion of SAM cases in less than five years children was 2.3 % in 2006, 2.8 % in 2007, 4.8 % in 2008 and 3% in 2009

Conclusion and Recommendation:-Severe acute malnutrition was one of public health problem in Bale Zone so screening and proper cases management should be improved

Keywords: Severe Acute Malnutrition, Surveillance Data Analysis, Bale Zone, Ethiopia

1. Introduction

Malnutrition can be either under nutrition or over nutrition. According to 2018 UNICEF nutrition report, 21.9% of children age less than five years globally had stunted growth. However, the overall trends are positive and between 2000 to 2018, stunting prevalence globally declined from 32.5% to 21.9% and the number of children affected fell from 198.2 million to 149 million(**1**).

The double burden of malnutrition, encompassing both under nutrition and obesity, is an increasingly pressing issue(**2**). Today, the two leading risk factors that contribute to ill-health, disability or early death globally are linked to poor diets rather than smoking, alcohol and drug use or environmental factors like air pollution. In fact, many households experience different types of malnutrition, e.g. with some members being overweight or obese, while others are underweight or suffer from micronutrient deficiencies. Of the 140 countries with data available, 123 countries (88%) face the coexistence of two or more forms of malnutrition.

Malnutrition is a major public health problem in many developing countries(**3**). It is one of the main health problems facing women and children in Ethiopia. The country has the second highest rate of malnutrition in Sub-Saharan Africa. The common four major forms of malnutrition in Ethiopia: acute and chronic malnutrition, iron deficiency anemia, vitamin A deficiency, and iodine deficiency disorder.

According to global nutritional report 2018, stunting declined in general community in developing countries. It is prevalence was higher in conflict area than non conflict area. In conflict countries the prevalence of stunting in children was 34% where as in non conflict countries was 20%(**4**).

Malnutrition is influenced by many factors acting at multiple levels(**5**). These factors often act in a continuous cycle and include dietary intake issues, diseases, food insecurity, and inadequate maternal and child health care and sanitation services. Illiteracy and poverty may also influence the food intake of people in your community and become causes of malnutrition.

The 2005 Demographic Health Survey has shown that about 47 %, 11%,38% and 11% of Ethiopian children less than five years of age were stunted ,wasted, underweight and severely underweight respectively(**5**). The prevalence of low birth weight in Ethiopia is also one of the highest in the world, and has been estimated to be 14%. Based on mother's subjective

assessment of the size of the baby at birth, 21% of births were reported to be very small and 7% were reported as smaller than average. One major contributing factor for Low birth weight is the poor nutritional status of women both before and during pregnancy, made worse by inadequate weight gain during pregnancy(**6**).

Malnutrition problems in Ethiopia occur due to inadequate food intake and illness(**7**). Inadequate food intake is a consequence of insufficient food available at house hold level and improper feeding practice include both the quality and quantity of foods offered to young children as well as timing of their introduction and poor sanitation that puts young children at risk of illness, like diarrhea, conjunctivitis, which adversely affect their nutritional status.

Malnutrition has significant health and economic consequences, the most serious of which is an increased risk of death(**8**). Other outcomes include increased risk of illness and a lower level of cognitive development, which results in lower educational attainment. In adulthood, the accumulative effect of long term malnutrition can be reduction in workers' productivity and increased absenteeism. It can not only reduces a person's life time earning potential and ability to contribute to national economy but also can result in adverse pregnancy outcomes such as abortion, still birth, pre term labor, etc.

Ethiopia's population is growing at the rate of 2.7% annually, while its annual agricultural growth is 2.4%.(**9**) The agricultural performance in the country has not kept up with the population growth over the past four decades, and the gap between the population's food needs and food availability has continued to widen, thus requiring additional food aid. Recurrent history of food crises in Ethiopia led into several famines in the past. The food security status of the agricultural, pastoral and agro-pastoral population in the country is constantly affected by drought. The crop and livestock production are the major sources of food in Ethiopia. In the absence of the rains, shortages of pasture and water significantly diminish the production capacity of the crop and livestock, creating food shortages and high levels of vulnerability to malnutrition.

Humanitarian needs in Ethiopia have tripled since the beginning of 2015 as one of the strongest El Niño events on record has caused severe drought, leading to successive crop failures and widespread livestock deaths(**9**). The drought started in early 2015 with unfavorable belg rains

(March–May) and continued with late and erratic kiremt rains (July–September), which produce 85 percent of Ethiopia's food. Crop harvests were well below average and failed in several areas. Food insecurity and malnutrition rates are alarming. Insufficient access to and availability of food has driven humanitarian needs to near-unprecedented levels. The current situation requires simultaneous and immediate scaling up of multi-sectoral lifesaving and livelihood support along with investment in resilience building efforts in the most affected and at-risk areas.

The El Niño-induced drought is not just a food crisis — above all, it is a livelihood crisis(**9**). Over 80 percent of the population depends on agriculture for their food and income – significant production losses have severely diminished households' food security and purchasing power, forcing many to sell their remaining agricultural assets and abandon their livelihoods. Meeting immediate needs is integral to longer-term recovery. To safeguard and build the resilience of agriculture-based livelihoods, urgent support is required to enable families to resume production and improve their ability to withstand future droughts and climate-related disasters.

According to study conducted by FAO, Ethiopia February 2016, One-quarter of Ethiopia's Woredas were officially classified as facing a nutrition crisis(**9**). About 435 000 children are in need of treatment for severe acute malnutrition– a 65 percent increase from previous year. More than 1.7 million children, pregnant women and lactating women are in need of supplementary feeding and many more are considered at risk, especially if the next rains fail.

According to SPHERES standard treatment guide line for treatment outcome indicate that >75% of recovery rate, weight gain 8gm/day,<15% of defaulter rate and <10% death rate for treatment of severe acute malnutrition is acceptable(**10**).

Community based nutrition program should be established; continuous nutrition supervision based on each nutritional status indicators and special attention to severely malnourished children is necessary to attempt the problem of malnutrition(**11**).

1. Objectives

1.1 General objective

To determine the pattern, trends and burden of severe acute malnutrition in the past four years in Bale Zone, Oromia Region

1.2 Specific objectives

- To determine the pattern of severe acute malnutrition in Bale Zone.
- To assess the past four years trends of severe acute malnutrition in Bale Zone.
- To determine malnutrition burden in Bale Zone.

2. Methodology

2.1 Case Definition

Suspected:- Children age from 6 months to 5 years who was the resident of Bale Zone during the period of 2006-2009 E.C with MUAC less than 11cm and/or children with bilateral edema regardless of their MUAC (**12**).

Confirmed:- an individual with MUAC less than 11cm and/or children with bilateral edema regardless of their MUAC who was the resident of Bale Zone during the period of 2006-2009 E.C (**12**).

2.2 Study Area

Severe acute malnutrition data analyzed was conducted in Bale zone, Oromia Region, Ethiopia.

2.3 Study Period

Secondary data of severe acute malnutrition for the past four years was collected, analyzed and interpreted from Feb 25, 2018 to March 5/2018.

2.4 Study Design

Descriptive cross-sectional study was conducted by reviewing data base softcopy and hard copy from PHEM and MCH department as well as by interviewing all concerned bodies.

2.5 Study Population

All population of Bale Zone, which is estimated to be 158,231 were included in the study.

2.6 Inclusion Criteria

All cases that fulfill case definition of severe acute malnutrition

2.7 Exclusion Criteria

Unrelated cases, deaths, morbidity with incomplete variables in the surveillance data were excluded.

2.8 Data collection methods

Secondary data of malnutrition cases for the last consecutive four years (2006-2009 E.C) were reviewed and collected from data base of Bale Zone PHEM department by using structured checklist. In addition Bale Zone population profile was taken from Zone Health Department and additional information was capture from all concerned bodies.

2.9 Data Analyze methods

Data were analyzed by using Microsoft Office Excel 2007, Microsoft Graph chart to analyze data in respect to important variables.

2.10 Data Variables

During data collection and analysis variables such as age category, admission type, treatment sites with respect to time and place were considered accordingly.

2.11 Supportive letter

Supportive letter was written by Addis Ababa University, School of Public Health and Oromia Regional Health Bureau in order to get permission from Zonal Health Department and all concerned bodies

2.12 Dissemination of results

The study finding was prepared to share with AAU/School of public health/ EFETP Coordinators and mentors, ORHB and Bale Zone Health Department in both hard copy and electronic soft copy.

3. RESULTS

3.1 Geographic Location of Bale Zone

Bale Zone is found in South-Eastern part of Oromia which is 430km away from Addis Ababa. Total population of Bale Zone is 1,839415. Among these population agriculturalist 66%,

Pastoralists 29% and others are 5%. Administratively, Bale Zone has 18 rural woreda and 2 Town.

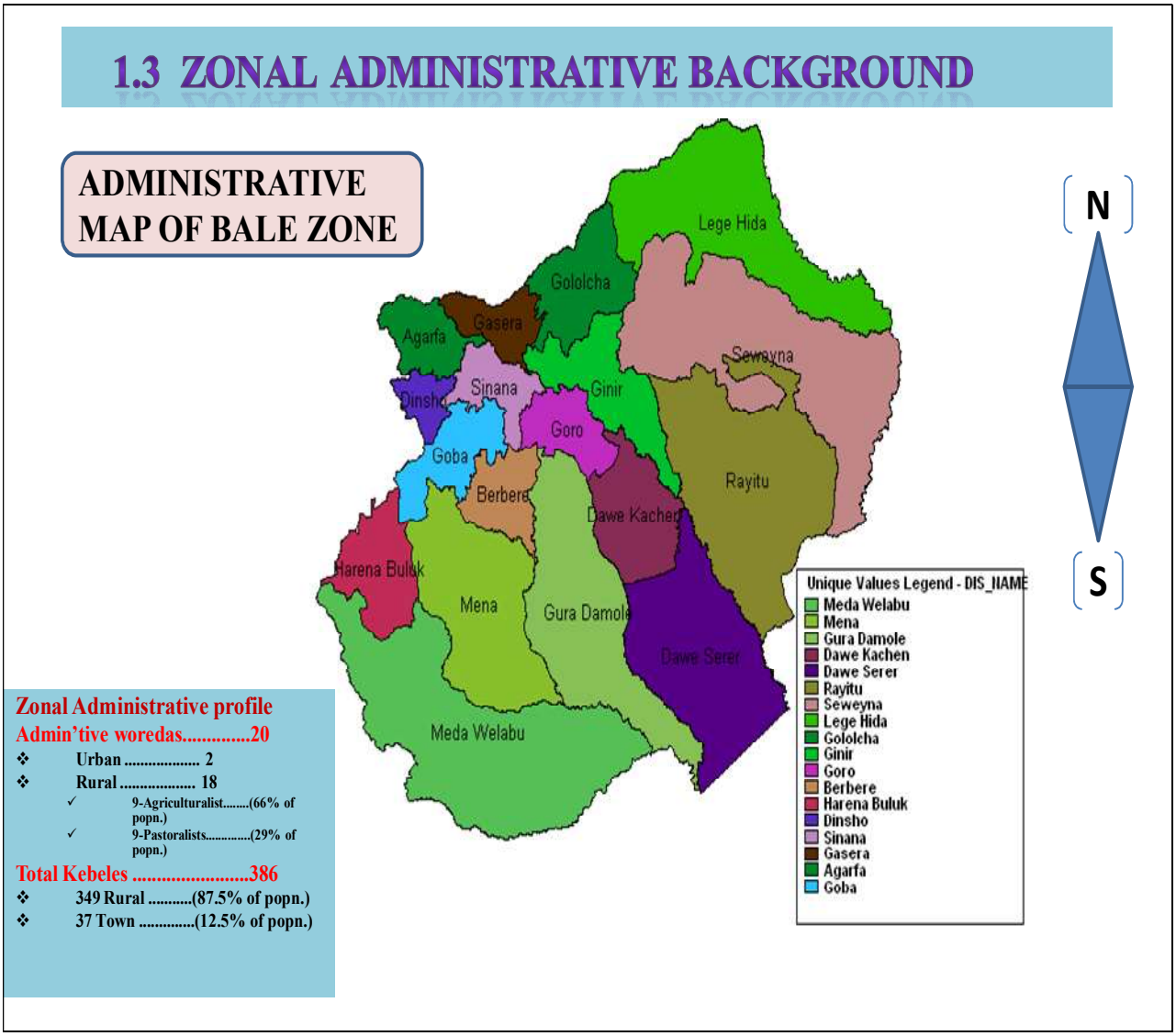

Figure 10: Administrative map of Bale Zone, Oromia, March 2018

3.2 Descriptive

Bale Zone is one of densely populated zone of Oromia Region that highly affected by severe acute mal nutrition due to climatic change and the majority of Woreda are lowland area. Currently there are 18 rural Woreda, 2 town and 345 Kebeles with 385 OTP sites and 82 SC

sites. During the last four years (2006-2009 E.C), 36,605 total cases of severe acute malnutrition were identified at OTP and SC sites. Among total cases, 34,024 of them were newly admitted. Out of total cases, 89.3 % of them were screened with MUAC measurement and 10.7%% were screened by bilateral edema. SAM cases were become increasing for three consecutive years and finally slightly decreased in2009. The proportion of SAM in less than five years children was 2.3 % in 2006, 2.8 % in 2007, 4.8 % in 2008 and 3% in 2009 E.C.

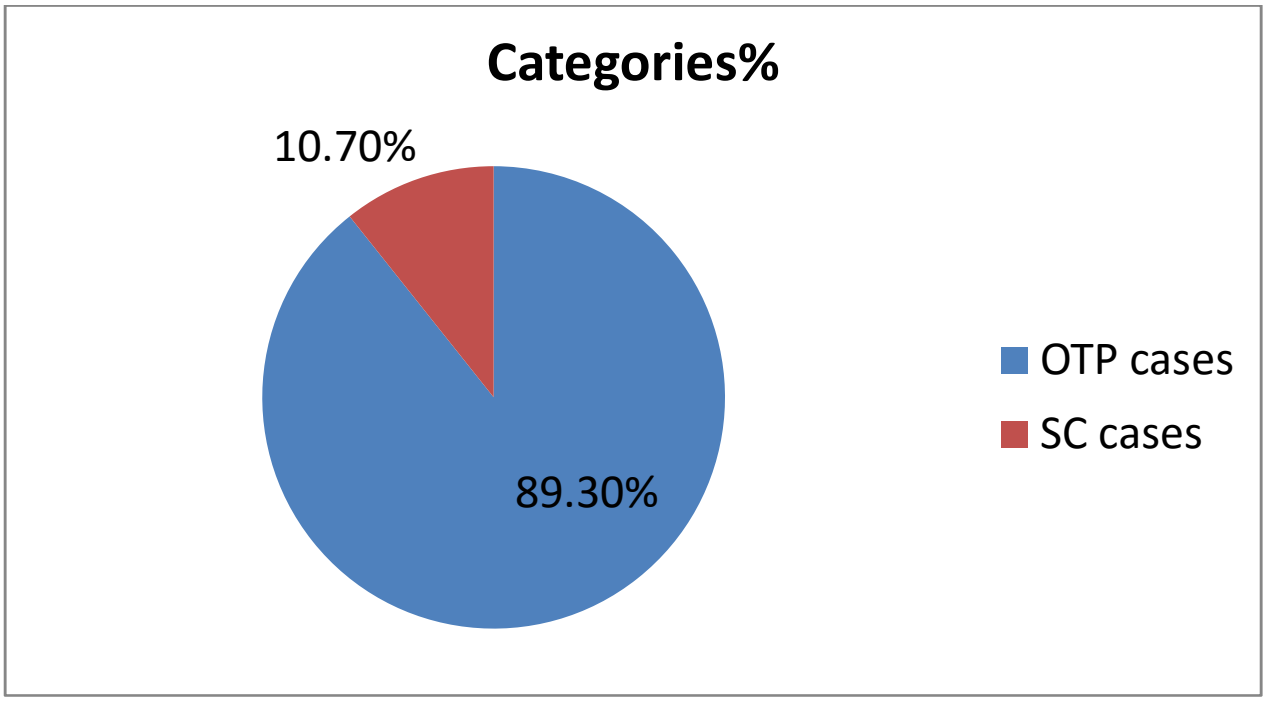

Figure 11; Categories of SAM cases based on site treatment and its complication during 2006-2009 E.C

As above figure showed, out of total four years severe acute malnutrition cases, 32670(89.3%) were treated at OTP sites and 3,908(10.7%) were treated at SC sites [Fig.11].

Table 7:-Distribution of population by Woreda in Bale Zone, Oromia Region, March, 2018.

S.N	Name of Woreda	2010Total population	HHs	<1yrs	<5yrs	<15years	15-49yrs women	PW
1	Agarfa	139412	29044	4489	22864	58553	30810	4838
2	Berbere	122485	25518	3944	20088	51444	27069	4250
3	D/kachen	41245	8593	1328	6764	17323	9115	1431
4	D/Sarer	57765	12034	1860	9473	24261	12766	2004
5	D/manna	121379	25287	3908	19906	50979	26825	4212
6	Dinsho	52984	11038	1706	8689	22253	11710	1839
7	G/mole	39018	8129	1256	6399	16387	8623	1354
8	Gasara	105682	22017	3403	17332	44387	23356	3667
9	Ginnir	163703	34105	5271	26847	68755	36178	5680
10	Robe Town	26615	5545	857	4365	11178	5882	924
11	Goba	54520	11358	1756	8941	22898	12049	1892
12	Goba Town	48204	10042	1552	7905	20245	10653	1673
13	Gololcha	136119	28358	4383	22324	57170	30082	4723
14	Goro	113033	23548	3640	18537	47474	24980	3922
15	H/ Buluk	110087	22935	3545	18054	46236	24329	3820
16	Laga-Hidha	83698	17437	2695	13726	35153	18497	2904
17	M/ Walebu	131385	27372	4231	21547	55182	29036	4559
18	Rayitu	45070	9390	1451	7392	18929	9961	1564
19	Sawena	88907	18522	2863	14581	37341	19648	3085
20	Sinana	158106	32939	5091	25929	66404	34941	5486
21	Zone	1839415	383211	59229	301664	772554	406511	63828

As below table showed, the proportion of severe acute malnutrition in Bale Zone under five children during the past four years (2006-2009 E.C) were 2.3%, 2.8%, 4.8% and 3% respectively. The highest proportion was reported in 2008 E.C. Among Woreda, the highest and

lowest proportion in less than five years children reported in 2008 E.C were Harana Buluk (8.9%) and Goba Town (0.3%) respectively [Table 8].

Table 8:- Distribution of malnutrition cases by woreda during the last four year in Bale Zone Oromia Region, from 2006-2009 E.C.

S.N	Name of Woreda	2014(2006)			2015(2007)			2016(2008)			2017(2009)		
		<5yrs	No.of cases	%	<5yrs	No.of cases	%	<5yrs	No.of cases	%	<5yrs	No.	%
1	Agarfa	20324	288	1.4	20931	364	1.7	21556	721	3.4	22200	518	2.3
2	Berbere	17856	555	3.1	18390	803	4.4	18939	1421	7.6	19505	811	4.2
3	D/kachen	6012	220	3.6	6192	241	4.0	6377	343	5.3	6568	402	6.1
4	Dawesarar	8421	133	1.5	8672	196	2.2	8931	311	3.4	9198	248	2.7
5	Dellomena	17695	859	4.9	18,224	1060	5.8	18768	1286	6.9	19328	998	5.2
6	Dinsho	7724	77	1.0	7954	126	1.5	8192	84	1.0	8437	62	0.7
7	G/mole	5688	254	4.4	5858	231	3.9	6033	351	5.9	6213	242	3.9
8	Gasara	15333	140	1.0	15,867	189	1.2	16341	255	1.6	16829	178	1.0
9	Ginnir	23865	529	2.2	24578	723	2.9	25312	1131	4.5	26068	795	3.0
10	Robe Town	3880	50	1.3	3995	80	2.0	4115	124	3.0	4238	37	0.8
11	Goba .R	7948	52	0.6	8185	54	0.6	8430	69	0.8	8681	60	0.7
12	Goba .T	7027	95	1.5	7237	135	1.8	7453	26	0.3	7676	175	2.3
13	Gololcha	19844	277	1.4	20437	278	1.4	21047	580	2.7	21676	290	1.4
14	Goro	16478	654	4.0	16970	720	4.2	17477	1265	7.3	17999	766	4.3
15	H/ Bulluk	16049	495	3.1	16528	838	5.1	17022	1523	8.9	17530	780	4.5
16	Lagahidha	12202	262	2.1	12566	264	2.1	12941	422	3.2	13328	300	2.3
17	M. walaabu	19154	438	2.2	19726	674	3.4	20315	1345	6.6	20922	878	4.2
18	Rayitu	6570	227	3.4	6766	315	4.6	6968	286	4.2	7177	211	2.9
19	Sawena	12961	423	3.2	13348	499	3.7	13747	1108	8.1	14157	825	5.8
20	Sinana	23068	70	0.3	23757	122	0.5	24466	233	0.9	25197	143	0.5
21	Zone	268182	6098	2.3	276191	7911	2.8	284,440	13495	4.7	292927	8720	3.0

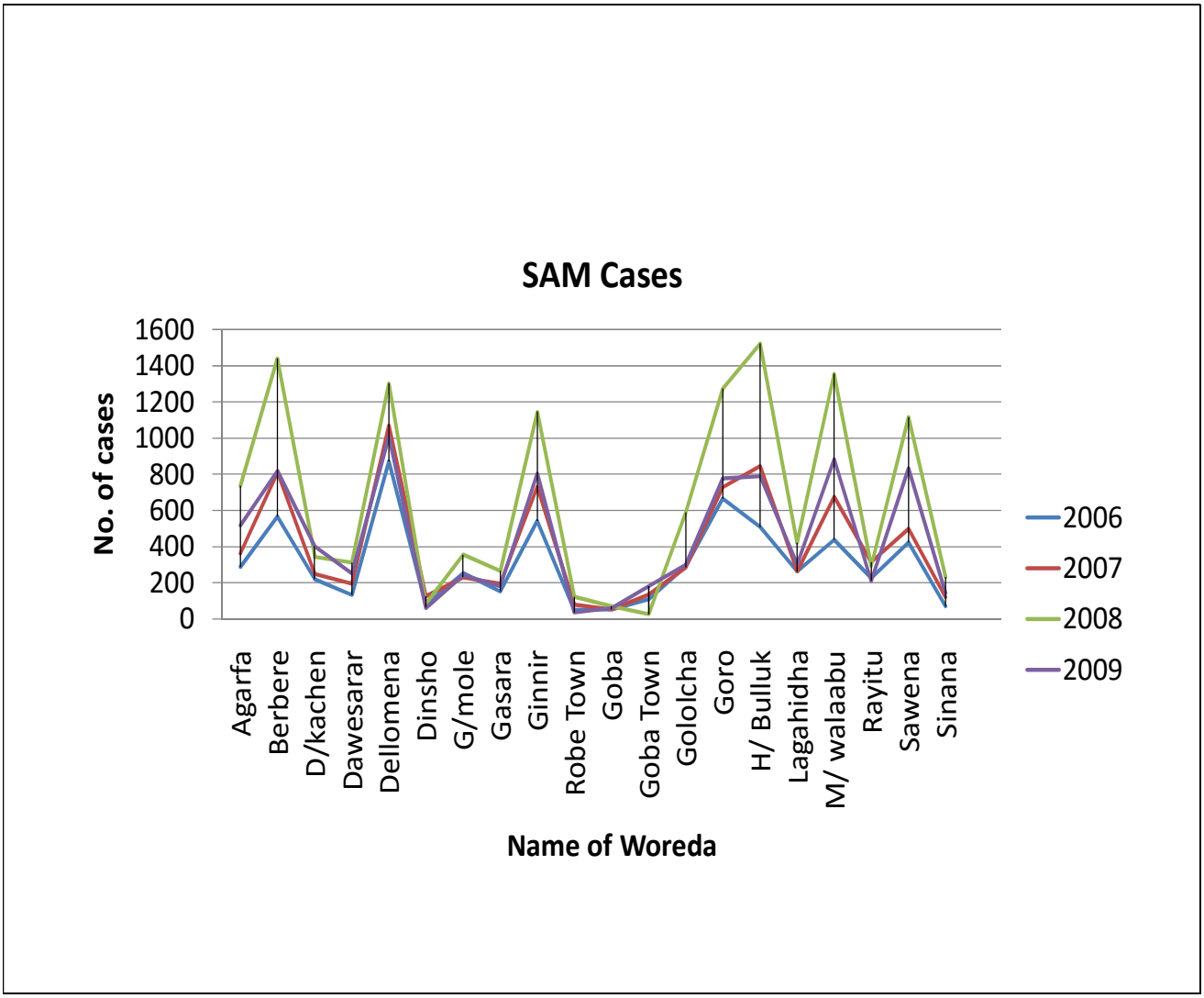

Figure 12; Trends of Malnutrion cases by Woreda in Bale Zone, Oromia, from 2006-2009E.C

As we can see from above figure, Harana Buluk, Berbere, Madawalabu, Dallo manna, Ginnir and Sawena were among Woreda with high malnutrition cases reported in the past four years. Based on assessment, Sawena, Harana Buluk, Mada Walebu and Dallo manna were among priority one woreda while Berbere and Ginnir were priority two woreda, but contributed high cases due to high total population [Fig.12].

According to 2017 Nutritional assessment by government and partner, **8** woreda categorized as Hot spot priority one, **6** Woreda as priority 2, **3** Woreda as priority 3 and Goba and Robe town has no risk assessment [Table 9].

Table 9:-Malnutrition Hot Spot priority Woreda categories in Bale Zone, Oromia, From 2006-2009 E.C.

S.N	Name of Woreda	Priority one(1)	Priority two(2)	Priority3
1	Sawena	✓		
2	Rayitu	✓		
3	D/kachen	✓		
4	D/Sarer	✓		
5	D/manna	✓		
6	Laga Hidha	✓		
7	Harana Buluk	✓		
8	Mada-Walebu	✓		
9	Ginnir		✓	
10	Gura dhamole		✓	
11	Berbere		✓	
12	Gasara		✓	
13	Gololcha		✓	
14	Agarfa		✓	
15	Goro		✓	
16	Dinsho			✓
17	Goba			✓
18	Sinana			✓
19	Goba Town			
20	Robe Town			
21	Zone	8	7	3

As we can see from below table , the majorities35,969(98.3%) of SAM cases reported in the past four years were found between 6---59months followed by less than 6 months 255(0.6%), 5-10years 193(0.5%),11---17years105(0.3%) and greater than 18 years 56(0.15%) respectively[Table10].

Table 10:-Distribution cases due to malnutrition in the past four years by age in Bale Zone, Oromia Region, From 2006—2009 E.C.

Age	2014(2006)		2015(2007)		2016(2008)		2017(2009)	
	No	%	No	%	No	%	No	%
<6months	35	0.56	54	0.68	77	0.57	89	1.2
6-59months	6063	97.9	7857	98.5	13418	98.7	8631	98
5—10yrs	42	0.67	44	0.56	64	0.48	43	0.6
11-17yrs	32	0.51	11	0.14	30	0.23	32	0.43
=<18yrs	22	0.35	10	0.12	15	0.11	9	0.12
Total	6194	100	7976	100	13604	100	8804	100

As below table Shows, severe acute malnutrition cases who screened with MUAC were treated at OTP program where as those screened with bilateral edema were treated at SC program. The proportion of severe acute malnutrition cases during 2006,2007, 2008 and 2009 E.C treated at OTP program were 90.6%, 88.8%, 88.7% and 89.7% respectively. The proportions of cases treated at SC program were also 9.4%, 11.2%, 11.3% and 10.3% respectively [Table 11].

Table 11:-Types of Malnutrition based on its complication, in the past four years in Bale Zone, Oromia Region, From 2006-2009 E.C.

Types of case based on site of admission/complication	2014(2006)		2015(2007)		2016(2008)		2017(2009)	
	No	%	No	%	No	%	No	%
OTP	5615	90.6	7085	88.8	12069	88.7	7901	89.7
SC	581	9.4	896	11.2	1535	11.3	923	10.3
Total	6196	100	7981	100	13604	100	8824	100

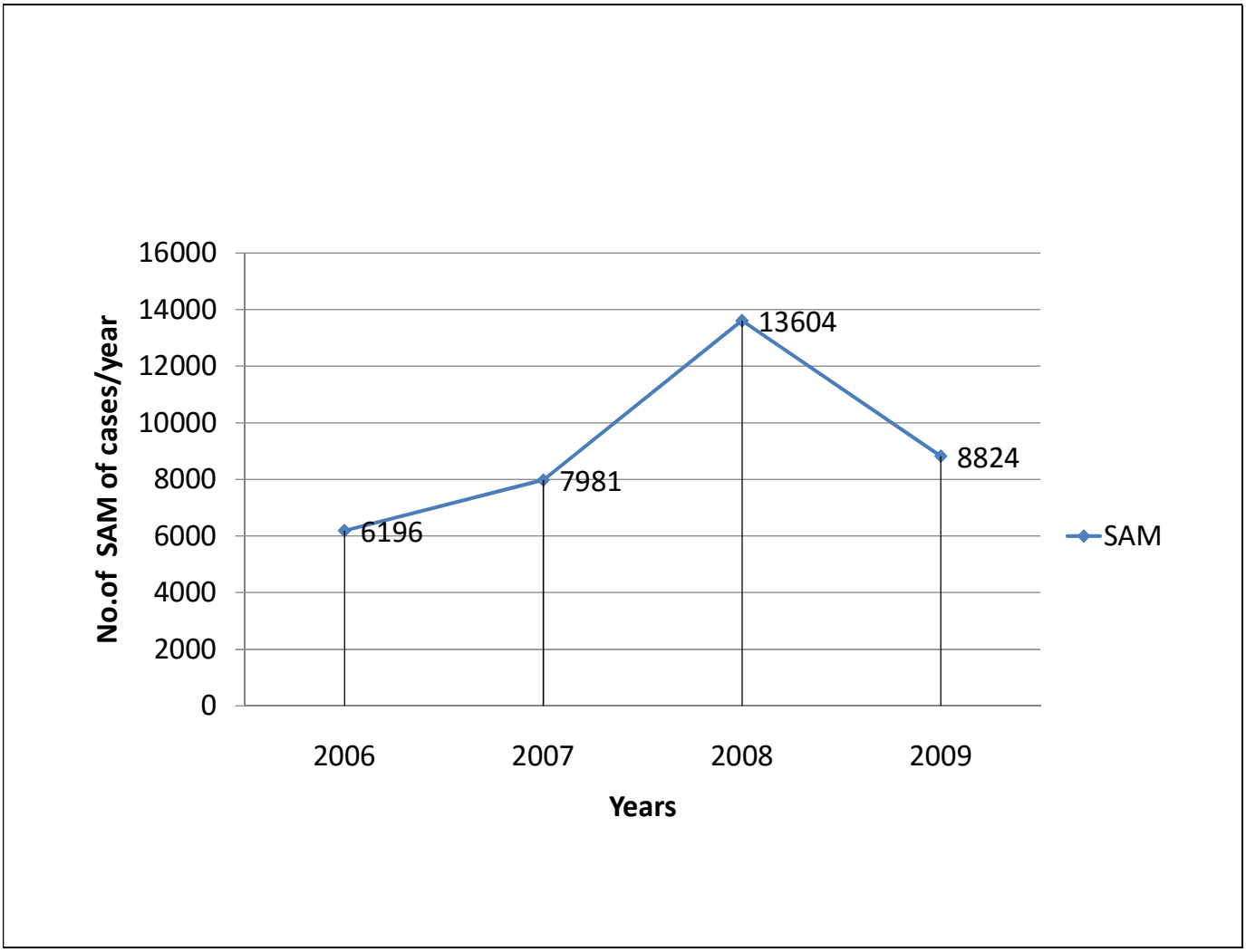

Figure 13:- Four years' trends of severe acute mal nutrition cases in Bale Zone, Oromia, from 2006---2009 E.C.

As we can see from above figure, severe acute malnutrition cases were become increased. Especially in 2008 E.C, SAM cases were doubled from previously years. In 2009, SAM cases were decreased by 35% [Fig.13].

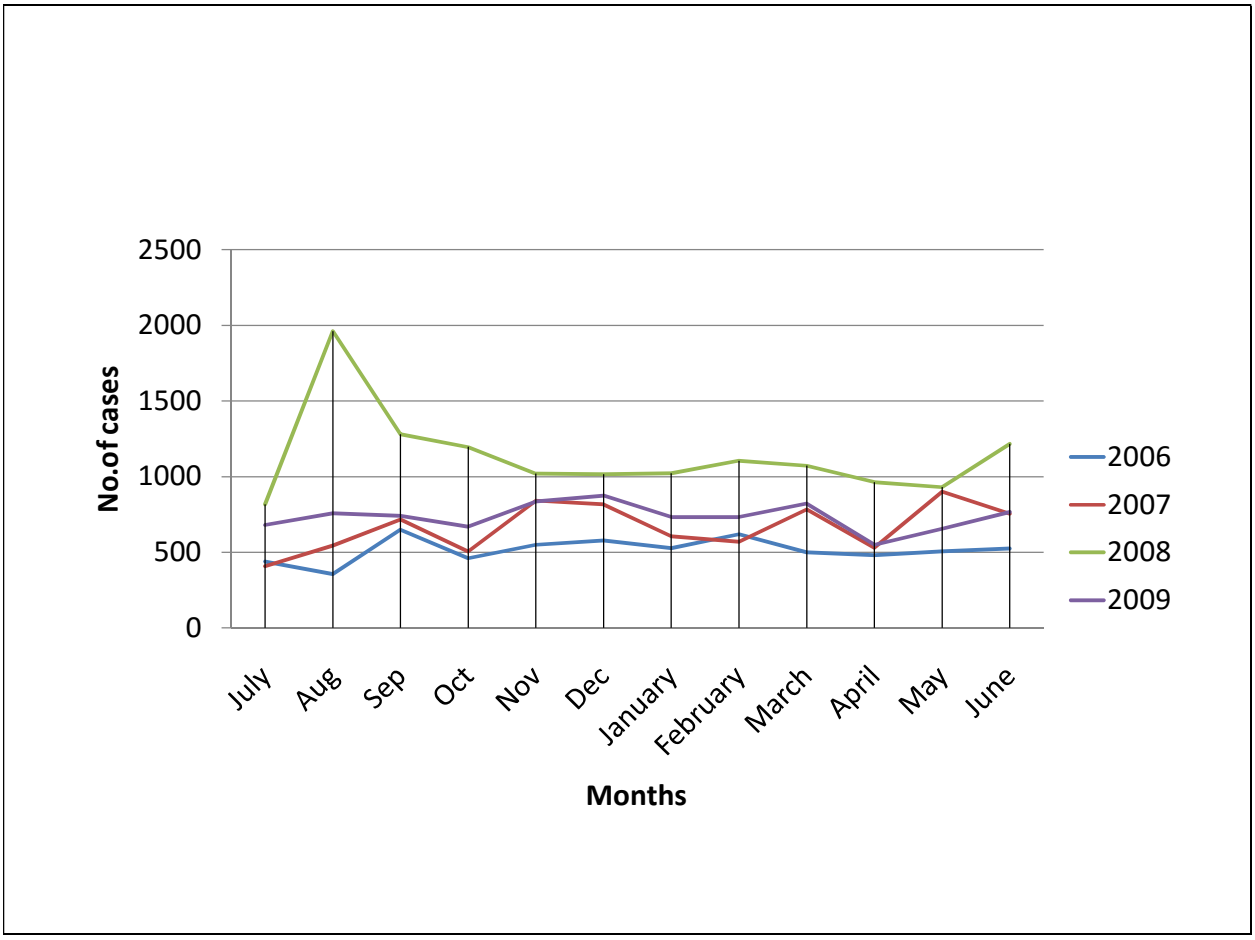

Figure 14 Monthly trends of severe acute malnutrition in Bale Zone, from 2006-2009 E.C.

As we can observe from figure, generally trends of severe acute malnutrition were increased from 2006 to 2008 and finally in 2009 slightly decreased from previously year of 2008 .In 2009 its trends become stable and move with similar trends throughout the year. In this zone malnutrition cases were increased at end of summer season and spring. Especially in 2008 the trends of malnutrition cases were peaked as epidemic in August and slightly became decreased in Outman season. In 2009 malnutrition cases were continued with similar trends throughout the year [Fig.14].

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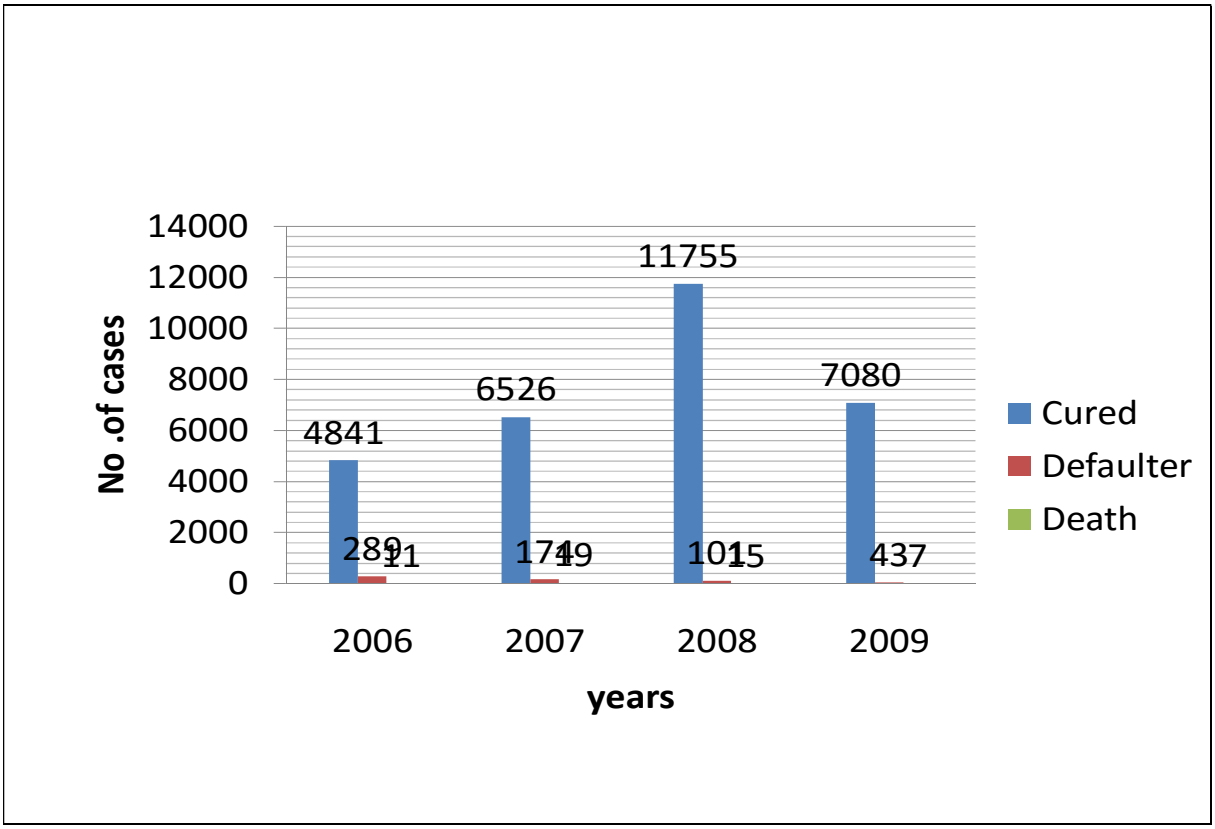

Figure 15:-Treatment outcome of SAM cases in Bale Zone, Oromia, from 2006---2009 E.C.

Figure below shows that treatment cure rate were 4841(78%), 6526(82.7%), 11755(86.4%), 7080(80%) in 2006, 2007, 2008 and 2009 respectively. Death rate were also 11(0.1%), 19(0.2%), 15(0.1%) and 7(0.07%) respectively. Out of total treatment started patients in the past four years, 607 (1.6%) of them were defaulted before finishing treatment course [Fig.15].

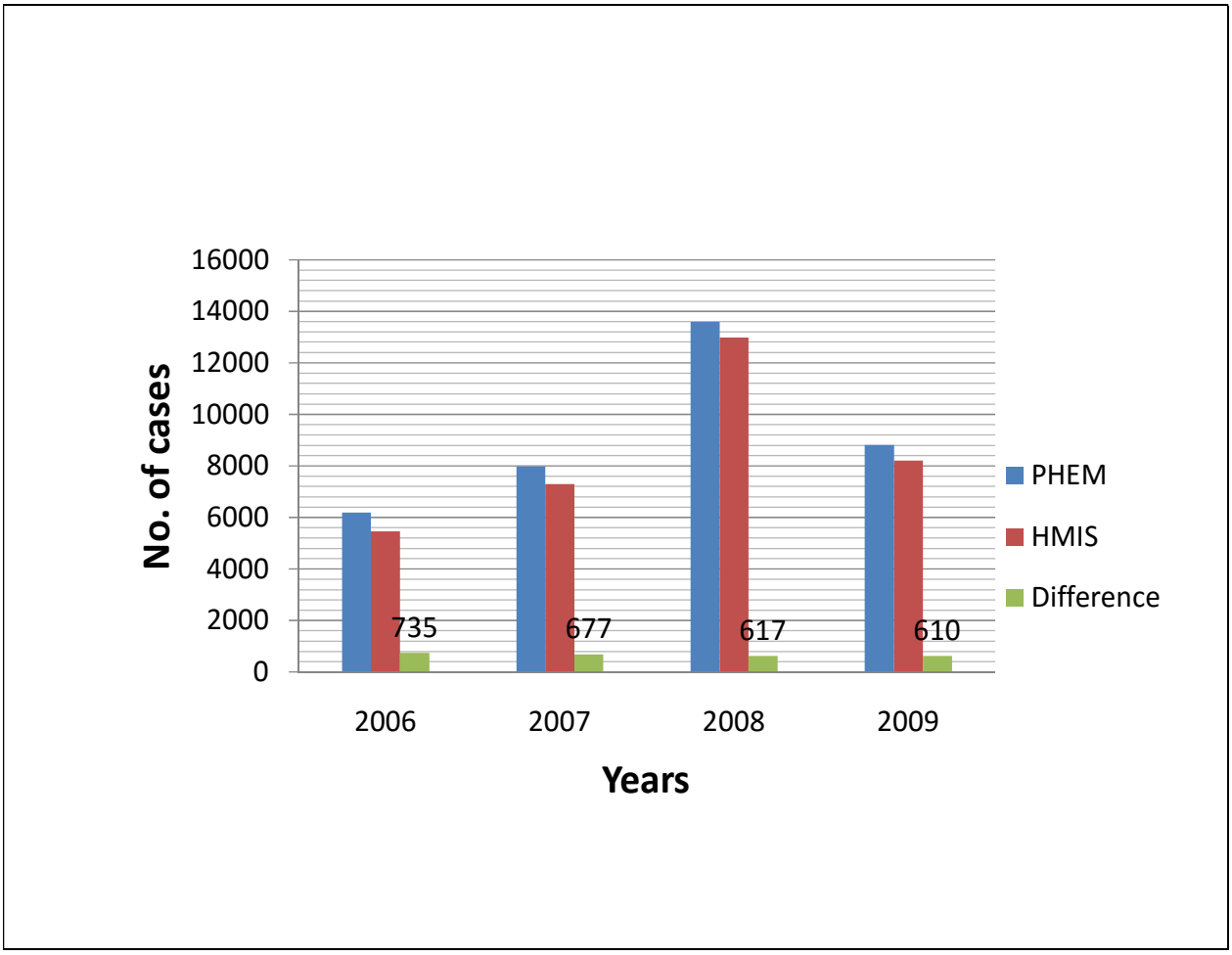

Figure 16:-Routine PHEM report versus HMIS report in Bale Zone, Oromia Region, from 2006—2009 E.C.

The above figure shows that generally PHEM report were higher than HMIS report in all academic years. The discrepancies between PHEM and HMIS report were due to missed hospital admitted cases. Totally about 2637(7%) of cases reported in IDSR were not reported in HMIS during the last four years [Fig.16].

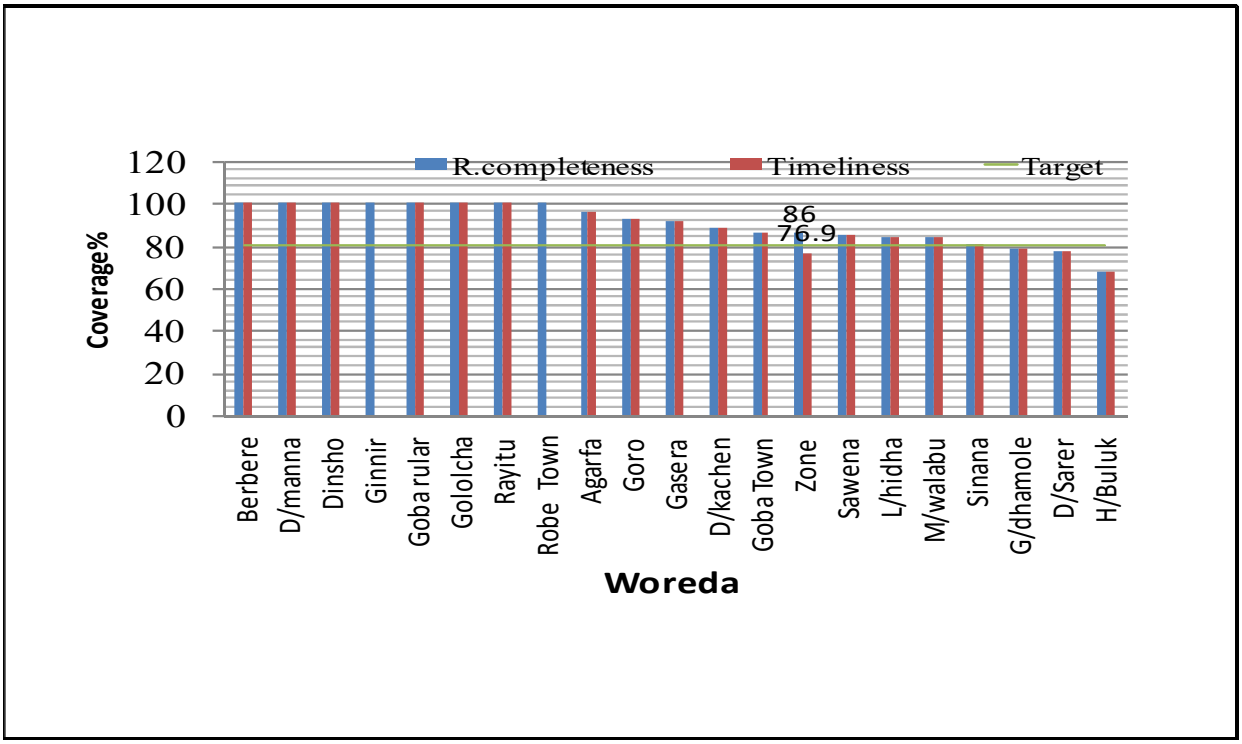

Figure 17:- Four years averagely report completeness and timeliness by Woreda in Bale Zone, from 2006-2009 E.C.

The above figure shows that, Berbere, D/manna, Dinsho, Goba, Gololcha, Rayitu, Agarfa, Goro, Gasara and D/kachen were among woreda achieved above zone target whereas Sawena, Laga Hidha, M/Walebu, Sinana, G/dhamole, D/Sarer and H/Buluk were below zone target with report completeness and timeliness. Ginnir and Robe town reports were always complete but not on time. Generally report completeness of Zone was 86% which is above the target where as timeliness 76.9% and it was below the target that should improve [Fig.17].

4. Discussion

Malnutrition is the major problem of Ethiopia due to food insecurity and climatic change. The same thing is true for Bale Zone which is highly affected by malnutrition in the past four years. Especially in 2008, severe acute malnutrition cases were became double from previous years due to ElNino happened in the country. Eight (40%) of Woreda are hotspot priority 1 and six (30%) are hotspot priority 2.This priority setting was based burden of the disease, geographical Location and climatic condition. According to this assessment, **Harana Buluk, Dawe Kachen, Dawe Sarer, Sawena, Rayitu ,Dallo Manna, Laga Hidha and Mada Walebu** are Hotspot priority one Woreda. Barbare, G/dhamole, Gololcha, Gasara, Goro, Ginnir and Agarfa are Hotspot priority two woreda.

The proportion of malnutrition was highest among 6-59months which accounts for 98.33% followed by less than 6months 0.7%, 5-10years 0.52%, 11—17years0.3 %and greater than 18years 0.15% respectively. This is similar with study conducted in East Hararge Zone 2005 E.C in which the highest proportion was among 6-59months accounted 99.34% of total severe acute malnutrition cases.

Among admitted patients during the past four years, 89.3% were treated at OTP sites while 10.7% were treated at SC sites. This is very high when we compared with national standard which was 5% of severe acute malnutrition cases expected to be treated at SC sites due to complication(**12**)

Generally the prevalence of severe acute malnutrition of under five children in Bale Zone was 2.3%, 2.8%, 4.8% and 3% in 2006, 2007, 2008 and 2009 respectively .This nearly the same with national prevalence which is 2.8, but in 2008 it higher than national prevalence. The highest prevalence (8.9%) was reported from Harana Buluk and the lowest (0.3%) from Goba Town in 2008 E.C. In 2009 the highest and lowest prevalence of severe acute malnutrition was 6.1% and 0.5% in Dawe kachen Woreda and Sinana Woreda respectively.

Averagely report completeness and timeliness of Bale Zones during the past four years was 86 % &76.9% respectively. Hence, report completeness above regional and national target whereas report timeliness below regional and national target (80%).

Among admitted cases 30202(82.5%) were cured, 607(1.6%) were defaulted, 52(0.14%) death, 394(1%) were transfer out to others zone, 110(0.3%) were unknown and 66(0.18%) non-response were reported in the past four years. The case fatality rate was 0.14% which is less than expected regional plan 1%. According to SPHERE standard treatment outcome malnutrition, recovery, death and defaulter rate was acceptable(**10**).

In the past four years, HMIS reported were less than routine PHEM report. This was because routine PHEM report from two Hospitals not included in HMIS report.

5. Limitation

1, There was no sex variable in data base/master file of severe acute malnutrition report format.

2, There was no recorded data on malnutrition before 2006 E.C

3, Absence of recorded data on Malnutrion of pregnant and lactating women

6. Conclusion

The burden of severe acute malnutrition became increasing, because of climatic change especially during 2008.E.C due to ELINO happen in our country. According to 2017 government and partner assessment, **Harana Buluk, Dawe Kachen, Dawe Sarer, Sawena, Rayitu ,Dallo Manna, Laga Hidha and Mada Walebu** are Hotspot priority one Woreda. Barbare, G/dhamole, Gololcha, Gasara, Goro, Ginnir and Agarfa are Hotspot priority two woreda.

The proportion of malnutrition was highest among 6-59 months. Among admitted patients during the past four years, 89.3% were treated at OTP program where as 10.7% were treated at SC program. Among admitted cases 30202(82.5%) were cured, 607(1.6%) were defaulted, 52(0.14%) death. Averagely report completeness and timeliness of Bale Zones during the past four years was 86 % &76.9% respectively.

7. Recommendation

1. Routine Screening for malnutrition in children under five years and Pregnant and lactating women should be enhanced at all levels
2. Reporting system should be strengthened at all levels to avoid report discrepancy
3. Increase community awareness to maintain food security at all season
4. The existing reporting format should include number of screened and managed pregnant and lactating women
5. Sex variable should be included in data base format and report format to identify factors associated with sex
6. Exclusively breast feeding should be encourage followed by complementary feeding
7. Food supplementation for individuals and groups at risk, such as children, pregnant and lactating women should be given at hotspot areas
8. Government should work on new agricultural technologies that adopt climatic change to overcome nutritional problems.

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CHAPTER FOUR

SURVEILLANCE SYSTEM EVALUATION ON MALARIA IN AKAKI DISTRICT FSSZ - OROMIA REGION, NOVEMBER 2018

Abstract

Introduction:-Public health surveillance is an ongoing systematic collection, analysis, interpretation and dissemination of data regarding a health related event for use in public health action and to improve community health. The purpose of evaluating public health surveillance is to ensure community health and to reduce morbidity and mortality.

Objectives:- To evaluate the surveillance system core function, attributes and major challenges for malaria disease in Akaki District, Oromia Region

Methodology:-We conducted cross sectional study of surveillance system evaluation in Akaki District in randomly selected health facilities using semi- structured questionnaire.

Results:-.About **47,774**(56%) of populations lived in malarious area. The ITN coverage of the Woreda was 84% and Health service coverage of the District was 88% for Health center and 100%for Health posts. The majority of reported malaria species during the study period were P.vivax which accounted for 65% of the total malaria cases. The slide positivity rate of malaria in Akaki District was 35.8%. The report completeness and timeliness were 94.5% and 77.8% respectively. The Surveillance system of the district was useful, simple, flexible, and sensitive to detect outbreak .However, it was not complete, timely and representative.

Conclusion& Recommendation:-The main gaps identified during system evaluation were weak supportive supervision, poor feed backs, absence of budget allocation for PHEM activities, logistic, training and resources gaps, water and electric supply and poor data management. The surveillance system of the district was useful, simple, flexible and sensitive but, not stable complete, timely and representative, to detect outbreak and early response. Hence, Woreda Health Office should give attention for PHEM activities such as preparing Emergency plan with budget, resource mobilization, capacity building, supportive supervision and feedback, strengthened reporting system and proper data management.

Key Words- Surveillance System Evaluation (Malaria), Akaki, Oromia, Ethiopia, 2018

1. Introduction

Public health surveillance is an ongoing systematic collection, analysis, interpretation and dissemination of data regarding a health related event for use in public health action to reduce morbidity and mortality, and to improve community health (**1**). Data and interpretations derived from surveillance activities are useful in setting priorities, planning and conducting disease control programs, and assessing the effectiveness of control efforts. Sources of data are often available and used for surveillance at the national and local levels (**2**).

The public health system is continually challenged by recurrent and unexpected disease outbreaks and is facing the challenge of managing health consequences of natural and human made disasters, emergencies, crisis, and conflicts (**3**). These problems continue to disrupt the health care system, while successful detection and response to these challenges is becoming increasingly complicated. It is clear that surveillance could not be carried out for all diseases and conditions. Therefore, priority should be given to those diseases that are of interest at national and international levels.

The FMoH of Ethiopia identified 20 top priority diseases, which are epidemic prone, of international concern and diseases on eradication and elimination programs for surveillance activities (**4**). These diseases are monitored by designated bodies through available means of communication- telephone, fax, e-mail paper based reporting etc.

Ethiopia developed different strategies to have functioning and effective surveillance system. Too often, however, surveillance data for communicable diseases are neither reported nor analyzed on time (**5**). As a result, the opportunity to take action with an appropriate public health response and save lives is insignificant. However, in cases where adequate information is collected; it is often not available for use at the local level. Cognizant of those problems, African States adopted integrated disease surveillance (IDS) as a regional strategy (resolution AFRO/RC48/R2) for early detection and efficacious response to priority communicable diseases for the African region in September 1998, during the 48th Regional Committee for Africa meeting in Harare, Zimbabwe. Ethiopia as member state also endorsed this initiative and is using it with frequent revision of the list of priority diseases.

Currently, since 2008 the Federal Ministry of Health (FMoH) launched a reform and restructuring of the health sector in to different core processes, and in particular the disease surveillance and response with the concept of Business Process Re-engineering (BPR) (**6**). This helps the surveillance of priority diseases to be a dependable system as Public Health Emergency Management (PHEM) center. This new structure is extended down to the woreda level in their capacities.

In Ethiopia, the interaction of mountainous terrain with variable winds, seasonal rains, and ambient temperature create diverse micro-climates for malaria transmission, which is weekly reportable diseases (**7**). When a micro-climate creates local puddles, flooding conditions, and warm ambient temperatures that persist for several weeks within a malarious area with low population immunity, the resulting Anopheles mosquito proliferation may cause focal malaria transmission to accelerate, sometimes explosively.

Risk of malaria is highest in the western lowlands of Oromia, Amhara, Tigray and almost the entire regions of Gambella and Benishangul Gumuz regions and also the midlands of Ethiopia between 1,000 and 2,200 meters altitude harvesting experience seasonal transmission of malaria with sporadic epidemics every few years, while in the eastern lowlands of Ethiopia (primarily Afar and Somali), malaria is endemic only along the rivers, as this part of the country is largely dry, away from rivers (**8**).

Malaria is one of the public health problems in Akaki District of Oromia Region due to Awash River and Akaki River that pass through the District and about 56% of district population is at risk for malaria (**9**). Typhoid fever and Dysentery were among food borne diseases reported from the District throughout the year (**10**). This is due to contaminated source of water from Akaki and Awash Rivers. Therefore, this study was conducted to evaluate surveillance system generally and focus attention on malaria since malaria is under elimination program. In this evaluation, we assessed whether the system is performing as per the set objectives and to identify the gap for improving the surveillance system.

The purpose of evaluating public health surveillance is to assess the core functions of surveillance system, surveillance system attributes and major gaps identified in the District for preparedness planning, effective health intervention, early warning and response.

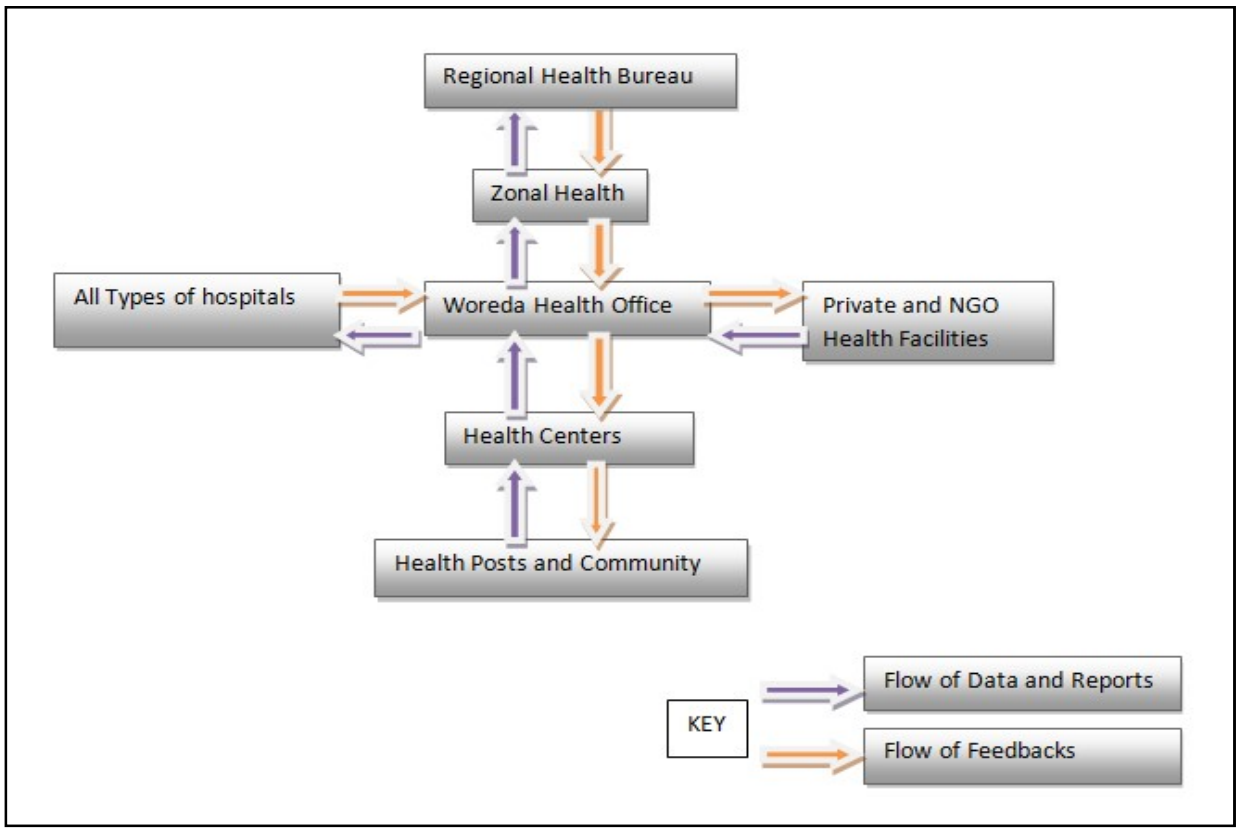

Figure 18:-Diagram of report and feedback flow from one unit to the other

The above schematic presentation of reporting system shows that report from lower level during emergency should reach the next higher level within 30 minutes and totally 2 hours from health post to national level to give feedback and response as soon as possible [Fig.18].

Rationale of the Study

Akaki District was one of the woredas repeatedly affected by flood disaster, Occurrence of AWD outbreak during 2009 E.C that affected 43 persons and acute febrile illness the leading cause of morbidity in the District. In this District, about 56% of populations are at risk of malaria and malaria cases were reported throughout the year(**9**). Nationally, malaria is under elimination program so evaluation of surveillance system is necessary to identify challenges, gaps, detect ability of the District to rule out malaria from other acute febrile illnesses and propose solution for decision making.

2. Objective

2.1 General objective

- To evaluate the surveillance system core function, attributes and major challenges for malaria disease in Akaki District, Oromia Region

2.2 Specific Objectives

- To assess the core functions of the surveillance system in the District
- To evaluate attributes of surveillance system in the District
- To identify major challenges of the surveillance system in the District

3. Methodology

3.1 Study area

We conducted Surveillance system evaluation in Akaki District, Finfinne Zuria Special Zone. We selected this District purposively since the District has challenges to provide accessible health service for all communities under its catchment, due to geographic area of the District and had low performance.

3.2 Study period

From November 10-30, 2018

3.3 Study Units

The study units were-District Health Office, three Health centers and randomly selected nine health posts.

3.4 Study population

All population of Akaki Woreda

3.5 Study Design

We conducted Cross-sectional study of review documents and interviewed all concerned bodies.

3.6 Sampling technique

We selected three health posts using simple randomly sampling technique from all health centers found in the District. Hence, the Woreda Health Office, three Health centers and nine Health posts were our study units.

3.7 Case Definitions of Malaria

Suspected:-Any person who the residents of Akaki District in the last six months within the period covered in the study and with clinical symptoms of fever headache, rigor, back pain, chills, sweats, Myalgia, nausea, muscle pain and vomiting diagnosed clinically as malaria(**4**).

Confirmed:-Any person who was the residents of Akaki District in the last six months within period covered in the study and malaria suspected case confirmed by microscopy or RDT for plasmodium parasites(**4**).

3.8 Data collection

Primary data:-Primary data were collected using semi-structured questionnaire by the principal investigator and observation was made using check-list.

Secondary data:-Different data sources, such as annual reports of the District, published articles in areas of those diseases, national integrated diseases surveillance and response (IDSR), and the public health emergency management guidelines were used.

3.9 Data analysis

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

3.10 Data quality assessments

Data quality of the assessed sites were measured based on the completeness throughout the year 2018 and the completeness of the reporting formats were documented.

3.11 Supportive letter

Supportive letter was written by Oromia Regional Health Bureau, Zonal Health Department and District Health Office in order to get permission from all concerned bodies.

3.12 Dissemination of results

Written report of both hard and soft copies were prepared and shared to the School of Graduate Studies of the Addis Ababa University, Oromia Regional Health Bureau PHEM Office, Finfinne Special Zone Health Office and Akaki District.

3.13 Operational Definitions

Terms used in the evaluation were operationally defined as follows:-

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

Case registration: is the process of recording the identified cases

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

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

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

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

Usefulness: Usefulness of the surveillance system is reflected by documented changes in policies and procedures as a result of information generated by the system. In this evaluation system, usefulness of the surveillance system was measured by the opinion of focal persons of each district and selected health facilities.

Simplicity: Simplicity denotes the structure and ease of operation of the surveillance system and case definitions of those diseases. In this evaluation, the system was evaluated by "Time spent with the preparation and dissemination of surveillance reports.

Flexibility: Flexibility of a surveillance system is its capacity to adapt to changing information needs or operating systems within minimal additional time. In this system evaluation, the system's flexibility was measured based on the reporting formats' capacity to hold anything new to be reported (how a system responded to a new demand) and the Focal person's adaption with the formats.

Quality: The quality of data reflects, the completeness and validity of the data recorded in the assessed Health offices, Health facilities and Zonal Health Department. The evaluation assessed the completeness of the reporting formats for the year 2010 EFY from the reports documented.

Acceptability: Acceptability is the willingness of persons, institutions or organizations to participate in the surveillance system. In this Evaluation, the acceptability evaluation was measured on randomly selected staff members' willingness.

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

Positive predictive value: Refers to "to what extent are reported cases really cases" cases that actually have the health condition in question. In this System evaluation, the PPV was measured based on standard measurement of true malaria cases reported and total positive tests.

- (PPV) = True positive tests x 100
  Total positive for standard case definition

Representativeness: Representativeness was assessed by comparing the characteristics of reported malaria cases in surveillance system to the actual malaria cases reported in the community. It was also assessed based on the health service coverage, the reporting rate of the health facilities and health seeking behavior of the community.

Timeliness: Timeliness reflects the speed or delay between steps in a surveillance system. This particular Evaluation system measured the amount of time between the onset of malaria cases and its reports to the ZHD for control and prevention measures.

That means = Total malaria reports Reported on time from woredas to ZHD/per year x 100%

Total Malaria reports Expected per year 2010 E.C

Stability: Stability was assessed by questioning the surveillance officers on the consistency of the system.

4. RESULTS

4.1 Geographic location

Akaki District is one of the Woredas found in Finfinne Surrounding Special Zone that was established in 1986 E.C and got this name from Akaki River. Distance from Addis Ababa is 37kms and shares boundaries with **Ada'a** Woreda in the East, **Sebata-Hawash** in the West, **Liban cuqala** in the South and **Barak** Woreda and **Bole sub-city** in the North. The climatic condition of the District is Kola and Weina-Dega.

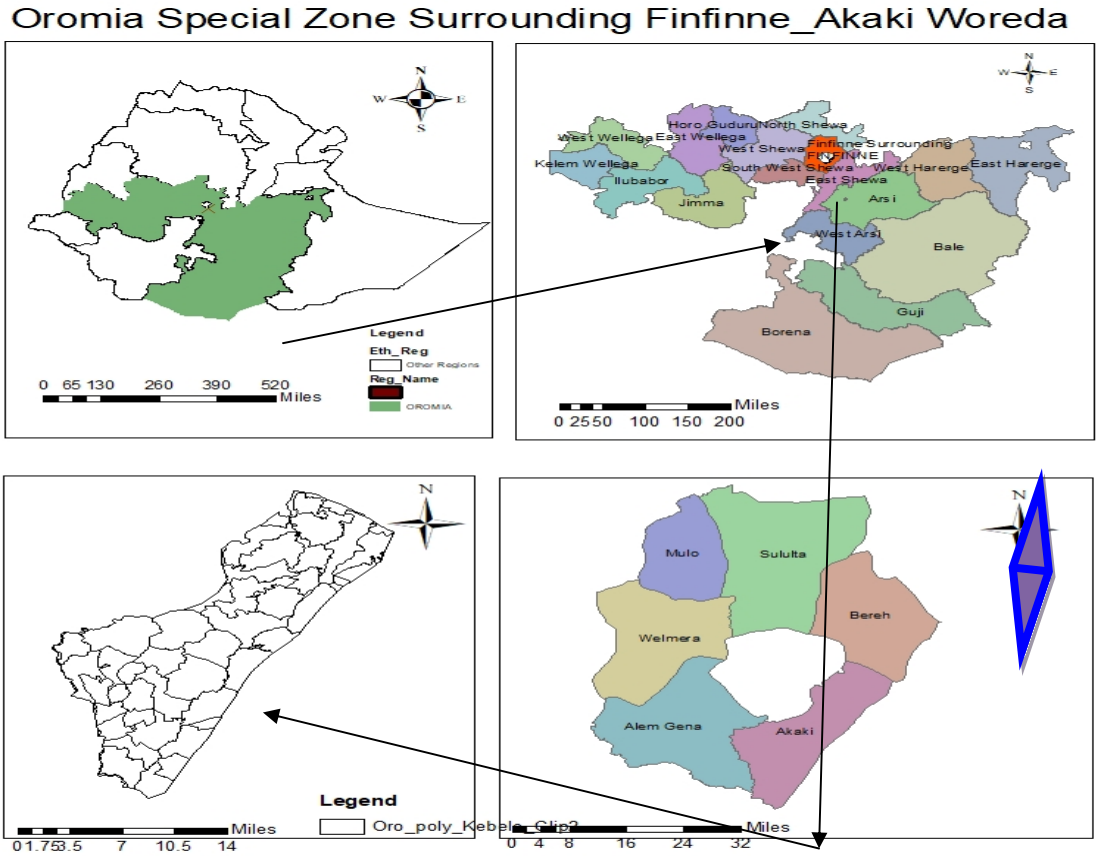

Figure 19:-Administrative map of Akaki Woreda, FSSZ, Oromia, November, 2018

4.2 Populations under surveillance

There were 28 Kebeles, 28 HPs, 3HCs and two private clinics in the district. There was one HP in each Kebele. Those HPs linked with three HCs in their catchment area in the District as PHCU. Hence, there were three PHCUs in the District namely, A/Sera PHCU, A/Samuel PHCU and Insilale PHCU. Based on catchment areas, A/Sera, A/Samuel and Insilale had 9, 9 and 10 HPs respectively. The total population of the District was **84,869**.There were estimated 17681 HHs, 13944 under five years and 2733 under one years in this Woreda. Health service coverage of the District was 88% for HC and 100%for HPs **[Table 12].**

Table 12:-populations under surveillance in Akaki District, FSSZ, Oromia, November 2018

S.N	Name of Kebeles/HP	HCs	T popn2011	HHs(4.8)	L.B(3.47%)	<1Yrs	<5yrs
1	Dhera Idoro	**Abu sera PHCU**	3838	800	133	124	631
2	Oda katicha		3901	813	135	126	641
3	D/Cirri		3476	724	121	112	571
4	A/sera		2694	561	93	87	443
5	A/Loya		4009	835	139	129	659
6	A/Serkama		1331	277	46	43	219
7	A/Lugna		1996	416	69	64	328
8	A/garbi		1660	346	58	53	273
9	A/Aciro		2697	562	94	87	443
10	Kombolcha	**A/Samuel PHCU**	1569	327	54	51	258
11	Qoftu		1821	379	63	59	299
12	Bilbilo		4146	864	144	134	681
13	Dufa		1868	389	65	60	307
14	A/Samuel		2124	443	74	68	349
15	Dhangaggoo		5839	1216	203	188	959
16	D/xino		4799	1000	167	155	788
17	Gamada		4470	327	54	51	258
18	Hechuu		4403	379	63	59	299

19	B/Guji		2385	931	155	144	734
20	O/nabe		2403	917	153	142	723
21	G/arabsa		3776	497	83	77	392
22	B/silxo		3837	501	83	77	395
23	y/Abay		1934	787	131	122	620
24	A/Silxo	**Insilale PHCU**	1935	799	133	124	630
25	y/nacho		1744	363	60	56	286
26	Insilaalee		3263	680	113	105	536
27	Gimashe		836	174	29	27	137
28	G/Koticha		6107	1272	212	197	1003
29	**Total(Woreda)**		**84,869**	**17681**	**2945**	**2733**	**13944**

The total visited health facilities during surveillance system evaluation were thirteen. Those were Akaki Woreda Health Office, Insilale HC,A/Sera HC,A/Samuel HC, A/Sera HP, Oda Koticha Hp, D/cirri HP, Kombolcha HP, Bilbilo HP, Hechu HP,G/Koticha HP, Insilale HP and Oda nabe HP. A/Sera HP, Oda Koticha Hp and D/cirri HP were from catchment of A/sera PHCU, Kombolcha HP, Bilbilo HP and Hechu HP were from A/Samuel PHCU and G/Koticha HP, Insilale HP and Oda nabe HP from Insilale PHCU were selected randomly[**Table 13**].

Table 13:-Name of visited Health facilities during study period in Akaki Woreda, FSSZ, Oromia, November 2018.

S.N	Name of Facilities	Total Population	HHs
1	Akaki Woreda Health Office	84869	17681
2	Insilale HC	21274	4432
3	A/sera HC	25605	5334
4	A/Samuel HC	22169	4618
5	A/Sera HP	2694	561

6	Oda Koticha HP	3901	813
7	D/Cirri HP	3476	724
8	Kombolcha HP	1569	327
9	Bilbilo HP	4146	864
10	Hechu HP	4403	379
11	G/Koticha HP	6107	1272
12	Insilale HP	3263	680
13	Oda nabeHP	2403	917

4.3 Case detection and Registration

Case detection and registration is one of the core functions of the surveillance system. There was registration in all visited health facilities and all cases were recorded. However, the registration was incomplete in some health facilities, especially in health posts. Case definition is vital for case and outbreak detection. In relation to case detection, among 17 respondents, all had the standard case definition, but the case definitions were posted only in four health facilities (three HCs and the Woreda Health Office).The rest nine health facilities (64%) did not post the case definition in their working areas, rather they memorized the case definition.

The common reportable diseases reported in Akaki District during the last six months were malaria, Typhoid fever, Dysentery, Typhus and severe acute malnutrition .The rest reportable diseases were reported as zero report. In the last 6 months, 143 malaria cases, 191 typhoid fever, 19 Typhus and 58 dysentery and 14 severe acute malnutrition cases were reported to Woreda Health Office [**Table14**].

Table 14:-Frequency of common weekly reportable priority diseases in Akaki District, FSSZ, Oromia, November 2018

S.N	Immediately reportable disease	Number of cases in the last 6 months	Weekly reportable disease	Number of cases in the last 6 months
1	Acute flaccid paralysis	0	Malaria	143
2	Anthrax	0	Typhoid fever	191
3	Avian Human Influenza	0	Dysentery	58
4	Pandemic influenza A	0	Typhus	19
5	Cholera	0	Severe acute malnutrition	14
6	SARS	0	Meningitis	0
7	Measles	0	Relapsing fever	0
8	VHF	0	Scabies	0
9	NNT	0		
10	Yellow fever	0		
11	Guinea worm	0		
12	Rabies	0		
13	Smallpox	0		
14	Maternal death	0		
15	Prenatal death	0		

Malaria

There are more than 75 hotspot districts for malaria in Oromia Region (**8**). About 20 million populations of the Region are at risk for malaria infection(**7**). Due to different efforts made by governmental and non-governmental agencies on malaria prevention and control, cases had decreased during the past 5 years. Malaria is one of the acute febrile illnesses endemic in Akaki District and about **47774**(56%) woreda population live in malarious area and malaria cases reported in the District throughout the year vary from season to season (**9**). Means of diagnosis for malaria cases in this District were RDT and microscopy. RDT is used at Health post level where as microscopy is used at Health center level. However, there were challenges in the

diagnosing malaria at Health center level by microscopy due to absence of electric power in two health centers (A/Sera HC and A/Samuel HC).Only Insilale HC has electric power. Among the visited twelve health facilities of the woreda, three Health Centers and nine Health posts, none of them posted cases definition for malaria, but all of them have standard case definition of malaria on the shelf. The clinical register was found in all of the visited health facilities. In this District, 8360(84%) households were supplied with ITN. No chemical spray was performed in the District during the last 6 months. However, Woreda Health Office planned to spray chemicals for high risk areas in the second quarter of 2011 E.C. According to the Woreda Health Office report, community awareness creation was given to all Kebeles on malaria symptoms, to increase health seeking behavior by health extension workers and health workers assigned in different Kebeles. During the last 6 months, 399 suspected fever cases were tested by microscopy or RDT. Out of those, 109(27%) cases were confirmed and 34(8.5%) cases were clinically treated. Insilale PHCU did not report malaria cases during the last 6 months since the area is not malarious. The slide positivity rate of the Woreda was 35.8%. The SPR of A/Sera and A/Samuel HCs were 37.7% and 31.3% respectively. The CFR of malaria in this Woreda during the last 6 months was zero. However, the total malaria cases in the District were not only treated in catchment health facilities, but also treated in the nearest health facilities, such as Dukem Health Center, Galan Health Center, Akaki sub-city and Bole sub-city [**Table15**].

Table 15:-Malaria cases by health facilities in Akaki District, FSSZ, Oromia, November 2018

S.N	Facilities name	Total malaria suspected fever cases	Total confirmed +clinically treated malaria cases	Slide +ve rate(SPR)	CFR
1	A/Sera PHCU	204	77	77/204=37.7%	0
2	A/Samuel PHCU	195	61	61/195=31.3%	0
3	Insilale PHCU	0	0	0	0
4	Woreda	399	143	143/399=35.8%	0

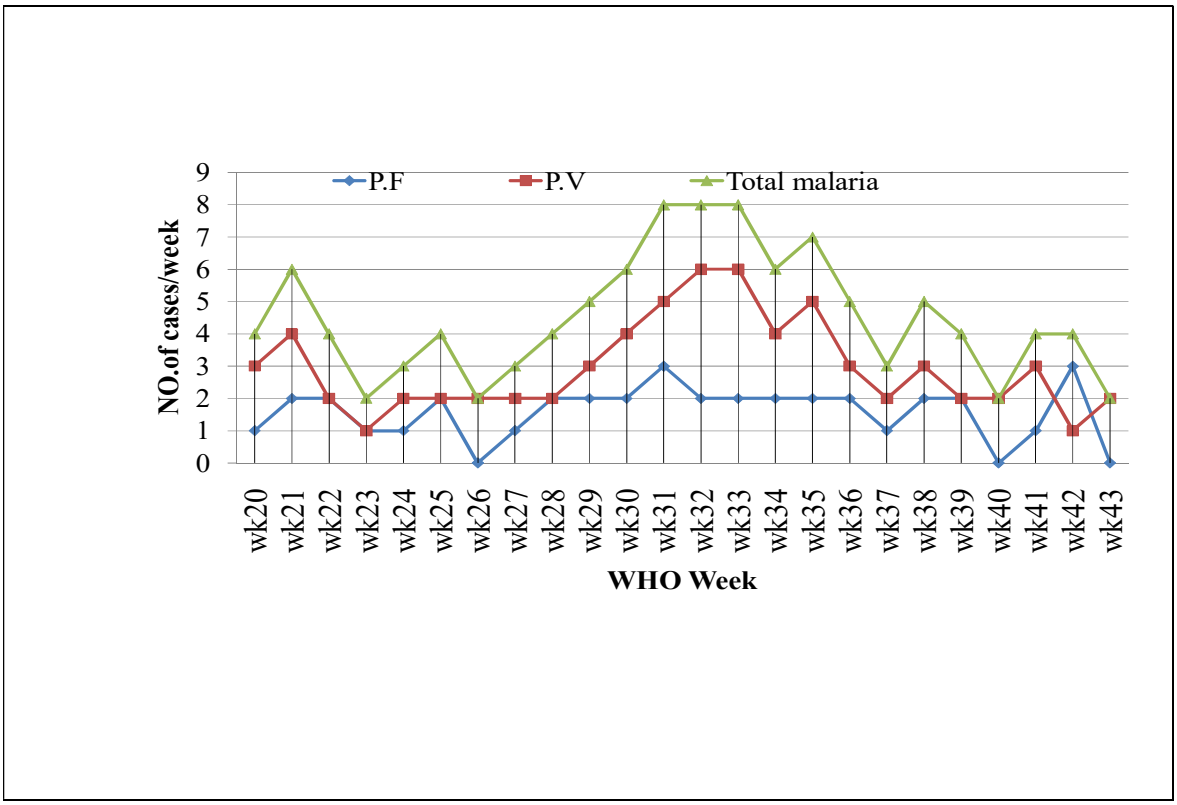

Figure 20:-Trends of malaria cases in the past 6 months by WHO weeks in Akaki district, November 2018

As we can see from above figure trends of malaria cases increased during WHO weeks31-34 and decreased gradually until the end of week 43.The majorities of reported species during study period were P.vivax. This accounted for 65% of the total malaria cases [Fig20].

4.4 Data reporting

In all visited health facilities in the District, there was no weekly reporting pad, but there was reporting format that came from the Woreda Health Office. Among visited health facilities, only one health center has functional computer and printer for developing report format. The reporting mechanism from HP to HC and HC to Woreda Health Office were by hardcopy and phone.

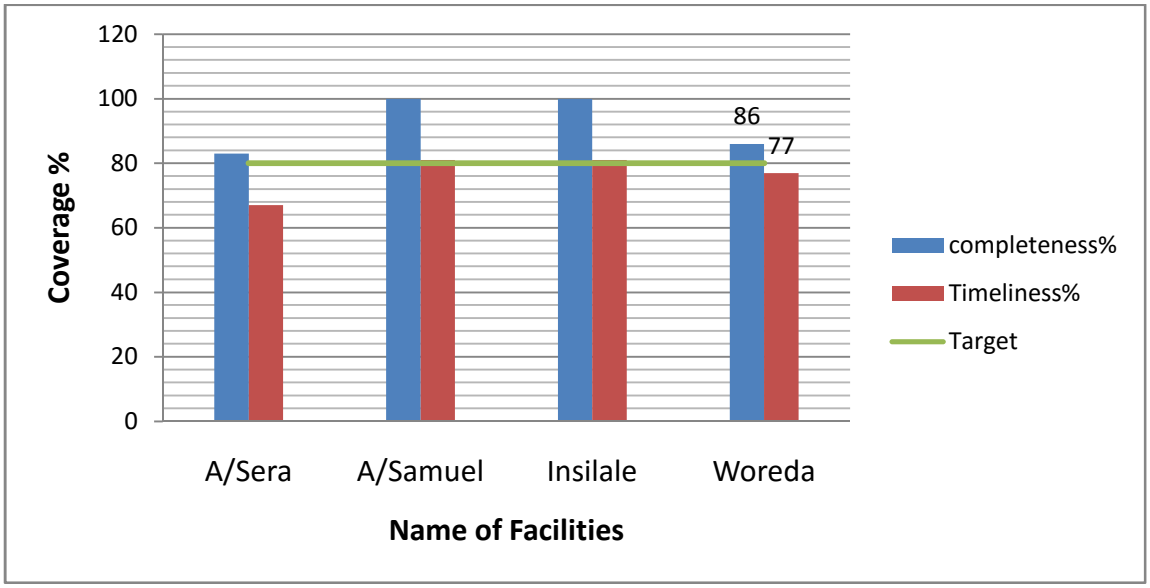

Figure 21: Six months PHEM report completeness and timeliness of vs Target in Akaki Woreda, FSSZ, Oromia, November 2018

Six months report completeness and timeliness of the Woreda were 94.5% and 77.8% respectively [Fig.21].

4.5 Data analysis

There were no analyzed data by person, place and time in all visited health facilities. However, there was malaria follow up chart at Woreda level.

4.6 Epidemic response

Woreda Health Office and HC PHEM Officers had experience on epidemic response in the past two years on AWD and flood disaster. Flood disaster occurred recently in the District and affected the community living in Hechu Kebele. All PHEM Officers participated in disaster response and rehabilitation process. There was emergency preparedness and response plan (EPRP) in the Woreda Health Office, but no EPRP at facilities level. No budget was allocated for PHEM activities at Woreda level.

4.7 Training

Training refers to the needs for capacity building to enhance the quality of the surveillance system through knowledge and skill transfer. In the past 6 months, no training was given for PHEM Officers at facilities and Woreda level on surveillance activities. Among ten randomly selected health workers at facilities level interviewed for Epidemic response, all of them complained of training gaps.

4.8 Supervision

Supportive supervision helps to strengthen the capacity of health staffs and ensure that the right skills are used appropriately to ensure that all necessary things are in place and that planned activities are implemented based on the schedule. All of the assessed health facilities of the District did not conduct regular supportive supervision according to guide line. Among the visited health facilities and woredas, none of them conducted supportive supervision for their respective health facilities as per the guideline. Supportive supervision given for HP from HC was intermittent .One quarterly supervision was under taken from Zonal Health Department to Woreda Health Office.

4.9 Feedback

In the past 6 months, no feedback were given for Woreda Health Office and other visited twelve health facilities from higher level on PHEM activities, but there was one integrated activities feedback from the Zonal to Woreda Health Office.

4.10 Resources

From visited health facilities, 12(100%) compiled weekly PHEM report manually. Woreda PHEM officers sent report by phone and private internet. No electric power in two Health centers. They used generator for laboratory microscopy. One HC used solar power alternatively donated by Non Government Organization. Woreda used two ambulances for delivery and routine activities, but no car at all. Only one HC had computer and printer to print report format. All visited Health Facilities had no internet service to disseminate information for higher level through email. HMIS data from Primary health care units are entered into computer at Woreda level. There was shortage of guideline, weekly report pad and report format. Case definition for epidemic prone diseases was available at all visited health facilities. Thresholds for epidemic diseases and PHEM guideline were only available at Woreda level. All visited Health centers use motor cycles to support peripheral health posts. All visited Health centers had functional fridge, phone and microscope. One Health Center used generator and another Health Center used solar system to continue laboratory and other services since there was no electric supply in two health centers. All visited health posts had no electric supply. In general, only 14% of health posts in the District used solar system to perform routine activity [Table16].

5 Table 16:-Availabilities of logistic and resources for PHEM activities in Akaki District, FSSZ, Oromia, November 2018

S.N	Materials	Woreda (N=1)	HCS(N=3)	HPS(N=9)
1	Electricity	100%	33%	0%
2	Bicycles	0%	0%	0%
3	Motor cycle	100%	100%	0%
4	Car	0%	0%	0%
5	Ambulance	100%	0%	0%
5	Computer	100%	33%	0%
6	Printer	100%	33%	0%
8	Fax	0%	0%	0%
9	Telephone	100%	100%	0%
10	Internet service	0%	0%	0%
11	Functional Fridge	100%	67%	0%
12	Microscopy	0%	100%	0%
13	Generator	0%	67%	0%
13	Solar	0%	33%	14%
14	E.HMIS	100%	33%	0%
15	PHEM Guideline	100%	100%	0%
16	Report pad	100%	0%	0%
17	Malaria Guideline	100%	67%	0%
18	Line list pad	0%	0%	0%
19	IX case based format	0%	0%	0%
20	Vaccine Carrier	100%	100%	100%
21	Sample container	0%	0%	0%
22	Cold box	100%	100%	0%
23	Malaria follow up chart	100%	0%	0%
24	Chemical spray pump	100%	0%	0%

6

6.1 Surveillance system Attributes

4.11.1 Usefulness

It is clear that a surveillance system is useful if it contributes to the prevention and control of adverse health events, including an improved understanding of the public health implications of events. In all visited health offices and health facilities, respondents had a common understanding of early detection of epidemic of diseases under surveillance as the major use of the surveillance system. All respondents (17 focal persons) believe that the surveillance system helps to "detect an outbreak" of malaria cases and others on time, "estimate magnitude of the morbidity and mortality", "used to detect factors related to the diseases" and to permit assessment of the effect of the prevention and control program of malaria.

4.11.2 Simplicity

The simplicity of a public health surveillance system refers to both its structure and ease of operation. In this assessment, all focal persons agreed that the case definitions of these diseases for identification of suspected cases are easy to understand and could be applied by all levels of health professionals. But to confirm cases, it was found usually difficult related to sample collection and delay in laboratory result for some diseases eg. Measles, rabies,etc. However, among the Health office and health facilities PHEM Officers, none of them analyzed data by place person and time. The malaria confirmatory test (RDT and microscopy) takes 10-20 minutes at health facilities level.

4.11.3 Flexibility

All visited woreda health offices and Health facilities responded as the PHEM system made the reporting format flexible to report other new events under immediately and weekly reportable case based conditions. Similarly, from the simple observation of weekly reporting format, there is a place to insert new demand/events. However, there is no any new health events filled in "others spaces" in 2018 reports documents of the Woreda health offices and HFs.

4.11.4 Data Quality

Out of three PHCU, two PHCU reported 100% complete reports to the Woreda, whereas one PHCU reported 83% of expected report. Among visited 9 Health posts,4(44%) filled weekly report format incorrectly. They wrote blank space instead of writing zero in case of absence of cases. However, all HCs filled weekly report format correctly.

4.11.5 Acceptability

Acceptability was assessed in terms of willingness of health workers to participate in surveillance system, participation of stakeholders and partners involvement. Out of randomly selected ten health staffs 8(80%) responded that they were not engaged well in the system. They complained of training gaps. The major reasons for some health staff for not regularly participating in the system were due to lack of training, but they have willingness to participate if they have the necessary training. Among visited facilities, only woreda health office had emergency preparedness and response plan (EPRP).However, since there was active participation among trained health workers, community participation and partner involvement, the system is noted to be acceptable.

4.11.6 Representativeness

Representativeness of surveillance system can be evaluated in terms of health seeking behavior, health service coverage and accessibility of the service. In our evaluation, we focused on malaria disease prevention and control service availability in the District and how it covers the service. The total malaria cases reported under surveillance system was low, compared to the District plan. Despite the good health seeking behavior of the community, some parts of the District were not accessible for service and used neighboring 'town from Addis Ababa sub-city, Galan Town and Dukem Town. The health service converge of the district was 88% and 100% for HC and HP respectively. Since some patients were treated in other Districts, the actual total cases in the Woreda were not clearly known. Hence the system was not representative.

4.11.7 Timeliness

This particular Evaluation system measured the amount of time between the onset of malaria cases and its reports to Woreda Health Office on time for control and prevention measures.

That means = Total malaria Reported on time from PHCU to Woreda x 100%

Total Malaria reports Expected per year

We sampled the last 6 months reported on time from three PHCU to Woreda Health Office

Timeliness $= \frac{4+5+5}{6+6+6} * 100 = 14/18*100 = 77.8\%$

4.11.8 Positive Predictive Value

Refers to "to what extent are reported cases really cases" from all reported positive cases by checking standard measurement. In this evaluation, malaria positive predictive value was measured by standard case definition and positive test. Hence, positive predictive value calculated from all suspected malaria cases that fulfilled standard malaria case definition by microscopy or RDT.

$$PPV=\frac{\text{True Positive test for malaria}*100}{\text{Total positive case definition for malaria}}$$

$$PPV=\frac{TP}{TP+FP}*100 = 109/399*100=\mathbf{27}\%$$

4.11.9 Sensitivity

Sensitivity of the system refers to the ability of the system to detect cases or outbreaks through trends in the surveillance data. In this particular system evaluation, the sensitivity was measured by the extent of the system to identify all malaria cases in the target population by the proportion.

- That means = $\frac{\text{Total true malaria cases reported by surveillance}}{\text{Total malaria cases reported by the surveillance}} \times \mathbf{100\%}$
- Where True reported case is considered as =total laboratory + RDT reported cases =**109**
- Total reported malaria cases = total confirmed and reported malaria cases + those clinically diagnosed and treated by malaria drugs=**143**

$$\textbf{Sensitivity}=\frac{TP}{TP+FN}*100 = \frac{109}{143}*100 = 76\%$$

4.11.10 Stability

Stability refers to the reliability to collect by managers, provide data properly without failure, availability, and the ability to be operational when it is needed for the public health surveillance system. Twelve (70.5%) respondents reported that, any new restructuring in the system may affect the procedures and activities of the surveillance system due to resource and training gaps and 29.5% respondents reported that they used community support to mitigate the problem.

4.12 Major Gaps/Challenges

There were many challenges and gaps identified during the evaluation which may affect the quality of Public health surveillance.

- Absence /weak supportive supervision and feedbacks from higher level for PHEM activities
- No clear PHEM activity plan at the hand of all PHEM officers, but there was integrated annual plan prepared by the Woreda Health Office.
- The majority of the interviewed staff at all levels did not involve themselves in the surveillance system activity due to training gaps
- The weekly malaria cases reported to PHEM focal persons and HMIS focal persons at each health facility were not the same in the last six months.
- PHEM focal persons have computer skills gabs for data analysis at all level.
- E-HMIS at health facilities level was not functional due to skill gaps and lack of electric power and internet service.
- Shortage of logistic and PHEM activities resources at all levels were apparent
- Distance and inaccessibility of health service for some part of communities due to geographic location of the area were a problem
- Weekly report did not reach Woreda Health Office on time for decision making
- No allocated budget for PHEM activities at Woreda Health Office.

Public Health intervention during evaluation

- Onsite training for PHEM officer how to analyze surveillance data
- Orientation for HEWs on how to fill report format of reportable diseases
- Technical support for Front line Field Epidemiology trainer
- Discussion with Head and managements of Woreda Health Office
- Supply community and standard case definition for all visited Health Posts

5. Discussion

The purpose of the evaluation was to assess the effectiveness of the surveillance and response system in terms of timeliness, quality of data, preparedness, case management, overall performance using indicators and attributes to identify gaps or areas that could be strengthened(**2**).

Absence/weak supportive supervision, feedbacks from higher level for PHEM activities and integrated services, absence of budget allocation for PHEM activities, logistic and resources gaps, training gaps, lack of water and electric supply and poor data record and management were the main gaps identified during system evaluation in Akaki District. This was due to low attention for PHEM activities from the Woreda Health Office and work overload on PHEM officers.

Among weekly reportable diseases, malaria, Typhoid fever and Dysentery were reported throughout the year and the rest were reported as zero report. The case detection capacities of health facilities in the District for reportable diseases were very low due to inaccessibility and some part of population got service in other Districts. Lack of electric supply for laboratory service had also limitation on case detection. The majority of reported malaria species during study period were P.vivax which accounted for 65%. The slide positivity rate of malaria in Akaki District during the last six months was 35.8%. This was lower than the study conducted in Shashamane District and West Shoa Zone (**11**, **12**). However the actual number of cases from this District was not clearly known, since some parts of the Woreda population used other districts or towns.eg .Dukem Town, Galan Town Akaki Kality sub-city and Bole sub-city.

The report completeness and timeliness of surveillance evaluation conducted in Akaki District, FSSZ showed that, it was 94.5% and 77.8% respectively. Report completeness was above the Regional target where as timeliness was below Regional target (**80%**) (**13**). Health coverage of the District was 88% for HC and 100% for HP. According to the World Health Organization standard, PHCU linkage to reach accessible health service in rural communities' one Health Center additionally needed for this District.

Surveillance system attributes were assessed and it was useful, simple, flexible, and sensitive to detect out break for early response and management .However, it was not complete, stable, timely and representative, since data from health facilities were not reported on time, resource and training gaps may affect the system and those treated in other districts/towns were not included in the system.

6. Conclusion

Since the data of the surveillance system does not end by itself, proper data collection, analysis, interpretation and decision making based on information obtained from data are necessary. Absence/weak supportive supervision, feedbacks from higher level for PHEM activities and integrated services, absence of budget allocation for PHEM activities, logistic and resources gaps, training gaps, lack of water and electric supply and poor data record and management were the main gaps identified during system evaluation in Akaki District.

Among weekly reportable diseases malaria, Typhoid fever and Dysentery were reported throughout the year. The majority of reported malaria species during study period were P.vivax. This accounted for 65% of total malaria cases. The positivity rate of malaria in Akaki District during the last six months was 35.8% and no death was reported in the District. The report completeness and timeliness of the District were 94.5% and 77.8% respectively. Health service coverage of the District was 88% for HC and 100% for HP.

Surveillance system attributes were assessed and it was useful, simple, flexible, and sensitive to detect out break for early response and management .However, it was not complete, stable, timely and representative.

7. Recommendation

- Woreda Health Office should work with other sectors to provide internet service, water and electric power for all health facilities to improve case detection data management
- Woreda Health Offices should allocate budget for PHEM activities
- Woreda Health Office should focus on data analysis at all levels.
- Feed backs should be given from all direction and regular supportive supervision should be conducted
- The PHEM focal persons of health facilities should have their own plans, feedbacks for emergency actions and required resources and materials.
- Woreda Health Office should give refresher training for all health staffs on regular basis to improve their capacities on case detection and response
- All Health facilities should send report on time to higher level

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CHAPTER FIVE

WOREDA HEALTH PROFILE OF SINANA WOREDA BALE ZONE OF OROMIA REGION, FEBRUARY 2018

ABSTRACT

Background:- Health profile is a system of collecting, organizing and summarizing health and other health related events to describe health and other health related conditions, demographic, socio-economic, political, cultural and other aspects of a particular geographic area of interest. This assessment was conducted in Oromia Region, Bale Zone, Sinana Woreda which is **430km** From Addis Ababa to South-East direction .Sinana Woreda is one of the 22 Woredas found in Bale Zone of Oromia Region.

Objectives: - To assess general health profile of Sinana woreda in BaleZone of Oromia Region.

Methodology: - We conducted cross-sectional study using questionnaire. Data collection was done from February21 2018 to February28, 2018 by reviewing Hard copy and softcopy. In addition, interviewing and discussion with concerned body was conducted. Data were entered and analyzed Micro soft Excel. The main data sources were all sectors under Sinana Woreda Administrative office.

Result: -The general health profile of Sinana Woreda was assessed.. Sinana Woreda is the third smallest area in hectares from Woredas found in Bale Zone, but the second highest populations next to Ginner Woreda with total population of 158,231. Among these total population 9868(6.2%) of them are residing in urban area while 148363(93.8%) of them live in rural area. The dominant ethnics group in the district is Oromo. Regarding religion distribution, most districts' populations are Muslim, with 68.5% followed by Orthodox 22.4%, while 9.1% of the populations are Protestant. Agriculture is the main economic activities of the district. The health service coverage of the district is **95**% for health center and **75**% for health post. Acute upper respiratory tract infection and diarrhea were the leading cause morbidity which accounted 19.8% and 15.5% respectively.

Conclusion and Recommendation:- Communicable diseases and infrastructures were the main problem of the district so that government involvement and community participation should be strengthened.

Key words:-**Health profile, Cross sectional study, Sinana, Bale Zone, Oromia, Ethiopia, February 2018.**

1. Introduction

Health profile assessment is a system of collecting, organizing and summarizing health and other health related events to describe health and other health related conditions, demographic, socio-economic, political, cultural and other aspects of a particular geographic area of interest. Health profile assessment is a process of gathering and interpreting information from multiple and diverse sources in order to develop a deep understanding of the health of a community (**1**)**.** It is also a process that uses these results to develop strategies to improve the health status of the community. This health profile provides an overview of health system, trends in priority health problems and includes a description of different institutional frameworks, key issues and challenges of the districts. Summarized and prioritized data is important for public health surveillance officials for planning, implementation and evaluation of public health surveillance programs.

According to 2011 study done in California showed that health profiles provide quick and easy access to the most commonly requested health indicators (**1**). The profiles present estimates to track changes in insurance status, disease prevalence, health behaviors and overall health status over time and enables frequent release of health estimates that will help policymakers, media, health advocates and others better respond to current events and the impact of a changing economic ,Social and Climatic condition on communities health.

Description of health related data and important health related indicators to determine the health and related sociological factors in the geographic area under study that provides an overview of the situation and trends of priority health problems and the health systems profile, including a description of different institutional frameworks, key issues and challenges of the districts (**2**)**.**

Health can seem like a very fragile thing — one minute you have it, the next minute it is gone(**3**). Some people look to their genetics to explain their ill health, others think of their bad behaviors.

Health profile description concerned with the changeable aspects of health, and therefore does not address genetics or heritable diseases (**3**)**.** While personal responsibility plays a role in each person's individual health, it's important to also consider other factors of social and

collective responsibility to improve health and to tell us the patterns of health across populations or groups of people, rather than examining health at an individual level.

The provincial government and health authorities are primarily responsible for health by providing health services and promoting healthy living (**4**). Local and First Nations governments and community organizations can also play a role in creating the conditions for citizens to make healthier choices and working with partners to promote community well-being.

People with higher levels of education tend to be healthier than those with less formal education (**4**). Education impacts our job opportunities, working conditions, and income level. In addition, education equips us to better understand our health options and make informed choices about our health. Offering or partnering with other organizations to deliver informal education, such as skill-building workshops (e.g., literacy training), can contribute towards improved individual and community health.

Income greatly impacts health by affecting our living conditions (e.g., adequate housing and transportation options), access to healthy choices (e.g., healthy food options and recreational activities), and stress levels (**5**). Those with the lowest levels of income experience the poorest health and with each step up in income, health improves. This means all segments of the population experience the effect of income on health, not just those living in poverty. Considering a range of incomes when designing community programs and services can improve access for all.

Health authorities can support your healthy communities' agenda by providing advice and expertise on health and health data, acting as a resource in the development of healthy public policy, and partnering with you on joint healthy living actions(**6**).

The purpose of Community Health Profile assessment is to describe the health status of the population, key health behaviors, describe determinants of health outcomes and behaviors, and examine root causes of ill health and health inequalities. This is useful for planning, administrative, budget allocation; identify major gaps, priority setting, for health intervention and corrective measures.

Rationale of the study

Sinana Woreda is the second densely populated Woreda of Bale Zone with low performance health service coverage. This Woreda also affected with acute watery diarrhea during 2009 E.C in which six cases reported. Health facilities of the District were not accessible for some parts of population due to geographic location of the Woreda. Despite nearest to Zonal Town and huge number of man power in the District, the performance of Sinana Woreda was low as compared to peripheral Woredas. Hence, assessment of health profile of the District was necessary to identify gaps and priority setting.

2. Objectives

2.1 General objective

- To assess general community health status, common health indicators and the main community health problems of Sinana woreda

2.2 Specific objectives

- To assess the health status and other health related conditions of the woreda
- To describe common district health indicators
- To identify the main community health problems for priority setting

3. Methodology

3.1 Study Area

Health profile description was conducted in Sinana woreda which is found in Bale zone Oromia Region and located 430km from Addis Ababa to the South East direction.

3.2 Study Period

All required data of health indicators and vital statics of the woreda in the past year were collected from February 20 to 30/2018.

3.3 Study Population

All population of Sinana Woreda and sectors under Woreda administration office

3.4 Study Design

Cross-sectional study was conducted using checklist designed for this purpose. Hard copy and softcopy were reviewed to capture different data.

3.5 Data collection methods and procedures

Health and others health related data was collected and reviewed by investigator from district Health Office, Education Office, Water & Energy Office, Administrative Office, Culture and Tourism Office, Transport Office and Finance Office

3.6 Data analysis

Data entry and cleaning was done. Then, data analyzed by Microsoft Excel 2010.

3.7 Data quality Assurance

Data quality was checked by data cleaning, comparing report with its source, report completeness and timeliness.

3.8 Ethical Consideration

Supportive letter was written by Addis Ababa University, School of Public Health and Oromia Regional Health Bureau in order to get permission from Zonal Health Department and all concerned bodies.

3.9 Dissemination of results

The findings of this study in both soft and copy were communicated with Oromia Regional Health Bureau, Sinana Woreda Administrative Office, Sinana Woreda Health Office, Mentors, Department Coordinators and Addis Ababa University.

4. RESULTS

4.1 Historical Background

Sinana Woreda is one of the district of Bale Zones in Oromia Region. Historically, name of the district was come from Community Tribes known as **Sinana**. As the culture and tourism Office told. Previously Sinana Woreda was combined with Dinsho Woreda and named as **Sinana-Dinsho**. In 1998 Sinana Woreda was separated from Dinsho Woreda for Administrative purpose.

4.2 Geography and climate

Sinana Woreda located at 430Kilometer away from Addis Ababa to the south-East direction and North-West part of Bale Zone.. The area of the district is **1,638.54KM^2**. The Altitude of the Woreda is **1650-2950**meters above the sea level. The **highest elevation** is located around boarder area of south east of Goro, namely **Gerardo mountain,** and head of kaso shekmara Kebeles, where as the **lowest area** is located around south east of boarder area named **Gurachu kubsa** Kebeles. From the total area of the district about 73.54 % is plain land, **3.7** % is hills, **9.6** % is mountains, **12.3** % is rugged and **0.86** % is gorge. The climatic condition of the Woreda is 13.3% highland, 85.84%midland and 0.86% lowland. Annual temperature is estimated to be between **9**^{0}c and **23**^{0}c. Annual range of rainfall is **114**mm-**1150** mm with an average annual rain fall of 632mm. Sinana Woreda is bordered in the **North** by **Gasara** and **Agarfa** Woreda, in the **south Goba** and **Barbare**, in the **East Goro and Ginner** and **Dinsho in the West**.

4.3 Administrative and political structure

Administratively, the district has Twenty (21) rural Kebeles and two (2) towns. All Kebeles are found out of Robe Town, but only Administrative Office found in Robe Town. The Woreda has also 67 villages, 727 women Development Army and 3615 one to five organized structures.

4.4 Demographic Information

Sinana Woreda is the third smallest area in hectares from Woredas found in Bale Zone and the second highest population next to Ginner Woreda. The dominant ethnics group in the district is Oromo. Regarding religion distribution, most districts' populations are Muslim, with 68.5% followed by Orthodox 22.4%, while 9.1% of the populations are Protestant.

In this Woreda there were 21 rural Kebeles and 2 Town administrative with total population of 158,231. Among these total population 9868(6.2%) of them are residing in urban area while 148363(93.8%) of them live in rural area. The older age group (>65) consists 7516 (4.75%) of the total population. There were also 32964 HHs, 5063 less than one year,25950 under five years,75951 <15 years,7515 >65 years and 34969 child bearing age women in the District[**Table 17**].

Table 17: Estimated population by Kebeles and age category, Sinana Woreda Bale Zone, Oromia, March, 2018

S.N	Name of Kebeles	Total population	Total HH (4.8)	<1 years (3.2%)	<5 years (16.4%)	<15 years (48%)	>65 years (4.75%)	Women (15-49) (22.1%)
1	W/Arjo	8678	1808	278	1423	4165	412	1918
2	Gurachu	4248	885	136	696	2039	202	939
3	Kubsa	1640	341	52	269	787	78	362
4	Hisu	11636	2424	372	1908	5585	553	2571
5	Obora	13366	2784	428	2192	6415	635	2954
6	Alamgena Town	2360	491	75	387	1133	112	521
7	Hassenbarera	8626	1797	276	1414	4140	410	1906
8	Hamida	6614	1378	211	1084	3174	314	1461
9	Shallo	7964	1659	255	1306	3822	378	1760
10	Selka Rural	5458	1137	174	895	2620	259	1206
11	Selka Town	7515	1565	240	1232	3607	356	1660
12	Basmena	3470	723	111	569	1665	165	767
13	Gamora	4773	994	153	783	2291	226	1054
14	Ilu Sanbitu	11228	2339	359	1841	5389	533	2481
15	Alage	7166	1493	229	1175	3439	340	1583
16	Shawwade	5089	1272	163	834	2442	241	1124
17	Kabira Xemo	8561	1783	274	1404	4109	406	1892
18	W/Barisa	4136	861	132	678	1985	196	914
19	Hawusho	7695	1603	246	1262	3693	365	1700
20	N/Robe	6930	1444	222	1136	3326	329	1531
21	H/Booqa	7782	1621	249	1276	3735	370	1719
22	Basaso	5508	1147	176	903	2643	262	1217
23	Q/shekmara	7788	1622	249	1277	3738	370	1721
Total Woreda		**158231**	**32964**	**5063**	**25950**	**75951**	**7515**	**34969**

4.5 Factors affect Health Status of the community

4.5.1 Agriculture

Agriculture is one of the main stay of the economic activity of the district in which **88%** of the population are engaged on it. Most of the productions are produced by **peasant holding farmers**. In Sinana Woreda there are 156 farmers cooperative having members of 23588 .These farmers services cooperative have a capital of 358073347.44 birr. There are nine farmers training centers in the district with 67 development agent workers. Sinana district have two major cropping seasons which is known as Maher and Belg. The two seasons is the main cropping season for district farmers.

The Belg land preparation usually starts in July and plantation usually starts in September with short season crop and including short maturing maize and legumes. Whereas the Maher season land preparation starts in January which is the main plantation season throughout the districts.

Cereals are the main crop that are largely produced and followed pulses, oil seed, vegetables, fruit, and spices. The mainly cultivated cereals are Wheat, Barley, Teff, Maize .etc.

As the table below shows the agriculture extension service of district hadn't been satisfactory because the ratio of development agent to farmers during 2005,2006,2007,2008 and 2009 E.C were 1:271,1:271, 1:476, 1:453 and 1:454 respectively [Table 18].

Table 18: District Agricultural Extension Service Coverage From (2005-2009), Sinana, Bale Zone, Oromia, March, 2018

Year	Number Of Development Agent	Number Of Farmer Served	DA: Farmers
2005	75	18161	1:271
2006	78	18161	1:271
2007	40	19027	1:476
2008	42	19027	1:453
2009	42	19082	1:454

Source -Sinana district Agricultural and Rural Development office

4.5.2 Land use and land cover

Land utilization is one of the principal ways to measure the performance of Agricultural production. As Land is one of the most important natural resources provided by nature for Man's. Agricultural is the main stay of economic activity in Sinana District.In2009, the total area of district is 1638.54km^2 (163854ha). Out of this land **60** % is under crop production,**15** % is under grazing land,**9** % is covered by forest and **16**%is covered by others such as river ,mountains, construction etc [Table19].

Table 19: Land use and Land cover of Sinana Woreda, Bale Zone, Oromia, March 2018.

Land Resource	Area coverage in hectares	Share (%)
Land Under crop	96676	60
Grazing Land	24632.64	15
Forest	14358	9
Others	28187.64	16
Total land area of the district	163854	100

4.5.3 Livestock and Poultry

Sinana district has a very large Livestock and poultry resource. From early days, livestock rearing has played an important role in the life of district population. In the district rearing and breading is the main stay of the people. The common livestock found Sinana district are Cattle, Goats, Sheep, Horses, Mules, Donkey, poultry, Beehives ,etc.

Livestock Feed

In majority of districts Kebeles less attention is given for preparation of livestock food. In some area to some extent livestock feed are good especially for cows which serve as source of milk. Most of time animals are feed from green fodders (grazing) which are simply pasture grasses and any kind of grasses. In general, the preparation of animals feed and the way they feed are very poor when compare their benefits. Thus, to increase the livestock sub sectors improving animals feed are needed.

Livestock Disease

Diseases have numerous negative impacts on productivity of herds' i.e. death of animals, loss of weights, slow down growth, poor fertility performance, decrease in physical power and the like. There have been many ways of fighting against disease and among these, Vaccination and treatments are the major ones. The availability of data on prevalence of disease is also very important to set up strategies that can assist in preventing and controlling disease, by and large in improving veterinary service of the district.

There are different diseases that affect livestock production in Sinana district. The major disease which affect bovine, ovine, equine, poultry and bees are listed below [Table20].

Table 20: Major Animal's disease in Sinana Woreda, Bale Zone, Oromia, March2018

	Type of Animals	Type of Disease
1	Bovine(cattle)	Anthrax, Blackleg, pasteurollosis, foot and mouth disease, Coccidian, Tetanus ,Internal and external parasite
2	Ovine(Sheep, Goat)	PPR ,Sheep &pox, pasteurollosis, Internal and external parasite
3	Equine(Horse, Donkey, Mule)	Lynphangitis, African Horse Sickness, Dourine, Tetanus, Internal and external parasite
4	Poultry	Coccidian, Newcastle, Fowl cholera
5	Bees	Wax muzz, Norseman, Accra, Amoeba
6	Canine/Dog	Rabies

Source- Sinana district Agriculture and Rural development

4.5.4 Veterinary Service and personnel

Beekeeping activity in the district is low activity. According to the data obtained from the district agriculture office, there are 2780 traditional beehives and 78 modern beehives. The major problem here is that no proper data is consolidated due to lack of skilled manpower in this

respect. Bee toxicity, Herbicide, and absence of proper management are among problems that affect beekeeping rearing.

The major problems that affect livestock rearing in Sinana district are climatic condition ,poor grazing land ,high animal mortality ,low productivity , poor quality(genetic makeup) , absence of proper management, prevalence of disease , absence of well treatment mechanism due to lack of medical facility ,etc

To alleviate the above problems there are few veterinary centers in the district. So far there are two types of veterinary clinics (One Type B & Eight type D) ,which provide veterinary services. On the other hand, 1(veterinary Medical Doctor) and 19(animal health assistants) are currently providing services in this Woreda [Table 21].

Table 21: Veterinary service, personnel and treatment in Sinana Woreda, Bale Zone, Oromia

S. N	Year	Types of veterinary clinic		Personnel					
				Doctor			Health assistant		
		D	B	Male	Female	Total	Male	Female	Total
1	2006	6	1	1	0	1	16	1	17
2	2007	6	1	1	0	1	16	1	17
3	2008	6	1	1	0	1	17	2	19
4	2009	8	1	1	0	1	17	2	19

4.5.5 Mining and Industry

Mining involves the extraction of mineral bearing substance from the crust of the earth. Mine At present the mineral resource of district is not identified well and surveyed. This is because at zonal and district level mineral prospecting and mapping requires a huge capital and skilled human power. But currently several type of minerals (Construction and Energy minerals) are identified by local and other peoples in different part of the district such as around Togona river

basin, Shaya river basin and around Selka village construction minerals like sand , gravel, clay and stone e.t.c are widely available in the district.

Industry is a key to economic development and cultural change in the economy. Industrialization in the district is at low level or infant. All most there is no Medium and Large scale industries in the district. The only Industry found in the district is small scale industries.

4.5.6 Water and Energy Supply

Water Supply

According to the source obtained from Sinana District water resource office shows, the source of drinking water are ranked according to their importance as tap water, spring water and river water. There are 17 Kebeles which are provided with pipe/potable/ water. 81.98% of the population of the district is supplied with portable water, 4 Kebeles are supplied by un protected well and 2 Kebeles use river water.

Energy supply

There are different kinds of domestic energy source in the district firewood, dung, crop residue; kerosene, electricity and charcoal are ranked according to their importance in the district. There are nine villages, which are access to the use of electricity power, which is generated by hydroelectric power. Hore-Boka, hawusho, Shallo, Selka, Gemora, Sanbitu, Alamgena, Hisu and hasenbarera are villages which are supplied with electricity power.

4.5.7 Education

In 2017/18, there are 3 governmental kindergartens, 37 primary schools (1^{st} cycle 1-4)=1 and 2^{nd} cycle (5-8))=36, 4 secondary school (9-10) and 1 Prepatory school (11-12) in Sinana district. However, there are no any governmental or non-governmental colleges. As information obtained from district education office, number of female students showed increment when compared to previous year in primary schools. On other hand, students drop out increase when compared with previous years. Out of 289 drop out students recorded last year, 98(34%) due to marraige,89 (30.8%) due to lack of interest,58(20%) due to economic problem,32(11%) move to others countries and 12(4%) due to health problem .There are 528 primary School, 55 secondary school teachers, 12 Prepatory school teachers, and 11 KG school teachers in the district.

Man power under woreda education office categorized by level of education as 419 degree, 312 Diploma, 6 MA degree and 1 certificate [Table22].

Table 22: Man power of Sinana Woreda Education Office by level of education, March 2018

S.N	Level of education	No	%
1	Certificate	1	0.13
2	Diploma	312	42.27
3	Degree	419	56.8
4	Master	6	0.8
5	Total	738	100

In 2010 E.C, total 29,131 students were registered at the beginning of the year. There are 15,542 male and 13,589 female students in Sinana district during study period. There are also 560 male teachers and 146 female teachers [Table23].

Table 23: Number of enrolled students and their teachers by sex in Sinana District, Bale Zone, Oromia, March 2018.

Types of School		Number of students			Number of teachers		
		Male	Female	Total	Male	Female	Total
Kindergarten		244	263	507	2	9	11
Primary schools	1-4	9589	7964	17553	8	5	13
	5-8	5091	4714	9805	499	116	515
Secondary School (9&10)		674	611	1285	41	14	55
Prepatory(11-12)		44	37	81	10	2	12
Total		**15,542**	**13589**	**29,131**	**560**	**146**	**706**

4.5.8 Facilities/Infrastructures

Availabilities of infrastructures have positive impact on health status of the community. In this district infrastructures is the main problem of the community that affect accessibility of health service delivery at all level. There is no district hospital, medium or higher private clinic in this Woreda. Six functional government health centers with water supply and five health centers with electric power supply are found in the district, Among 24 Health post, 9 of them supplied with electric power and 15 of them supplied with water. In this district, only seven rural Kebeles and two towns has supplied with electricity power. There are only two high schools, one Prepatory school and neither private nor government colleges in this district.

Sinana Woreda has 25 kilometers of all-weather and the rest are dry-weather road. Among 23 Kebeles of the district, 6 Kebeles have road transportation access to woreda town in all weather 13 Kebeles were only in dry season and 4 Kebeles has no access road transportation at all. Due to transport problem, accessibility of health service delivery at all community levels is not reached properly. Ambulance service is not functional due to no access road transportation and hard to reach in some villages such as **Gurachu, Kubsa, Shawade**, pocket area **Dilbo** and **Gurdubaj.**

Telecommunication is one of effective mode of communication. Urban areas of the district have supplied with wave satellite type of telecommunication and rural didn't have any functional satellite or wireless telecommunication service. There is no satellite or wireless telecommunication in all health facilities. There is a mobile network working in 19 Kebeles and 4 Kebeles has no network access in the District. This is main problem of health workers and community to call ambulance during delivery to decrease maternal death during pregnancy and pregnancy related condition.

There is no Postal Office in Sinana serving the community of the district. There is only one Commercial Bank of Ethiopia in Sinana Woreda which is found in Alamgena town.

4.5.9 Health facilities and their services

Primary health care unit is a system designed by Ministry of Health to enhance the linkage between health center and health posts. In this system all health center staff is expected to support technically the health posts under their catchment. According to the principle of primary health care unit one health center should be included at least five satellite health posts under it,

Sinana Woreda has 6 functional type B Health centers:-namely Oborra, Selka, Sanbitu, Hisu, Hawusho and Amallama and , and **24** health posts under its catchment. All the health centers were giving both inpatient and outpatient services and only Oborra Health Center providing ART service .The health service coverage of the district is **94.8**% for health center and **75**% for health post [Table24].

Table 24: Infrastructures in health facilities in Sinana Woreda, BaleZone, Oromia, March 2018

Facility type	Total number of health facility in the district	No. of facilities with				Remark
		Water supply	Electricity Power	Telecommunication Service	Road transportation access to district town	
Health Center	6	6	5	0	5	
Health Post	24	6	9	0	9 all weather& 15 only dry season	

Cold chain system

Good cold chain management system is essential for vaccine efficacy and prevents the occurrence of outbreak. In Sinana District all health centers (six) and only six health posts have functional refrigerators. All these refrigerators are working with both kerosene and electricity power.

Immunization Coverage

Immunization program is focused on vaccine preventable diseases, and about 10 diseases are vaccine preventable. In this district among 5332 total live births, 4865 (91%) were vaccinated for BCG in 2009 E.C. In addition, of the 4917 eligible infants, 5113 (104%) and 4922(100%) of them were vaccinated for penta-1 and Penta-3 vaccines respectively. In this year 4859 (98.8%) under 1 year children were vaccinated for measles and 4793 (97%) were fully vaccinated. Of a total 4917 under 1-year children, 64.5% of them were protected at birth; their mother was vaccinated two or more doses of TT vaccination during their pregnancy or three or more doses

before she give birth. Of 28,625 planned non-pregnant women, 19,509 (68%) were vaccinated for TT2 and more during 2009 E.C. During the same year, out of 5,332 planned pregnant women, 4444 (83%) were vaccinated for TT2 in Sinana Woreda.

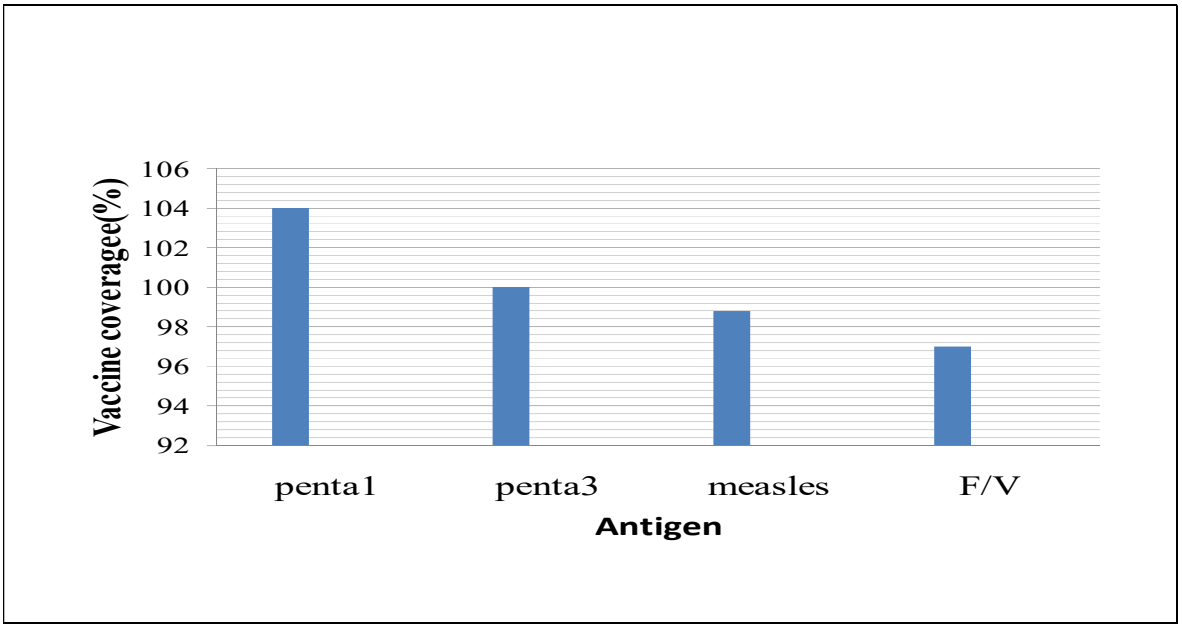

Figure 22: Vaccination coverage of children in Sinana District, Oromia Region, 2009 E.C

The above figure shows that vaccination coverage of the District generally good and above 95% for all antigens, but penta1 was 104%.Fully vaccination coverage of the District was 97% [Fig.22].

Maternal Health Service

ANC1 services were given for 5511 (103%), ANC4 for 4444(83%) , HIV test and counseling for pregnant women 2462(45%),Sphills test for 1171(21%) of pregnant Women, Skill delivery for 1818(35%) and delivery by HEWs is 85(2%) .Different family planning methods were given for 24909(84%) of Non pregnant Women. Comprehensive abortion care also given for 194(36%) of estimated abortion occur.

Water supply and sanitation

According to data obtained from Sinana District Water Resource Office, of the total rural population of the district, 81.98% was supplied with potable water. In this district, there are 1 protected spring, 1 protected well, 48 stand pipes of water sources. Among 32,965 households,

28,680 (87%) of them has any types of latrine where as 17,471(53%) has standard latrine in 2009 E.C. There is no clear data on utilization of latrine in the district. Five Kebeles of the district are free from open defecation in and others Kebeles of the district are on progress to become open defecation free. All households in these open defecation free Kebeles are using their latrine properly. Out 41 Schools 32(78%) schools has separated latrine for male and female and 30(73%) has water supply [Table 25].

Table 25:2009 E.C. Plan and Achievement of common Health indicators in Sinana Woreda, Bale Zone, Oromia

S.N	Common indicators	Plan	Ach	%
1	Family planning all methods	28625	24909	87
2	ANC1	5332	5511	103
3	ANC4	5332	4444	83
4	PMTCT test	5332	2462	46
5	PMTCT Positive	5	1	20
6	Skill delivery	5332	1818	34
7	Post Natal Care	5332	1818	34
8	BCG	5332	4865	91
9	Penta1	4917	5113	104
10	Penta3	4917	4922	101
11	Measles	4917	4859	98.8
12	F/vaccinated	4917	4793	97
13	HIV Testing and Counseling	46095	9824	21
14	TB Case detection all forms	346	97	28
15	TB Cure rate	24	20	83
16	TB-HIV test	97	97	100
17	HIV positive linked to ART	12	9	75
18	SAM	578	175	30
19	Latrine Coverage and utilization	32010	27849	87

The leading causes of outpatients visit

Acute upper respiratory tract infection is the leading cause of morbidity in Sinana Woreda, followed by diarrhea non- bloody and pneumonia respectively [Table 26].

Table 26: 2009 E.C Adult Top ten causes of outpatient morbidity in Sinana District, Bale Zone, Oromia,

Rank	Disease	Number of cases	%
1	Acute upper respiratory infection	2814	19.8
2	Diarrhea (non bloody)	2203	15.5
3	Pneumonia	2059	14.49
4	Trauma(injury)	1447	10.18
5	Acute febrile illness	1276	8.98
6	Dyspepsia	1124	7.91
7	Disease of musculoskeletal system	895	6.3
8	Infection of Skin and subcutaneous tissue	839	5.9
9	Urinary tract infection	806	5.67
10	Helmenthesis	751	5.28
	Total	**14214**	**100**

The below table shows that , the leading cause of morbidity in less than five years children were Diarrhea and Acute upper respiratory tract infection[Table 27].

Table 27: 2009 E.C top five leading causes of outpatient morbidity in pediatrics in Sinana District, Bale Zone, Oromia,

Rank	Disease	Number of cases	%
1	Diarrhea(non bloody)	1263	33.7
2	Acute upper respiratory infection	1066	28.4
3	Pneumonia	986	26.3
4	Diarrhea with dehydration	237	6.3
5	Infection of skin and subcutaneous tissue	197	5.3
Total		**3749**	**100**

Source:-Woreda Health Office HMIS Class.

Endemic Diseases

Tuberculosis and Leprosy

A total of 97 tuberculosis cases (All form of tuberculosis) were reported from health facilities to the district in 2009 EFY. From the total all forms of TB cases 41 PTB negative, 31 PTB positive and 24 extra PTB. The TB detection rate of the woreda was 28% with 83% and 91% of TB cure rate and TB treatment success rate respectively. One TB case move to MDRTB, Three (3) deaths and in the rest were not evaluated 2009 E.C. All of 97 Tb patients were screened for HIV in the same year. In this year there was no leprosy case in Sinana District.

HIV/AIDS

In this district, 9824 people were screened for HIV/AIDS in 2009 E.C. Among these clients, 12 of them were confirmed as positive result. The positivity rate of HIV/AIDS is 0.12%.Currently on ART there are 23 PLWHAs in the district. Among this, 9 of them were new cases, 14 people were previously on ART service. Oborra health center is the only health center on which ART service is given in the district. Community conversation is undertaking in all Kebeles of the district to enhance awareness of the community on prevention and control of HIV/AIDS.

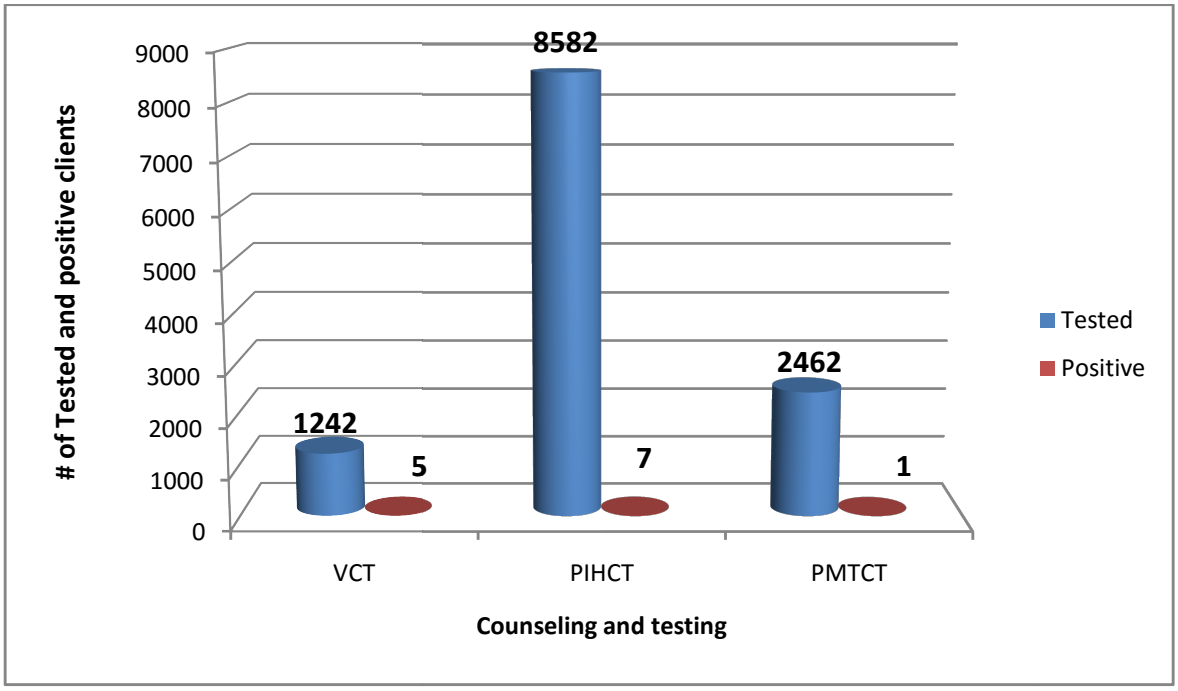

Figure 23: Number of tested and positive clients for HIV in Sinana Woreda, Bale Zone, Oromia, 2009 E.C.

The above figure shows that, 1242, 8582 and 2462 clients were offered HIV counseling and testing at VCT, PIHCT AND PMTCT respectively. Among tested, five, seven and one positive clients from VCT, PIHCT and PMTCT sites respectively [Fig.23].

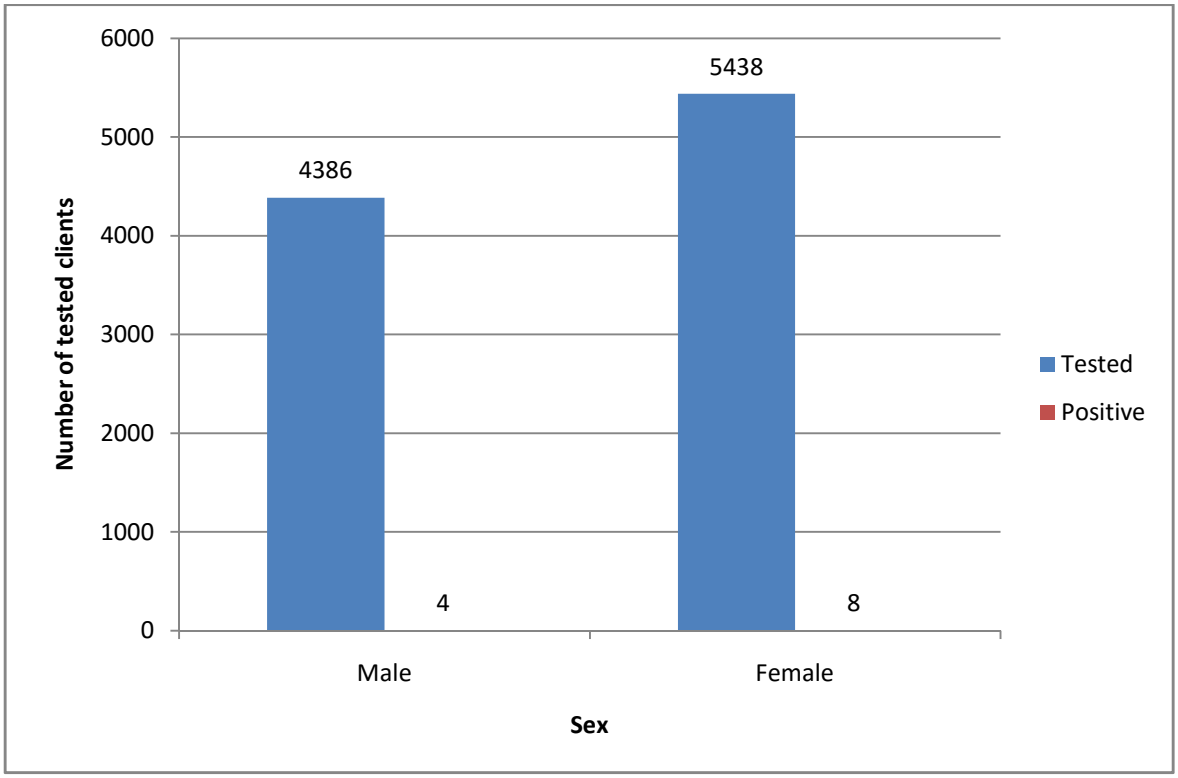

Figure 24: Number of screened and positive clients by sex in Sinana Woreda, Bale Zone, Oromia, 2016/17

The above figures shows that, out of 4386 males clients tested for HIV, four of them were positive for HIV and also out of 5438 females' clients tested, eight of them were positive for HIV [Fig.24].

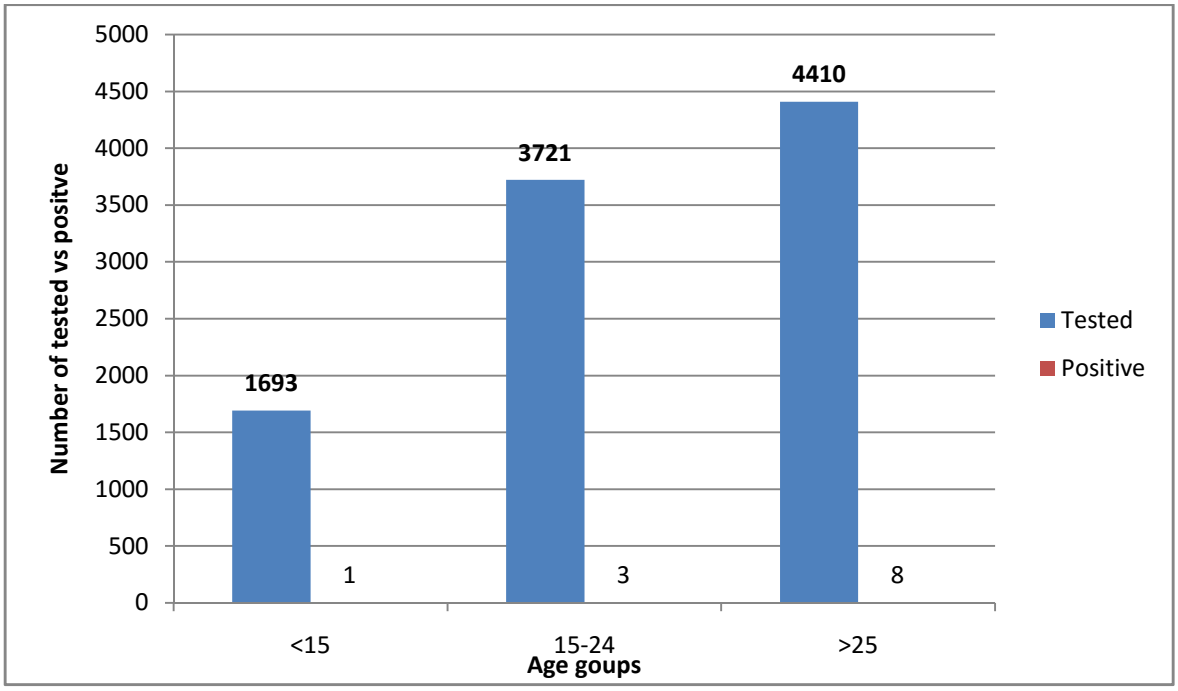

Figure 25: Number of tested and positive clients for HIV in VCT and PICT by age group in Sinana Woreda, Bale Zone of Oromia Region in 2009 E.C.

The above figure shows that, 1693, 3721 and 4410 clients tested for HIV were in the age of <15yrs, 15-24yrs and >25yrs and one, three and eight clients were positive for HIV respectively in this age groups [Fig.25].

Severe Acute Malnutrition

Severe acute malnutrition is one of public health problem of the district. This is not only shortage of foods, but also due to mal practice. Thirteen OTP and one SC sites were found in Sinana Woreda. 175 new cases were treated at OTP and no admission at SC in the district. There were also TSF and CBN programs working on nutritional activities in 6 Kebeles which enrolled 238 children in the program in 2009 E.C.

Malaria

Malaria case was not common in this district since geographical location of Woreda is highland and semi-highland**.**

Outbreak and other disaster situations

In this district, there were 6 AWD cases occurred last years as an outbreak. Among these 1 case was confirmed as cholera and the rest were treated as suspected cases. There was no death reported from AWD. The index cases had travelling history to Dirre Shek Hussein where AWD outbreak had occurred and the other five cases had contact history with index case.

There were also three measles cases reported in this Woreda in the last year, but no death reported during this period.

Budget allocation for district health office

In 2017/18, **116,511,909** ETB was allocated for Sinana Woreda. Of this total budget, **21,257,371(**18%) of ETB allocated for Woreda Health Office. These total budget allocations for Woreda Health Office meet World Health Organization standard recommendation which is at least **15%** of Woreda budget. No budget allocated for PHEM activities at Woreda Health Office level. The Woreda allocated **84**% for salary and **16**% for running different routine activities. In addition, in this year, **707,170.48** ETB funded from different donors were distributed to this district from Regional Health Bureau for different activities such as polio campaign, hygiene and sanitation promotion, WASH project,etc.

Human Resources

In this district, 78 health professionals, 50 Health Extension Workers and 71 supportive staff have been working in the district health office and different governmental health institutions. There were no physicians due to absence of hospitals and type A health Center in the district [Table 28].

Table 28: Distribution of human resources of all categories in the Sinana District health office, Bale Zone, Oromia, March2018

S.N		Level of education	Structure	Available	Profession: population Ratio	Gap
1	Health officers	S	20	12	1:13186	8
2	Nurses	BSC	8	3	1:52744	5
		Dip	44	37	1:4276	7
3	Environmental health	BSC	7	5	1:31646	2
4	Laboratory	BSC	6	1	1:158231	5
		Dip	6	3	1:52744	3
5	Pharmacist	BSC	6	0	-	6
6	Druggist	Dip	6	5	1:31646	1
7	Mid-Wifery	Dip	18	12	1:13186	6
8	HEWs	Level3&4	52	50	1:3165	2
9	HIT	Dip	7	7	-	0
10	Supportive staff	Dip & cert.	71	64	-	8
Total			**252**	**199**	-	**53**

The main community health problems of Sinana Woreda were identified and prioritize based on magnitude, feasibility, community concern and government concern. According to that assessment the top five community problems identified were communicable diseases, poor maternal health service, shortage of budget for PHEM activities and infrastructures [Table 29].

Table 29:-The main community problems of Sinana Woreda, Bale Zone, Oromia Region during study period based on priorities criteria, March 2018

Rank		Magnitude(5)	Feasibilities(5)	Community concern(5)	GOV'T concern(5)	Total grade 20
1	Communicable disease due to hygiene and sanitation	**5**	**4**	**5**	**5**	**19/20**
2	Poor maternal health	**4**	**4**	**5**	**5**	**18/20**
3	Shortage of Budget for PHEM activities	**5**	**4**	**4**	**4**	**17/20**
4	Shortage of drugs and medical equipments	**4**	**3**	**5**	**4**	**16/20**
5	Infrastructures such as roads, Hospital, veterinary clinic, etc	**4**	**3**	**5**	**3**	**15/20**

N.B .This priority setting was based on discussion with community leader, expert, administrative bodies and principal investigator.

Table 30:-Action plan for priority problems identified in Sinana Woreda, Bale Zone, February 2018

S. N	Priority problem	Cause of the problem	Solution	Responsible body	Time frame
1	Prevalence of communicable diseases	-Poor hygiene &sanitation -Poor latrine utilization -poor community awareness	-Practice good hygiene & sanitation -Increase latrine utilization -Create community awareness	-Community -HWs -HEWs	Start from now
2	Poor maternal health service	-Low community awareness -resource gaps -lack of infrastructures eg. Hospital -Lack of skilled person	-Increase community awareness -Resource mobilization -Equip infrastructures with skilled person	-HEWs -HWs -Community leader -WorHO -HFs -ZHO -ORHB	Start from now
3	Lack of budget for PHEM activities	Low attention for PHEM activities	Budget allocation for PHEM activities	-Woreda -WorHO	From next year
4	Shortage of drugs& medical supplies	Low budget allocation& week HCF	-Budget allocation improvement -Strengthen HCF	-Woreda -HFs	From next year
5	Lack of infrastructures	Lack of budget	-Budget allocation from Government -Community participation	ORS,ORHB ZHO, Woreda &Communit y	From next year as much as possible

5. Discussion

Generally health status of the community influenced by education, economy, infrastructures, population density, climatic conditions, health service coverage, distance from health facility, environmental factors, etc.

Sinana Woreda is the third smallest area in hectares from Woredas found in Bale Zone and the second highest population next to Ginner Woreda. The main problems of the district were communicable diseases, poor maternal health, absence of budget PHEM activities, shortage of drugs and medical equipments and infrastructures such as roads, hospitals, veterinary clinic, preparatory school and, electric power, etc

Communicable disease such as acute upper respiratory tract infection and diarrhea were the leading cause of morbidity in Sinana district which accounted 19.8% and 15.5% respectively. High prevalence of communicable disease indicated that there were poor hygiene and sanitation activities in the district. This was similar with study conducted 2007 E.C in Arsi Nagelle district which was 21.9% and 15.3% respectively.

Health service coverage of Sinana district 94.8% for health center and 75% for Health post .This was not similar with study conducted 2007 E.C in Arsi Nagelle district that was 75% and 100% for Health center and Health post respectively.

Among 32,965 households, 28,680 (87%) of them had any types of latrine where as 17,471(53%) had standard latrine with hand washing from 2009 E.C annual report. This higher than national latrine coverage 62% from 2016 EDHS and nearly similar with study done 2007 in Shashamane woreda with 85% and 55% latrine coverage and standard latrine with hand washing facilities respectively.

Tuberculosis detection rate of the woreda was 28% which lower than the regional case detection rate of 2009 E.C which was 41%. Generally in 2009 E.C, there were a total of 97 all forms of tuberculosis cases were diagnosed and reported in the district .This is may be due to poor diagnostic procedure and community TB tracing. TB cure rate also 83% which is lower than regional plan 91%.

Out of 9824 clients screened (tested) for HIV 5438 (55%) of them were female. This may revealed that there was poor awareness creation from the health professionals for male partners particularly during PMTCT services. Generally HIV positivity rate of district is 0.12%. Among the total clients registered at OPD level 25,376, 39% of them were screened for HIV particularly at PICT service which is below the expected 90% with regional plan. The explanation for this may be low initiation and commitment of health workers who worked at OPD rooms and/or the refusal of clients for HIV testing due to poor awareness and shortage of HIV test kites at health facility level.

Maternal health coverage of Woreda generally poor when we compared with Zonal and regional plan, specially PMTCT and Skill delivery service which is46% and 34% respectively.

The district immunization coverage in the year targeted to children less than one year old to prevent them from vaccine preventable diseases was generally good when we compared with regional target. Penta1 >100% indicated that there was problem of under planning.

The overall provision of safe (potable) water supply was 81% coverage in the year 2009 E.C. This was higher than study done 2007 E.C in Shashamane Woreda which was 33% of Woreda population provide with potable water.

6. Limitations

- Absence of mortality data at woreda level.

7. Conclusions

The main problems of the district were communicable diseases, poor maternal health, absence of budget PHEM activities, shortage of drugs and medical equipments and infrastructures such as roads, hospitals, veterinary clinic, preparatory school and, electric power, etc.

Agriculture was the main economic stay of the community

Acute upper respiratory tract infection and diarrhea are a top leading cause of outpatient morbidity in adults and pediatrics in the district cases respectively in 2009 E.C.

TB case detection rate and HIV test and counseling of the district was below regional and national plan and also only functional one ART site in the district.

Maternal Health status was generally poor when we compared with intended plan.

Only 25km all weather roads is found in Sinana Woreda and only 4 Kebeles access to all weather road.

Vaccine coverage of the District for all antigens was generally good and above 95%.

Out of 289 drop out students in the District, 98(34%) were due to marriage.

Despite availability of latrine and water coverage utilization of latrine was poor.

8. Recommendations

1, Woreda Health Office should encourage community participation on Environmental sanitation and hygiene.

2, Woreda should be allocated budget to strengthened PHEM activities.

3, Community TB tracing and DOTs service should be Strengthened at community and facilities level, by motivating health workers and HEWs

4, Woreda Health Office should improve quality maternal health service through motivation of health workers, community participation and provision necessary materials.

5, Government should allocate budget for infrastructure such as road, Hospitals, veterinary clinic, etc.

6, Woreda Health Office should be established ART site at all Health Centers to improve HIV Counseling and Testing

7, Mortality data should be recorded in all health facilities and Woreda level.

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CHAPTER SIX

MANUSCRIPT FOR SCIENTIFIC WRITING

Manuscript for scientific writing

TITLE- MEASLES OUTBREAK INVESTIGATION AND RESPONSE IN GORO WOREDA, BALE ZONE, OROMIA REGION-ETHIOPIA, DECEMBER 2018

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ABSTRACT

Background: Measles is a highly contagious respiratory tract infection caused by a Morbillivirus. The disease causes high morbidity and mortality worldwide. We conducted measles outbreak investigation to confirm the outbreak, describe magnitude, identify risk factors and take control measures.

Methodology: -We described cases and conducted unmatched 1:2 case-control study .We interviewed study participants using structured questionnaire and Epi info 7.1 and SPSS version 23 were used to enter and analyze data.

Results:-A total of 34 measles cases and no death were reported from Goro district. Of the total of 34 cases, 22 (64.7%) were males. Thirty two cases (94%) were not vaccinated. Less than five years ages were more affected with age specific attack rate of 13 per 1000 population. Having vaccinated for measles had protective effect (Odds Ratio: 0.1075, 95% CI: 0.0237-0.4872), Large family size (Odds Ratio: 1.4339, 95% CI: 1.3077-1.5601), knowledge on vaccine preventability of measles (Odds Ratio: 0.3600, 95% CI: 0.1442-0.8985), Poor ventilation (Odds Ratio: 2.8889, 95% CI: 1.1461-7.2818) and family education status (OR: 0.3462, 95% C.I: 0.1372-0.8725).

Conclusion& Recommendation:-Most cases were reported among less than five years and low vaccine coverage reported among measles cases. Low awareness level also identified as risk factors for measles transmission .We recommend District Health Office and health facilities to enhance the measles vaccine coverage and improve awareness on measles

Keywords: Measles, Outbreak, Case-Control, Goro Woreda, Bale, Ethiopia, 2018

Introduction

Measles is a highly contagious, serious human disease caused by a virus**(1**). It is caused by a virus in the paramyxovirus family, genus Morbillivirus and it is normally passed through direct contact and through air. Measles virus replicates in the nose and throat of an infected child or adult(**2**)**.** Then, when someone with measles coughs, sneezes or talks, infected droplets spray into the air, where other people can inhale them. The infected droplets may also land on a surface, where they remain active and contagious for several hours. You can contract the virus by putting your fingers in your mouth or nose or rubbing your eyes after touching the infected surface.

The incubation period of measles, from exposure to onset of symptoms ranges from 7 to 14 days (average, 10-12 days)(**3**). Patients are contagious from 1-2 days before the onset of symptoms. Healthy children are also contagious during the period from 3-5 days before the appearance of the rash to 4 days after the onset of rash. On the other hand, immunocompromised individuals can be contagious during the duration of the illness. The first sign of measles is usually a high fever (often >104 ^{oF} [40 ^{oC}]) and rash that typically lasts 4-7 days, cough, coryza, conjunctivitis and other symptoms for complicated cases.

Before widespread vaccination in 1980, measles was responsible for an estimated 2.6 million deaths worldwide each year(**4**)**.** Despite the availability of a safe and effective vaccine, measles remains one of the leading causes of death among young children around the world, according to the World Health Organization. Vaccination coverage levels of 90% or more might be required before a marked reduction in incidence is seen in younger infants through herd immunity. On the other hand, epidemics of measles occur when the number of susceptible individuals in a population reaches a critical threshold(**5**). A single dose of MMR vaccine induces measles immunity in about 95% of vaccines; however, due to measles extreme infectiousness and vaccine failures in case of poor vaccine management, 2 doses are recommended(**6**).

Measles outbreak occurs worldwide(**7**). In temperate zones, peak incidence occurs in late winter and early spring. In developing countries, case fatality rates average 3-5%, but can be as high as 10-30%. Measles is associated with long-term health problems(**8**)**.** These, include blindness, chronic lung disease, malnutrition (marasmic or kwashiorkor) and failure to thrive, and recurrent infections. Furthermore, the risk of contracting other infections or dying remains high for several months after recovery from acute measles infection.

According to the study done in 2005 by FMOH and WHO on measles case fatality survey in Ethiopia indicated that there is still a high tendency not to seek treatment for measles and low belief in modern health services(**9**)**.** The most common reason (38%) for not visiting health facilities for measles cases in those areas where health facilities are relatively accessible were lack of belief in modern health services.

According to the study done in Ethiopia from2006-2016, the incidence of measles in Ethiopia was high and has remained above 5 per 1000,000(**10**)**.** This was above the target set for accelerated measles control less than 5 per 1000,000 or measles elimination target less than 1 per 1000,000. There were 66,719 confirmed cases, out of the 94,104 suspected measles cases reported between January

2006 and December 2016. In this study measles incidence increased from 20 cases per million total populations in 2006 to 194 cases per million in 2015 and declined to 49 per million in 2016.

According to the study done on epidemiology of laboratory confirmed measles virus cases in the southern nations of Ethiopia from 2007–2014, measles was a seasonal infection reaching a peak during January and February(**11**). In this area, measles continued as an important public health problem. The incidence of confirmed measles was found to be increasing from year to year mostly affecting children aged a month to 4 years. To reduce the incidence of measles, it is highly recommended to improve routine immunization, and conduct a wide age group campaign. Additional study is needed to better understand the age shift, and the knowledge, attitude and practices of the general population and health care professionals about measles infection and vaccination. As Ethiopia gets closer to measles elimination targets, it will be important to introduce genotyping to determine virus strains(**12**).

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(**13**).

According to the study conducted in June 2016 in South East Ethiopia, less awareness toward the disease and not fully immunizing children were potential cause for measles outbreak in Ethiopia(**14**). The morbidity and mortality due to measles has been reduced dramatically and many districts have become MNT-free(**15**).

In Oromia Region measles outbreak is still a main public health concern. During the period of 2018, measles epidemics were reported from different zones namely; Bale, East Hararge, East Wellega, etc (ORHB bulletin). Unpublished outbreak investigation report by Field Epidemiology Training Program Residents showed that the possible factors associated with the disease were low immunization coverage, malnutrition, poor cold chain management and community attitude toward measles control(**16**). About 731 confirmed and epidemiologically linked measles cases with 14 deaths were reported from different zones in 2018(**17**). In the last five years there were measles epidemics in Dawe kachen, Dawe Sarer Harana Buluk, Ginnir and Gololcha districts of Bale Zone(**18**).

On November 24, 2018, Goro Woreda Health Office informed Bale Zone Health Office that there were suspected measles cases identified in W/sayida and W/hora Kebeles of this Woreda. After having received this report from Zonal Health Office, organized team that consists of FETP residents was deployed to this Woreda and investigated the outbreak. Measles outbreak was not reported from Goro Woreda in the past five years.

This study was intended to confirm the existence of outbreak, describe magnitude of the disease, identify risk factors and take co

Methodology

We conducted 1:2 unmatched case controls studies on measles outbreak investigation and response in W/sayida and W/hora Kebeles, Goro Woreda, Bale zone, Oromia Region from 24 November to 9 December 2018 This area was under catchment of

W/sayida PHCU. The total populations of the Woreda are 116,121. The area has distance of 23km from woreda, 46km from Zone and 490km from Addis Ababa to South-East direction. The climatic condition of the area of the district is 36% highland,46% midland and 18% lowland and average temperature of 27$^{oc.}$ The area of the district is Km^2 2243.75 with altitude of 760m below sea level and 2800m above sea level. The district shared borders with Ginnir in North, Guradhamole and Barbare in South, Dawe kachen in East and Sinana in West. Total population of Goro woreda is study population of measles outbreak investigation. During this outbreak investigation, all confirmed and suspected to have measles cases, deaths and selected unmatched community controls were target population of this study. We conducted assessment of environmental and individuals risk factors for selected case and control households during this investigation. These factors includes vaccination status, nutritional status, family size, area of living house and ventilation status of the house, distance from health facilities,etc. Data entered and summarized using Microsoft Excel. Analysis of different risk factors/exposures was done by using Epi info version 7.1software and SPSS version 23.Findings of this study in both soft and copy was communicated with Oromia Regional Health Bureau, Bale Zone Health Department, Goro Woreda Health Office, Mentors, Coordinators and field supervisors. Support letter was written from regional

Results

Geographic Area of the District

Goro District is one of 21 Woredas found in Bale Zone which is far away 60km from Zone and 490km from Addis Ababa in South East direction. It is bordered by Ginnir in North, Guradhamole and Barbare in South, Dawe Kachen in East and Sinana in the West. The climatic condition of the area is 36% highland, 46% midland and 18% lowland and average temperature of 27^{oc}.The area of the district is Km^2 2243.75, with altitude range of 760m below sea level and 2800m above sea level.

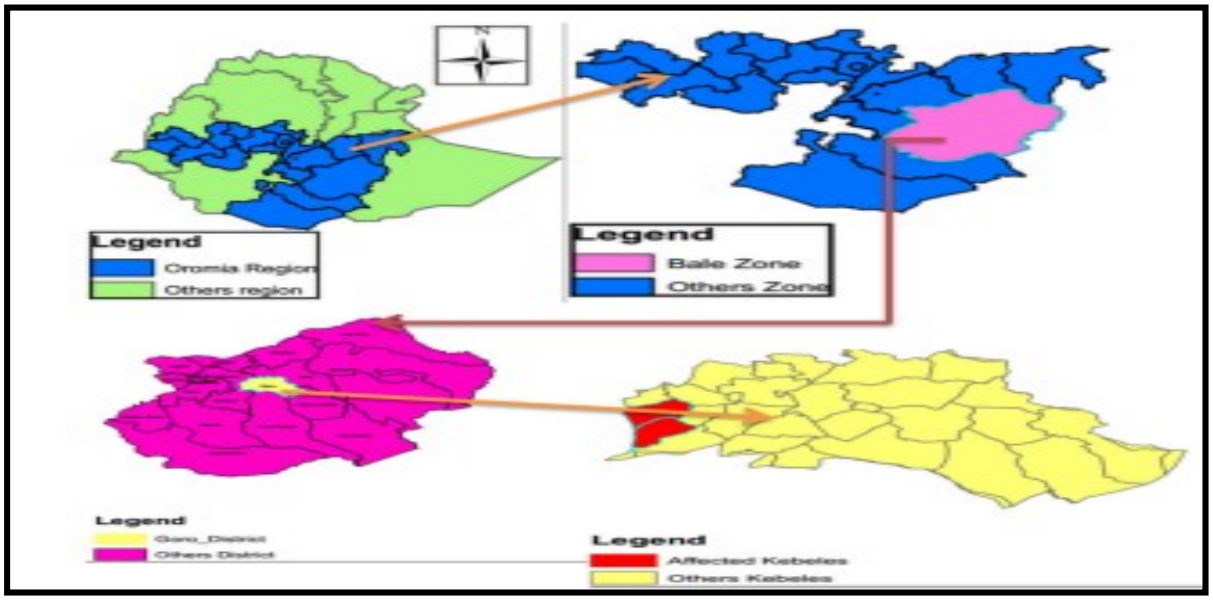

Figure 26: Map of Goro Woreda and its boundary, in Bale Zone of Oromia Region December, 2018

Socio-demographic characteristics of the study population

All households and study participants families staying in measles affected Kebeles were Oromo by ethnic group, Farmer by occupation and Muslim by religion.

Laboratory results

Five blood samples were collected and sent to the Central Laboratory for IgM confirmatory test. Of those sent samples, four of them were confirmed positive for measles IgM test. The rest 30 cases were epidemiologically linked with confirmed measles cases.

Descriptive Epidemiology

A total of 34 measles cases and no deaths were reported from 21/11/2018 to 04/12/2018 from W/sayida PHCU in Goro Woreda. Out of 34 cases, five cases were identified by active case search. The overall incidence rate of the disease in the District per 10000 populations was 2.9 and the CFR was 0% in this Woreda. Out of 34 cases, 7 (20.6%) of them were admitted with measles complications, such as pneumonia and feeding problem. Of those affected Kebeles, the highest attack rate (23.7 per 10000 populations) was reported from W/sayida Kebele .The mean ages were 6.1 and 5.6 for cases and controls respectively. The index case with laboratory confirmed case in W/sayida Kebele specific area known as ''Dabaye.'' Her house was nearest to W/sayida HC which was less than 2km. She was 9 years old born from illiterate family. She didn't have any routine vaccination history. She took only polio vaccination during house to house visit during the polio campaign. Her family didn't believe in the use of vaccine and have negative attitude toward vaccination. She had history of contact with other students in the school and in the family. Those children who had contact with the index case in the family and at the school developed rash after she was seen at HC.

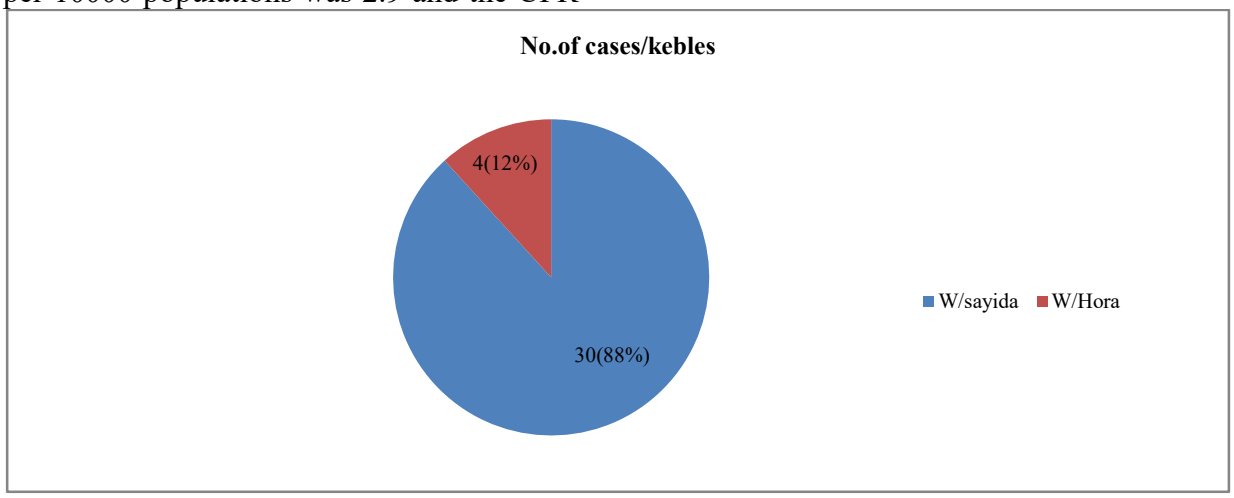

Figure 27:-Number of measles suspected cases by Kebeles in Goro Woreda, Bale Zone of Oromia, December, 2018

As above figure showed, about 30(88%) of cases were reported from W/sayida Kebele and the rest from W/hora Kebele. Of the total 29 Kebeles of the woreda, only two (6.9%) Kebeles were affected by this outbreak [Fig.27].

Less than five years ages were more affected 17(50%) of the total cases with attack rate of

13per 1000 populations. Twenty two (64.7%) of reported cases were males [Table 31].

Table 31: Measles cases by Age and Sex category, Goro Woreda, Bale, Oromia, December 2018

Age categories	Sex		Total number of cases (%)
	Male (%)	Female (%)	
<5yrs	10(45.5)	7(58.3)	17(50)
5-14yrs	9(40.9)	5(41.7)	14(41)
15-24	2(9.1)	0(0)	2(6)
25-49yrs	1(4.5)	0(0)	1(3)
=/>50yrs	0(0)	0(0)	0(0)
Total	22(64.7)	12(35.3)	34(100)

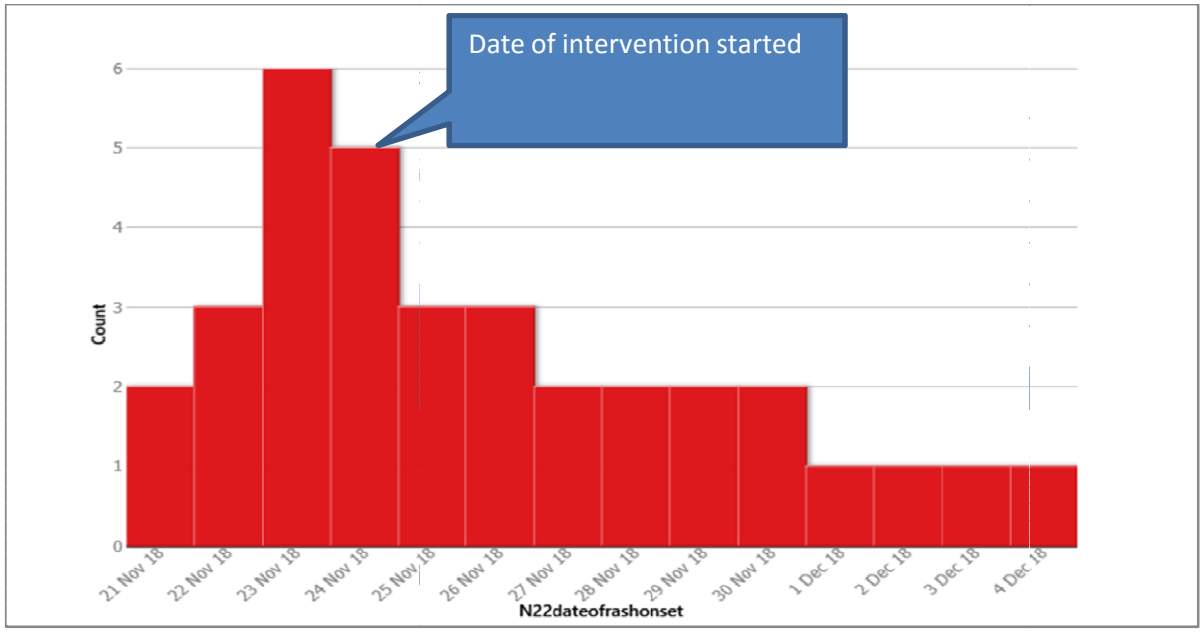

Figure 28: Date of onset of rash for measles outbreak in Goro Woreda, Bale Zone of Oromia Region, November, 2018

The above figure show that, date of onset started on 21November and ended on 4 December 2018 .On 21 November, two suspected cases seen at health facility were from one family within 4 hours apart. One of the two cases first seen at health center was probably the index case. On November 21, the index case was seen at W/sayida HC in the morning and her brother came in the afternoon with the same signs and symptoms. The outbreak reached peaks on 23 November of 2018 and gradually decreased till the end of the outbreak [Fig.28].

The previous five years and 1st quarter 2011 E.C of measles vaccine coverage of the District were reviewed and collected. Similarly, this data were collected from health facilities for data quality assurance.

Among 102 study participants included in that study only 27(26%) had measles vaccination history. Previously there were two HEWs in W/sayida Kebele. Currently there is no HEWs in this Kebele. There was no electric power and also poor cold chain management in all Kebeles under catchment of W/sayida Primary Health Care Unit.

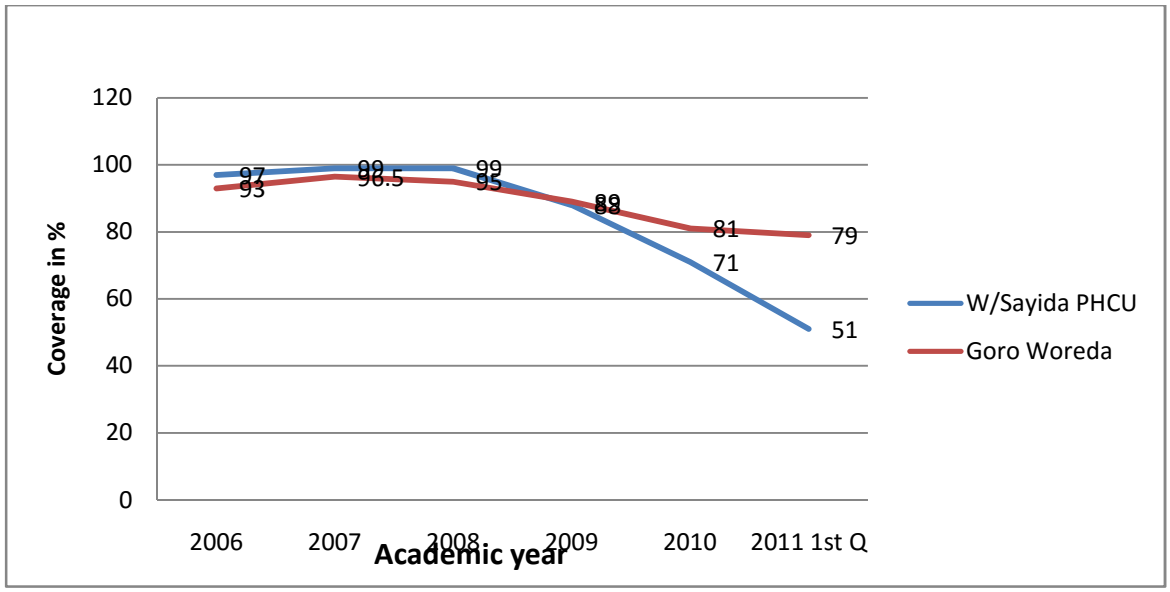

Figure 29:-Trends of measles vaccine coverage of Goro Woreda and W/sayida from 2006-1st quarter 2011 E.C, December 2018

The annual measles coverage of Goro Woreda during 2006, 2007, 2008, 2009, 2010 and 1st quarter 2011 E.C were 93%, 96.5% ,95%, 89%, 81% and 79% respectively. Measles vaccine coverage of W/sayida PHCU, in which current measles outbreak occurred during the last five years and 1st quarter of 2011E.C were97% , 99%. 99% , 88%, 71% and 51% respectively [Fig.29].

As table below indicated, 67(65.69%) of respondents had no awareness on vaccination, 21(20.59%) did not believe in the use of vaccine, 10(9.8%) were waiting for announcement and 4(3.92%) were absence during vaccination schedule [Table 32].

Table 32 :-The reason why the families did not vaccinate their children in Goro Woreda, Bale Zone, Oromia Region, December 2018

S.N	The reason why they did not vaccinate their children	Number of Respondent	%
1	Lack of awareness	67	65.69
2	Did not believe in the use vaccine	21	20.59
3	Waiting for announcement	10	9.80
4	Absence during vaccination schedule	4	3.92
5	Total	102	100.00

Environmental Assessment

Housing condition for ventilation, family size and estimated area of the house for interviewed case-patients and controls were compared. The mean of family size were 9.1 and 7.9 for cases and controls whereas mean of estimated area of house 22.3 and 23 respectively. According to below table 2.45m2 per individual for case and 2.91m2 per individual for control [Table 33].

Table 33:-Mean of Family size and estimated area of interviewed households members in meter square, in Goro Woreda, Bale zone, Oromia, December 2018

Case status	Family size			Estimated area of house in m2		
	Min	Max	Mean	Min	Max	Mean
Case	6	12	9.1	16	28	22.3
Control	4	12	7.9	16	32	23

Risk factors Assessments

We conducted 1:2 unmatched case control studies in Goro Woreda, Bale Zone of Oromia Region to assess risk factors for measles outbreak in the District. Thirty four cases and sixty eight controls were included in this study. Among participants, 66 of them were males. Significance of associated variables was assessed by bivariate and multivariate analysis. Age, sex, family education, family size, vaccination status, ventilation status of the house, contact history with someone in family, estimated area of the house and knowledge on measles vaccine preventability were analyzed and checked for association by bivariate analysis and finally, checked by multivariate analysis for those variables with P.Value<0.025. Having been vaccinated for measles had protective effect (Odds Ratio: 0.1075, 95% CI: 0.0237-0.4872).Family size (Odds Ratio: 1.4339, 95% CI: 1.7101-1.9625), knowledge on vaccine preventability of measles (Odds Ratio: 0.1091, 95% CI: 0.2419-0.9305),family educational status(OR:0.3462,95% CI:0.1372-.8725) and Poor ventilation (Odds Ratio: 3.7154, 95% CI: 8.5851-9.4923) were significantly associated with measles outbreak. Age, sex, estimated area of house and contact history

were not associated with measles occurrence .Ethnic groups, religion, family occupation, distance from health center and malnutrition status were the same for all cases and controls. Hence has no any association [Table 34].

Table 34:-Multivariate logistic regression analysis for measles case control studies in Goro Woreda, Bale Zone, Oromia Region, December 2018

S.N	Variables		Cases (%)	Controls (%)	AOR	C.I at 95%	P.Value
1	Contact history with someone with measles symptoms	Yes	8(23.5)	6(8.8)	3.1250	1.1009-8.8704	0.7235
		No	26(76.5)	62(91.2)			
2	Family size	Min	6	4	1.4339	1.3077-1.5601	**0.0031**
		Max	12	12			
3	Vaccination status	Vaccinated	2(6)	25(36.8)	0.1075	0.0237-0.4872	**0.0047**
		Not vaccinated	32(94)	43(63.2)			
4	Housing condition	Ventilated	13(38.2)	42(61.8)	2.8889	1.1461-7.2818	**0.0309**
		Not ventilated	21(61.8)	26(38.2)			
5	Knowledge on vaccine preventability of measles	Yes	9(26.5)	38(55.9)	0.3600	0.1442-0.8985	**0.0030**
		No	25(73.5)	30(44.1)			
8	Family education status	Illiterate	23(67.6)	36(52.9)	0.3462	0.1372-0.8725	**0.0000**
		Literate	11(32.4)	32(47.1)			
9	Estimated area of house in meter square	Min	16	16	0.9448	0.8835-1.0061	0.3525
		Max	28	32			

Public Health Intervention

Active measles case search and management were conducted in affected areas of the woreda. Additionally, antibiotics and Vitamin A for measles treatment were mobilized from the Woreda Health Office. Tracing of vaccination status of children were conducted in all Kebeles. Woreda Health Office and Health center professionals were sensitized on measles case detection and management. We conducted community mobilization and health education at three mosques as well as two elementary schools. Screening of children for malnutrition was done mainly in highly measles affected Kebeles.

Discussion

Several factors may contribute to the occurrence of measles outbreak in the affected woreda. Measles outbreak is expected and could frequently occur in areas with low measles immunization coverage and poor cold chain management, even with high vaccination coverage. The Woreda measles vaccination coverage of the last five years (2006 – 1st Q 2011 E.C) were 93%, 99% 95%, 89%, 81% and 79% respectively. Similarly, the measles vaccine coverage of

five years (2006 – 1st Q 2011 E.C) of W/sayida PHCU were 97%, 96.5% 99%, 88%, 71% and 51% respectively. This shows that low vaccination coverage in the woreda resulted from poor community mobilization and absence of HEWs in the Kebele.

Out of total respondents 20.59% of them did not believe the use of vaccine. This was similar with the study done in 2005 by FMoH and WHO on measles case fatality survey in Ethiopia indicated that there is still a high tendency not to seek treatment for measles and low belief in modern health services(**19**).

Lack of vaccination, poor house ventilation, large family size, family education status and lack of knowledge on measles vaccine were significantly associated with measles. Additionally, absence of functional refrigerator in all Kebeles of the woreda may alter vaccine potency. This is similar with case-control study done in Dawe Serer, Dawe kachen and Harana Buluk woredas of Bale Zone in Oromia region showed that low vaccination coverage and non-functional cold storage likely contributed for measles outbreak occurrence in those areas(**20**).

The case fatality rate in this woreda was 0%. This is not similar with community-based study conducted in West Hararge Zone in Ethiopia following a measles outbreak in 2007 estimated that the case- fatality rate was 6.7%(**21**). Current WHO estimates of CFR for measles in endemic countries range between 0.05% - 6%(**20**). Our finding of case-fatality rate was out of this range. This may be due to no underlying malnutrition and strong case management in affected Kebeles.

Our study exhibited that poor ventilation of the case-patient's house significantly contributed for the outbreak. Additionally, in this woreda area of the house may support measles transmission in the family, since the mean of estimated house area of this District was 22.8m2 and the mean of family size was 8.17.This indicated that, 2.79 meter square for 1 person. This is not similar with WHO recommendation. WHO recommends 11 or more meter square floor space for 2 persons, 9-10 for 1.5 persons and 7-9 for 1 person(**22**).

Malnutrition, Family occupation, ethnic groups and religion had no any association according to this study, since they were similar for both cases and controls.

Conclusion

We confirmed the presence of measles outbreak in Goro Woreda of Bale Zone. The results of this investigation suggested that low measles vaccination coverage in the Woreda was the main contributing factor for the occurrence of the outbreak. During this outbreak, males and age less than five years children were more affected than other age groups. Poor ventilation and Low community awareness on vaccination service was also associated with the disease. Additionally, inadequate poor storage of vaccines and management may contribute for measles outbreak in the District. Since no malnutrition problems in the Woreda, the outbreak was easily controlled and few admission cases and no death were reported from the district.

The Woreda disease surveillance was poor as it can't identify measles vaccine defaulters and no HEWs in the Kebeles. All treated cases at outpatient and inpatient services recovered from their illness. This shows that the case management was good and intervention was undertaken timely. The activities performed by the team on community mobilization and providing key

messages for the community to prevent and control measles outbreak was strong and effective.

Recommendation

1. Woreda Health Office should conduct mass campaign in all area of low vaccine coverage.

2. Woreda Health Office should assign HEWs in all Kebeles

3. Routine EPI and cold chain management should be improved in all health facilities in District

4. Health Workers should increase the community awareness on measles

5. Active surveillance activities of the woreda should be strengthened at all Kebeles

6. Oromia Regional Health Bureau should be provided the second dose of measles

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CHAPTER SEVEN-ABSTRACT FOR SCIENTIFIC CONFERENCE

Abstract 1

Title- Four years (2006-2009 E.C) surveillance data analyses on severe acute Malnutrion in Bale zone, Oromia, Ethiopia, March 2018

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ABSTRACT

Background:- Malnutrition is a major public health problem in developing countries. Ethiopia has the second highest rate of malnutrition in Sub-Saharan Africa. Malnutrition occurs due to inadequate food intake and illness, improper feeding practice, quality and quantity of foods offered to children. Bale Zone is one of hotspot area affected by severe acute Malnutrion. This study intended to determine the pattern, trends and burden of malnutrition in the past four years in Bale Zone, Oromia Region.

Methodology:- We conducted cross-sectional study on review document of severe acute malnutrition in Bale Zone, Oromia Region from February 25 to March 5,2018 by reviewed data ,interviewed all concerned bodies and analyzed by Microsoft Office Excel 2007.

Result:- Bale Zone is one of densely populated zone of Oromia Region with total population of 1,839,415 and highly affected by severe acute mal nutrition . Total reported cases from OTP and SC sites during the last four years were 36,603. Out of these, 32686(89.3%) were treated at OTP and 3,917(10.7%) were treated at SC sites. The prevalence of severe acute malnutrition in under five year's children was 2.3 % in 2006, 2.8 % in 2007, 4.8 % in 2008 and 3% in 2009 E.C. Among admitted cases, 52(0.14%) were death and 607 (1.6%) of them were defaulted.

Conclusion and Recommendation:- Malnutrition was one of public health problem in Bale Zone and become increasing especially during 2008 due to **ElNino** happened and slightly decreased in 2009 by intervention so that to overcome this problem early prevention and proper management should be under taken by government and stakeholders.

Keywords: Severe Acute Malnutrition, Surveillance Data Analysis, Bale Zone, Ethiopia

TITLE- MEASLES OUTBREAK INVESTIGATION AND RESPONSE IN GORO WOREDA, BALE ZONE, OROMIA REGION-ETHIOPIA, DECEMBER 2018

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ABSTRACT

Background: Measles is a highly contagious respiratory tract infection caused by a Morbillivirus. The disease causes high morbidity and mortality worldwide. We conducted measles outbreak investigation to confirm the outbreak, describe magnitude, identify risk factors and take control measures.

Methodology: -We described cases and conducted unmatched 1:2 case-control study .We interviewed study participants using structured questionnaire and Epi info 7.1 and SPSS version 23 were used to enter and analyze data.

Results:-A total of 34 measles cases and no death were reported from Goro district. Of the total of 34 cases, 22 (64.7%) were males. Thirty two cases (94%) were not vaccinated. Less than five years ages were more affected with age specific attack rate of 13 per 1000 population. Having vaccinated for measles had protective effect (Odds Ratio: 0.1075, 95% CI: 0.0237-0.4872), Large family size (Odds Ratio: 1.4339, 95% CI: 1.3077-1.5601), knowledge on vaccine preventability of measles (Odds Ratio: 0.3600, 95% CI: 0.1442-0.8985), Poor ventilation (Odds Ratio: 2.8889, 95% CI: 1.1461-7.2818) and family education status (OR: 0.3462, 95% C.I: 0.1372-0.8725).

Conclusion& Recommendation:-Most cases were reported among less than five years and low vaccine coverage reported among measles cases. Low awareness level also identified as risk factors for measles transmission .We recommend District Health Office and health facilities to enhance the measles vaccine coverage and improve awareness on measles

Keywords: Measles, Outbreak, Case-Control, Goro Woreda, Bale, Ethiopia, 2018

CHAPTER EIGHT

NARRATIVE SUMMARY OF DISASTER ON IDP SITES OF BEGI DISTRICT WEST WELLEGA ZONE OROMIA REGION, JULY 2018

EXCUTIVE SUMMARY

An internal displacement during conflict is one of the complex emergencies that occurs by man-made activities and may follow complex problem. On 17/10/10 E.C, 4090 people were displaced from Benishangul Gumuz Region, Maho-komo Liyu Zone/ Tongo Town. Many people were affected and displaced from their original place. Before1988 Tongo District was under Begi District of West Wellega Zone. Now, internally displaced people were settled in Begi District at three different sites namely Begi Secondary School, Tenzi Town and Tulu Kebele. Begi District is one of the Woredas found in West Wellega Zone sharing border with Tongo in all directions, except Mena -sibu Woreda in west direction and located **720K**M from Addis Ababa.

This study was intended to assess basic needs of displaced people and to give immediate response in order to minimize further damage. Observation of the situation, discussion with stake holders and interview with 232 registered Households using systematic randomly sampling. Sample size was determined from Epi.info calculation of sample size at 95% C.I. Data were collected from June 25-28 by using standard checklist adopted from CDC disaster guideline and analyzed by Microsoft excel.

The total population of the District was **162591** and there were 42 health posts,5 health centers ,two private clinics and one hospital in the District. The total population displaced from Tongo town and settled in Begi Town were 4090.Among those, 3257 (80%) were settled in Begi Town of those, 1889(58%) were females. Four hundred sixty nine cases were seen at temporary clinics within two weeks of settlement. The majority of cases were diarrhea followed by acute upper respiratory tract infection. The main problems of displaced people were cloth and mattress, food, water, separate shelters, personal hygiene, Light, medical problems., Dignity kits, chemical water treatments, separate and adequate latrine, Wash materials etc .Anticipated prone diseases at IDP sites were Acute Watery Diarrhea, Measles, Malnutrition, Malaria, Acute febrile illnesses, Skin Infections (Scabies) Other Diarrheal Diseases, etc. Since internal displacement is complex in nature, multsector collaboration, community and partner involvement should be mandatory to overcome this problems and discussion with Benishangul Gumuz Region to return back the internal displaced people.

Introduction

As human populations grow and societies become increasingly interconnected and complex, the damage from natural and human-induced disasters have become more and more extensive(1). Our vulnerabilities as societies have deepened the effects that disasters have on human health. Socioeconomic, political, cultural, geographical, and other factors combine and compound to increase the scope of a disaster's consequences (1). An internal displacement during conflict is one of the complex emergencies that occur by man- made activities and may follow complex problems (2).

The public health system is continually challenged by recurrent and unexpected disease outbreaks and is facing the challenge of managing health consequences of natural and human made disasters, emergencies, crisis, and conflicts. These problems continue to disrupt the health care system, while successful detection and response to these challenges is becoming increasingly complicated (3).

After an emergency or a disaster, the impact of damage that occurred on the health of the population and the system that serves them needs to be objectively assessed to clearly identify the gaps and to design the appropriate strategy for the specific context(3). Hence, a major activity during the recovery process is an effective Post Emergency/Event Assessment (PEA) to guide the implementation of recovery activities. The health sector Post Emergency Assessment is led and coordinated by the health sector itself, from Ministry of Health to the woreda health offices depending on the degree of the emergency, in collaboration with its partners and other sectors. It also needs to be linked with humanitarian coordination mechanisms as well as with pre-existing sector wide coordination and (Multisectoral) development partners.

Disaster Epidemiology is a new field of study used to investigate disaster in two approaches(4). The first approach is the typical epidemiological study of the underline cause of the disaster. This may focus upon events itself, morbidity and mortality associated with events. The second approach is mainly act after disaster happened how to reduce the burden of disasters and the consequence of disaster. The most direct application of epidemiology in this situation is establishments of surveillance system to identify injuries and possible emergency of communicable diseases.

On 17/10/10 E.C, 4090 people were displaced from Benishangul Gumuz Region, Maho-Komo Liyu Zone/ Tongo Town. Conflict was started on peaceful-demonstration to support the new Ethiopian Prime Minister. Many people were affected and displaced from their original places. Before1988 Tongo District was under Begi District of West Wellega Zone .Since 1988, Tongo District has been under Benishangul Gumuz and named as Maho-Komo Liyu Zone. Different Ethnic groups have been living together for many centuries and there was no ethnic conflict previously in the District. Now, internally displaced people were settled in Begi District at three different sites namely, Begi Secondary School, Tenzi Town and Tulu Kebele.

The objectives-To assess IDP sites situation, basic needs of displaced people, identify anticipated prone diseases and to give public health intervention in order to minimize further damage.

Methodology-Observation of the situation, discussion with stake holders and interview with 232 registered Households using systematic randomly sampling. Sample size was determined from Epi.info calculation of sample size at 95% C.I. Sampling interval was determined by dividing total households to sample size. The starting point selected by lottery method. Data were collected from June 25-28 by 6 health workers, including the principal investigator organized into three teams containing two persons by using standard checklist adopted from CDC disaster guideline and analyzed by Microsoft excel.

Sampling procedures:-Total Households displaced who registered at woreda level=1868, Total population=4090.Hence, sample size determined by Epi info calculation formula at 95% C.I=232, interval determined by dividing listed Households 1868/ sample size 232=8 and starting point selected from 1-8 by lottery method which was number 2

RESULTS

Begi District is one of the woredas found in West Wellega Zone, shares border with Tongo in all directions except Mena -sibu Woreda in the west direction and located **720K**M from Addis Ababa. In this District, there were 42 Health posts, Five Health Centers, One District Hospital and two private clinics. Health service coverage of the District was 77% and 100% for Health Center and Health Posts respectively. Total population of the District was 162591, of which

82109(50.5%) of them were females**.** There were also 33873 Households, 26664 under five children, 5235 under one year children and 6682 estimated Pregnant Women in the District **[Table 35].**

Table 35:-Population profile of Begi District, West Wellega, Oromia, July 2018

Population distribution of the district	**Number**	**Percent (%)**
Total population of district before IDP	162591	100
Total male population before IDP	80482	49.5
Total female Population before IDP	82109	50.5
Total Households before IDP	33873	4.8
Under one children before IDP	5235	3.22
Under five children before IDP	26664	16.4
Estimated pregnant women before IDP	6682	3.47

Among 232 interviewed households, all households(100%) had no separate shelter and they had been living together with 50 other head of households and separate from their wives and children due to lack of separate room for each households. All of them complained about inadequate shelter, cloths, food and non food items for their family. Out of total respondents,173(74.5%) of households had interest to return back to their original place if the problem was resolved and the rest had no interest to return back even if the problem was resolved.

The total populations displaced from Tongo Town were 4090. Among those, 3257 (80%) were settled in Begi Town and the rest were settled in Tenzi Town and Tulu Kebele. Those displaced people settled in Tenzi Town and Tulu Kebele were forcedly mixed with community due to security problem and hard to reach to support them .Among displaced people, 2399(59%) were males. Total number of HHs displaced were 1868, under five children 976, under one year children 121, Pregnant Women 22, Lactating Women 164.There were also families those unknown where there settled weather they live or not [Table 36].

Table 36:-Name of IDP sites in Begi district, West Wellega, with their respective displaced population, Oromia, July 2018

IDP* Sites	House holds			Under five			Total displaced people		
	M	F	T	M	F	T	M	F	T
Begi town	747 (57.8%)	545 (42.2%)	1292 (100%)	297 (41.3%)	422 (58.7%)	719 (100%)	1882 (57.7%)	1375 (42.3%)	3257 (100%)
Tenze Kebele	197 (65.2%)	105 (34.8%)	302 (100%)	106 (50.5%)	104 (49.5%)	210 (100%)	362 (70.7%)	150 (29.3%)	512 (100%)
Tulu Kebele	170 (62%)	104 (38%)	274 (100%)	22 (46.8%)	25 (53.2%)	47 (100%)	155 (48.3%)	166 (51.7%)	321 (100%)
Total	1114 (59.6%)	754 (40.4%)	1868 (100%)	425 (43.5%)	551 (56.5%)	976 (100%)	2399 (58.6%)	1691 (41.4%)	4090 (100%)

*IDP=Internally Displaced Population

Health status of the displaced population during the study period

The majority of displaced people settled in Begi High School in overcrowded conditions. Adolescent, Women and men live in separate rooms. There is no any mattress or sheet in all rooms. Injured patients were treated in mobile clinic, Health Center and Begi Hospital. During conflict 28 people had bullet injury, 8 people were injured by car accident. Among injured people 3 of them died and 8 of them were referred to higher levels. After settlement in Begi Town,6 patients were identified with chronic diseases and were referred to Begi Hospital to continue their follow up and 469 cases were seen at temporary clinics within two weeks of settlement. The leading causes of morbidity identified at IDP temporary clinic within two weeks of settlement in Begi District were diarrhea, followed by acute upper respiratory tract infection [Table 37].

Table 37:-Top ten diseases identified at mobile clinic within two weeks of Internally Displaced Population, Begi, West Wellega, July 2018

Rank	Disease	Number of cases	%
1	Diarrhea(non bloody)	101	21.5
2	AURTI	79	17
3	AFI	75	16
4	Pneumonia	48	10
5	Diarrhea with bloody	31	7
6	Disease of skin and subcutaneous tissue	30	6.4
7	Malaria	29	6
8	Dyspepsia	27	5.7
9	Disease of muscle skeletal and connective tissue	25	5.3
10	Others total unspecified disease	24	5.1
11	Grand total	469	100

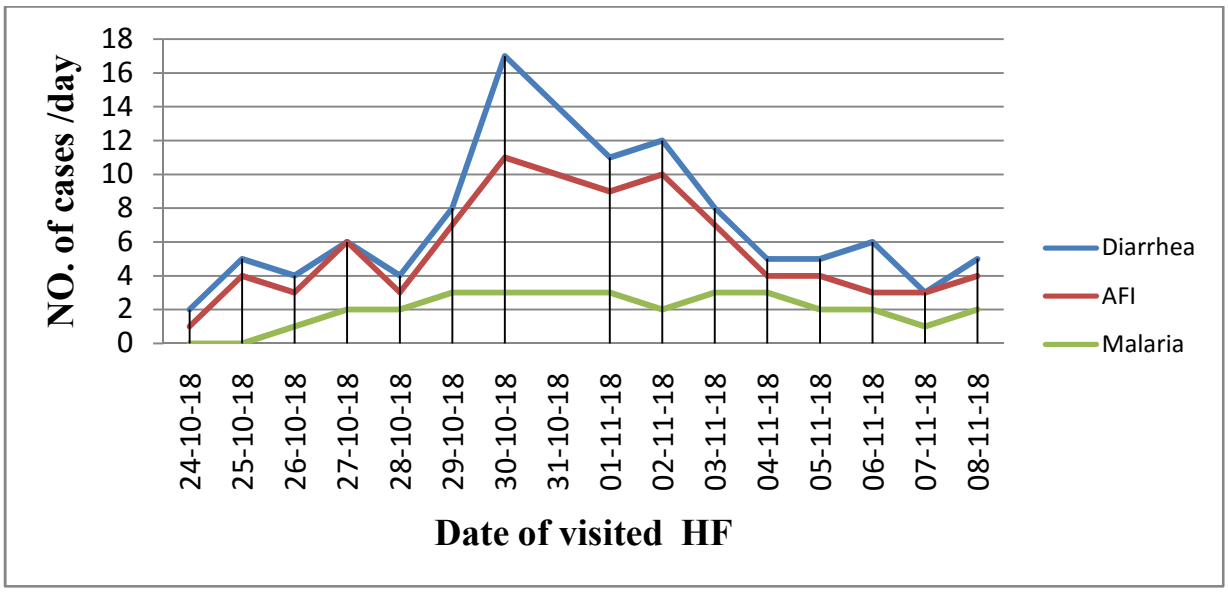

Figure 30:-Sixteen days trends of common cases treated at temporary clinics during our visit in Begi Town, West Wellega, Oromia, from June 24-July 8, 2018.

As we can see from the above figure, trends of common diseases, such as diarrhea, acute febrile illness and Malaria increased at the end 1st week of settlement and slightly decreased in the 1st week of July. Diarrhea was the leading cause of morbidity followed by acute febrile illness and malaria [**Fig. 30**].

SITUATION ANALYSIS

Coordination

The Task Force at zonal level was not functional due to security problems and all zonal administrative offices were not properly working during the study period. Multisectoral taskforce and sub-technical teams were established at woreda level. Political leaders in collaboration with Kero/Folle and community leaders played their role in stabilizing and supporting the community. The displaced people were settled temporarily at Begi Secondary School. Females, elders and Youngsters were settled in separate rooms. Until visiting date, they were supported by the local community.

Supporting

There was not enough support for displaced people until date of visit. However, West Wellega Red Cross gave 30 jerkins and 37 blankets. Fifty thousand birr allocated from the Zonal Disaster Preparedness and Response Office and estimated 54,000 Birr Emergency drugs and medical supplies from Oromia Regional Health Bureau were the only support provided for displaced people.

Public Health intervention activity

- Among public health interventions undertaken during our visit were, establishment of temporary clinic at settlement site
- Orientation was given on community health condition and anticipated outbreak for woreda task force
- Establishments' of rapid response team at Woreda level
- Separate latrine for female and male and two temporary showers
- Water container for storage and hand washing
- Clinicians were assigned at temporary clinics
- Some drugs and medical supplies were provided to the hospital and HC from ORHB

- Referral and ambulance service were given for injured patients
- ITN provided for 22 pregnant women
- Collection of food and non food items from community
- Orientation for all health workers on prone disease and Public Health Emergency Managements
- Active surveillance was conducted for epidemic prone diseases
- Psychosocial support for displaced community

Major Gaps

- Major gaps identified during study period were lack of establishment task force at zonal level
- Week multi-sectoral collaboration
- Rapid humanitarian response not still given from government side
- Health workers with different health professionals were not deployed in IDP site for integrated health interventions
- No/shortage of drugs and medical supplies for IDP for health service
- Shortage of safe water supply, no water tracking, water container and water treatment chemicals
- Poor hygiene and sanitation practices
- Mass screening was not conducted for all IDPs for communicable and chronic diseases including nutrition and child vaccination
- Trench latrines were not constructed at IDP site(only 8 rooms latrines are providing service for all displaced people, no water and light in area)
- Lack of WASH materials for IDPs (Soaps, water treatment chemicals, Water container, Hand Washing facilities, Water basin, bucket, Jerkins
- Lack of dignity/sanitation kits (Diaper, Popo and Modus)
- Health education was not given for IDPs on epidemic diseases prevention and control including reproductive health problems
- No distribution of Non-Food Items (NFI) Kits and shelter for IDPs. Existing Partners in the zone did not start to provide support on IDP responses

- ITNs were not distributed for other people rather than pregnant women
- Lack of operational cost for IDP health interventions
- Interruption of basic infrastructures (electricity, water supply)

During our visit, major gaps identified and items required for at least two months were requested by teams. Foods, non food items and medical supplies prepared by teams based on households needs. Food items, Mattress, Blanket and Clothes were requested per households and family size. Dignity kit requested based on number of lactating Women and drugs and medicals supplies were requested based on top ten diseases treated at temporary clinic, health facilities drugs out stock and anticipated prone diseases.

Based on woredas stock, 1853 mattress, 1843 blanket, 1968 dignity kits, 9340 soaps, 8180 personal clothes, 1818 Jerkins, 3 water trucks 1868 Kuntals food items,41 items of drugs and medical supplies estimated to 180,000 ETB were requested for minimum of two months [Table 38].

Table 38:-Major items required at least for 2 months for three IDP sites in Begi District, West Wellega, July 2018

S. N	ITEMS	No. of items available	Unit	Required items
1	Mattress	15	No	1853
2	Blanket/sheet	25	No	1843
3	Dignity kit	0	No	1968
4	Soap	0	No	9340
5	Personal clothes	0	No	8180
6	Water container	50	No	1818
7	Food items	50	Kuntal	1818
8	Rubber sheet 1.20m*1m	0	No	184
	Emergency drugs and medical supplies			
1	Plump net	0	Box	100

2	Paracetamol 500mg	1 box	Box	5boxes
3	Paracetamol100mg	0	Box	1box
4	Paracetamol120mg/5ml	20 bottle	Bottle	200 bottle
5	Paracetamol suppository	0	Supp.	100 supp
6	Diclofenac 75mg/3ml	50 ampoule	Ampoule	400 ampoule
7	Amoxicillin 125mg/5ml	50 bottle	Bottle	200bottle
8	Amoxicillin 250mg/5ml	0	Bottle	200 bottle
9	Amoxicillin 500mg	1box	Box	10boxes
10	Cotrimoxazole240mg/5ml	20 bottle	Bottle	300 bottle
11	Cotrimoxazole 960mg	1box	Box	5 boxes
12	Ciprofloxacillin 500mg	1box	Box	5 boxes
13	Metronidazole500mg	1box	Box	2 boxes
14	Metronidazole 125mg/5ml	1box	Box	3boxes
15	NS	10	Bag	100 bag
16	Ringer Lactate	0	Bag	100 bag
17	ORS	50 sachet	Sachet	500 sachet
18	Doxycycline 100mg	1box	Box	5boxes
19	Consumables : Syringes, D. Gloves	10 boxes	Box	30 boxes
20	S. Gloves	5boxes	Box	20 boxes
21	Tetracycline ointment	0	Tubes	100 tubes
22	Vit A (measles)	1bottle	Bottle	5 bottle
23	Courtum for Malaria	1 tin	Tin	10tin
24	Quinine (PO)	50doses	Dose	200 doses
25	Quinine (IV)	0	Amps	200 amps
26	Chloroquine (po)	30doses	Doses	100 doses
27	Ceftriaxione 1gm	0	Amps	100amps
28	Lab supply: RDT	1box	Box	50 box
29	Artesunate (rectal)	0	Supp	50 supp
30	Artesunate (Injection)	20	Amps	100 ampoule
31	Emergency pills	0	Pk	10pk

32	Cut guts	0	Pk	10pk
33	Roll bandage	5 roll	Roll	50 rolles
34	Gauze 90cmx10cm	1 roll	Roll	5 roles
35	Adrenaline	0	Ampoule	50 amps
36	BBL	0	Bottle	50 bottle
37	Alcohol	0	Liters	3liters
38	Iodine solution	0	Bottle	2 bottle
39	Savilon	5liters	Liters	20 liters
40	Barakina	5Liters	Liters	50 liters
41	Adhesive plaster	1 roll	Roll	10 roll

Anticipated disease/Outbreak

Acute Watery Diarrhea, Measles, Malnutrition, Malaria, Acute febrile illnesses, Skin Infections (Scabies) Other Diarrheal Diseases, etc are expected to emerge in the internally displaced population settlement sites.

Conclusion

The main problem of displaced people were clothes and mattress ,foods, water ,separate shelters, personal hygiene, Light, medical supplies., Dignity kits ,chemical water treatments, separate and adequate latrine, Wash materials etc. Health service coverage of the District was 77% and 100% for Health Center and Health Posts respectively. Within two weeks of settlements, 469 different cases were treated at temporary clinic. Diarrhea and Acute upper respiratory tract infection were the leading cause of morbidity in IDP sites. Anticipated diseases outbreak may occur at IDP sites were Acute Watery Diarrhea, Measles, Malnutrition, Malaria etc. Political leaders in collaboration with Kero/Folle and community leaders played their role in stabilizing and supporting the displaced community. Since internal displacement is complex in nature, multsector collaboration, community and partner involvement should be mandatory to overcome this problem.

Recommendations

- Establish and strengthen coordination activities at all levels
- Disaster preparedness and response Officer and PHEM Officer should focus communication and data management
- Woreda Health Office strengthening of temporary treatment centers at IDP sites with well equipped personnel and supplies
- Woreda Task force should focus effective and efficient resource mapping, mobilization and utilization at all levels
- Provision of adequate and clean water at IDP sites(Woreda Water & Energy Office)
- Mobilization and distribution of food and NFI kits (Woreda Task force)
- Separate shelter for Households (Woreda Task force)
- Conduct regular monitoring and evaluation of IDP interventions at both zonal and district level.

Acknowledgment

I sincerely appreciate the support extended by the ORHB, Mr. Bokona Dhaba (PHEM expert), West Wellega Zone Health Department, Begi District Health Office, Begi District Administrative Office, Begi District Disaster Risk Management Office, My mentors Pr. Ahmed Ali, Mr. Mengistu Yilma, EFETP coordinators and Instructors and team from Begi District Health Office

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Chapter Nine – Protocol/Proposal for Epidemiologic Research Project

Title:-Assessments of sanitary condition of food and drinking establishments in Bishoftu Town, Oromia Region, Ethiopia, 2019

ADIS ABABA UNIVERSITY

FACULTY OF MEDICINE SCHOOL OF PUBLIC HEALTH

MASTER OF PUBLIC HEALTH IN FIELD EPIDEMIOLOGY

RESEARCH PROJECT SUBMISSION FORM

Name of investigator	Umer Kedir Geda
Name of Advisors	1.Pr. Ahmed Ali 2.Mr.Mengistu Yilma
Full Title of research project	Assessments of sanitary condition of food and drinking establishments in Bishoftu Town, 2019
Study Area	Bishoftu Town of Oromia Region
Duration of study	Three months
Total estimated cost of project	46,2200.21 ETB
Address of Investigator	Umerkedir80@gmail.com Mobile-0912834386

Summary

Back ground:- Bishoftu Town is one of the 18 major Towns under Administration of the Oromia Region. It is 47Kms away from Addis Ababa in the Eastern direction and shares borders with Ada'a Woreda in the East, South and North direction and Dukem Town in the West. The area of the Town is 182,878 hectares with temperature range of 11.18-26.5^{oc}. The total population of the Town is 167,318. There are nine urban Kebeles and five rural Kebeles currently included under Bishoftu Town administration. There are also one General Hospital, five HCs, five HPs, 58 private clinics, one Ethiopian Air Force Clinic, one primary hospital of Federal Air Force and two traditional healers in the Town.

Food sanitation refers to the overall cleanliness and maintenance of kitchen equipment, or facilities. Food safety refers to the proper handling, cooking, and preservation of food in order to protect ourselves from food borne illnesses caused by microbes, such as viruses, bacteria, parasites, and fungi or the conditions and practices that preserve the quality of food to prevent contamination and food-borne illnesses. Safe food supplies support national economies, trade and tourism, contributes to food and nutrition security, and underpins sustainable development. Assessment of sanitary condition of food establishments will be undertaken in Bishoftu Town of Oromia Region.

Objective:- To determine the sanitary conditions of food establishments, assess knowledge and practice of food handlers and identify major gaps that may contribute to the existence of food borne diseases.

Methodology:-A cross-sectional study will be conducted by interview, observation and laboratory sample test.

Expected Outcome:-This study expected to assess sanitary status of food and .drinking establishments, knowledge and practice of food handlers, latrine coverage and utilization, water quality, major gaps and what and how to improve and provide base line for regular activities

Conclusion and recommendation:-Conclusion and recommendation will be given based on the main findings of the study

1. Introduction

Back ground: - Bishoftu Town is one of the 18 major Towns under the Administration of Oromia Region. It is 47Kms away from Addis Ababa in the Eastern direction and shares borders with Ada'a Woreda in the East, South and North direction and Dukem Town in the West. The area of the Town is 182,878 hectares with temperature range of 11.18-26.5^{oc}. The total population of the Town is 167,318. There are nine urban Kebeles and five rural Kebeles currently included under Bishoftu Town administration. There are also one General Hospital, five HCs, five HPS, 58 private clinics, one Ethiopian Air Force Clinic, one primary Hospital of the Federal Air Force and two traditional healers in the Town. Bishoftu Town is one of the truism towns in our country. It is the homeland of Irecha Festival, seven lakes, Ethiopian Air Force, Center of Conference and different industries. As Bishoftu Town is centre of truism and homeland of Irecha Festival, millions of people move to this area every year from all directions of the Region. During the Irecha Festival, not only our citizens, but also many tourists come to this area from different countries. Since movement of population is high in this Town, availability and quality of food establishments are mandatory to serve these people and to reduce the risk of food borne diseases in the Town and prevent expansion of food borne disease to other towns or countries.

Food sanitation refers to the overall cleanliness and maintenance of buildings, kitchen equipment, storage, dining room, water sources and latrine with proper liquid and solid waste management (**1**). Food safety refers to the proper handling, cooking, and preservation of food in order to protect ourselves from food borne illnesses caused by microbes such as viruses, bacteria, parasites, and fungi or the conditions and practices that preserve the quality of food to prevent contamination and food-borne illnesses (**2**). Safe food supplies support national economies, trade and tourism and contribute to food and nutrition security, underpins sustainable development and healthier life (**3**).

Globalization has triggered growing consumer demand for a wider variety of foods, resulting in an increasingly complex and longer global food chain. As the world's population grows, the intensification and industrialization of agriculture and animal production to meet increasing demand for food creates both opportunities and challenges for food safety. Climate change is also predicted to impact food safety, where temperature changes modify food safety risks

associated with food production, storage and distribution (**3**). These challenges put greater responsibility on food producers and handlers to ensure food safety and also local incidents can quickly evolve into international emergencies due to the speed and range of product distribution.

Food hazards, including germs and chemical contaminants, can enter the food supply at any point from farm to table (**4**). These illnesses are preventable and underreported public health problem and its burden on public health and contribute significantly to the cost of health care. They also present a major challenge to certain groups of people. Although anyone can get a food borne illness, some people are at greater risk. for example children, elders, etc. Most of these hazards cannot be detected in food when it is purchased or consumed. In addition, a food itself can cause severe adverse reactions in people who are allergic to it.

Food borne illnesses are usually infectious or toxic in nature and caused by bacteria, viruses, parasites or chemical substances entering the body through contaminated food or water (**5**). Those pathogens can cause severe diarrhea or debilitating infections including meningitis. Chemical contamination can also lead to acute poisoning or long-term diseases, such as cancer, disability or death. Examples of unsafe food include uncooked foods of animal origin, fruits and vegetables contaminated with faeces, and raw shellfish containing marine biotoxins can cause severe disease, disability or death.

There are three main types of hazards or contaminants that can cause unsafe food: Biological, chemical, and physical (**6**). Biological includes, microorganisms; chemicals, includes cleaning solvents and pest control and physical means hair, dirt, or other matter. The five frequently mentioned sanitation tips to prevent food borne illnesses in food service and retail businesses. They are:-Proper personal hygiene, including frequent hand and arm washing and covering cuts, proper cleaning and sanitizing of all food contact surfaces and utensils, proper cleaning and sanitizing of food equipment, good basic housekeeping and maintenance; and food storage for the proper time and at safe temperatures.

1.1 Statements of the problems

Even though an adequate supply of safe and wholesome food is essential to the health and wellbeing of humans, there are plenty of conditions that food affects the health of people across the globe due to contamination (**7**). Although the problem is worse in developing nations, it is

also common in developed countries. Even modern technological advance could not stop the occurrence of food related diseases.

Food-borne diseases encompass a wide spectrum of illnesses and that are common in developing countries including, Ethiopia (**8**). Their occurrence is mainly because of the prevailing poor food handling and sanitation practices, inadequate food safety laws, weak regulatory systems, lack of financial resources to invest in safer equipment and lack of education for food-handlers.

Illness and death from diseases caused by contaminated food are a constant threat to public health and a significant impediment to socio-economic development worldwide (**9**). To measure the global and regional burden of food borne disease, the World Health Organization (WHO) established the Food borne Disease Burden Epidemiology Reference Group (FERG), which here reports their first estimates of the incidence, mortality, and disease burden due to 31 food borne hazards. According to Food borne disease Burden Epidemiology Reference Group(FERG)report, the global burden of food borne disease is comparable to those of the major infectious diseases, HIV/AIDS, malaria and tuberculosis and the most frequent causes of food borne illness were diarrheal disease agents, particularly Norovirus and *Campylobacter* species.

Study conducted in Addis Ababa in 2017 revealed that, the majority of the establishments had poor sanitary conditions; where an absence of sanitary facilities for waste management was major cause of food borne diseases (**10**). The risk of epidemics has been observed in the era of globalization that is characterized by increased frequency of travels and eating outside of home (**11**).

Food borne illness due to poor sanitation and hygiene and in developing countries, including Ethiopia estimated up to 70% of cases of diarrheal diseases may be caused by contaminated food (**12**). In Oromia Regional state, Diarrheal diseases were the leading cause of morbidity during 2010 E.C (**13**). In this Region, the numbers of food establishments' service were increasing in the last two decades as a result of urbanization and movement of people from place to place. The same things true for Bishoftu Town. As Bishoftu Town is centre of truism and homeland of Irecha festival, a millions of people move to this area. Despite the increasing numbers of food establishment, the sanitary status of the Bishoftu Town was not known. No study was done previously on sanitary condition of the Town. Unless hygienic food handling and preparation is

ensured in all food establishments, the health of large number of consumers will be endangered since food prepared in the same kitchen by the same food handlers is eaten. On February 25/02/2019 suspected food borne outbreak occurred in the cafeteria of Ethiopian Defense Air Force of Bishoftu Town, in which 164 students were affected and I was participated in investigation as co investigator. To prevent health problems that can arise from food establishments, assessment of sanitary condition, knowledge and practice of food handlers are necessary. This study intends to assess the sanitary condition of food establishments, knowledge and practice of food handlers and major gaps to be improved in Bishoftu Town to reduce the risk of food borne diseases.

1.2 Significance of the Study

As human life depends on food, human beings need safety and quality of food to perform daily activities. Now a day, eating outside home is increasing from time to time due to high population movement from rural to urban areas. To prevent food borne diseases that arise from food establishments, assessment of sanitary condition, knowledge and practice of food handlers, environmental observation and taking water sample for bacteriological test should be necessary. In our study, we will assess sanitary conditions of selected food establishments in Bishoftu Town, assess knowledge and practice of food handlers, assess medical conditions of food handlers, assess protocols of food workers and handlers, assessment of latrine conditions, kitchen, water sources, food storage, process and preparation. The result of this study will be used as baseline for Bishoftu Town to check regularly and take corrective measures. Food establishments in the Town may improve quality and safety of food after assessment based on feedback. Improvement of food quality can result in healthier life of our community and reduce the risk of food borne diseases. Therefore, this study will have significant input in the formulation of appropriate strategy to modify and facilitate the overall regulatory activities for planning and program evaluation as well as baseline information for policy makers to improve sanitary conditions of food establishments and reduce the incidence of food borne diseases.

2. Literature Review

Human being needs food to survive, grow, reproduce and for well being. Food safety is essential for being health (**14**). Food safety is a condition and /or effort such that foods do not contain biological, chemical and physical hazards at level that can cause adverse effects on human's health. When all people, at all times, have physical and economic access to sufficient, safe and nutritious food to meet their dietary needs and food preferences for an active and health life.

The term food quality and food safety can sometimes be confusing it is important to briefly explain their distinction. Food quality is the extent to which all established requirements related to food are met (**15**). Quality characteristics of food include attributes such as the origin, quantity, colour, flavor, texture, and processing methods of the food. Food safety implies absence or acceptable and safe level of contaminants, adulterants, or any other substances that may make food injurious to persons . This means that food safety is related with the absence or acceptable and safe level of harmful substances present in the food and concerned with whether the food has been prepared, handled, and stored under controlled and sanitary conditions in conformance with practice prescribed by government regulations.

Acute diarrheal illness is very common worldwide and estimated to account for 1.8 million childhood deaths annually, predominantly in developing countries (**16**). The investigation and control of diarrheal disease outbreaks are multi-disciplinary tasks requiring skills in the areas of clinical medicine, epidemiology, laboratory medicine, food microbiology and chemistry, food safety and food control, and risk communication and management.

CDC estimates that each year roughly 1 in 6 Americans (or 48 million people) gets sick, 128,000 are hospitalized, and 3,000 die of food borne diseases (**17**). These estimates provide the most accurate estimates of which known food borne pathogens (bacteria, viruses, and parasites) are causing the most illnesses in the United States, and how many food borne illnesses are caused by unspecified agents.

The incidence of food borne disease is increasing globally, but food borne disease data collection systems often miss the bulk of home-based outbreaks of sporadic infection, it is now accepted that many cases of food borne illness occur as a result of improper food handling and preparation

by consumers in their own kitchens (**18**). Some of the most compelling evidence has come from the international data on *Salmonella* species and *Campylobacter* species infection.

More than 250 different food borne illnesses are caused by various pathogens or by toxins (**19**). Consumption of food containing pathogens such as bacteria, viruses, parasites or the food contaminated by poisonous chemicals or bio-toxins resulted in food borne disease. Socio-demographic condition of owners and food handlers, environmental factors like housing condition, availability of toilet facility, liquid and solid waste management, water supply, and infestation of vectors are some of the factors that affect food safety(**20**).

Several aspects of food borne diseases outbreaks present difficulty in investigation (**21**). Firstly, cluster identification and outbreak recognition may be delayed because the pathogen is a common isolate. Secondly, their vehicle of infection may be a food commonly eaten by both cases and controls and the source not easily identified unless precise details (for example, brand, batch number, supplier) are elicited. Thirdly, cases may be geographically scattered hampering both early cluster identification and coordination of investigation and finally, delay in investigation may lead to recall bias and problems obtaining food for microbiological examination.

If a food borne outbreak investigation fails to identify a definite source of contamination at the place of preparation (example infected food -handlers or cross contamination), it may be that contamination occurred at earlier stage in the food production chain(**22**). Multiple outbreaks due to the same pathogen occur at different sites, may provides further evidence of primary contamination at earlier stage. In this case, investigators can perform a trace-back to find out where and how contamination occurred. Diseases related to inadequate water, sanitation and food hygiene are a huge burden in developing countries and estimated that 88% of diarrheal disease is caused by unsafe water supply, and inadequate sanitation and hygiene (**23**).

The preparation, transportation, sale of food and washing of dishes by a single person to serve a large number of people is unsafe and has the potential for improper food handling and likely contamination (**24**). Presence of animals in the kitchen of the food vendor, and lack of possession of valid health certificate were also contraventions of food safety regulations that could compromise the quality of food.

Food-handlers can be a source of food borne contamination (**25**). Stool specimens or rectal swabs may be collected from food-handlers for laboratory analysis to identify potential carriers or sources of contamination. Toxin-producing strains of S. aureus are carried in the nostrils, on the skin and occasionally in the feces of many healthy persons. If S. aureus intoxication is suspected, the nasopharynx of food-handlers can be swabbed. Swabs should also be taken from skin lesions (pimples, boils, infected cuts, burns etc) on unclothed areas of the body. Arrangements should be made for workers to be examined by a medical practitioner as appropriate. If hepatitis A virus (HAV) is suspected, blood from food-handlers can be tested for IgM antibodies against HAV, which are an indication of acute infection.

Ensuring food safety is a critical and fundamental component of public health and food security. Efficient food safety and quality program reduce food losses by about 30 percent, which is important for food security (**26**). Strengthening food safety within the Region will help minimize the burden of food borne diseases. The major gaps to ensure food safety include lack of policy coherence among the different sectors, inadequate food safety capacities, inadequate financial investments, fragmented food control systems, weak food borne disease surveillance, obsolete food regulation and weak law enforcement and the inability of small- and medium-scale producers to provide safe food.

According to the study done in 2005 in Eastern Accra on food borne illness among school children, the possible source of infection was meat stored in fridge (**27**). The storage system at the kitchen for meat was not adequate. Due to the frequent power outages, the freezer was unable to maintain the right temperature to keep products frozen. There was water that had drained from meat/fish placed in the freezer which was a ready medium for growth of pathogens. The possible source of contamination might have been the meat probably due to poor storage and subsequently improper boiling in preparation of the soup.

In Ethiopia, key stakeholders involved in food safety management include Ministry of Health , Ministry of Agriculture, Quality and Standards Authority of Ethiopia, Environmental Protection Authority, Ministry of Industry, Ministry of Trade, different Federal and Regional Governmental Bodies, Research Institutions, Ministry of Education, Food Manufacturers, Food distributors and Hotels(**28)**. Although effective food safety systems are vital to maintain consumer confidence in the food system and to provide a sound regulatory foundation for domestic and international

trade in food, there are gaps in Ethiopian food safety system on legal and policy frame work, food-borne diseases surveillance, coordination of organizations involved in food safety management, and laboratory services for relevant food hazards. Lack of appropriate food safety assurance systems are problems that have become obstacles to Ethiopia's economic development and public health safety.

The study done in Arba Minch revealed that, relatively low practice was observed in wearing clean gown and head cover, shorting of finger nails and medical screening (medical cheek up)(**29**). Lack of solid waste management facility, dish washing facility and pipe (running) water in kitchen area were the identified gap in food establishments. Food hander whose age greater than 29-34 and ≥ 35 years, having supervisor, medical cheek up and training on food sanitation in the past were the identified significant factors associated with food handlers practice.

The study done in Woldia Town revealed that only 1.7% of establishments had used three-compartment for washing drinking glasses (**30**). The main sanitary problems identified by the study were: poor state of repair of the kitchen and dining room floors; lack of latrine facilities in a few establishments and improper management of latrines; inappropriate solid and liquid waste management; a poor standard of hand-washing facilities in the majority of establishments; inadequate use of hot water for cleaning food utensils; and improper storage of food utensils.

According to the study done in 2002 in Zeway Town of Southern Ethiopia, food handlers in 14.8% of food establishments had active skin and respiratory infection (**31**). The personal hygiene of food handlers in most establishments was very poor and that only 21.65% of them had acceptable type of over coats used while working. That study also revealed that, only 59% of food establishments had functional latrine with 73.5% and 81% proper liquid waste and solid waste management.

Conceptual frame work model

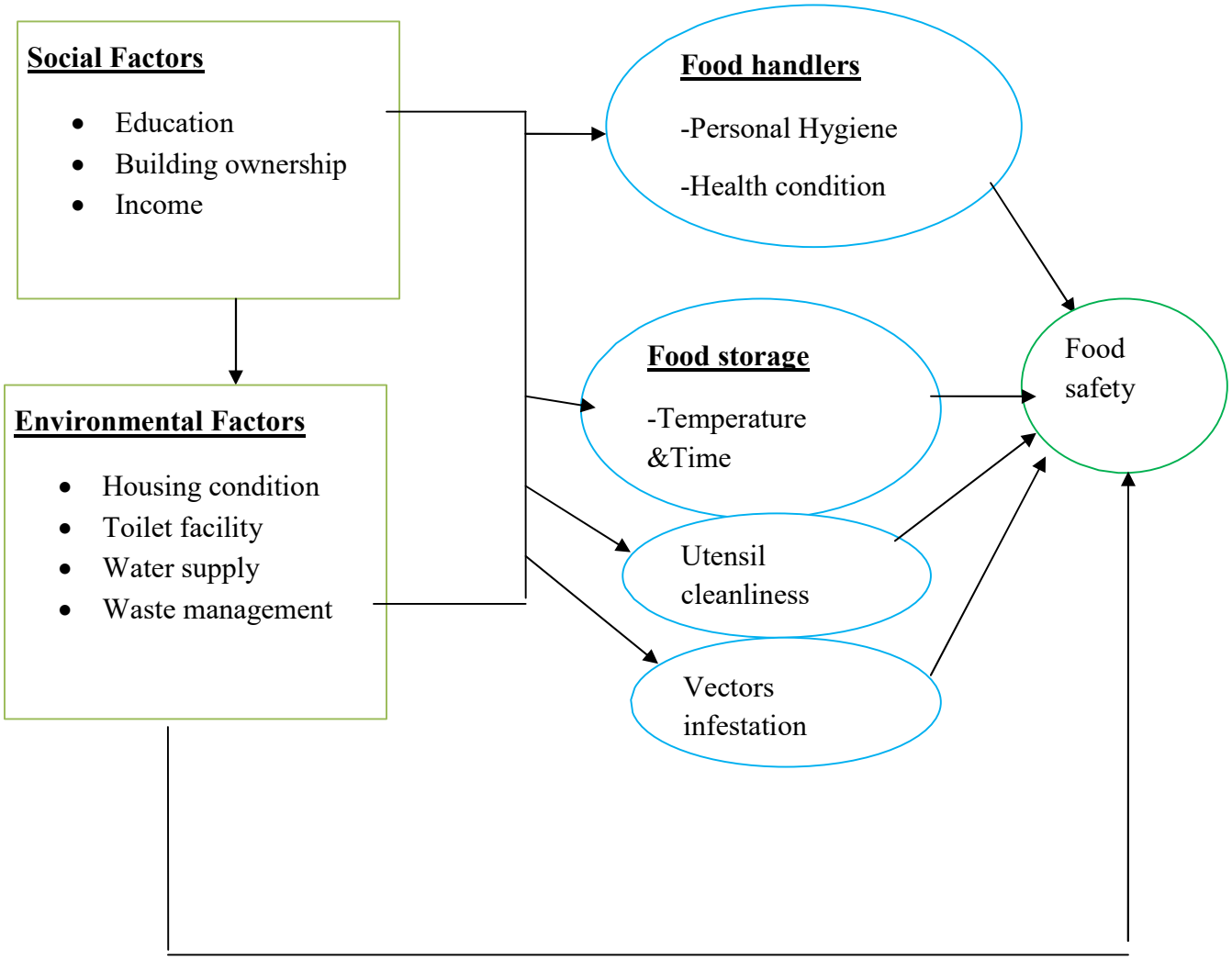

Figure 31:-Factors affecting food safety in food and drinking establishments

As above ischemic figure indicated, social factors and environmental factors can be influence food safety in food and drinking establishments. Social factors, includes education, income, building ownership, etc. Environmental factors, includes housing condition, toilet facility, water facility, waste management, etc. Food safety can be insured by practicing personal hygiene, health education, maintaining food temperature with time, maintaining cleanliness of food utensil and avoid infestation of vectors[Fig.31].

3. Objectives

3.1 General objective

- To determine the sanitary conditions of food and drinking establishments, assess knowledge and practice of food handlers and identify major gaps that may contribute to the existence of food borne diseases in Bishoftu Town, Oromia Region, Ethiopia

3.2 Specific objectives

- To describe the sanitary conditions of food and drinking service establishments
- To assess the Knowledge and Practice of food handlers towards hygienic food handling
- To identify major gaps that may contribute to the existence of food borne diseases

4. Methodology

4.1 Study area

Bishoftu Town of Oromia Regional State which is located 47 kms away from Addis Ababa, in the Eastern part of the country.

4.2 Source populations

All food service establishments regardless of their legal status will be the source populations

4.3 Target population

Randomly selected mass catering establishments will be the study subjects and food handlers from randomly selected establishments will be recruited for knowledge and practice study

4.4 Study design

A cross-sectional study will be conducted

4.5 Exclusion criteria

Local tela bet –because no guideline to effect regulatory activity. Establishments which provide services temporarily around construction sites, market places, bus stations and that provide packed and canned foods will be excluded from the study, because they are less likely to be contaminated.

4.6 Sample size determination

Sample size (n) will be determined based on the assumption of a 50% proportion (P) of poor sanitary conditions of the overall sanitary facilities, 0.05 expected margins of error (d), and with 95 % confidence level Z α/2) and 10% contingency will be considered for non response.

$n = (Z \alpha/2)2 * P (1-P)/d2$, $n = (1.96)^2 0.5(1-0.5)^2$ n = 384+ 38= **422** , Therefore sample size including non response will be **n=422**

Sampling procedures:- First a census will be conducted in each Kebele of the Town to obtain the list of existing food and drinking establishments (sampling frame). The existing establishments will be stratified by the type of service they provide as hotels, restaurants cafeterias, bars, butcher shops, juice shop and pastry. Sample size will be determined proportionately from each stratum and selection will be performed using simple random sampling. The main purpose of stratification is to avoid over or under representation of certain types of establishments.

One food handler will be selected from each food and drinking establishments, which provide meals for the knowledge and practice assessment. In the presence of more than one food handler in a single food preparation area/kitchen, selection will be done by lottery method. Food utensils (dish plates) for bacteriological swab test examination will be selected from a series of plates cleaned and shelved. The establishments for swab test will be randomly selected from those already recruited for the overall sanitary condition assessment.

4.7 Data collection

Standardized and structured questionnaire will be developed for the purpose of data collection. The questionnaire will be structured and designed to accommodate the response of respondents and the physical observation of data collectors. The structured questionnaire prepared originally in English will be translated into Afan Oromo and Amharic language by principal investigator and Environmental health expert in order to obtain content validity.

Finally the questionnaire will be administered in Afan Oromo and Amharic language. Standard swab sample collection and transportation procedure will be implemented for microbiological food utensil examination and water sample will be taken from common source and will send to EPHI. This questionnaire will also be designed to obtain information on socio-demographic

characteristics of owners and food handlers, repair condition of premises, availability of water supply, toilet facility, refuse management, food utensil washing facility, storage system of food and food utensils as well as to measure the knowledge and practice of food handlers. Information on building condition, water facility, toilet facility, waste management facility, work place safety and license were obtained from owners where as information on knowledge and practice and food safety were obtained from food handlers.

Three public health professionals and one medical laboratory professional will be participated for data collection and microbiological analysis of food utensils respectively. Data collectors and one supervisor will be trained for two days. After training is given pretest will be conducted in establishments that will not be included in the actual study to ensure the quality and validity of data. Regular supervision, spot checking and reviewing the completeness of the questionnaire will be carried out by the principal investigator daily to maintain data quality. The public health professionals will be assigned to collect data from establishments other than their permanent work place or catchment's area in order to minimize interviewer bias. Each data collector will be complete an average of 10 questionnaires daily, and hence the actual data collection took 10.5 days excluding the training and pretesting time.

4.8 Variables

Dependent variable:

Sanitary facilities like water supply, toilet facility, utensil cleanliness, hand washing basin availability

Knowledge and practice of food handler

Quality of water source

Independent variables:

Socio-economic characteristics like age, sex, educational status, marital status, building owner ship and service year of establishment

4.9 Data quality assurance

The quality of data will be ensured through training of data collectors, close supervision and prompt feedback, reviewing each of completed questionnaires daily and re-interviewing certain

establishments randomly. Moreover a sort of brief daily activity evaluation method will be established to correct problems that could emerge during the course of data collection. The consent for the survey and the assurance of confidentiality will be delivered to improve the quality of data. Data consistency and completeness will be checked during data collection, data entry and analysis.

4.10 Data analysis

Epi Info version7.1 and SPS Soft ware will be used for data analysis. The principal investigator will perform data entry and cleaning. About 20% of the questionnaire will be also cross checked with the already entered data to maintain its validity.

4.11 Operational definition

Mass catering establishments:- is any business enterprise, serving or vending food and drink regardless of its legal status

Hotel is an establishment providing accommodation and meals for payment

Restaurant is an establishment selling ready to eat food and drinks

Snack bar/Cafeteria is an establishment rendering foods that can be served quickly and hot as well as non alcoholic drinks

Butcher shop is an establishment mainly involved in raw meat sale for take home

Pastry/cake bet is an establishment rendering hot drinks like tea, coffee and cakes any time

Juice shop is an establishment that serves mainly different type of fruit juices

Food handler is personnel who are involved in the preparation and handling of food in the kitchen

Personal hygiene - refers to those protection measures primarily with the responsibility of the individual, which promote and limit the spread of infectious disease, like hand washing using soap and water, keep body clean etc.

Good repair condition: - shall mean absence of big cracks or detached areas, holes and lack of painting for food preparation areas/kitchens, dining room or service room; and being free of breaks (open seams), corrosion, cracks and easily cleanable for food utensils and equipments.

Adequate lighting: - is to mean that a healthy person (without major visual problem) can see or easily identify objects in the room comfortably without straining of the eye.

Adequate ventilation: - is to mean that a room is free of reasonably disagreeable odor and have at least one open able window.

Properly managed toilet: - shall mean when a toilet/latrine is found free of litters, tissue/anal cleansing paper, fly access and other dirty materials like feces or urine around the latrine.

Proper storage in this paper context is to mean:- When prepared food is stored in clean container with a tight cover and/or covered with clean cloth or plastic sheet. When food utensils are stored in shelf, cupboard or other area in such a way that it is not exposed for dust particles deposition and insect contamination

Cleanliness/clean: - shall mean absence of dust particles, grease, finger and other marks for food utensil and being free of spider webs, dust and smoke particles for kitchen and dining /service room.

Sign of spoilage: - means the change of the physical characteristics (color change, bad odor) of perishable foodstuffs that can be easily detected by observation.

4.12 Ethical considerations

The study will be approved by the Addis Ababa University, School of Public health and Oromia Regional Health Bureau research Directorate Ethical Review Committee. Verbal consent will be also obtained from each respondent after explaining the purpose of the study. Confidentiality and anonymity will be maintained by avoiding personal identifiers

4.13 Dissemination of the results

The findings of this study in both soft and copy will be communicated with the Oromia Regional Health Bureau, Bishoftu Town Municipality, Bishoftu Town Health Office, This study also will be disseminate to other organization those can improve sanitary condition of the Town.

5. Work plan for the study

No.	Tasks to be performed	Period	Responsible body
1	Topic selection	January10-15,2019	PI
2	Review different journals	January 16---February 15,2019	PI
3	Proposal preparation	February16-----February 30,2019	PI
4	Proposal submission	March 1-7,2019	PI
5	Preparation for field	January 1-7,2020	PI
6	Training for data collectors	January8-10,2020	PI+ Dc
7	Data collecting	January 11-22,2020	PI+ Dc
8	Data entry	February 1-10,2020	PI
9	Data analysis	February11-30,2020	PI
10	Writing research results	March 1-20,2020	PI
11	Dissemination of findings	March 21-30,2020	PI

NB:-This schedule will be rearrange by principal investigators based on availability of sponsor

Key:-PI------Principal Investigator

Dc--------Data collectors

6. Budget plan

Budget categories	Unit cost	Multiplying factor	Total
1.Personnel	**Daily wage**	**No. of personnel *No. of working days**	**Total cost(ETB)**
Per diem for Data collectors	300	4*11	13,200
Per diem for supervisor	300	1*11	3,300
Training for personnel	300	5*2	3000
Hall rent for training with tea-coffee program	400	2	800
Sub total			**20,300**
2.Supplies	**Cost per items**	**Number**	**Total costs /ETB**
Questionnaire duplication	1.75birr/page	422*3*1.75	2215.5
Pen	5.75	10	57.5
Pencil	2	5	10
Note book	39.50	5	197.5
Flash(USB) 32 GB	500	1	500
Mobile cards	100	5	500
Internet subscription	365	2	730
Printing and binding	113.75	5	568.75
Sub total			**4779.25**
3.Transport	**Transport cost**	**Frequency of transportation**	**Total costs/ETB**
1 car rent with fuel	1700	1700*11	18700
Sample transportation to Adama Regional Lab.	60	60*2*2	240
Sub total			**18.940**
Total costs(1+2+3)			**44019.25**
Contingency	5% of total cost		2200.96
Grand total			**46,220.21 ETB**

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CHAPTER TEN

Additional Out puts

*Summary report of training

* ORHB PHEM bulletin preparation

Summary report of training

Introduction

The burden of disease in our country is mainly due to preventable communicable diseases which are the common causes of morbidity, mortality and disability. The National Health Policy gives due attention to the control and prevention of preventable communicable and epidemic prone diseases as well as public health importance diseases.

The best strategy for strengthening of prevention and control of communicable diseases is surveillance as it provides evidences on which to base decisions on public health interventions. The importance of disease surveillance in guiding health planning and intervention was recognized long ago; nevertheless, current routine surveillance system is constrained by many factors such as shortage of trained personnel, poor data collection, non recording, failure to report diseases of epidemic potential in time, incomplete and late reporting of notify able diseases and inadequate data analysis especially at peripheral level. As a result of these constraints new approach community based surveillance was started as pilot test in some area of Ethiopia that assigned focal person at community levels.

As to the frequent supervisory visits carried out by the health bureau personnel the reports received from zone health offices are incomplete and observation at health facilities shows that the case management, of priority diseases was very poor. In addition there is also evidence of increasing epidemic disease of zoonotic origin. Ethiopia is also one of the countries with high chance of acquiring zoonotic disease and other epidemic prone disease.

Therefore, there is a need from JSI Transform primary health care and Oromia Regional Health Bureau (ORHB) to train PHEM focal persons from selected Woreda and Health center in Kellem Wellega Zone in order to achieve effective community based disease surveillance system, improve case management and strengthen the surveillance of maternal death (MDSR) and all Public Health Emergency Management (PHEM) activities.

Objectives

General objective

- To strengthen PHEM focal persons on community based surveillance system for zone, Woreda and Health centers focal persons so that they will cascade to all health professionals.

Specific objectives

- To establish community based surveillance focal person at community level for early detection and management.
- To improve PHEM activities at community and facilities levels by improving coordination of health workers with community.

Methodology

Training component

- ✓ Power point presentation.
- ✓ Discussion and experience sharing.
- ✓ Question and answering (oral).

Participant selection criteria

PHEM focal persons were selected from five woreda and health centers under its catchments.

- ✓ Kellem Wellega Zone---------- 3
- ✓ From selected Woreda ----------34
- ✓ Total ----------37

Training period

Training was conducted from March29-30/2018.

Venue:

Dambi Dollo Hospital, Dambi Dollo Town

Results

Trainee profiles

A total of 35 trainees were participated in this training from Kellem Wellega Zone. Of the total, 31(88.5%) males and 4 (11.5%) females were participated and majority of them 27(77%) were from Health centers and the rest from woredas and zonal health department.

Training topics covered

- ✓ Objectives of CBS and Methods of the training
- ✓ Introduction of surveillance and community based surveillance
- ✓ Establishing Community based surveillance
- ✓ Role and responsibility of focal person at zone, Woreda, Health center and community level
- ✓ Community based case definition and standard case definition
- ✓ Public Health Emergency Early Warning System
- ✓ Major indicators of early warning system
- ✓ IDSR Versus PHEM
- ✓ Reportable disease
- ✓ Weekly report format
- ✓ Monitoring and evaluation

Trainers

A total of three trainers and two facilitators gave training. Trainers were Field Epidemiology resident (me) and Zonal PHEM focal person. Facilitators from JSI Oromia Region and National head Office [Table 39].

Table 39: Schedule training of presenter and moderator with JSI Transform primary health care, Community Based surveillance, Dambi Dollo Hospital

Date	Time	Topics	Presenter	Moderator
29/3/2018	8:00am-8:30am	Registration	Organizer	Hailu and Aychilu
	8:30am-	Participant Introduction	Participants	

Date	Time	Topics	Presenter	Moderator
	8:45am			
	8:45am-9:00am	Objectives and Methods of the training	Mr. Takelegn	
	9:00am-9:40am	Introduction of Surveillance and Community based surveillance	Mr.Umer Kedir	
	9:40am-10:15am	Early Warning system and major indicotors of EWS	Mr.Umer Kedir	
	10:15am-10:35am	Tea Break	Organizer	
	10:35am-11:00am	Establishing CBS	Mr. Phawlos	
	11:00am-11:15am	Discussion	Participants	
	11:15am-12:00pm	Role and responsibility of focal person at zone, Woreda, Health center and community level	Mr. Umer Kedir	
	12:00am-12:30pm	Discussion	Participants	
	12:30pm-2:00pm	Lunch	Private	
	2:00pm-3:00pm	Community case definition	Mr. Phawlos	Hailu and Aychilu
	3:00pm-3:30pm	Discussion	Participants	
	3:30pm-4:00pm	Tea Break	Organizer	

Date	Time	Topics	Presenter	Moderator
	4:00pm-5:00pm	IDSR Versus PHEM and reportable disease	Mr.Umer Kedir	
	5:00pm-5:30pm	Discussion	Participants	
	8:30am-8:45am	Monitoring and evaluation	Mr.Phawlos	
	8:45am-9:45am	Integrated pocket outreach service(IPOS)	Mr.Aychilu(from JSI head office)	
	9:45am-10:15am	Discussion	Participants	
	10:15am-10:30am	Tea Break	Organizer	Hailu and Aychilu
	10:30am-12:00pm	Facilities Action Plan	Mr.Umer Kedir	
	12:00pm-12:30pm	Discussion	Participants	
	12:30pm-2:00pm	Lunch	Private	
30/3/2018	2:30pm-2:45pm	Clossing	Mr.Takelegn	

2.1.1 Discussion

All of trainees were attended the whole training days. At the end of specific topic presentation most trainees were actively participated on discussion either by asking question or answering, sharing their experience and doing some practical exercises as well as oral feed back at the end of the training. The training was aimed to build the capacity of Public Health Emergency Management (PHEM) focal persons based on the need of JSI and regions so that will be

cascaded accordingly to all health professionals. Participants were from selected Woreda of Kellem Wellega Zone of Oromia Region. This participation from different places of Woredas facilitated for more discussions and experience sharing to have common understanding within the woreda and Zone. The trainees were also evaluated qualitatively through the discussion, question and answering as well as some practical exercises so that they completed the training with good performances. However, the training was conducted within two days for all topics which is not adequate time and limed some of our discussions.

Challenges

Inadequate training day (needs at least 4-5 days)

Distance from Addis Ababa

Security problems in the town

Conclusion and recommendations

The training was completed with good discipline, full attendance and active participation of the participant as well as effective in addressing the objective. The trainers were also very concerned and prepared well on the topics accordingly to share their experiences for the trainees. Based on the daily evaluation from the trainee we recommended the JSI Transform primary health care and regional health bureaus have to prepare and share the standard reporting formats for the improvement of the reporting system, allocate some budget for cascading the training for the other health professionals and also try to select convenient training center for the future and monitor the training outcome.

OROMIA REGIONAL HEALTH BUREAU, PUBLIC HEALTH EMERGENCY MANAGEMENT AND HEALTH RESEARCH DIRECTORATE

WEEKLY BULLETIN

2.2 Epidemiological WHO Week51,2018 ORHB bulletin

Highlights of the Week

- *Regional surveillance report completeness and timeliness were 88.2% & 86.8% respectively.*
- *121 Suspected Measles Cases were reported in this week. It was increased by 29(31.5%) as compared to week 50, of these 40(33%) ,26(21.5%),7(5.8%),7(5.8) and 6(5%) were reported from HawiGudina of West Hararge ,Sayo Nole of West Wellega ,Babile town and Midhega of East Hararge and Dawe Sarer of Bale zones respectively.*
- *This week the region declare the interruption of local transmission of AWD outbreak after 60 days of zero AWD case report*

Introduction

This bulletin serves to summarize weekly surveillance data and performance of ORHB/PHEM on epidemic prone diseases and other public health emergencies. It comprises completeness, timeliness, trends of priority diseases and response activities. It also provides feedback on surveillance activities for WHO week 51, 2018.

Table 40: *Key Indicators/diseases/conditions Reported in week 51, December, 2018*

S/N	Indicators	Reported
1	Malaria cases Ex. With RDT/Mic	20078
2	Total malaria confirmed & clinical Cases	1440
3	Confirmed malaria (PF+PV)	1439
4	Sum of SAM	1674
5	Scabies Cases	2874
6	Completeness	88.2
7	Timeliness	86.8
8	Dog/Animal bite	88
9	Suspected Meningitis cases	16
10	Measles Cases	121
11	Maternal Death	8
12	Cholera/AWD Cases	0
12	Sum of Dracunculiasis Cases	0
13	Suspected Anthrax	0
14	Relapsing Fever	6
15	AFP	2

Weekly Surveillance Report

Regional surveillance report completeness and timeliness of government health facilities were 88.2% and 86.8% respectively. Report completeness of three zones and two adminstrative towns was below target as well as reports were not received timely from three zones and six

administrative towns. This week report were not received from Ambo and Nekemte towns.

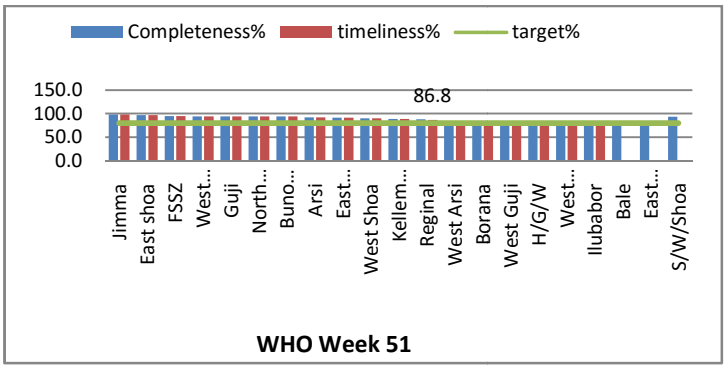

Figure 32: Report complteness and timeliness by Zones, Oromia as of WHO week 51, Dececember, 2018

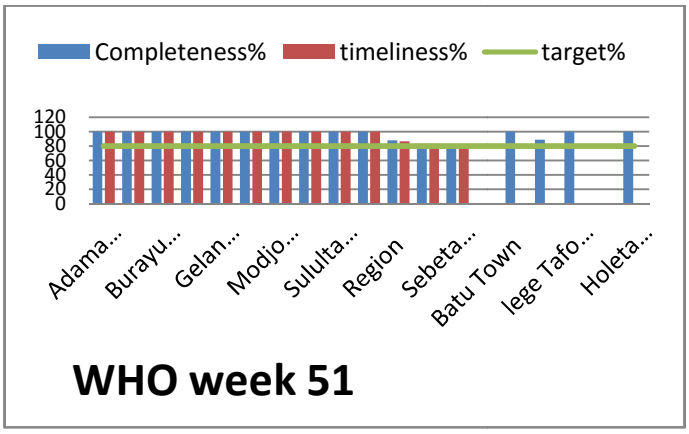

Figure 33: Report complteness and timeliness by town, Oromia as of WHO week 51, Dececember, 2018

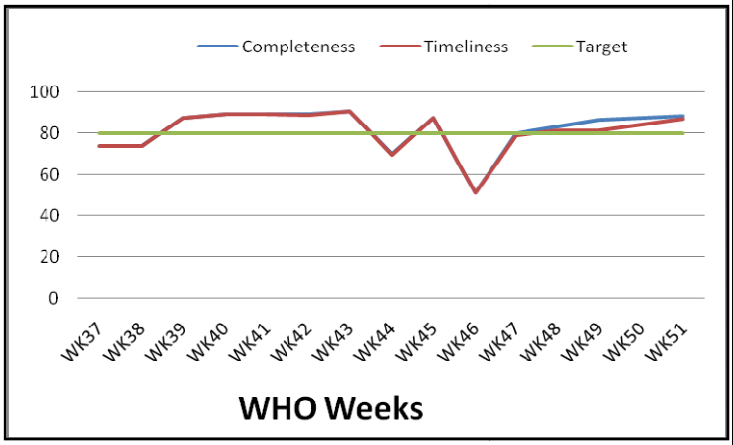

Figure 34:*-Trends of regional surveillance report completeness and timeliness of 19 consecutive weeks, (WHO weeks 37–51, December, 2018*

Diseases or conditions

Malaria

In this week, 1440 clinical and confirmed malaria cases were reported. Among the total clinical and confirmed malaria cases 1439(99.9%) of them were confirmed cases. Of the total confirmed cases, 953(66.2%) of them were plasmodium falciparum and 8 inpatient case in this week. Confirmed malaria cases were decreased by 204(12.4%) as compared to Week 50, 2018. A total of 20078 febrile cases were laboratory tested, yielding a positivity rate of 7.2 % were reported this week.

The highest number of confirmed malaria cases were reported to region from zones and woredas as depicted (table -41) below.

Table 41: *Malaria Positivity rate by zones/ woredas of Oromia Region, week 51, December 2018*

Zone/Woreda name	Exam. by RDT/Mic	PF+PV	SPR	% from reg/zones
West Guji	**626**	**165**	**26.35**	**11.5**
Galena	145	66	45.5	40
Abaya	271	50	18.45	30.3
East shoa	**2679**	**199**	**7.4**	**13.8**
Fantalle	373	59	15.8	29.6
Matahara	366	57	15.6	28.6
Boset	408	28	6.9	14
Guji	**821**	**130**	**15.8**	**9**
Shakiso town	196	44	22.5	33.8
Negelle town	136	27	19.8	20.8
West Wellega	**1916**	**111**	**5.8**	**7.7**
Kondala	100	37	37	33.3
South West Shoa	**835**	**34**	**4**	**2.4**
Waliso town	373	31	8.3	2.1
West Shoa	**755**	**80**	**10.6**	**5.6**
Nano	132	27	20.45	33.75

Shashamane Town	**747**	**27**	**3.6**	**1.9**
East Wellega	**1311**	**153**	**11.7**	**10.6**
Sasiga	245	26	10.6	17

A trend of regional confirmed malaria cases for the last 15 consecutive weeks is indicated below.

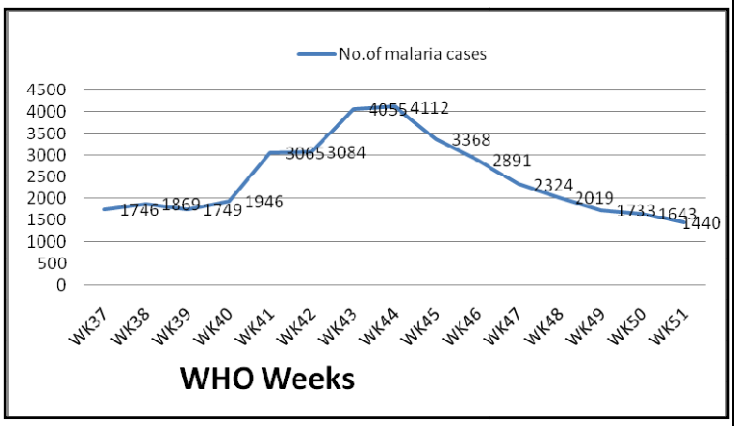

Figure 35: *Trends of confirmed malaria cases by week, Oromia Region, 37-51 Week, Dec ,2018*

Dysentery

In this week, a total of 1284 dysentery cases were reported to the region. There was no admitted dysentery cases in this week. Cases were decreased by 91(6.6%] as compared to week 50. The highest number of cases were reported from East Hararge 111(8.6%), Arsi 101(7.8%), Jimma 92(7.2%), North Shoa 87((6.8%) and West shoa Zone87(6.8%) .

Trends of dysentery cases for the last 15 consecutive weeks are shown below

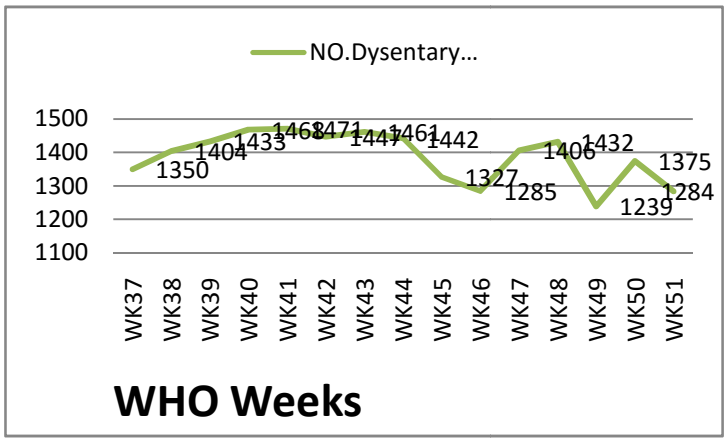

Figure 36:- *Trends of Dysentery cases by weeks, Oromia Region, 37 to 51 weeks, Dec, 2018*

Measles

In this week, 121 suspected measles cases were reported to the region. The cases were reported from Hawi Gudina 40 (33) ,Midhaga (7),Chiro Hospital(2),Gelamso Hospital(1) of of West Hararge, Sayo Nole of West Wellega (26), Babile town(7),Babile Woreda(5) ,Gola oda(3) of East Hararge,Dawe sarer(6),Gololcha(1) of Bale, Berek Woreda(4) of FSSZ,Ilu(4),Jida(1) of South West Shoa Jimma town(3),Limu Hospital of Jimma, Merti(3), Guna(2),Jeju(1),Chole(1) of Arsi,Goro Dola(2),Dama(1) of GujiAdola Hospital(1) of Guji zones reported a measles suspected outbreak cases.

Trends of the past 15 consecutive weeks of suspected measles cases were shown below(Fig:37).

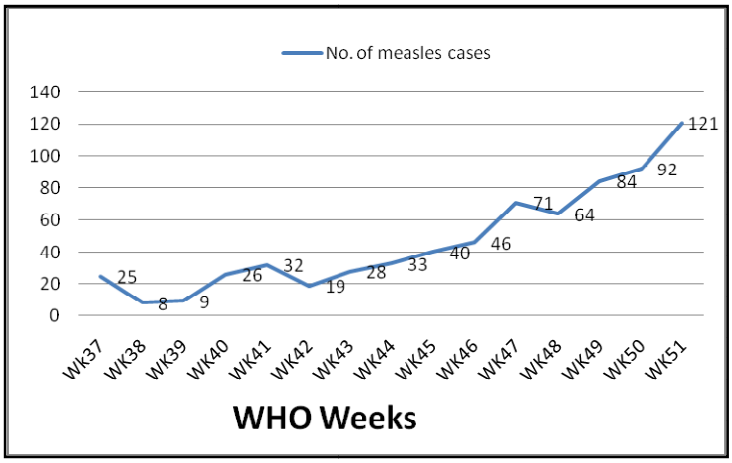

Figure 37:-*Trends of suspected measles cases by time,Oromia Region,week 37 to week 51, Dec. 2018*

AFP

In this week, 2AFP cases were reported to the region. Cases were reported from West Guji (1) and Jimma(1) Zones.

Malnutrition

In this week 1674 new severely acute malnutrition (SAM) cases were reported to the region. Of the total cases, 192(11.5%) of them were treated at stabilization center. SAM cases were increased by 5(0.3%) as compared to week 50.

Most of the cases were reported from East Hararge 381(22.8%), West Hararge249(14.9%),Bale160(9.5%), West Arsi143(8.5%), Jimma 127(7.5%) and Arsi 98 (5.8%) Zones.

Among Woredas; Fadis 47(12.3%) Haramaya 36(9.4%),Girawa 35(9.1%) and Gursum34(8.9%) of East Hararge, Shalla 41(28.6%), Shashamane rural 36(25.2%), Siraro 35(24.4%) of west Arsi, Mieso 35(14%),Mesela 33(13.3%) of West Hararge,Harena Buluk 32(20%) of Bale and Bule hora 25(31.6%) of West Guji zones were contributing higher number of cases in this week.

Note: Percentage of Malnutrition in the districts was calculated from their respective zones.

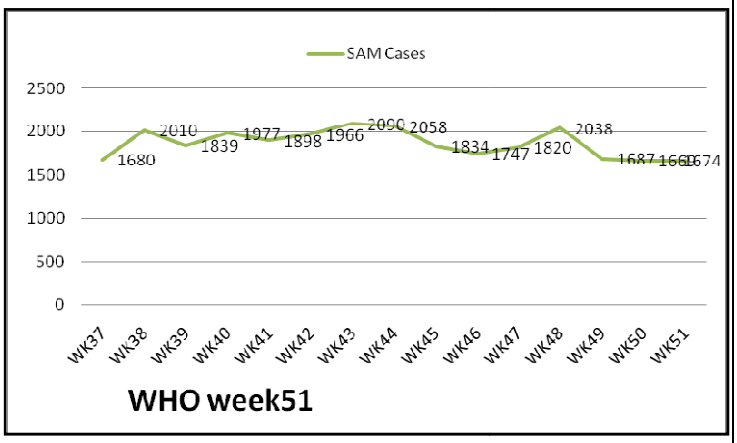

Figure 38: *Trends of regional SAM cases by time, Oromia Region, week 37 to week 51, Dec, 2018*

Meningococcal Meningitis

In this week, 16 suspected meningococcal meningitis cases were reported to the region. These cases were reported from Guji (8), West Shewa (3), Arsi (2),Burayu town(1) West Guji(1)& KellemWollega (1) zones.

Anthrax

In this week, zero suspected anthrax case was reported to the region in this week.

Relapsing Fever

In this week, 6 suspected Relapsing Fever cases were reported to the region. These cases were reported from Arsi (4), East Shoa(1) and Asella town (1).

Maternal deaths

In this week, 8 suspected maternal deaths were notified. Cases were reported from West Arsi(2), Jimma town (1) , FSSZ (1),Eest Hararge(1),Borena(1),Buno Bedele(1) and West Welega (1) in this week.

AWD Cases

Regionally, since the occurrence of AWD outbreak, a total of 9,066 suspected cases were reported up to WHO week 2/2018; where 14 zones, 13 administrative towns and 124 districts have been affected. After eight months of zero AWD case report in the region ,No case reported this week and there is no new AWD cases in the region for the last consecutive 60 days that enable us to declare over the local transmission of AWD outbreak this week in the region as per the national and WHO guideline(at least 42 consecutive days).

Guinea Worm

In this week, no suspected guinea worm case was reported to the region.

Scabies

Regionally, since the occurrence of Scabies outbreak a total of 162545 cases were reported to date of which 42,775 cases were reported in 2009 EFY while the rests were in the 2010 and 2011EFY. Seventeen zones, twelve towns and 118 woredas were affected up to now. In this week 2874 scabies cases were reported to the region.

Table 42: *Scabies cases by zones/towns of Oromia Region, week 51, Dec, 2018.*

Zone/town name	# of case	% from region
Region	2874	100
East Hararge	845	29.4
West Harerge	588	20.5
East Shewa	492	17.1
West Arsi	381	13.3

Arsi	217	7.6
West Guji	139	4.8
Jimma	67	2.3
Sululta Town	30	1.0
Horro Guduru Wollega	26	0.9
East Wollega	24	0.8
North Shoa	21	0.7
West Shoa	13	0.5
Finfine Zuria Oromia Special Zone	12	0.4
Kellem Wollega	7	0.2
Batu Town	5	0.2
Bishoftu Town	4	0.1
Robe town	2	0.1
Jimma town	1	0.03

Other cases

In this week, a total of 90 other cases reported to the region., were 88 Dog bites/animal bite and 2 prenatal death.

Response Activities

Based on weekly surveillance report, feed-back is often given to all zones and towns timely. Health and nutrition taskforce meeting is conducted with our partners every two weeks. Any rumors have been received, verified and risks have been communicated timely.

Contact us:

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About this newsletter:

This bulletin is weekly Public Health Emergency Management and Health Research Directorate of Oromia Regional Health Bureau. It is prepared and disseminated on a weekly basis. Your comment & suggestion will plays a great role in improving our bulletin.

Declaration

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

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

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Signature:_____
Date _____

2 .**Mr.Mengistu Yilma**

Signature_____

Date _____

ANNEX 1: -DATA COLLECTION TOOLS

1. **Questionnaire for Case - control study on Measles outbreak in Goro Woreda, Bale Zone, Oromia Region, November 2018**

Region_____ Zone_____ Woreda_____ Kebele _____ Got _____ Phone_____

Location: Longitude:_____ Latitude:_____ Date of data collection_____

I Socio-demographic

Status of the person **1.Case** **2.Control**

1.1 Patient code number_____(Patient Name_____)

1.2 Sex 1. Male 2 . Female

1.3 Age years_____ Months_____

1.4 Occupation of the patient/control 1. Farmer 2. House wife 3. Student 4. Unemployed 5. Daily laborer 6. Merchant 7. Gov't 8. Other (specify)_____

1.5 Family Occupation 1. Farmer 2. House wife 3. Student 4. Unemployed 5. Daily laborer 6. Merchant 7. Gov't 8. Other (specify)_____

1.6 Religion 1. Orthodox 2. Protestant 3. Muslim 4. Catholic 5. Other (specify)_____

1.7 Ethnic group 1. Oromo 2. Amhara 3.Tigray 4. Other (specify) _____

1.8 Educational level of the patient/control 1. Illiterate 2. Read and write 3. Elementary 4. Secondary 5. Above secondary 6. Under school age

1.9 Educational level of the family 1. Illiterate 2. Read and write 3. Elementary 4. Secondary 5. Above secondary

1.10 Marital status of the patient/control 1. Single 2. Married 3. Divorced 4. Widowed 5. Separated, 6.not applicable

1.11 Family size _____

1.12 Is there any sick person with rash, fever, running nose/conductivities (illness)? In the family? 1. Yes 2. No

1.13 If yes, number of sick person _____

II. Clinical History of Diseases:

2.1 What was the symptom?

1. fever 2.Rash 3.cough, 4.coryza (runny nose), 5. conjunctivitis (red eyes) 7. Ear discharge 8. diarrhea 9. Vomiting 10. Others_____

2.2 Ask ONLY if complication and specify it_____

2.3 Date of rash on set _____

2.4 Duration of rash_____

2.5 Date seen at health facility _____

2.6 Illness duration before visiting the health facility _____ in days/hours

2.7 Did you (he/she) take treatment? 1. Yes 2.No

2.8 Location when rash started? District_____Kebele_____

2.9 Did you recovered after the treatment? 1. cure 2. partially 3. deteriorated/disabled 4.death

III. Risk factor

3.1 Did you ever vaccinated for measles? 1. Yes 2.No 3. Unknown 4. Not applicable

3.2 If yes, last vaccination date

1. Patient recall_____ dd/mm/yy

2. Vaccination card_____ dd/mm/yy

3. Don't remember

3.3 Number of vaccine doses received

1. One dose 2. Two dose

3. Three and above 4.dont remember

3.4 Age of vaccination at first vaccinated. _____

3.5 If not vaccinated why? 1 lack of knowledge about vaccination campaign,

2. Absence during vaccination campaign,

3. other, specify

3.6 Did you have any travel history 7-18 days to areas with active measles cases before onset of symptoms? 1. Yes 2.No

If Yes where _____

3.7 Did you contact with a person with measles symptoms within the last 2-3 weeks?

1.yes 2. no

3.8 Do you have any travel history four days before and after rash onset 1.Yes 2. No

If yes where _____

3.9 Do you have any contact history with someone else four days before and after rash onset

1.yes 2.No

If yes with whom_____

3.10 If Yes to question 3.5 place of travel 1.School 2.Neighbor 3.Market 4.Other_____

3.11 Do you know modes of transmission for measles?

1.Yes 2.No

3. If yes specify_____

3.12 Nutritional status of the cases 1. Normal 2.Moderate 3.Severely malnourished

3.13 What is the estimated area of the house? _____

3.14 House condition? 1. ventilated 2. Not-ventilated

3.15 Distance from house to HC? 1. Greater than 5 km 2. Equal or less than 5 km

3.16 Where did you go first when you get ill? 1. Health Facility 2. Traditional Healers 3. Holy Water 4. Stayed at home 5. Other :(Specify)_____

3.17 How do you think people get measles? 1. Contact with ill person 2. From God 3. Evil eye 4. Other (Specify)_____

3.18 Do you Know measles is vaccine preventable?

1. Yes 2. No 3. Don't Know

3.19 Who do you think can be affected by measles?

1. Children of aged less than 5 years 2.Children of aged less than 18 years 3. Women of any ages 4. Any age groups of both male and women ,5. Other (specify):_____

3.20 How do you think measles can be cured? 1. Using modern medicine 2. Using traditional Medicine 3. Holly water 4. Spiritual 5. Keeping the sick person indoor 6. Other (Specify)_____

Name of data collectors_____

Date of data collection_____

Sign_____

2. Questionnaire for cross sectional study on scabies outbreak in Ginnir Woreda, Bale Zone, Oromia Region, February 2019

Region_____ Zone_____ Woreda_____ Kebele _____ Got _____ Phone_____

Location: Longitude:_____ Latitude:_____ Date of data collection_____

I Socio-demographic

1.1 Patient code number_____(Patient Name_____)

1.2 Sex 1. Male 2 . Female

1.3 Age years_____ Months_____

1.4 Occupation of the patient/control 1. Farmer 2. House wife 3. Student 4. Unemployed 5. Daily laborer 6. Merchant

1.5 Family Occupation 1. Farmer 2. House wife 3. Student 4. Unemployed 5. Daily laborer

1.6 Religion 1. Orthodox 2. Protestant 3. Muslim 4. Catholic 5. Other (specify)_____

1.7 Ethnic group 1. Oromo 2. Amhara 3.Tigray 4. Other (specify) _____

1.8 Educational level of the patient/control 1. Illiterate 2. Read and write 3. Elementary 4. Secondary 5. Above secondary 6. Under school age

1.9 Educational level of the family 1. Illiterate 2. Read and write 3. Elementary 4. Secondary 5. Above secondary

1.10 Marital status of the patient/control 1. Single 2. Married 3. Divorced 4. Widowed 5. Separated, 6.not applicable

1.11 Family size _____

1.12 Is there any sick person with similar disease in the family? 1. Yes 2. No

II. Clinical History of Diseases:

2.1 What was the symptom?

2.2 Date of onset of itching _____

2.3 Time of itching worsed _____

2.4 Date seen at health facility _____

2.5 Illness duration before visiting the health facility _____ in days

2.6 Did you (he/she) take treatment? 1. Yes 2.No

2.7 Location when itching started? District_____Kebele_____

III. Risk Factors

3.1 Economic status of the patient /family

1. Poor 2.medium 3.wealth

3.2 Is there provision of pure water supply in the Kebele/Medresa?

1. Yes 2.No

3.3 Do you have any contact history for long duration with someone with similar disease?

1. Yes 2.No

3.4 Are shared your close with your friend? 1. Yes 2. No

3.5 Do you know modes of transmission for scabies?

1.Yes 2.No

3.6 Nutritional status of the cases 1. Normal 2.Moderate 3.Severely malnourished

3.7 Where did you go first when you get ill? 1. Health Facility 2. Traditional Healers 3. Holy Water 4. Stayed at home

3.8 How do you think people get scabies? 1. Contact with ill person 2. From God 3. Evil eye 4. Other (Specify)_____

3.9 Do you Know scabies can be treated?

1. Yes 2. No

3.10 Who do you think can be affected by scabies?

1. <5yrs 2. <15 yrs 3. Any person

3.11 How do you think scabies can be cured? 1. Using modern medicine 2. Using traditional Medicine 3. Holly water 4. Spiritual 5. Keeping the sick person indoor 6. Other (Specify)_____

Name of data collectors_____

Date of data collection_____

Sign_____

3. Questionnaires for evaluation of surveillance system, Akaki, Finfinne Surrounding Special Zone, Oromia, Ethiopia, November 2018

Background Information of woreda

1. Name of Region_____
2. Number of Zone_____
3. Background of the district Name_____, Climate_____, Area km2_----------, distance from Addis_____, Total population----------,Total HF_____, Gov't_____, private_____,
4. Is there a national manual for surveillance?
   A. Yes
   B. No
5. If yes, describe (last update, diseases included, case definitions, surveillance and control, integrated or different for each disease): for which disease? _____
6. Is surveillance/PHEM included in the annual health plan (EFY 2011) A. Yes B. No
7. Do you have standard case definitions for the Country's priority diseases like malaria and measles? (Observed the standard case definition for each priority disease) A. Yes B. No C. Unknown D. Not applicable
8. Is there surveillance report format in the health facilities? A. Yes B. No C. Unknown D. Not applicable
9. If yes, is there shortage of appropriate surveillance forms at any time during the last 6 months? A. Yes B. No 3. Unknown 4. Not applicable
10. What are the reporting units for the surveillance system?
    A. Public health facilities
    B. NGO health facilities
    C. Military health facilities
    D. Private health facilities e. Others_____
11. Number of reports received at district level during the past 3 months:
12. Number of reports in the last 3 months compared to expected number Weekly: /12 times the number of districts Immediately: /------ times the number of districts
13. Number of weekly reports received on time (in this 3 months): /12 times the number of districts On time (use national deadlines)
14. Was there any report of the immediately reportable diseases in the past 1 month? A. Yes B. No

14.1 If yes, with in what time is the report received after detection of the case/ diseases? 1. Less than 1 hour 2. 2-24 hour 3. 1- 2 days 4. 3- 7 days 5. After 1 week

14.2 Means of reporting to next level by: 1. E-mail 2.Telephone 3. Fax 4.Radio

15. Did the region/zone describe data by person (case based, outbreaks, and sentinel)? Observed description of data by age and sex: 1. Yes 2. No 3. Unknown 4. Not applicable
16. Did the zone/district describe data by place? Observed description of data by zone/district (tables, maps) A. Yes B. No C. Unknown D. Not applicable
17. Did the zone/district describe data by time? Observed description of data by time: A. Yes B. No C. Unknown D. Not applicable
18. Did the zone/district Perform trend analysis? Observed line graph of cases by time A. Yes B. No C. Unknown D. Not applicable
19. List disease(s) for which line graph is observed _____
20. Did the district have an action threshold defined for each priority disease? (AWD, Measles, AFP/polio, malaria) A. Yes B. No
21. Who is responsible for the analysis of the collected data? _____
22. How often do you analyze the collected data? A. Daily B. Weekly C. Every 2 weeks D. Monthly E. Quarterly F. As needed……..
23. Have appropriate denominators? Observed presence of demographic data (E.g. population by district and hard to reach groups) A. Yes B. No C. Unknown D. Not Applicable
24. Number of outbreaks suspected in the past year:_____
25. 26. List the diseases: _____
26. Number of investigated outbreak: (Observe reports & take copies) _____
27. Number of outbreaks in which risk factors were looked for:_____
28. Number of outbreaks in which findings were used for action: [Observe report] _____
29. Number of districts that looked for risk factors [observe in reports] _____
30. Number of districts that used the data for action [observe in final report] _____
31. Does the district have a written emergency preparedness plan for any of the outbreak disease relevant to the area? (Observed a written plan) A. Yes B. No C. Unknown D. Not applicable
32. Does the Zone/district have emergency stocks of drugs, vaccines, and supplies at all times in past 1 year? A. Yes B. No C. Unknown D. Not applicable
33. Does the Zone/district experienced shortage of drugs, vaccines or supplies during the most recent epidemic (or outbreak)? A. Yes B. No C. Unknown D. Not applicable

34. Do you have a standard case management protocol for AWD, Malaria, AFP (polio), measles (Observed the existence of a written case management protocol for at least 1 priority disease) A. Yes B. No C. Unknown D. Not applicable (if yes list:_____)
35. Is there a budget line for epidemic response? A. Yes B. No C. Unknown D. Not applicable
36. Is there zonal/district epidemic management committee? Observed minutes (or report) of meetings of epidemic management committee A. Yes B. No C. Unknown D. Not applicable
37. Does the zone/district/facilities have a rapid response team for epidemic?
    A. Yes B. No C. Unknown D. Not applicable
38. Does the region/zone respond within 48 hours of notification of most recently reported outbreak? Observed that the region/zone responded within 48 hours of notification of most recently reported outbreak (from written reports with trend and intervention)
    A. Yes B. No C. Unknown D. Not applicable
39. Has epidemic management committee evaluated its preparedness and response activities during the past year (Observe written report to confirm)? A. Yes B. No C. Unknown D. Not applicable
40. How many feedback reports has the regional/zonal level produced in the last year? Observed the presence of a report _____
41. How many supervisory visits have you made in the last 6 months? _____
    Obtained required number of visits from regional/zonal level _____
42. The most usual reasons for not making all required supervisory visits. (Text) _____
43. Have you been trained in disease surveillance? A. Yes B. No C. Unknown D. Not applicable

44. If yes, specify when, where, how long, by whom?_____ Total reporting sites---------- Number of sites that have:

45. Data management Computer and Printer---------- Photocopier---------- Data manager ---------- Statistical package----------

46. Communications Telephone service---------- Fax----------Radio call---------- Satellite phone----------

47. Do you have a computerized surveillance network at this level? A. Yes B. No C. Unknown D. Not applicable

49. How could surveillance be improved? (Opportunities for strengthening surveillance)_____

50. Is there a focal unit for surveillance at the district/facilities level? [Observe organo-gram to confirm] A. Yes B. No C. Unknown D. Not applicable

Questionnaire for Attributes and level of Usefulness:

51. What is the incidence / Prevalence of priority disease in your area 1. Malaria _____cases _____Deaths _____
52. What is ITN coverage of the district?_____%
53. Does the surveillance system help for this selected priority disease to detect outbreaks of these selected priority disease early? A. Yes B. No
54. Does the surveillance system help for this selected priority disease to estimate the magnitude of morbidity and mortality related to this disease, including identification of factors associated with this disease? B. Yes C. No
55. Does the surveillance system help for this selected priority disease permit assessment of the effect of prevention and control programs?

    A. Yes B. No

56. Does the surveillance system help for this selected priority disease allow interventions and disease trends analyzed? A. Yes B. No
57. Is the case definition of malaria easy for case detection by all level health professionals? A. Yes B. No
58. What are the organizations which need to receive reports of the surveillance data? ----------
    ----
59. Do you feel that additional data collected on a case is time consuming? A. Yes B. No
60. How long does it take to have laboratory confirmation of Malaria?_____
61. Can the current reporting formats be used for other newly occurring health event (disease) without much difficulty? A. Yes B. No
62. Do you think that any change in the existing procedure of case detection, reporting, and formats will be difficult to implement? A. Yes B. No Comment:_____ _____
63. Are the data collection formats for these priority diseases clear and easy to fill for all the data collectors/ reporting sites? A. Yes B. No
64. Are the reporting site / data collectors trained/ supervised regularly?

    A. Yes B. No

65. Review the last month's report of this disease

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

ii. Percent of reports which are complete (i.e. with no blank or unknown responses) from the total reports_____

66. Do you think all the reporting agents accept and well engaged to the surveillance activities? A. Yes B. No
67. If yes, how many are active participants (from the expected)? _____
68. If No, what is the reason for their poor participation in the surveillance activity?
    A. Lack of understanding of the relevance of the data to be collected
    B. No feedback / or recognition given by the higher bodies for their contribution; i.e. no dissemination of the analysis data back to reporting facilities
    C. Reporting formats are difficult to understand
    D. Report formats are time consuming
    E. Other_____
69. What is the health service coverage of the district/ ? _____%
70. Do you think, the populations under surveillance have good health seeking behavior for diseases under surveillance? A. Yes B. No
71. Do you think diseases under surveillance are well represented by the surveillance system? A. Yes B. No
72. Was the new BPR restructuring affect the procedures and activities of the surveillance of diseases under surveillance? A. Yes B. No
73. Was there lack of resources that interrupt the surveillance system? A. Yes B. No

I. CASE DETECTION AND REGISTRATION (Observation)

1. Is there a clinical register in health facilities? Yes/No_____
2. Do health facilities correctly registered cases? Yes/No_____(Observe the last 30 days)
3. Is there a standardized case definition for the country's priority diseases in health facilities? Yes/No_____

II. **DATA REPORTING** _____

4. Is there appropriate surveillance forms for that site at all times over the past 6 months? Yes/No_____
5. Does report and register have consistency? Yes/No_____

Observed that the last monthly report agreed with the register for 4 diseases (1 for each targeted group [eradication; elimination; epidemic prone; major public health importance])

a. **Obs.** Measles Y / N
b. **Obs.** Malaria Y / N

c. **Obs.**AFP (polio) Y / N

d. **Obs.** AWD Y / N

6. Number of reports in the last 6months compared to expected number

Obs. Weekly: /24 times the number of sites

Obs. immediately: /-- times the number of sites

7. On time (use national deadlines**)**

Obs. Number of weekly reports submitted on time:-_____ /24 times the number of sites

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

8. Means for reporting in health facilities/health office to next level

a. Mail

b. Fax

c. Telephone

d. Radio

e. Electronic

f. Other

9. How can reporting be improved? _____

III. DATA ANALYSIS

10. Described data by person (outbreaks, sentinel)

Obs. Observed description of data by age and sex

Yes No

11. Described data by place

Obs. Observed description of data by place (locality, village, work site etc)

Yes No

12. Described data by time

Obs. Observed description of data by time

Yes No

13. Performed trend analysis

Obs. Observed line graph of cases by time

Yes No

IV. Epidemic response

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

V. Feedback

15. How many feedback bulletin or reports has the health facility received in the last year?

Obs. Observed at least 1 report or bulletin at the health facility from a higher level during the past year on the data they have provided

Yes No

16. How many meetings has this health facility conducted with the community members in the past six months? _____

Obs. Observed the minutes or report of at least 1 meeting between the health facility team and the community members within the six months

Yes No

VI. Supervision:

17. How many times have you been supervised in the last 6 months?_____

Obs. Observed supervision report or any evidence of supervision in last 6 months

Yes No

18. Was supervision intended for surveillance activities?

Obs. Observed supervision report or any evidence for appropriate review of surveillance practices

Yes No

VII. Training

19. Have you been trained in disease surveillance and epidemic management?

Yes No

20. ***If yes,*** specify when, where, how long, by whom?_____

VIII. Resources

Health facilities that have:

21. Logistics
    a. Electricity
    b. Solar/Generator
    c. Bicycles
    d. Motor cycles
    e. Vehicles
22. Data management
    a. Stationery

b. Computer
c. Software
d. Printer

23. Communications
    a. Telephone service
    b. Fax
    c. Computers

24. Information education and communication materials
    a. Posters
    b. Megaphone
    c. Generator
    d. Screen
    e. Other:

25. Hygiene and sanitation materials
    a. Spray pump
    b. Disinfectant

26. Protection materials (list) _____ _____ _____

*27. The main gaps identified in the surveillance system and how to improve*_____

4. Questionnaires/Data collection tools for Descriptive Woreda Health Profile

1, Historical Aspects of the area

1.1 Historical background of the Woreda and year of establishment_____

2, Geographic description of the woreda

2.1Woreda map

2.2Woreda area in Km2_____

2.3Location (distance from capital city and direction _____

2.4Altitude _____

2.5Annual rain fall (average)_____ Max_____Min_____

2.6Annual temp(average)_____High _____Low_____

2.7Climatic zones Highland_____% Midland _____% Lowland _____%

2.8Accessibility to main roads_____

3, Administrative setup

3.1Total no. of Kebeles: _____ Rural_____Urban_____

3.2Woreda boundaries North_____South_____

East_____ West_____

4, Demographic information

4.1 Population: Total_____ urban_____.rural_____

Male Popn _____Female Popn _____ sex ratio_____

< 1yrs_____, < 5 yrs_____, < 15 years_____, >64 years_____,Women 15-49 yrs of age_____.

4.2Total population by Kebele (each Kebele pop)_____

4.3 Ethnic composition/language and religion_____ _____

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

5.1Main source of the economy _____

5.2Others sources of economy_____

5.3 Average HHS income_____(_EBr)

5.4Total land coverage in Hectares _____

5.5Farming _____(%)

5.5Grazing _____(%)

5.6Forest **_____(%),**

5.6 Others_____(%)

5.7Agriculture and its organization_____

5.8The main Crops in the Woreda **----------,----------,----------**

5.9The main livestock in the Woreda----------,----------,----------,----------

5.10The main problems of crops production_____

5.11Methods of improvement_____

5.12The main problems of Livestock_____-

5.13Methods of improvement_____

6, Education and school Health

6.1Distribution of Schools:

6.1.1 Primary (1-8) ____1st Cycle(1-4)_____ 2ndCycle (5-8)____

6.1.2 Secondary (9-10)_____

6.1.3Preparatory schools (11-12)_____,

6.1.4TVET/colleges_____

6.1.5K.G _____

6.2 Educational status of the community

6.2.1Total School Age Children (target)_____

6.2.2Total Enrolment _____(_____%)

6.2.3School dropout in 1st semester of 2010 _____

6.2.4If there is school dropout, why _____

6.2.5Total Educated people as a whole, _____ Male _____ Female _

School health activities:

6.3.1Water supply: schools with water supply_____

6.3.2Toilets: schools with functional latrines (Male& Female)_____

6.3.3Schools with HIV/other Health clubs_____

7, Woreda infrastructures (Transport, Telecommunication, Power supply, Water supply…)

7.1How many of the **health posts/Kebeles** have access to transportation_____(_____%)

7.2Telecommunication_____(_____%) ,

7.3Electric power_____(_____%)

7.4Water supply _____(_____%)

7.5How many of the health centers have access to transportation_____(_____%)

7.6 Telecommunication_____(_____%)

7.7. Electric power_____(_____%)

7.8Water supply _____(_____%)

8, Health delivery system (Woreda Health Structure/organogram)

4.6 Types and Number health Facilities in the District----------

4.7 Health facilities ratio to population----------

4.8 Number of Beds per health facilities----------

4.9 Health service coverage of the District----------

4.10 Total Woreda health Office man power----------

4.11 Total health professional in the District----------

4.12 Total supportive staff in the District----------

4.13 Health professional ratio to population----------

4.14 Number of Woreda Health office man power by level education---------- (%)

Top ten Cause of morbidity and mortality in the District during 2009

4.15 2009 Top ten causes of morbidity in Adult OPD with number and percent in the District

4.16 2009 Top ten cause of morbidity in Adult IPD with number and percent

4.17 2009 Top ten cause of morbidity in Pediatrics' OPD with number and percent

4.18 2009 Top ten cause of morbidity in Pediatrics' IPD with number and percent

4.19 2009 top ten cause of mortality in Adult ward with number and percent

4.20 2009 top ten cause of mortality in Pediatrics' ward with number and percent

Vital Statistics and Health Indicators

4.21 1Infant Mortality Rate (IMR) ____(total <1 yr deaths in the last yr)

4.22 Total live birth----------

4.23 Total still births_____

4.24 Total neonatal deaths_____

4.25 Child Mortality Rate_____(total <5 yr deaths in the last year yr)

4.26 Crude Birth Rate_____

4.27 Crude Death Rate_____ (total deaths last yr)

4.28 Maternal Mortality Rate_____(total maternal deaths in the last year)

4.29 Contraceptive Prevalence rate_____

4.30 Contraceptive acceptance rate _____

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

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

4.33 Percentage of deliveries attended by skilled birth attendants_____

4.34 Percentage of deliveries attended by HEWs_____

4.35 Percentage of deliveries attended by TBA _____

Immunization Coverage (%) (For children)

4.36 BCG _____

4.37 OPV-3 _____

4.38 Penta-1_____

4.39 Penta-3 _____

4.40 PCV1 _____

4.41 PCV3 _____

4.42 Measles _____

4.43 Fully immunized_____

4.44 Vitamin A_____

4.45 PAB_____

4.46 PW TT2+ _____

4.47 NPW TT2+ _____

Health budget allocation

4.48 Total government budget allocated for the district _____

4.49 Total budget allocated for health _____(____%)

4.50 Is woreda allocate budget for PHEM?_____

4.51 Total Funds from NGO _____ and its (purpose/programs)_____

Disaster situation in the woreda

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

4.53 Any recent disease outbreak/other public health emergency_____

4.54 If yes, cases_____ and deaths_____

General Status of Primary Health Care Components, Availability of common service(Yes/No)

4.55 MCH(Delivery, ANC, PNC)_____

4.56 FP(Methods) _____

4.57 EPI(outreach service, cold chain, vaccine)_____

4.58 Community Based health Insurance(CBI)_____

4.59 Communicable disease control_____

4.60 Essential drugs and logistic availability_____

4.61 Hygiene and sanitation activities _____

Environmental Health, Sanitation Hygiene. (WASH)

4.62 Latrine coverage_____(____%) & utilization rate_____(_____%)

4.63 Total safe water supply coverage_____ (_____%)

4.64 Safe water supply coverage by kebele with its popn _____

4.65 Main source of water supply _____

4.66 Others_____

4.67 ODF Kebeles_____(_____%)

Endemic diseases; (in No & % for all questions)

Malaria:

4.68 Total malarious Kebeles_____

4.69 Pop at risk_____

4.70 ITNs coverage _____

4.71 Is there IRS this year (No of kebeles) _____

4.72 If yes, No of Kebeles undertaking IRS_____

4.73 Population covered _____

4.74 HHs covered_____

4.75 Total malaria cases/yr_____ Deaths/yr_____,

4.76 Malaria supplies (Courtum, RDT, etc) shortage _____(month)

4.77 If, Other issues_____

TB/Leprosy

4.78 Total TB cases_____

4.79 PTB negative_____

4.80 PTB positive____

4.81 Extra PTB _____

4.82 TB detection rate _____

4.83 TB Rx completion rate _____

4.84 TB cure rate _____

4.85 TB Rx success rate _____

4.86 TB defaulter_____

4.87 Death on TB Rx_____

4.88 Total TB patients screened for HIV_____

4.89 Total Leprosy cases_____ on Rx_____

HIV/AIDS;

4.90 Total people screened for HIV (last one year)_____

4.91 VCT_____

4.92 PITC_____

4.93 PMTCT_____

4.94 HIV Positive rate_____

4.95 HIV Incidence (new cases/yr)_____

4.96 Total PLWHA_____

4.97 On ART_____

4.98 On Pre-ART_____

4.99 Other HIV prevention activities_____

Nutrition (malnutrition)

4.100 OTP sites exist, Plan_____,Ach_____(___%)

4.101 Total Annual admissions to OTP_____

4.102 Total SC sites establishment, Plan_____ach_____(_____%)

4.103 Total admissions to SC _____

4.104 Is there TSF (Targeted Supplementary Feeding) program in the woreda? ____

4.105 If yes children in the program, _____ (No & %)

4.106 CBN program_____

4.107 If yes children in the program, _____ (No & %)

4.108 Is there PSNP program?_____

4.109 If yes children in the program, _____(No & %)

4.110 General food security condition_____

9. Is there shortage of Essential drugs? if yes ,specify._____
10. The major Health problem/s of the woreda?_____
11. Highlights of main findings of the health profile assessment and description_____

_____

12, Problem Identification and priority setting

1,_____

2,_____

3,_____

4,_____

5,_____

5. **Check list /Data collection tools for IDP situation assessments in Begi District of West Wellega Zone, July 2018**

Background of the woreda----------

1. Date (MM/DD/YY)_____

. Name HHs member interviewed_____

3. No of family size _____

4. from where displaced? Region _____woreda/town_____

5. current settlement woreda/kebles_____

6. Is there under one children in the house?_____

7. No.Of under five children in the house_____

8. How many in your household were children less than 2 years old? Number: _____

9. How many in your household were 65 years of age or older? Number: _____

10. If one or more children are currently living in the household, do you have access to enough diapers and formula for 7 days (if needed)? □Yes □No □Don't Know □Ref □NA

11. Is anyone in your household pregnant? _____

11a. If YES, how many? _____

12.is there lactating women in your family?_____

12. Have you shelter for your family? , if yes what type of shelter?_____

13. Have you closes for you and your family?_____

14 .Have you rubber sheet or matters for your family?_____-

15. have you food for your families?_____

16, Have you water supplies for your families?_____

16a if yes from what source_____

17. Is there latrine for your family?_____

18. is somebody in your family currently ill?_____ if yes who? What type of disease?

19.was somebody your family injured during conflict?_____

20.was somebody in your family died during conflict?_____

21.Was somebody in your family has previously ill? , if yes what type of disease?

22.is there nearby health facilities or mobile clinic for families?_____

23. have you got any support from community or government?, if yes what kind of support?

24. Does your household have electricity from the utility company? _____

25. Is your household treating your drinking water?

25a. If YES, how is your household treating your drinking water?

1=Boiling 2=Bottled 3=Chemical treatment 4=No treatment 88=Other

26. Does anyone in your household need medical care or supplies now?

27. Can everyone in your household get the medical care and supplies he or she needs?

27a.If NO, what is preventing you/them from getting the medical attention you/they need?

1=Lack of transportation 2=No medical services available 3=Financial reasons 4=other specify

28.List of anticipated prone diseases identify at IDP sites? List_____

29. What is your household's greatest need right now? _____

30. Do you want to return back to original place if the problem is solved?_____

Data collector name _____Professional_____

Epi Project Consent Form

Title: Assessment of sanitary condition of food and drinking establishments in Bishoftu Town, Oromia, Ethiopia, 2019

Objective: To assess sanitary condition food and drinking establishments, knowledge and practice of food handlers and identify major gaps that may contribute the occurrence of food borne diseases outbreak in the town.

Procedure: This project will take about 30 minutes of your time. There are two parts. First, we will clearly explain you the purpose, benefits and risks of the study. We will give you a chance to ask questions and gate answers about the study. Second, we will ask you about sanitary condition, building condition, availability of latrine, waste management and water facilities as establishments' owner and food handlers will be on knowledge and practice of food handlers in your establishments. Water sample will be also taken from its source and sent for Regional Laboratory for bacteriological test. All information collected during this study will be kept private and will only be known by the investigators.

Benefits: This project will help our community to improve food safety in order to prevent food borne diseases outbreak and Bishoftu Town Health Office to put base line for regulatory purpose.

Risks: There is no risk to you from answering the questions or being participated in this study. We will give you a copy of this consent.

Privacy: We will keep information about you private. We will not collect your name. Only the investigators will have access to the data and only for study purpose. We will not use any information that might identify you when we present or publish the study's results.

Payment: There is no cost to you for being part of the project. The approximate time that this study will take is 30 minutes.

Participant Agreement: The project has been explained for me. I have been given a chance to ask questions. I feel that all my questions have been answered. Being in this study is my choice. I may change my mind and leave the study any time during the interview.

The purpose of the study and confidentiality procedures has been explained to me and me on my own consent: a) Agree _____ b) Disagree_____

Signature of Interviewer_____

Date of interview _____Time started_____ Time completed_____

Checked by supervisor: Name_____ Signature_____ Date_____

6. Questionnaires for assessment of sanitary condition of food and drink establishment and knowledge and practice of food handlers

Code No._____

English Version Questionnaire Addis Ababa University Faculty of Medicine Department of Community Health Questionnaire for Data Collection on Sanitary Conditions of Mass Catering Establishments in Bishoftu Town, Oromia 2011E.C

Identification Type of establishment----------Name of Establishment_____ Address of establishment----------Establishment code No._____ Verbal consent form before conducting interview Greeting:

Hello, my name is _____. I am working in the research team of Addis Ababa University. I would like to interview you a few questions about the sanitary condition of your establishment and some of the questions require physical observation. The objective of this study is to determine the sanitary conditions of food establishments in Bishoftu town, which is important to improve the sanitary status so as to safeguard the health of consumers from food borne disease. Your cooperation and willingness for the interview and observation is helpful in identifying problems related to the subject matter. Your name will not be written in this form. All information that you give will be kept strictly confidential. Your participation is voluntary and you are not obliged to answer any question you do not wish to answer. If you are not still comfort with the interview please feel free to drop it any time you want. Do I have your permission to continue? 1. If yes, continue to the next page 2. If no, skip to the next participant Interviewers name and code _____ signature _____

Date of interview _____ Time started_____ Time finished_____ Supervisors name _____ signature _____

General instruction

Almost all questions have pre-coded response. So it is important to follow the following instructions while you are interviewing respondents and recording their answer. Ask each question exactly as it is written on the questionnaire. Do not rely on the response of respondents only; inspect/observe the areas that need physical observation. Do not read the pre-coded response to respondents. Listen only the response of respondent. Circle the response in the response column that best matches the answer of the respondent.

DATA COLLECTION TOOLS

1. GENERAL INFORMATION

- Name of the establishment: _____
- Name of manager: _____Tel: _____
- Name of Ownership_____Tel:_____
- Address: Zone/Town: _____ District/Town: _____ Kebele
- Average number of consumers/days: _____Persons.
- Number of food handler : Male _____ Female _____Total_____
- Number of Workers ;Male_____Female_____Total_____

A. **Food handler**

a. Sex of food handler 1. Male 2. Female
b. Age of food handler: _____years _____
c. For how long you stay in this work? _____

1.4 Marital status of food handler 1. Single 2.Married 3.Divorced 4.Widowed

1.5 Educational status of food handler 1. Illiterate 2.Elementary 2. High school 4. 12+

A1. Knowledge of food handlers

1.6 Have you ever heard about food borne disease? 1. Yes 2.No

1.7 Who is your source of information about food borne disease? 1. Health center 2. Environmental Professionals 3. Mass Media 4. Other specify----------

1.8 What is the cause of food borne disease? 1. Germs 2.Evil eye 3.God 4.Do not know

1.9. Food borne disease is transmitted by

1. Contaminated food 2.Contaminated water 3.insects 4.Rodents

2.0 What is the reason for food contamination?

1. Dirty hands. 2. Infected food handlers 3. Dirty utensils 4.insect and rodents 5.Others specify-

A2. **Practice of food handlers**

2.1. Do ready to eat foods kept in clean container and covered properly during inspection? 1. Yes 2. No

2.2 Do food utensils stored in well-arranged manner in shelf or cupboard during inspection? 1. Yes 2. No

2.3 Does the food handler wear outer garments/gown during inspection? 1. Yes 2. No

2.4 . Does the gown clean? 1. Yes 2. No

2.5 Does the food handler's hair covered? 1. Yes 2. No

2.6 Does the food handler wear finger ornaments? 1. Yes 2. No

2.7 Does the food handler's finger nail cut short? 1. Yes 2. No

2.8Does the kitchen free of dust, litter or other dirt? 1. Yes 2. No

2.9 Does the food handler wash his/her hand before starting food preparation today (this morning)? 1. Yes 2. No

3.0Does the food handler takes medical checkup in the past one year? (See medical certificate) 1. Yes 2. No

3.1 If the answer for number 35 is no, does he/she had made medical checkup ever before? 1.Yes 2.No

3.2 Is the food handler trained on food preparation and handling? 1. Yes 2.No

4 **Does the food handler have symptom of the following infections**?

4.1 Diarrhea 1. Yes 2. No

4.2 Respiratory infection/cough 1. Yes 2. No

4.3 Skin lesion (boils, cuts wounds etc) 1. Yes 2. No

4.4 Discharge from ear 1. Yes 2. No

4.5 Discharge from nose 1. Yes 2. No

4.6 If food handler has symptoms of illness was he/she treated? 1. Yes 2. No

4.7 For how long she/he withdraws from work after illness?

B. Assessment of sanitary conditions food establishments

For the following question write ''1''' instead of Yes, ''2'' instead of No

S.N	Inspection Criteria	Yes=1 No =2
5.0	**Building location**	
5.1	Free from solid & liquid wastes, flood, objectionable odors & source of pollution.	
5.2	Free from insects, rodents, flies and other pests.	
5.3	Constructed of hygienic and well-maintained construction material.	
6.0	**Raw materials and storage room**	
6.1	Is the storage room clean and kept in good repair?	
6.2	Are all **raw materials** placed separately in orderly manner/is there gap between them/ so as to freely move in the store from one corner to another?	
6.3	Are the raw materials placed 20 cm from the ground /using **pallets** /and far at least 50 cm from the wall and 60 cm far from ceiling/roof?	
6.4	Are the floors being free from cracks, open joints and non-slippery?	
6.5	Are floors, walls, ceilings, doors and windows constructed of easily cleanable materials?	
6.6	Are floors, walls, ceilings, doors and windows prevent the entry of pests, rodents and birds also no breeding places for them?	
6.7	Is Lighting, air circulation and ventilation of the room in a good condition?	
6.8	**Labeling of stored food and drink:** All food and drink should be labeled and separately stored in the required temperature and records should be present and FIFO should implement.	
6.9	Are the raw materials properly coded and labeled /name, batch no., production date, expiry date, manufacturer, address and others /?	
6.10	**Stores classified by temperature zone:** Dry store($10C^0$-$21C^0$), chiller ($2C^0$-$8C^0$) and freezer (-$18C^0$ and above) stores	
6.11	Are chemicals, cleaning compounds and other hazardous materials kept in original containers coded and stored separate from other materials?	
7.0	**Personnel hygiene facilities and toilets**	
7.1	Is there pre–employment medical checkup certificate for the workers?	
7.2	Is there quarterly (four times per year) medical and holiday return checkup?	
7.3	Is occupational or work place safety and hygiene training given for the workers?	
7.4	Are all the workers have their own lockers and changing facilities kept clean?	
7.5	Are personnel with confirmed of having any communicable disease or other illness: had given rest until they being well from their illness?	
7.6	Do employees wear suitable protective devices/apron, cap, safety shoes/boots, dust mask, gloves and ear muffle / while at work?	
7.7	Do all workers wash their hands at every interval of in contact with any contaminants, after using toilets, before leaving the establishment compound and etc.?	
7.8	Employees refrain from eating, spitting, chewing, sneezing, drinking, smoking in working area	

7.9	Are adequate toilet rooms for male and female staffs with washing facilities available?	
7.10	Are Lavatories /toilet rooms/ have appropriate hygienic design available and clean?	
7.11	Are **staff quarter** or **dining** and **rest room** facilities separate from other rooms?	
8.0	***Food Preparation and Cooking/Kitchen***	
8.1	**Premises:** Should be close to the restaurant and have direct access (door, designated lift)	
8.2	Physical status of kitchen utensils: they are free of or not any crack and rusting	
8.3	Absence of improperly disposed solid and liquid waste	
8.4	Absence of rodents, vermin and insects	
8.5	Adequate illumination: check by reading in the room	
8.6	Adequate ventilation: check by observation	
8.7	Exhaust ventilation hood available	
8.8	Hand washing: check the critical time	
8.9	Adequate space for movement and kitchen materials:	
8.10	Adequate space for row and prepared foods (shelves, cabinets…)	
8.11	Adequate space for kitchen utensils (shelves, cabinets…)	
8.12	Waste disposal dust bins with pedals	
8.13	Fire extinguisher: Should be working, fully charged, and recently inspected	
8.14	First aid kit: with full set	
8.15	Separate processing of raw meat, fish, and poultry	
8.16	Food processing: when preparing food remove only sufficient for the task. (only daily consuming)	
8.17	**Food processing**: Food products produced by the establishment and opened fabricated products should be labeled before storage and discarded after 2 days if not used.	
8.18	Cutting boards: polypropylene and color-coded cutting boards.	
8.19	Thawing: ($(7^0$C-10^0C) within 72 hours)	
8.20	Food preparation: food should be prepared in specially designated area	
8.21	Personal Protective Equipment: all staff should wear white uniform including hair net and shoes	
8.22	Leftover food: properly managed	
8.23	Vegetable and fruits sanitization:	
9.0	***Cleaning, sanitizing and dishwashing service***	
9.1	**Dish washer**: a three-compartment dish/cooking equipment –washing basin	
9.2	Availability of Un interrupted hot and cold water	
9.3	Functional Waste water pipe system installed properly with sewer line.	
9.4	**Racks**: for drying washed materials must be in good condition and clean	
9.5	Cabinet or shelves for placing cleaned equipment: must be protected	
9.6	Necessary detergent: presence of cleaning materials	
9.7	All working surface should be cleaned after each task. (observe)	
9.8	**Washing practice**: full practice the 6 steps (scraping, wash with hot water, rinsing in detergents, washing with clean water, racking, drying)	
10	***Restaurant/Dining/café service room***	

10.1	Absence of improper disposal of solid and liquid waste	
10.2	Absence of rodents, vermin and insects	
10.3	Adequate illumination:	
10.4	Adequate ventilation:	
10.5	Waste disposal dust bins with pedals	
10..6	Furniture's and existing materials shall be clean and in good condition.	
10..7	Area of the windows: should cover at least 10-15 % of the total area of the room	
10.8	Should be close to the kitchen or have direct access (door, designated lift)	
10.9	Fire extinguisher: Should be working, fully charged, and recently inspected	
11	***Pastry and bakery service room***	
11.1	Absence of solid and liquid waste	
11.2	Absence of rodents, vermin and insects	
11.3	Adequate illumination:	
11.4	Adequate ventilation:	
11.5	Exhaust ventilation hood available	
11.6	Hand washing: practice at critical time	
11.7	Adequate space for movement and kitchen materials	
11.8	Refrigerators: check whether its functional or not and proper utilization	
11.9	Adequate space for kitchen utensils and for row and prepared foods	
11.10	Separate space (shelves, cabinets) for food additive/preservatives, and powders and all these should be stored by their own packaging and be covered	
11.11	Clean, smooth and easily cleanable processing marble, fabricated wood or stainless steel	
11.12	Separate from kitchen	
11.13	Pre-proceed pastries: should be stored at appropriate T^{o} and must be used within 72 hours	
11.14	Easily manageable doors, temperature reader, clean and in good condition.	
11.15	Waste disposal dust bins with pedals	
12	**Water Supply and water distribution system piping**	
12.1	Is the establishment having safe and adequate supply of water?	
12.2	Is the interior piping in a water distribution system being installed and maintained properly?	
13	***Liquid waste management system***	
13.1	Is the facility has organized liquid waste management system?	
13.2	Is sewage and liquid waste generated from establishment collected and treated in septic tank, and disposed off in seepage or cesspool?	
14	***Solid waste management system***	
14.1	Is Garbage and refuse in the premises of establishment kept in containers which are easy to clean & well maintain?	
14.2	Is there solid waste temporary collection and storage container available?	
14.3	Is incinerator available for burning combustible wastes in the compound?	

Name of data collector1._____Sign_____Date

Annex 2

Some of my pictures captured during field visit at IDP Sites


This was housing condition of IDP site of Adele, Lega Hida, Bale Zone, Oromia (>27,000 population lived here& waiting for humanitarian need


Discussion with Adele PHCU staff on free Health service delivery for displaced people and EPRP on anticipated diseases outbreak


Discussion with community leader at Adele IDP site on latrine utilization and its