Addis Ababa University, College of Health Sciences,

School of Public Health

Ethiopian Field Epidemiology Training Program (EFETP)

Compiled Body of Works in Field Epidemiology

By

Abushet Asnake Shibeshi

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

May, 2014

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Approval by Examining Board

_____ _____

Chairman, School Graduate Committee

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Examiner

_____ _____

Examiner

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Abbreviations and Acronyms

AAU	Addis Ababa University
AFI	Acute Febrile Illness
AFRO	Africa Regional Office
AIDS	Acquire Immune Deficiency Syndrome
ANC	Antenatal Care
AR	Attack Rate
ART	Anti-Retroviral Therapy
ARTI	Acute Respiratory Tract Infection
BCG	Bacillus Calmate Guarine
CBN	Community Base Nutrition
CDC	Center for Disease Control and Prevention
CFR	Case Fatality Rate
CHP	community health pro
CHW	Community Health Workers
CI	Confidence Interval
CTC	Cholera Treatment Center
Deg.	Degree
Diag. Lab.	Diagnostic laboratory
Dip.	Diploma
DRMFSS	Disaster Risk Management Food Security Sector
E.C.	Ethiopia Calendar
EFETP	Ethiopia Field Epidemiology Training Program
EFY	Ethiopian Fiscal Year
EHNRI	Ethiopia Health and Nutrition Research Institute
Env.	Environmental
EPHA	Ethiopia Public Health Association
EPI	Expanded Immunization Program
EPR	Emergency Preparedness and Response
EPRP	Emergency Preparedness and Response Plan
FDRE	Federal Democratic Republic Of Ethiopia
FMoH	Federal Ministry of Health
FP	Family planning
FWEM	Federal Water and Energy Minster
G.P.	General practitioner
Gov.	Government
H.C	Health Center
H.F	Health Facilities
H.O.	Health Officer
H.P	Health Post

HC	Health Center
HEW	Health Extension Workers
HIT	Health Information Technology
HIV	Human Immunodeficiency Virus
HP	Health Post
IDSR	Integrated Diseases Surveillance and Response
IgM	Immune globulin M
IRS	Indoor Residual Spray
ITNs	Insecticide Treated Net
IV	Intra Venous
KM^2	Kilo Meter Square
Lab.	Laboratory
LLITN	Long Lasting Insecticide Treated Net
LP	Lumbar Puncture
MCH	Maternal and child health
MMWR	Morbidity and Mortality Weekly Report
MOH	Ministry of Health
MUAC	Middle Upper Arm Circumference
NGO	Non-Governmental Organization
NMA	National Meteorology Agency
NNT	Neonatal Tetanus
OPD	Out Patient Department
OPV	Oral Polio Vaccine
OR	Odds Ratio
ORHB	Oromia Regional Health Bureau
ORS	Oral Rehydration Salt
OTP	Out Therapeutic Program
PCV-10	Pneumococcal Vaccine 10
PHEM	Public Health Emergency Management
PITC	Provider Initiated Test and counseling
PLWHA	People Living With HIV/ADS
PMTCT	Preventing Mather to Child Transmission
Pop.	Population
PPE	Personal Protective Equipment
PSNP	Productive Safety Net Program
PTB	Pulmonary tuberculosis
RDT	Rapid Diagnostic Test
RHB	Regional Health Bureau
RK_Name	Rural Kebele_Name
RRT	Rapid Response Team

Rx	Treatment
SAM	Sever Acute Malnutrition
SARS	Severe Acute Respiratory Syndrome
SC	Establishing Center
SFP	Supplementary Feeding Program
SIA	Supplementary Immunization activities
SPH	School of Public Health
TB	Tuberculosis
TBA	Traditional Birth Attendant
TSF	Targeted Supplementary Food
TTBA	Trained Traditional Birth Attendant
UN	United Nation
UNICEF	United Nation Children's Fund
URTI	Upper Respiratory Tract Infection
UTI	Urinary Tract Infection
VCT	Voluntary Counseling Test
VHF	Viral Heamorregic Fever
WFP	World Food Program
WHO	World Health Organization
Yr.	Year

Executive summary

Public Health Emergency Management (PHEM) is one of the core processes identified in Federal Ministry of Health. PHEM is the process of anticipating, preventing, preparing for, detecting, responding to, controlling, and recovering from the consequences of public health threats in order that health and economic impacts are minimized. PHEM is designed to ensure rapid detection of any public health threats, preparedness related to logistic and fund administration, and prompt response to and recovery from various public health emergencies, which range from recurrent epidemics, emerging infections, nutritional emergencies, chemical spills, and bioterrorism. The activities under this core process are to be implemented by appropriately trained and capable professionals. Since 2009 Ethiopia Field Epidemiology Training Program had been giving the program to contribute for trained and capable professionals.

The Ethiopia Field Epidemiology Training Program is a two years and in service training program in the assigned field bases. The program is giving in collaboration. Addis Ababa University, School of public Health, Ethiopia Field Epidemiology Training Program, Federal Ministry of Health/Ethiopia Public Health Institute, Ethiopia Public Health Association with CDC Ethiopia and the Regional Health Bureau are executing the program. Field epidemiology Training Program has two components; a 25% class room teaching component and 75% practical or field placement component. During practical component residents assigned in the field base staying in the field base there are two residency out puts, which are residency I and residency II. During practical or field placement outbreak or epidemic investigation, desk review data analysis, description of health profile, writing a scientific manuscript for peer review journals, abstracts for scientific conferences, writing a protocol/proposal of epidemiologic research projects, narrative of a disaster situation or report on health and nutrition need assessment in visited woredas and also additional outputs like PHEM training are including in this document. In the Field base, the field supervisor is leading the whole activities throughout the academic years (two). The field base residency outputs are described in detail on the so called body of work. This body of work contains nine chapters.

The first chapter reflects about outbreaks investigations. The outbreaks occurred in Guji and Horo Guduru Wollega zones and the affected districts were Liben and Abay Chomen,

respectively. In both outbreak investigations being unvaccinated for measles was one of the risk factors for the occurrence of the outbreak.

The second chapter contains measles data analysis. We reviewed five year data (2008 through 2012) to analyse the epidemiology of measles in Arsi Zone, Oromia Region. Based on the finding the administrative vaccine coverage and episode of disease were increased simultaneously in different woredas. This is due to accumulation of susceptible persons in the community and nonexistence of second opportunity for vaccination.

The third chapter describes about the health surveillance system evaluation. The surveillance system evaluation (SSE) was done in West Shewa zone. A total of 14 PHEM focal persons were interviewed about their institution on core function of the surveillance system like case detection, registration, confirmation, reporting, data analysis and interpretation; we also used supportive functions and surveillance system attributes as a tool for the evaluation of the surveillance system. Under SSE we described Public health surveillance system is crucial for population wellbeing. According to the evaluation, the system is in place and help full for detection of the diseases and outbreaks. The main public health problem of the Zone was malaria. Measles was the second public health concern within the Zone and affected more than 180 people in one woreda. At zone and woreda level there was no preparedness plan in place but whenever an outbreak is emerged it is responded reactively. On the issue of completeness and timeliness report, the Zone and its Woredas did not perform well and below the target(80%).

The fourth chapter is about description of health profile. The health profile was done in Lume woreda, East Shewa zone. According to the findings the three top leading diseases in the district, which attacked both adults and children under five years of age were acute upper respiratory tract infection, diarrhoea and acute febrile illness. Most of the diseases were affected the population due to lack of personal and environmental sanitation.

The fifth chapter is describes a Scientific Manuscripts which prepared for submission for Peer reviewed Journals. Measles outbreak in Abay chomen woreda, Horo Guduru Wollega zone, Oromia, February, 2014 is an outbreak investigation which prepared for scientific manuscript.

In chapter six, three abstracts are listed and prepared for submission for scientific presentations. The two abstracts were prepared on measles outbreak investigations done in two Zones (Guji and Horo Guduru Wollega) and one abstract was prepared on measles review data analysis of five years in Arsi zone.

Chapter seven describes about narrative summary of health assessment during pre harvest term of two visited zones (Arsi and Bale) in November 2013. In the two zone totally six selected districts were visited. Based on the findings there were epidemic prone diseases and malnutrition which were risk of the population found in the visited districts.

Chapter eight contains the protocol/proposal on epidemiologic research on selected topic, which is Assessment of ownership and utilization of insecticide treated nets at house hold level in malaria endemic kebeles, Lume Woreda, East Shewa zone, Oromia. It prepared based on the discrepancy between malaria morbidity and complete coverage of ITNs in the woreda. The study will be done in September 2014. A total of 57,812.25 estimated Eth Birr will be needed for the study.

The final chapter contains an additional output report on the PHEM training for PHEM focal persons, who came from different Zone, Woreda and Town. The training was given at Shashemene from April 2-6/2014. The PHEM training needed for capacity building to enhance the quality of the surveillance system through knowledge and skill transfer. A total of 57 trainees had participated on the training in one class 'A'. All trainees had taken pre and post-test to evaluate the gaps and to look that expected outcomes were achieved or not. Based on the finding during the pre-test the maximum test result was 96% and the minimum 40% with mean score 72.6%. During the post-test the maximum score was 100% and the minimum score was 60% with mean score of 88%. Based on the T test result there were a significant association between post and pre-test scores.

Chapter I - Outbreak/Epidemic Investigation

1.1 Measles outbreak investigation in Liben woreda, Guji zone, Oromia, November 2013

Abstract

Introduction

Measles is an acute and highly contagious illness caused by a virus of the family paramyxovirus. It is the leading cause of death among young children globally even in the presence of vaccine. An estimated 157,700 people died from measles in 2011 mostly children under the age of five. The study done to investigate and confirm measles outbreak and assess factors associated with the outbreak in Liben district.

Methods

A line list was prepared to describe the outbreak by place, person and time. Case control study was used with ratio of 1 to 2. Forty-two measles cases and eighty-four controls were enrolled in the study. Cases are those febrile individuals who present with generalized macula popular rash and one or more of cough, coryza and conjunctivitis. Controls were identified from the same area matched for age and sex but with no any of the signs and symptoms of the disease. Data was obtained from parents or care takers by face to face interview with structured questionnaire.

Results

A total of 57 cases were line listed during the outbreak, of whom 31(54.4%) were males. The mean and median ages of the cases were 8.2 and 4 years, respectively. Thirty (52.8%) cases were in the age category of less than five years. From total cases, 21.1% (12/57) were not vaccinated. Based on the case-control finding: being unvaccinated for measles OR=0.3, 95% CI (0.13, 0.65), and contact to measles patient at neighbour, school and other places OR= 5.3, 95% CI (2.4, 11.8) were significantly associated with the outbreak.

Conclusion

Low vaccination coverage was the main contributing factor for the occurrence of the outbreak. In addition to low vaccination coverage, poor cold chain management system may be the cause of the outbreak. Therefore, the woreda health office should strengthen measles routine immunization activities with the target of reaching more than 90% and better cold chain management.

Keywords: Measles, Outbreak, Guji, Oromia, Ethiopia

1.1.1. Introduction

Measles is an acute and highly contagious illness caused by a virus of the family paramyxovirus, genus Morbillivirus. The illness spreads easily from person to person via droplets. Anyone who is not immune to measles is susceptible for infection. The symptoms of measles generally begin about 7-14 days after a person is exposed and usually include fever, runny nose, cough, red watery eyes, and a rash. The skin rash usually appears about 2 to 4 days after the early symptoms developed. The rash begins on the face and soon spreads to other parts of the body. The rash usually lasts 5 to 6 days and then disappears in the same order it appeared (head to foot)(1)

An infected person is able to spread measles from 4 days before and after the rash appears. Serious problems resulting from measles infection include pneumonia, seizures, diarrhoea, ear infections, brain infections and death. Babies less than 12 months of age are too young to be vaccinated against measles and can get very sick if infected. Pregnant women need to take special care to avoid measles because it can cause miscarriage, premature labour or low birth weight in the foetus. Persons who have had measles in the past have lifelong immunity. Since measles can be confused with other infections that cause fever and a rash, a person needs a special blood test to be sure they are immune.

There is no specific treatment for measles. Most people will recover spontaneously(1). To stop virus transmission, population immunity of > 95% is generally considered to be necessary(2). Measles is associated with case fatality rates of 2%–15% in developing countries(3).Measles occurs worldwide; control efforts have substantially altered the global distribution(4). Measles incidence has decreased substantially in regions where vaccination has been instituted; measles in the developing world has been attributed to low vaccination rates(5).

Measles is the leading causes of death among young children globally even in the presence of vaccine. An estimated 157,700 people died from measles in 2011 mostly children under the age of five. Since 2000, more than one billion children in high risk countries were vaccinated against the disease through mass vaccination campaigns of whom 225 million of them in 2011. Global measles deaths have decreased by 71% from 548,300 to 157,700 between 2000 and 2011(6).

In Africa Region, the improved vaccination rates were associated with a 93% reduction in measles cases, from 492,116 cases in 2001 to 32,278 cases in 2008. Measles outbreaks continue to occur, and failure to vaccinate has been identified as the primary cause. However, given the overall success, the African Region recently established several goals, including the year 2012

goal of reducing measles deaths by 98 % compared with year 2000 estimates and the goal of measles eradication by 2020. In 2006 the African Region adopted a goal to achieve 90% measles mortality reduction by 2010 compared with the estimate for 2000. By 2008 in the African Region, reported measles cases decreased 93% and estimated measles mortality decreased 92% compared with 2000. The strategies include improving routine vaccination coverage, providing a second opportunity for measles vaccination SIAs, improving measles-case management, and establishing case-based measles surveillance. Since 2002, Ethiopia accepted the Regional goals and strategies and executed all important steps to control measles. The Africa Region and Ethiopia are working towards measles elimination by 2020. The WHO UNICEF coverage estimates for measles vaccination for Ethiopia also indicate an increase from 37% in 2000 to around 80% in 2010 but still measles is the commonest cause of mortality and morbidity in young children(7).

The vaccine coverage of measles, in 2003 EFY was 81.5% and 83.4% at National and Oromia regional levels ,respectively(8). From January to April 2008 a large outbreak including 1619 confirmed cases occurred in the Guji zone. Among the total confirmed cases, 516 (27%) were unvaccinated children aged less than 5 years(9). In 2005 EFY, three woredas of Guji zone namely/Dolla, Shakiso and Uraga/ were reported measles outbreak(10).

1.1.2. Back ground of the woreda and outbreak situation

Liben woreda is one the woredas in the Guji zone divided in 17 kebeles. The total population of the woreda's is 82,138 with male to female ratio of 1 to 1. A total of 21 health facilities are found in the woreda that includes 4 health centers and 17 health posts. In the 21 health facilities, 40 refrigerators which used for vaccine storage are found, of which, 26(65%) are functional, 10(25%) are non-functional and 4(10%) are on the process of installation. Lega Gula kebele is one of the kebeles found in Liben woreda when the outbreak of measles was reported between October and November 2013. The vaccine coverage of Liben woreda and Lega Gula kebele in 2013 were 102% and 58%, respectively.

The Zonal health office PHEM focal person reported suspected measles cases on October 28,2013 to the Regional Health Bureau PHEM department and subsequently five blood samples were sent to EHNRI for laboratory investigation. After a week, the report revealed four out of the five samples were positive for measles IgM.

The index case was a 30 years old man living in Lega Gula kebele. He come to health facility on 28/10/2013 with signs and symptoms of measles. However his onset of illness was started on 21/10/2013. Having concerned the problem, Oromia Regional Health Bureau/PHEM field base in collaboration with AAU/SPH/EFETP had sent field epidemiology residents to the outbreak site for further investigation.

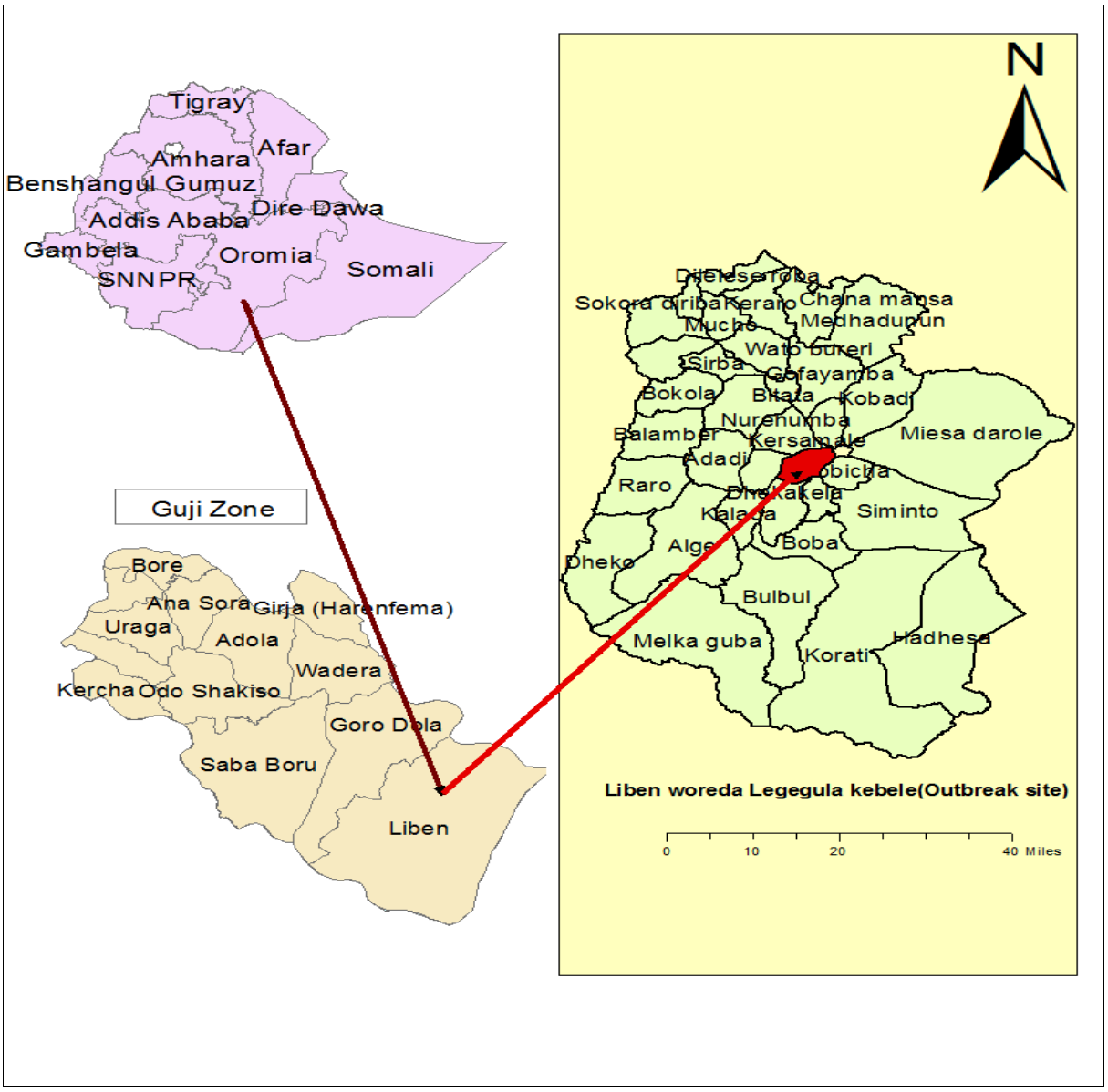

Figure 1.1 : Measles outbreak site in Liben woreda,Guji zone,Oromia,November 2013.

1.1.3. Objectives

1.1.3.1. General Objective:

- To confirm and assess factors associated with measles outbreak and provide technical support in control and prevention activities

1.1.3.2. Specific Objectives:

- To verify the outbreak
- To manage identified cases and applying prevention and control measures.
- To conduct descriptive analysis of the outbreak
- To identify risk factors of the outbreak

1.1.4. Methods

1.1.4.1. Study area and population

The case control study was conducted from November 13-24/2013 in Lega Gula kebele of Liben woreda, Guji zone, Oromia. It is Located to the Central part of the woreda. The total population of the Lega Gula kebele's is 5,248 with male to female ratio of 1 to 1.

1.1.4.2. Study design, sampling and data collection method

A line listing of suspected cases was collected from woreda health office to describe the outbreak by place, person and time. Matched case control was used to assess associated risk factors for the outbreak. Surveillance reports and records were reviewed. Cases were defined based on national standard measles case definition and an age, sex matched living in the same residential area with no sign and symptoms of measles during the same period was defined as a control. Forty-two measles cases and eighty four controls ratio of 1:2 were enrolled in the study. A face to face interview was conducted using structured questionnaire with adult cases and controls and care takers in case they are children. Measles vaccine coverage and other health related data were collected from woreda health office. Cold chain management of the health facilities was assessed during this investigation.

1.1.5. Case definition

1.1.5.1 Suspected measles case:

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.

1.1.5.2 Confirmed measles case:

Cases with a positive laboratory result for measles specific immunoglobulin (IgM) antibody testing that had not received measles vaccination within the 4 weeks before the specimen collection.

1.1.5.3 Measles outbreak:

Three or more laboratory confirmed measles IgM -positive cases occur in a health facility or district in a month.

1.1.5.4 Epidemiologically linked case:

A suspected measles case that did not have a specimen taken for serologic confirmation and is linked (in place, person and time) to a laboratory confirmed case, (living in the same or in

an adjacent district with a laboratory confirmed case), where there is a likelihood of transmission; onset of rash of the two cases being within 30 days of each other.

1.1.5.5 Measles death:

Death from an illness that occurs in a confirmed case or epidemiologically linked case of measles within one month of the onset of rash.

1.1.6 Operational definition

1.1.6.1. House ventilation:

A living house consist at least one functional window for air ventilation

1.1.6.2. Knowing modes of transmission:

A person responds the mode transmission of measles disease from infected person to the uninfected individual via droplet (sneezing, cough)

1.1.6.3. Nutritional status

Nutritional status of children aged 6- 59 months was determined by measuring the middle upper arm circumference(less than 12 cm is taken as malnutrition).

1.1.7 Data analysis

Data from questionnaires were entered and analysed into a computerized data base using Epi -info version 7.1.0.6 and micro- soft excel. During the analyses odds ratio (OR) with 95% confidence interval (CI) was used to assess risk factors association.

1.1.8. Results

1.1.8.1. Description of the outbreak

The first (index) case, visited the health facility was a 30 years old male patient with unknown vaccination status. He had no history of travel to other areas before the onset of measles signs and symptoms, but he had history of contact with a relative who had probable signs and symptoms of measles, who came from other kebele (Karsamale).The index case was registered on October 28, 2013, but he reported the date of onset started on 21/10/2013. The distribution of measles cases by date of onset indicates below (Figure1.2).

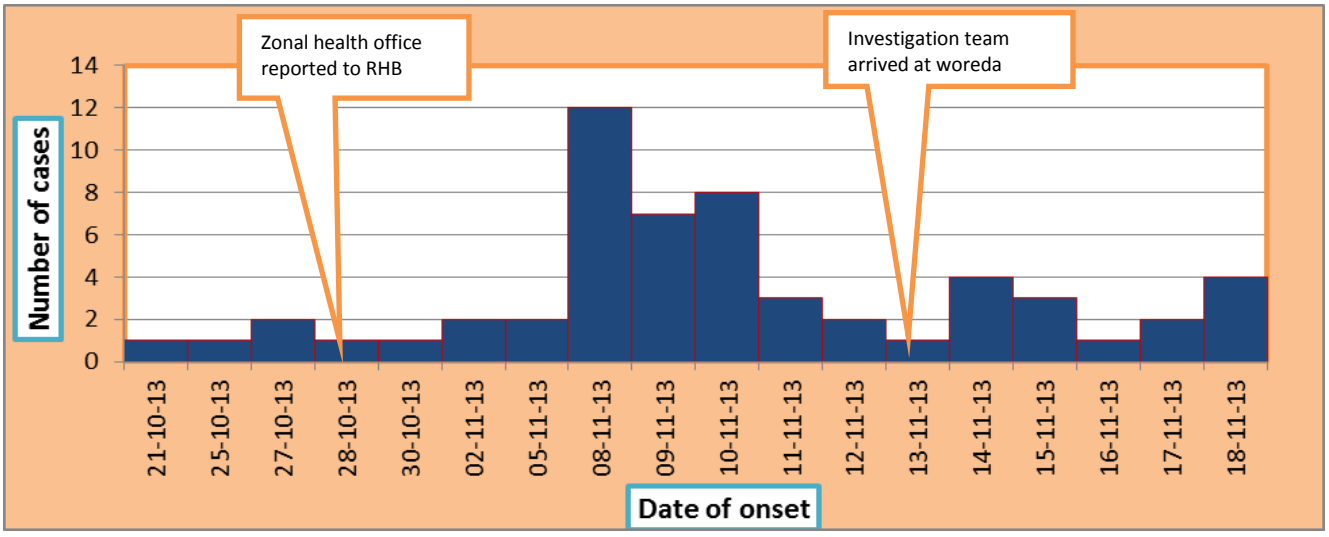

Figure 1.2: Distribution of measles cases by date of onset at Lega Gula kebele, Nov.2013 (n=57).

A total of 57 cases were registered in the line list. Of whom, 31(54.4%) were males. The age range of the cases was 7 months to 34 years with mean and median age of 8.2 and 4 years, respectively. Higher proportion of the cases, (52.8 %(30/57)) were in the age category of under five years (Fig.1.3).

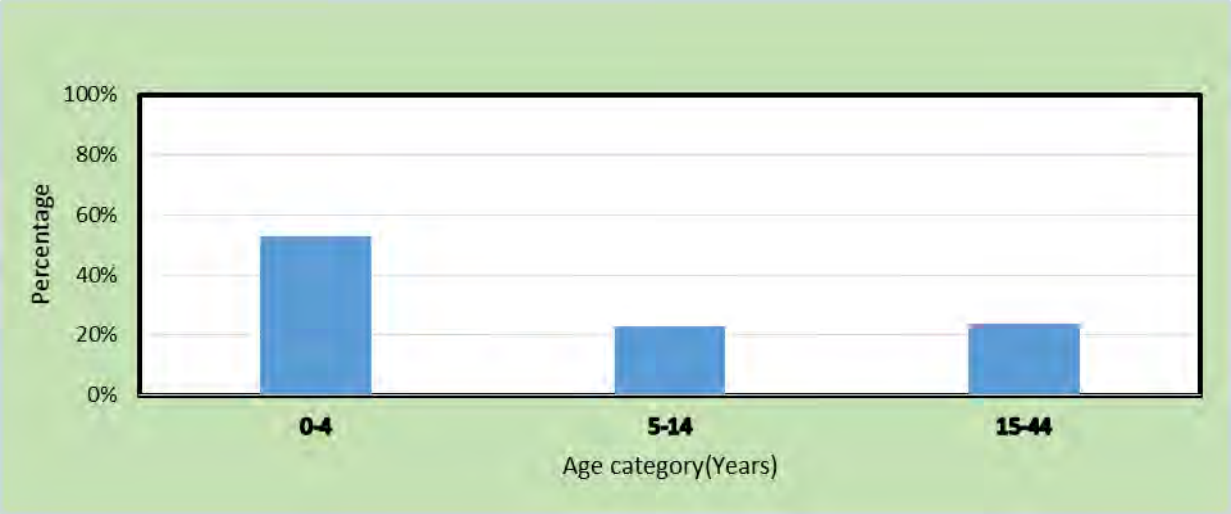

Figure 1.3: Distribution of measles cases by age category at Lega Gula kebele, Nov.2013

From the total cases, 49.1% (28/57) had received measles vaccine, 21.1% (12/57) were not vaccinated and 17(29.8%) cases did not know their vaccination status (Figure 1.4). Regarding to vaccine dose, 10(17.5%) cases received one dose and 18(31.6%) cases received two doses.

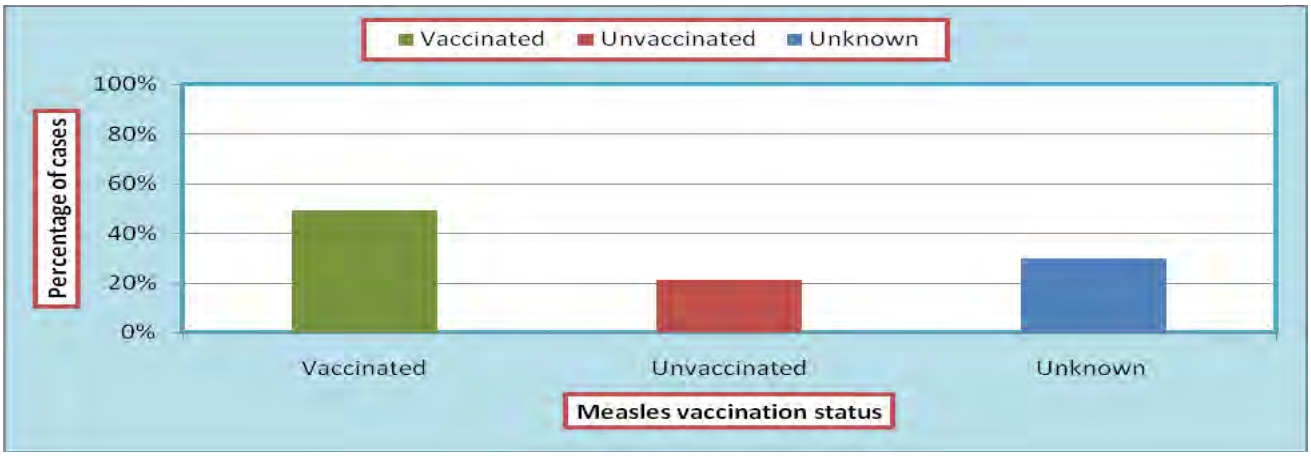

Figure 1.4: Distribution of cases by vaccination status at Lega Gula kebele, Nov.2013

The attack rate (AR) of measles at woreda level during the outbreak was 70 per 100,000 populations. During the outbreak period two cases had developed complications due to measles infection.

1.1.8.2. Case-control study

A case-control design was applied to assess associated factors for the outbreak. From the total 57 cases, 42 participated in the study. The controls were matched to cases in terms of age and sex from the same area (community) of the case, with a case to control ratio of 1:2.

Regarding to clinical signs and symptoms of the cases, all the 42 cases had rash and fever during the outbreak period. Other signs and symptoms were cough in, 95.2 %(40/42) and conjunctivitis in 66.7% (28/42) (Table 1.1).

Table 1.1: Distribution of clinical signs and symptoms of the study participant cases, Lega Gula kebele, Liben woreda, Guji zone, Oromia, Nov.2013

Clinical sign and symptoms	Frequency	%
Rash	42	100
Fever	42	100
Conjunctivitis	28	66.7
Coryza	24	57.1
Cough	40	95.2
Diarrhoea	1	2.4

Twenty nine (69.1%) of the cases and 25(29.8%) of the controls had contact history with measles cases either at home, school, neighbourhood, social gathering or market place. Contact to a measles case was significantly associated with measles infection (OR= 5.26, 95% CI (2.36, 11.77)). Having contact to infected person within the family member was also significantly associated to the occurrence of the outbreak (OR=22.3, 95%CI (6.03, 82.1)) (Table 1.2).

Of the total, 23(54.7%) of cases and 17(25.8%) of controls were not vaccinated. The odds of infection was significantly lower (OR=0.3, 95% CI (0.13, 0.65) among vaccinated compared to unvaccinated participants (Table 1. 2).

Factors like educational level, nutritional status, knowledge about the mode of transmission and others had not significant association to the occurrence of the outbreak.

Table 1.2: Association of categorical demographic characteristics and health related factors to measles outbreak in Lega Gula kebele, Liben, woreda, Guji zone, November 2013.

Variables	Case(n=42)	Control(n=84)	OR(95% CI)
Family Education Level			
Able to read and write	8	12	1.4(0.53,3.77)
Unable to read and write	34	72	
Measles vaccine received			
Yes	19	49	0.3 *(0.13, 0.65)
No	23	17	
Contact with measles patient			
Yes	29	25	5.26 *(2.36, 11.77)
No	13	59	
Knowing mode of transmission			
Yes	12	31	0.68 (0.3, 1.5)
No	30	53	

*Significant association

High proportion 106(84.1%) of the study participants parents and care takers were not able to read and write. Concerning knowledge of mode of transmissions of measles, 83(65.9%) did not know mode of transmission of measles.

1.1.9. Discussion

Although measles morbidity and mortality rate decreased in Africa and Ethiopia, but sporadic cases and outbreaks continue to occur(7). The measles outbreak described here line listed 57 cases and zero death. The index case was registered on October 28/2013, but his date of onset was on 21/10/2013. Several factors may have contributed for the occurrence of this outbreak. Usually, measles outbreaks are expected in areas where there is no adequate vaccination coverage and low potency of vaccine.

In the year 2005 E.C. routine measles vaccination coverage of the Woreda and the kebele were 102% and 58%, respectively. But target of the measles morbidity and mortality reduction indicated that routine immunization of greater or equal to 90% for children aged 9 to 11 months(10).

Vaccination coverage of the kebele in 2005 E.C. was lower than the previous years' report(85% in 2003 and 88% in 2004). Appropriate cold chain management is necessary to maintain the

potency of measles vaccine. But based on our observation 'Lega Gula kebele had no functional refrigerator for vaccines storage.' Inappropriate storage of vaccines may have led to degradation of the vaccines and leading to significantly reduced vaccine effectiveness. High proportion of the affected children (53%) were under five years of age, this was below the study findings in Somalia (78%) and lower than that of the study done at national level(12). This may indicate that the measles containing vaccine coverage for those under five years of children is lower than expected.

In this study, 21% of the line listed cases had not been vaccinated, which was lower compared to study done at national level in 2011(11). However, about 30% cases reported that their vaccination status to be unknown. Iif the vaccination status could not be verified, the individual was considered to be unvaccinated. In this study, being contacted to measles infected case was one of the associated factors for the occurrence of the outbreak, which was almost similar with previous study(14). And being contact to an infected person with in the family member was also significantly associated to the outbreak, which was higher than a study done in Somalia region, Ethiopia(13). It indicates that measles virus is highly contagious, which transmit from infected patient to the susceptible host via droplets(1). During the outbreak period there were two (3.5%) patients who developed complications due to measles infection but that was lower than done at Mozambique in 2011(14).

During the outbreak investigation period the main limitations were incomplete vaccination registry of children based on their age at the health facility, difficulty to identifying the nutritional status of the cases and controls that age above five years and recall bias on their vaccination status especially for those cases and controls whom age above 15 years.

1.1.10. Conclusion

The outbreak was verified and a total of 57 cases and zero death were line listed. Higher proportion of the cases was in the age category of less than five years. This investigation documented high rate of vaccination coverage in the woreda but not in the kebele; which is likely to be the main contributing factor for the occurrence of the outbreak. Besides to the low vaccination coverage, based on our observation cold chain management system of the woreda might have played a significant role for this outbreak, but it needs further study. Contact to infected patient and measles vaccination status were significantly associated to the occurrence of the outbreak.

1.1.11. Intervention Activities

Active case searching and early management were our preliminary duty during the outbreak investigation. Identified suspected cases were treated with antibiotics and vitamin A at health facility and community level. Health education was conducted at gathering and house to house to create social awareness about the outbreak in the community. Additionally, school communities were advised to identify and report any probable cases of measles. A total of 120 households were actively searched and all their family members with estimated population of 850 were given health education on measles disease control and prevention mechanisms. These activities increased the number of self-reported in those who suspected to have measles disease.

1.1.12. Recommendations

Even if the outbreak ends with minimal complications and no death, this will not ensure guarantee for the future in the community. So, the woreda health office should strengthen measles routine immunization activities with the target of reaching more than 90% infants of 9 months to 11 months of age and the coverage should be monitored accordingly. Cold chain management system should be strengthened. The health extension worker in the health post of the kebele should enhance the awareness of the community towards measles infection and other epidemic prone diseases as well.

1.1.13. References

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Annex 1-1: Questionnaires for Case - control study on Measles outbreak in Liben Woreda, Guji Zone, Oromia Region November, 2013.

*Case status
1. Case GPS N_____
2. Control E_____
Patient Name_____ date of Data collection_____
Region_____ Zone_____ Woreda_____ Kebele _____ Got _____ Phone_____
Location: Longitude: _____ Latitude: _____

I. Socio-demographic Characteristics

S. No	Questions	Alternatives
1.1	Sex	1. Male 2. Female
1.2	Age	years_____ Months_____
1.3	Occupation of the patients	Farmer 2. House wife 3. Student 4. Unemployed 5. Daily labourer 6. Merchant 7. Gov't 8. Other (specify)_____
1.4	Family Occupation(HH head)	1.Farmer 2. House wife 3. Student 4. Unemployed 5. Daily labourer 6. Merchant 7. Gov't 8. Other (specify)_____
1.5	Religion	Orthodox Protestant Muslim Catholic Other (specify)_____
1.6	Ethnic group	Oromo Tigre Amhara Other (specify)
1.7	Educational level of the patient	Illiterate Read and write Elementary Secondary Above secondary N/A
1.8	Educational level of the family	Illiterate Read and write Elementary Secondary Above secondary
1.9	Marital status	Single Married Divorced Widowed

		Separated, 6 N/A
1.10	Family size	_____
1.11	Is there any sick person with rash, fever, running nose/conductivities (illness)? In the family before two weeks till now?	1. Yes 2. No
1.12	If yes, number of sick person	_____

II**. Clinical History of Diseases:* for the case only**

2.1	What was the symptom?	1.fever 2.Rash 3.cough, 4.coryza (runny nose), 5. conjunctivitis (red eyes) 7. Ear discharge 8. pneumonia 10. Vomiting 11. Others_____
2.2	**Ask ONLY if complication**	Pneumonia:☐ yes no ☐ Cornea: ☐ yes no ☐ Blindness : ☐ yes no ☐ Convolution ☐ yes no ☐ Otitis media (ear discharge): ☐ yes no ☐ diarrhoea : ☐ yes no ☐ Feeding problem☐ yes no ☐
2.2	Date of rash on set	__/ /_____
	Duration of rash_____	
2.3	Date seen at health facility	__/ /_____
2.4	Did you (he/she) take treatment?	1.Yes 2.No
2.5	If yes, treatment taken	1.ORS 2.Antibiotics 3.Vitamin A 4.Supplementary food 5. TTC ointment 6.Anti pyretic 7.Others given_____
2.6	Location when rash started?	District_____Kebele_____ ____
2.7	Have you recovered after the treatment?	1.cure 2. partially 3. deteriorated/disabled

		4.death
2.8	Visited health facilities? ☐ yes no ☐, if yes date	____/____2013
2.9	Illness duration before visiting the health facility	_____ in days/hours

III. Risk factor

3.1	Have you been vaccinated for measles?	1.Yes 2.No 3.Unknow 4.Not applicable
	If yes last vaccination date	1.patient recall_____ dd/mm/yy 2. vaccination card_____ dd/mm/yy
3.2	Number of vaccine doses received	1.one dose 2. two dose 3.three and above
3.3	Age of vaccination at first vaccinated.	_____
3.4	If not vaccinated why?	☐ lack of knowledge about vaccination campaign, ☐ absence during vaccination campaign, ☐ other, specify
3.5	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 _____
3.6	Had you contact with a person with measles symptoms within the last 2-3 weeks?	☐ yes ☐ no
3.7	Do you have any travel history four days before and after rash onset	1.Yes 2. No If yes where _____
3.8	Do you have any contact history with someone else four days before and after rash onset	1.yes 2.No If yes with whom_____
3.9	If Yes to question 3.5 place of travel	1.School 2.Neighbor 3.Market 4.Other_____
3.10	Do you know modes of transmission for measles?	1.Yes 2.No 3. If yes specify_____
3.11	Have you ever had measles infection?	1.Yes 2. No 3. Don't know
3.12	Nutritional status of the cases	1.Normal 2.Moderate

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

1.2 Measles outbreak Investigation in Abay chomen woreda, Horo Guduru Wollega zone, Oromia, February, 2014.

Abstract

Introduction

Measles is a highly contagious and the leading causes of death among young children even though a safe and cost-effective vaccine is available. In 2011, there were about 157,000 measles deaths occurred globally. The investigation was carried out to assess the magnitude and risk factors associated to the occurrence of the outbreak in Abay chomen woreda.

Methods

A line listing of suspected cases was used to describe the outbreak and a case control was done to assess associated risk factors. Cases were defined based on national standard measles case definition and control was age, sex and neighbourhood matched of cases who did not have history of signs and symptoms of measles during the same period. Fifty-nine cases and fifty-nine controls were participated in the study. Measles vaccine coverage and other health related data were collected from woreda health office. A face to face interview was conducted using structured questionnaire with adults, and care takers for children <18years of age. Epi info was used to analyse the data.

Results

A total of 87 cases were line listed, among whom 48(55%) were females. The age range of cases was from five months to 35 years with mean and median age of 8.1 and 7 years, respectively. The case fatality rate (CFR) was 0%. High proportion, 40(46%) of the cases were in the age category of less than five years. The odds of measles infection was higher for those who had contact history (OR=7.89, 95%CI (3.39, 18.37)), but lower in those who were vaccinated and living in ventilate house OR=0.32, 95% CI (0.15, 0.69) and OR= 0.21, 95% CI (0.09, 0.47), respectively. Measles vaccine coverage of Abay Chomen woreda was 77%.

Conclusion

The outbreak was verified and stayed for three months. During the outbreak high proportion of cases were found in less than five years age. The vaccination coverage of the district was below the target. Being contacted to infected patient, measles vaccination status and nonexistence of window for ventilation were risk factors for the occurrence of the outbreak. The woreda should be strengthen measles routine vaccination and enhance the awareness of the community on epidemic prone diseases.

Key words: Measles, outbreak, Horo Guduru Wollega, Abay Chomen, Oromia.

1.2.1. Introduction

Measles is a highly contagious and serious disease caused by a virus of the paramyxovirus family genus Morbillivirus. The virus grows in the cells that line the back of the throat and lungs. Measles is a human disease and is not known to occur in animals. The first sign of measles is usually a high fever, which begins about 10 to 12 days after exposure to the virus, and lasts four to seven days. A runny nose, a cough, red and watery eyes, and small white spots inside the cheeks can develop in the initial stage. Serious problems resulting from measles infection include pneumonia, seizures, diarrhoea, ear infections and brain infections (1).

Although measles outbreaks occur worldwide, they become smaller and less frequent in countries and regions get closer to elimination. Outbreaks can be useful to identify gaps in immunization program performance that may not be evident through monitoring vaccination coverage. Immunization program weaknesses can include low coverage, heterogeneity of coverage with pockets of missed children, population movements, community resistance, cold-chain failure, inadequate human resources, poor data collection, and reporting errors(2).

Measles is one of the leading causes of death among young children even though a safe and cost-effective vaccine is available. In 2011, there were 157, 000 measles deaths globally – about 430 deaths every day or 18 deaths every hour. More than 95% of measles deaths occur in low-income countries with weak health infrastructures. However the number of measles deaths globally decreased by 71% between 2000 and 2011, from 542 000 to 157, 000. Over the same period, new cases dropped by 58% from 853, 500 in 2000 to 355, 000 in 2011(3).

Since 2000, with support from the Measles and Rubella Initiative, more than 1 billion children have been reached through mass vaccination campaigns — about 225 million of them in 2011. Despite this global progress, some populations remain unprotected; an estimated 20 million children worldwide did not receive the first dose of vaccine in 2011. More than half of these children live in five countries: the Democratic Republic of the Congo (DRC) (0.8 million), Ethiopia (1 million),India (6.7 million),Nigeria (1.7 million) and Pakistan (0.9 million)(4).

A total of 42,658 suspected cases of measles were reported from the 40 countries of Africa in the network between January 1st and July 7th, 2011, a total of 18,658 cases were confirmed as measles by lab and epidemiological linkage. Nigeria accounted for 7052 cases while Zambia and Tanzania reported 5339 and 1144 cases ,respectively(5).

Before the introduction of measles vaccination, measles in Africa was primarily a disease affecting young children, and >1 million cases were reported annually. In urban areas, measles epidemics occurred every 1–2 years, and the median age of cases was 1.5–2.5 years; in rural areas, outbreaks occurred less frequently, and the median age was 2.5–5.0 years(6).

Since 2002, Ethiopia adopted these regional goals and strategies and has been taking important steps to control measles. The National Immunization Program was established in the 1980s, and currently delivers service through static and outreach sites nationwide. The current routine immunization schedules recommend a dose of measles vaccination at 9 months of age. The WHO UNICEF coverage estimates for measles vaccination for Ethiopia also indicate an increase from 37% in 2000 to around 80% in 2010(7).

1.2.2. Background of the woreda

Abay Chomen woreda is one of the woreda found in the Horo Guduru Wollega zone. The total population of the woreda is 59,371. The woreda has 20 kebeles. Agamessa kebele is one of the kebele, which found in Abay Chomen woreda and it had been affected by measles. The kebele is located to the northern direction of the Woreda town (Finchua) with distance of 48 Km (nearest to Finchua Sugar factory). Initially, the suspected measles cases were reported from the woreda health office PHEM department to Zonal health office PHEM department on November 23, 2013.

The suspected measles cases were reported from Agamessa kebele to woreda health office PHEM department. The total population of the kebele is 27,391. The administrative vaccine coverage of Abay Chomen woreda and Agamessa kebele in 2005 EFY was 77% and 83.4%, respectively.

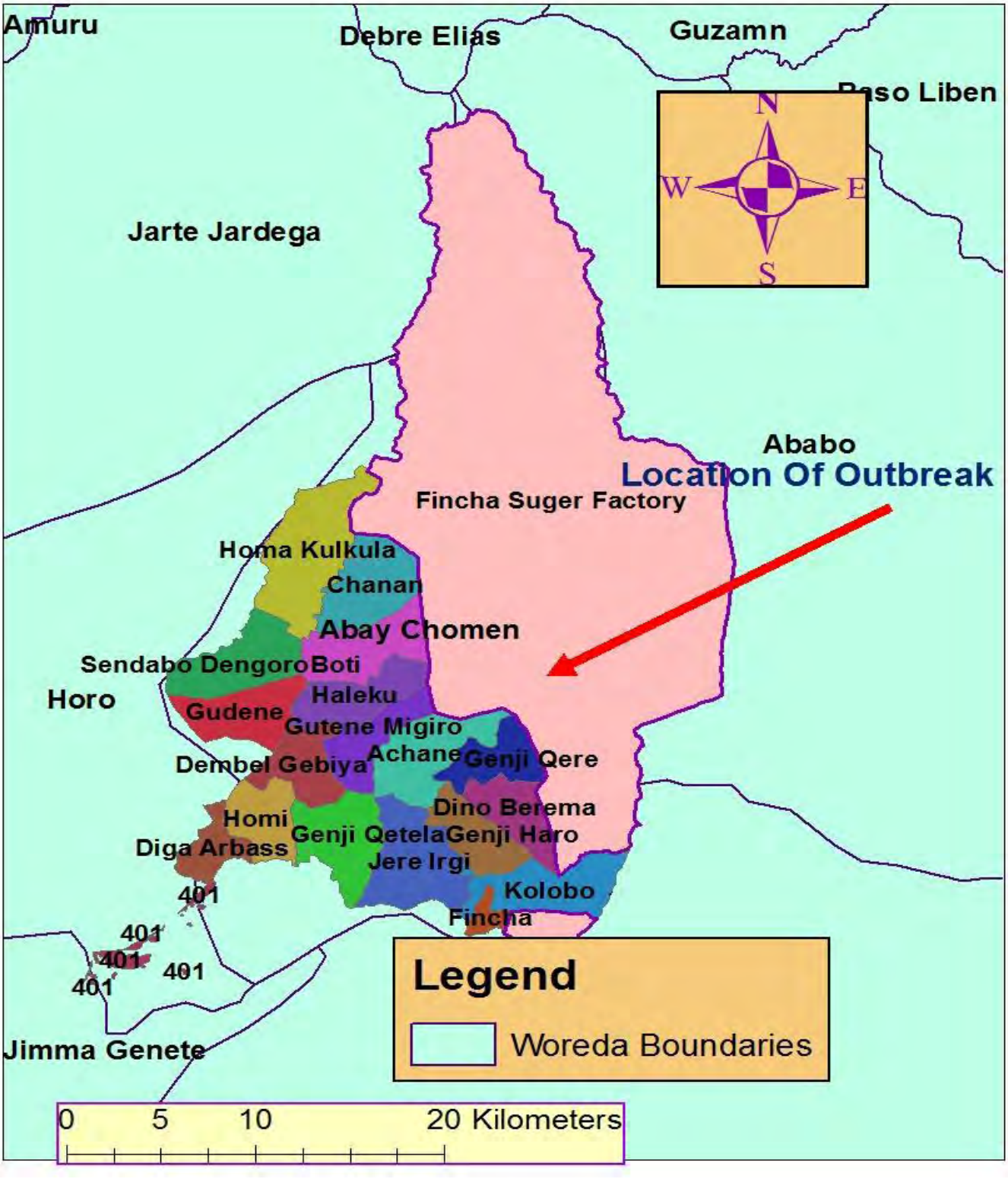

Figure 1.5: Measles outbreak site in Abay Chomen Woreda,Agemssa kebele, Horo Guduru Wollega Zone, Oromia,February, 2014

1.2.3. Objectives

1.2.3.1. General Objective

- To assess the magnitude and risk factors associated with the occurrence of the outbreak in Abay chomen woreda.

1.2.3.2. Specific objectives

- To verify Measles outbreak in the woreda
- To describe measles outbreak in terms of person place and time
- To identify factors associated to the measles outbreak

1.2.4. Methods and materials

1.2.4.1. Study area

The outbreak investigation was conducted in Agemessa kebele, Abay Chomen Woreda, Horo Guduru Wollega zone, Oromia. Abay Chomen woreda has 20 kebeles with the total population of 59,371. Among the total population, 27,391 are living in Agemessa kebele.

1.2.4.2. Study Period

Descriptive data were analysed from line listed reported cases since November 23/2013 until the last line listed case reported on February 24/2014. The case control study began on January 25/2014 to February 05/2014.

1.2.4.3. Study design, sampling and data collection method

A line listing of suspected cases was collected from woreda health office to describe the outbreak by place, person and time. Case control was used to assess associated risk factors for the outbreak. Surveillance reports and records were reviewed. Cases were defined based on national standard measles case definition and a control was a neighbor of cases who did not have history of sign and symptoms of measles during the same period. Fifty-nine cases and fifty-nine controls were participated in the study. A face to face interview was conducted using structured questionnaire with adults, and care takers for children <18years of age. We conducted active case search in the affected site. Measles vaccine coverage and other health related data were collected from woreda health office.

1.2.5. Case definitions

1.2.5.1. Measles suspected cases at community level:

A community member should report any person with **rash** and **fever** to a health worker and also advise the person to go to a health facility.

1.2.5.2. Suspected measles case:

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.

1.2.5.3. Confirmed measles case:

Cases with a positive laboratory result for measles specific immunoglobulin (IgM) antibody testing that had not received measles vaccination within the 4 weeks before the specimen collection.

1.2.5.4. Measles outbreak:

Is laboratory confirmed when 3 or more laboratory confirmed measles IgM -positive cases occur in a health facility or district in a month.

1.2.5.5. Epidemiologically linked case:

A suspected measles case that has not had a specimen taken for serologic confirmation and is linked (in place, person and time) to a laboratory confirmed case; i.e., living in the same or in an adjacent district with a laboratory confirmed case where there is a likelihood of transmission; onset of rash of the two cases being within 30 days of each other.

1.2.5.6. Measles death:

For surveillance purposes, a measles death is defined as any death from an illness that occurs in a confirmed case or epidemiologically linked case of measles within one month of the onset of rash.

1.2.6. Operational definition

1.2.6.1. House ventilation: A living house contain at least one window to use for air ventilation

1.2.6.2. Knowing modes of transmission: A person respond the mode transmission of measles disease from infected person to the uninfected individual via droplet (sneezing, cough)

1.2.6.3. Nutritional status: Nutritional status of children aged 6- 59 months was determined by measuring the middle upper arm circumference(less than 12 cm is taken as malnutrition).

1.2.7 Data analysis

Data from questionnaires were entered and analysed into a computerized data base using Epi -info version 7.1.0.6 and micro- soft excel. During the analyses odds ratio (OR) with 95% confidence interval (CI) was used to assess risk factors association.

1.2.8. Results

1.2.8.1. Description of the outbreak

On November 23, 2013 the first case (Index) was registered in the health facility. The index case was female, 11 years old, primary school student with a previous history of unvaccinated for measles. She had no travel history to other place rather than school before the onset of the illness.

Throughout the outbreak period, totally 87 measles cases were line listed. Among the cases, 48(55%) were females. The age range of cases was from five months to 35 years with mean and median age of 8.1 and 7 years, respectively. The case fatality rate (CFR) was 0%. However, 42(48.3%) cases were admitted to the health facility. At the beginning of the outbreak (November 23/2013), two cases were registered (including the index case) and two weeks later other cases were recorded (Figure 1.6). A total of seven samples were sent to reference lab for serological test, of the total samples, 6(86%) were positive for Measles IgM.

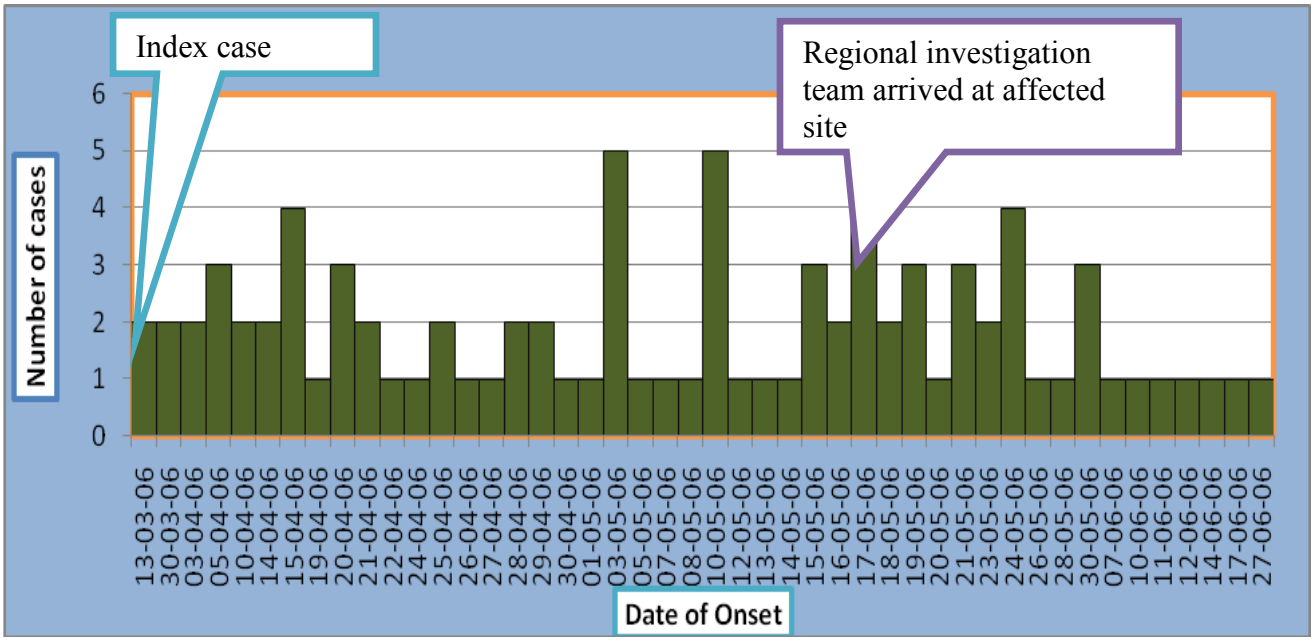

Figure 1.6: Distribution of measles cases by date of onset at Agemessa kebele, February, 2014(n=57)

From the total of line listed cases, high proportion of the cases were in the age category of less than five years, 40(46%) followed by age category 5-14 years, who comprised 30(34.5%) of the cases (Table 1.3).

Table 1.3: Magnitude of measles cases by age category, Agamessa kebele, Abay Chomen woreda, February, 2014

Age category	Frequency(N=87)	%
Less than 9 months	20	**23.0**
9months-4 years	20	**23.0**
5-14 years	30	**34.5**
15-35 years	17	**19.5**

In relation to the vaccination status, of the total cases, 41(47%) had received measles contain vaccination, 28(37%) had not been vaccinated, and 14(16%) of the cases were with unknown measles vaccination status (Figure 1.7).

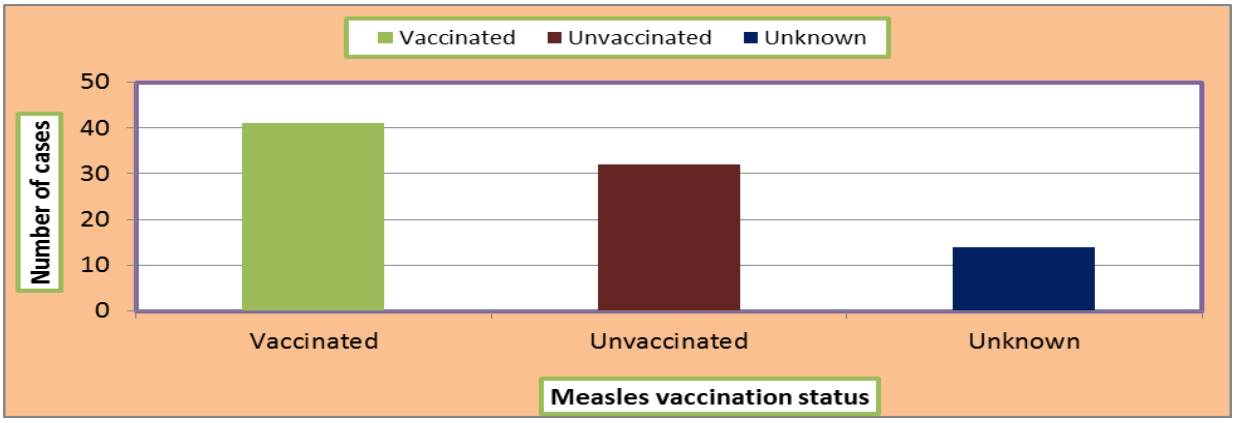

Figure 1.7: Distribution of cases by vaccination status in Agemassa kebele, February, 2014

In 2005 EFY measles vaccination coverage of the woreda and Agemessa kebele was 77% and 83.4%, respectively. Based on our observation at the outbreak site refrigerators uses for vaccine storage are functional and the temperature monitoring chart was registered on daily basis. The attack rate (AR) of the disease at the woreda and Kebele level were 15 and 32 per 10,000 midyear populations, respectively.

1.2.8.2. Case control study

A case control study design was applied to identify the associated factors in related to the outbreak. A total of 59 cases and 59 controls were participated in the study. Age and sex matched controls were selected from the same neighbourhood. The most frequent reported signs and symptoms during the outbreak were rash and fever 59(100%) each, cough 54(92%) and conjunctivitis 36(61%). The lowest frequent signs and symptoms were diarrhoea and pneumonia 5(8%) each (Table 1.4).

Table 1.4: Distribution of signs and symptoms of measles in Agamessa kebele, February, 2014.

Signs and Symptoms	Frequency(n=59)	Percent (%)
Rash		
Yes	59	100%
No	0	0%
Fever		
Yes	59	100%
No	0	0%
Cough		
Yes	54	92%
No	5	8%
Conjuctivitis		
Yes	36	61%
No	23	39%
Coryza(Runny nose)		
Yes	24	41%
No	35	59%
Vomiting		
Yes	23	39%
No	36	61%
Diarrhoea		
Yes	5	8%
No	54	92%
Pneumonia		
Yes	5	8%
No	54	92%

The vaccination status of the study participants was significantly associated to the occurrence of the outbreak. Twenty four (40.7%) cases and 45(76.3%) controls received measles vaccine with OR= 0.32, 95% CI (0.15, 0.69).

Contact history to an infected patient was one of the associated factors for the outbreak with 48(81.4%) cases and 21 (35.6%) controls and OR 7.89, 95% CI (3.39, 18.37).

Nonexistence of window for ventilation was one of significantly associated factors for the occurrence of the outbreak, with, 59.3 %(35/59) of cases and 23.7% (14/59) of controls, and OR 0.21, 95%CI (0.09, 0.47). Factors like family size, family educational level and nutritional status and other factors were not associated to the outbreak.

Table 1.5: Association of categorical demographic characteristics and health related factors to measles outbreak in Agamessa kebele, February, 2014.

Variables	Case(n=59)	Control(n=59)	OR(95% CI)
Measles vaccine received			
Yes	**24**	**40**	**0.32 *(0.15, 0.69)**
No	**35**	**19**	
Contact with measles patient	**48**	**21**	**7.89 *(3.39, 18.37)**
Yes	**11**	**38**	
No			
Family Education Level			
Able to read and write	**30**	**36**	**0.66 (0.31, 1.37)**
Unable to read and write	**29**	**23**	
House Ventilated(presence of window)			
Yes	**24**	**45**	**0.21* (0.09, 0.47)**
No	**35**	**14**	

* Significant association

1.2.9. Discussion

The outbreak which occurred in Abay Chomen woreda began on November 23/2013 and the last case was line listed on February 24/2014. During the outbreak period 87 cases were line listed. There was no death reported. The index case was registered on November 23, 2013. There were different factors which associated to the occurrence of the outbreak.

The measles containing vaccine coverage of the woreda and the Kebele in 2005 EFY were 77% and 83.4%, respectively. There were below the National target routine coverage (over 90%) for a sustainable reduction in measles morbidity and mortality(7)

During the outbreak period, being unvaccinated against measles was one of the factor for the outbreak and this was below study done at National level (8) and in Zaka,Masvingo Province, Zimbabwe(9). Besides to line listed unvaccinated cases, study subjects of unknown vaccination status (Figure3) suggested to be unvaccinated and might be increased the chance of the manifestation of the outbreak in the site.

Among the line listed cases, the high proportion (34.5%) of cases were in the age category of less than five years followed by 5-14 years of age category(32%), this was almost similar to study done in Malawi(10).

Based on results from the case control part of this study, subjects who had been vaccinated measles containing vaccine were significantly lower chance of acquiring measles infection when compared to unvaccinated. Studies done at National level (8) and Zaka,Masvingo Province of Zimbabwe (9) show similar findings to our study

Having contact with measles patient was one of the associated factors for the occurrence of the outbreak, which was almost similar to study done in India(11) and this is for the reason that measles is highly contagious and the secondary attack rates among susceptible household contacts have been reported to be 75%–90%(10).

During investigated the outbreak the main limitation was delayed of report and subsequently the investigation was not done at the beginning of the outbreak.

1.2.10. Conclusion

The outbreak was verified and stayed for three months. A total of 87 cases and zero death were reported throughout the outbreak period. High proportion of cases was found in less than five years age category. Among the woreda kebeles only one kebele was affected by the outbreak. Vaccination coverage of Abay Chomen was below the target. Being contact to infected patient, measles vaccination status and nonexistence of window for ventilation were associated to the occurrence of the outbreak.

1.2.11. Intervention Activities

Active case searching and early management were our preliminary duty during the outbreak investigation. Identified suspected cases were line listed and sent to the health facility for treatment. Health education was conducted at gathering and house to house to create social awareness about the outbreak in the community. Schools teachers were mobilized to identify and report any suspected cases of measles to the health facilities. We informed to small private health

sectors to inform any suspected measles cases to health extension workers. A total of 250 households were actively searched and all their family members that estimated to 1000 were received health education on measles disease.

1.2.12. Recommendations

The Regional health bureau and Zone health office should be strengthening the surveillance system. The woreda health office should be strengthen measles routine vaccination activities with the target of reaching more than 90% infants of 9 months to 11 months of age and the coverage should be monitored accordingly. The health extension worker in the health post of should enhance the awareness of the community towards measles infection and other epidemic prone diseases as well. Communities should be ventilating their living house.

1.2.13. References

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Annex 1-2: **Questionnaires for Case - control study on Measles outbreak in Abay Chomen Woreda, Horo Guduru Wollega Zone, Oromia Region-January, 2014**

*Study participant status
1. Case
2. Control

GPS N_____
E_____

Patient Name_____ date of Data collection_____
Region_____ Zone_____ Woreda_____ Kebele _____
Got _____ Phone_____
Location: Longitude: _____ Latitude: _____

I. Socio-demographic Characteristics

S. No	Questions	Alternatives
1.1	Sex	1. Male 2. Female
1.2	Age	years_____ Months_____
1.3	Occupation of the patients	1. Farmer 2. House wife 3. Student 4. Unemployed 5. Daily laborer 6. Merchant 7. Gov't 8. Other (specify)_____
1.4	Family Occupation(HH head)	Farmer 2. House wife 3. Student 4. Unemployed 5. Daily labourer 6. Merchant 7. Gov't 8. Other (specify)_____
1.5	Religion	1. Orthodox 2. Protestant 3. Muslim 4. Catholic 5. Other (specify)_____
1.6	Ethnic group	1. Oromo 2. Tigre 3. Amhara 4. Other (specify)
1.7	Educational level of the patient	1. Illiterate 2. Read and write 3. Elementary 4. Secondary 5. Above secondary 6.N/A
1.8	Educational level of the family	1. Illiterate 2. Read and write 3. Elementary 4. Secondary 5. Above secondary
1.9	Marital status	1. Single 2. Married 3. Divorced 4. Widowed 5. Separated, 6 N/A
1.10	Family size	_____

1.11	Is there any sick person with rash, fever, running nose/conductivities (illness)? In the family?	1. Yes 2. No
1.12	If yes, number of sick person	_____

II**. Clinical History of Diseases:* for the case only**

2.1	What was the symptom?	1.fever 2.Rash 3.cough, 4.coryza (runny nose), 5. conjunctivitis (red eyes) 7. Ear discharge 8. pneumonia 10. Vomiting 11. Others_____
2.2	**Ask ONLY if complication**	Pneumonia:☐ yes no ☐ Cornea: ☐ yes no ☐ Blindness : ☐ yes no ☐ Convolution ☐ yes no ☐ Otitis media (ear discharge): ☐ yes no ☐ diarrhea : ☐ yes no ☐ Feeding problem☐ yes no ☐
2.2	Date of rash on set	__/__/_____
	Duration of rash_____	
2.3	Date seen at health facility	__/__/_____
2.4	Did you (he/she) take treatment?	1.Yes 2.No
2.5	If yes, treatment taken	1.ORS 2.Antibiotics 3.Vitamin A 4.Supplementary food 5. TTC ointment 6.Anti pyretics 7.Others given_____
2.6	Location when rash started?	District_____Kebele_____ ____
2.7	Did you recovered after the treatment?	1.cure 2. partially 3. deteriorated/disabled 4.death
2.8	Visited health facilities? ☐ yes no ☐, if yes date	____/____2014
2.9	Illness duration before visiting the health facility	_____ in days/hours

III. Risk factor

3.1	Did you have been vaccinated for measles?	1.Yes 2.No 3.Unknow 4.Not applicable
	If yes last vaccination date	1.parent recall_____ dd/mm/yy 2. vaccination card_____ dd/mm/yy
3.2	Number of vaccine doses received	1.one dose 2. two dose 3.three and above
3.3	Age of vaccination at first vaccinated.	_____
3.4	If not vaccinated why?	☐ lack of knowledge about vaccination campaign, ☐ absence during vaccination campaign, ☐ other, specify
3.5	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 _____
3.6	Did you contact with a person with measles symptoms within the last 2-3 weeks?	☐ yes ☐ no
3.7	Do you have any travel history four days before and after rash onset	1.Yes 2. No If yes where _____
3.8	Do you have any contact history with someone else four days before and after rash onset	1.yes 2.No If yes with whom_____
3.9	If Yes to question 3.5 place of travel	1.School 2.Neighbor 3.Market 4.Other_____
3.10	Do you know modes of transmission for measles?	1.Yes 2.No 3. If yes specify_____
3.11	Did you ever have measles infection?	1.Yes 2. No 3. Don't know
3.12	Nutritional status of the cases	1.Normal 2.Moderate 3.Severely malnourished
3.14	What is the estimated area of the house in M^2?	_____
3.15	House condition?	☐ ventilated ☐ not-ventilated
3.16	Distance from house to HC?	☐ greater than 5 km ☐ equal or less than 5 km
3.17	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)_____
3.18	How do you think people get measles?	1. Contact with a virus from ill person 2. From God 3. Bad attitude of other people 4. Other(Specify)
3.19	Do you Know measles is vaccine preventable?	1. Yes 2. No 3. I don't Know
3.20	Who do you think can be affected by measles?	4. Children of aged less than 5 years 5. Children of aged less than 18 years 6. Women of any ages 7. Any age groups of both male and women 8. Other (specify):_____
3.21	How do you think measles can be cured?	1. Using modern medicine 2. Using traditional Medicine 3. Holly water 4. By feeding nutritious foods 5. Keeping the sick person indoor 6. Other(Specify)_____

Chapter II - Surveillance Data Analysis Report

2. Measles Surveillance Data Analysis-Arsi Zone, Oromia, Ethiopia, 2008-2012

Executive summary

Background: Measles is an acute infectious disease caused by measles virus. It is the leading cause of death among young children. Globally, an estimated of 157,700 people died from measles in 2011, mostly children under the age of five. We reviewed data from 2008 through 2012 to analyse the epidemiology of measles in Arsi Zone, Oromia Region.

2.3.2. Methods: We used document review of measles surveillance data from 2008-2012 to describe it in terms of person, place and time. A suspected measles-infected patient is any person with fever and maculopapular (non-vesicular) generalized rash, and one of the following signs cough, coryza or conjunctivitis.

Result: In the year 2008-12, a total of 26 measles outbreaks were reported, except for the year 2009, as zone level. On these period, a total of 857 cases and 1 death (CFR, case fatality rate = 0.001%) were reported. Of these patients, 211(24.6%) were Laboratory confirmed, 390(45.4%) epidemiologically linked and 256 (29.9%) were clinical. About 242(28.2%) were vaccinated, 202(23.6%) unvaccinated and 413(48.2%) with unknown vaccination status. Nearly 47% (403/857), of patients were 5-14 years of age. Of the total patients, 95(11.1%) recorded at Tiyo and 89(10.3%) at Limo Bilbilo woredas; whereas the average administrative vaccine coverage of these woredas were 88.4% and 97.5%, respectively. High proportion, 60.8% (521/857) of patients developed the disease from January through June in the study period.

Conclusion: The administrative vaccine coverage and episode of disease were increased simultaneously. This is due to accumulation of susceptible persons in the community and nonexistence of second opportunity for vaccination. So action should be implementing to prevent the disease by supplementary immunization activities.

Keywords: Measles, surveillance, outbreak, Arsi, Oromia, Ethiopia

2.1. Introduction

Measles is a highly transmissible disease caused by measles virus. It is one of the most infectious diseases of man and reasons for millions of deaths globally each year prior to measles vaccines (1, 2). Measles is also one of the leading causes of death among young children globally even in the presence of vaccine. An estimated 157,700 people died from measles in 2011 mostly children under the age of five. Accelerated immunization activities have had a major impact on reducing measles deaths. Since 2000, more than one billion children in high risk countries were vaccinated against the disease through mass vaccination campaigns about 225 million of them in 2011. Global measles deaths have decreased by 71% from 548,300 to 157,700 between 2000 and 2011 (3).

In Africa Region, the improved vaccination rates were associated with a 93% reduction in measles cases, from 492,116 cases in 2001 to 32,278 cases in 2008. Measles outbreaks continue to occur, and failure to vaccinate has been identified as the primary cause. However, given the overall success, the African Region recently established several goals, including the year 2012 goal of reducing measles deaths by 98% compared with year 2000 estimates and the goal of measles eradication by 2020 In 2006 the African Region adopted a goal to achieve 90% measles mortality reduction by 2010 compared with the estimate for 2000. By 2008 in the African Region, reported measles cases decreased by 93% and estimated measles mortality decreased by 92% compared with 2000. The strategies include improving routine vaccination coverage, providing a second opportunity for measles vaccination through supplementary immunization activities (SIAs), improving measles-case management, and establishing case-based measles surveillance(4).

Since 2002, Ethiopia accepted the Regional goals and strategies and executed all important steps to control measles. The Africa Region and Ethiopia is working towards measles elimination by 2020. The WHO UNICEF coverage estimates for measles vaccination for Ethiopia also indicate an increase from 37% in 2000 to around 80% in 2010(4).

During 2004–2009, 302 measles outbreaks were confirmed throughout the country. Of the 302 outbreaks, 90 (30%) comprised three confirmed cases, the minimum number of laboratory-confirmed cases needed to declare an outbreak, and 270 (93%) comprised, 50 confirmed measles cases. A large outbreak including 1619 confirmed cases occurred from January to April 2008 in the Guji zone of Oromia Region. Of these 1619 confirmed cases, 516 (27%) were unvaccinated

children aged, 5 years. Between the years 2005 and 2009, the national disease surveillance program in Ethiopia has met the targets for each of the two principal measles surveillance performance indicators non-measles febrile rash illness rate of two cases per 100,000 population, and 80% districts reporting one suspected measles case with a blood specimen per year. Since the start of measles case-based surveillance in 2004, the incidence of confirmed measles has ranged from one case per 100,000 populations in 2004 to 4.1 cases per 100,000 populations in the year 2008(5).

Measles is one of a public health priority problems and an immediate reportable disease in Ethiopia. The routine surveillance data analysis is used for plan interventions, detect epidemics early and to assess the trend of the disease.

Furthermore, adequate disease surveillance data and analysis will permit implementation of appropriate measures to control and eliminate measles. It also will be used in the assessment of progress and in making adjustments to programmes as required. Surveillance data are essential for describing the characteristic of measles cases in order to understand the reasons for the occurrence of the disease and develop appropriate control measure, predicting potential outbreaks and implementing vaccination strategies in order to prevent outbreaks, monitoring progress towards achieving disease control and elimination goals.

2.2. Objectives

2.2.1. General objective

- To assess the five year measles morbidity and mortality trend in, Arsi zone, Oromia region.

2.2.2. Specific objectives

- To describe the surveillance data in terms of time, place and person characteristics
- To identify the disease trend in the study zone
- To provide recommendation based on the finding

2.3. Methods and materials

2.3.1. Study area: Arsi zone, Oromia region, Ethiopia

2.3.2. Study period: We reviewed Measles surveillance data of case based records and Arsi Zone Health Department EPI records from 2008-2012.

2.3.3. Study Population: All case based reported subjects from Arsi zone

2.3.4. Study design: Document review of surveillance data to describe the data in terms of person, place and time.

2.3.5. Data collection and procedure: We reviewed data of suspected measles cases from case based rport of WHO surveillance data record and Arsi zone PHEM and EPI Department.

2.3.6. Data processing and analysis: Data was processed ,organized and anayzed by Microsoft Office Excel 2007.

2.3.7. Data dissemination: Written report (both hard and soft copies) arranged and shared to Addis Ababa University, School of Public Health, EFETP, and Oromia Regional Health Bureau, EPHA and EFETP Resident advisors and coordinators.

2.3.8. Case definition

2.3.8.1. Measles suspected cases at community level:

A community member should report any person with rash and fever to a health worker and also advise the person to go to a health facility.

2.3.8.2. Suspected measles case:

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.

2.3.8.3. Confirmed measles case:

Cases with a positive laboratory result for measles specific immunoglobulin (IgM) antibody testing that had not received measles vaccination within the 4 weeks before the specimen collection.

2.3.8.4. Epidemiologically linked case:

A suspected measles case that has not had a specimen taken for serologic confirmation and is linked (in place, person and time) to a laboratory confirmed case; i.e., living in the same or in an adjacent district with a laboratory confirmed

case where there is a likelihood of transmission; onset of rash of the two cases being within 30 days of each other.

2.3.8.5. Clinically compatible cases:

Included those who met the clinical case definition, for whom neither a sample for laboratory testing nor an epidemiologic link to a laboratory-confirmed case were available.

2.3.8.6. Measles death:

For surveillance purposes, a measles death is defined as any death from an illness that occurs in a confirmed case or epidemiologically linked case of measles within one month of the onset of rash.

2.3.8.7. Measles outbreak:

Is laboratory confirmed when 3 or more laboratory confirmed measles IgM -positive cases occur in a health facility or district in a month.

2.4. Results

2.4.1. Measles cases vaccination status

From 2008 to 2012, a total of 857 suspected measles patients were recorded in Arsi zone, Oromia region. Among these, 211(24.6%) were laboratory confirmed by IgM (positive for Immunoglobulin M), 390 (45.5%) were confirmed through epidemiological link with already confirmed cases within one month duration from the date of onset and 256(29.9%) were clinical compatible cases (Table2.1). Of the total 211 laboratory confirmed cases, only 20(9.5%) were vaccinated (Table 2.2).

Table 2.1: Suspected measles cases classification by year, Arsi zone, Oromia, 2008-2012

Case classification	2008		2009		2010		2011		2012		Total	
	Freq.	%	Freq.	%	Freq.	%	Freq.	%	Freq.	%	Freq.	%
Confirmed	11	9	3	3	29	16	58	28	110	46	211	**25**
Epi linked	47	38	75	74	99	53	54	26	115	49	390	**46**
Clinical	67	54	24	24	58	31	95	46	12	5	256	**30**
	125		102		186		207		237		857	

Table 2.2: Measles vaccination status of lab. Confirmed measles cases - Arsi zone, Oromia

Lab.confirmed cases	2008		2009		2010		2011		2012		Total	
	Freq.	%	Freq.	%	Freq.	%	Freq.	%	Freq.	%	**Freq.**	**%**
Vaccinated	5	45.5	1	33.3	4	13.8	0	0	10	9.1	**20**	**9.5**
Unvaccinated	6	54.5	2	66.7	25	86.2	58	100	100	90.9	**191**	**90.5**
Total	11	100	3	100	29	100	58	100	110	100	**211**	**100**

2.4.2. Measles vaccination status

From the total measles suspected cases, 242(28.2%) had taken measles vaccine, but 202(23.6%) cases did not take the vaccine before the onset of the disease and 413(48.2%) cases had unknown vaccine status (Table 2.3).

Table 2.3 : Vaccination status of measles suspected cases by year-Arsi zone, Oromia, 2008-2012

Vaccination status	2008		2009		2010		2011		2012		Total	
	Freq.	%	Freq.	%	Freq.	%	Freq.	%	Freq.	%	Freq.	%
Vaccinated	34	**27.2**	57	**55.9**	77	**41.4**	37	**17.9**	37	**15.6**	242	**28.2**
Unvaccinated	58	**46.4**	20	**19.6**	39	**21.0**	40	**19.3**	45	**19.0**	202	**23.6**
Unknown	33	**26.4**	25	**24.5**	70	**37.6**	130	**62.8**	155	**65.4**	413	**48.2**
Total	125	**100**	102	**100**	186	**100**	207	**100**	237	**100**	857	**100**

2.4.3. Measles administrative vaccine coverage and number of cases

The average administrative routine vaccine coverage for eligible children increased from 2008 to 2012 and the number of measles cases in the study Zone increased from 2009-12 (Fig.2.8). There was no supplementary immunization activities in the zone during the study period.

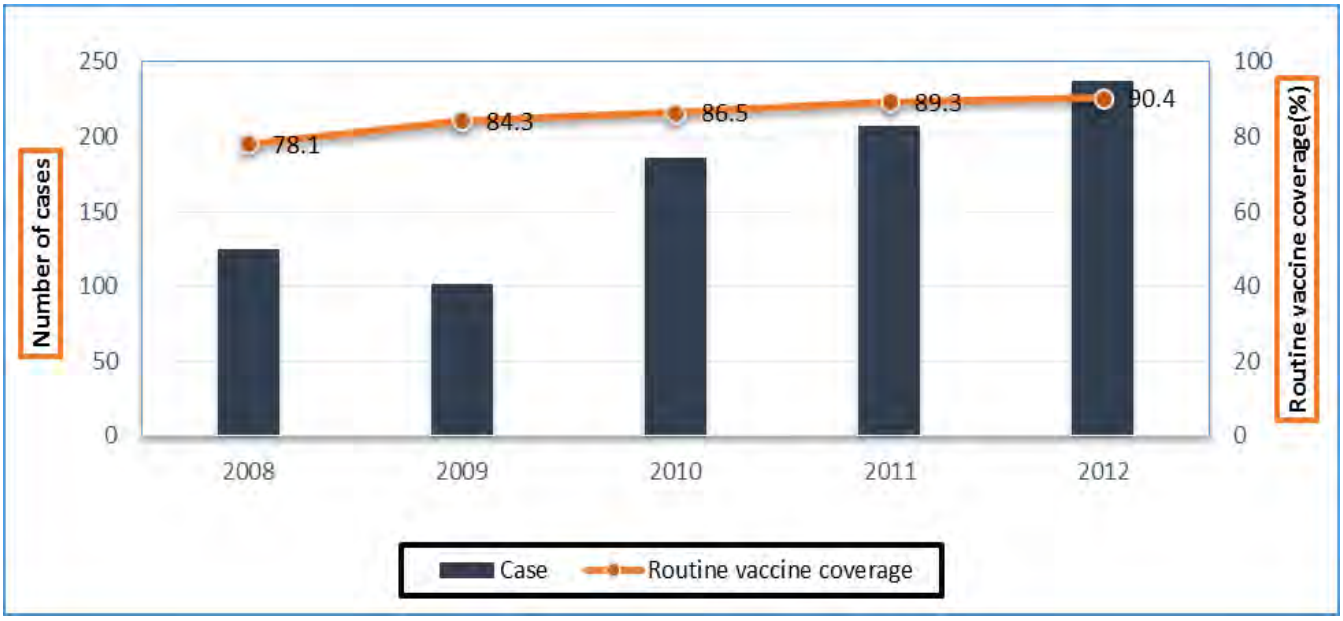

Figure 2.1: Number of measles cases and average administrative routine Vaccination coverage by year, Arsi zone, Oromia, 2008-2012

2.4.4. Suspected measles cases by age category

Of the total suspected measles cases, 403(47%) were in the age category of 5-14 years, 267(31.1%) cases were 0-4 years of age ,183(21.4%) were 15-44 years of age and 4(0.5%) were 45 and above years of age (Fig.2.2).

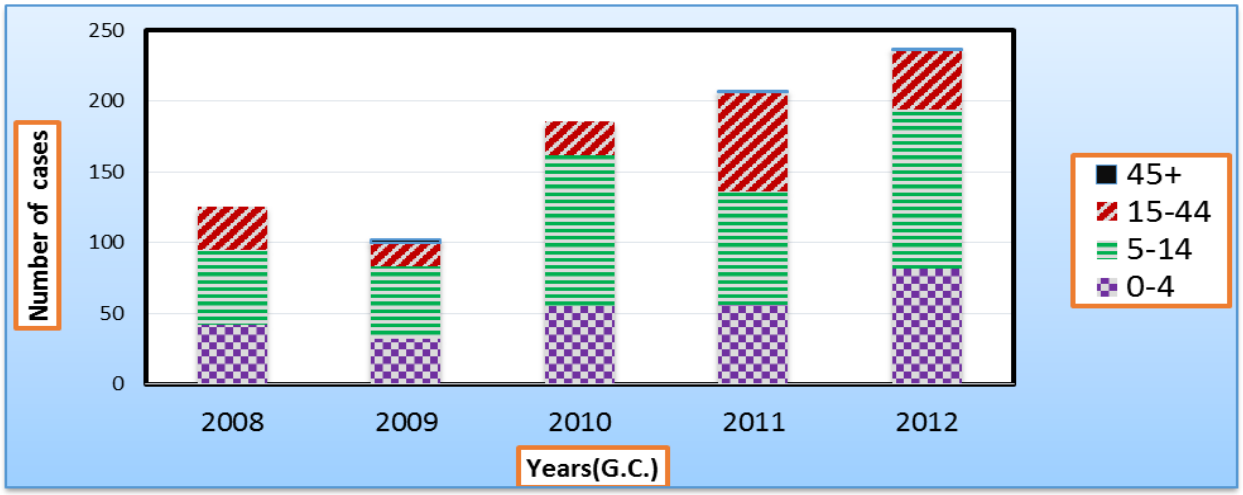

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Figure 2.2: Measles suspected cases by age category in each year in Arsi zone, Oromia, 2008-2012

2.4.5. Measles vaccine eligible children and susceptibility

During this period there were 483,220 vaccine eligible children, of these, 114280(23.6%) were susceptible for measles disease. (These included unvaccinated and 15% children from those vaccinated because of lack of seroconversion at nine month) (Fig.2.3).

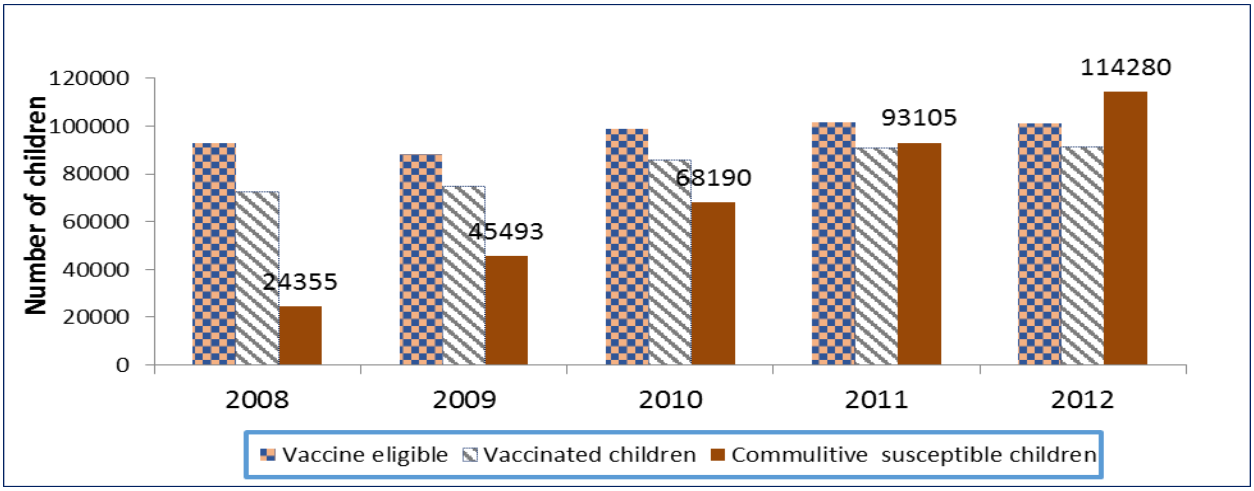

Figure 2.3: **Eligible, vaccinated and measles susceptible children by year, Arsi zone,Oromia, 2008-2012**

2.4.6. Measles case distribution by woreda

Among the total patients in the 2008-2012 period, 95(11.1%) and 89(10.3%) cases were recorded at Tiyo and Limo Bilbilo woredas ,respectively, despite the fact the administrative vaccine coverage of these woredas were 88.4% and 97.5% ,respectively.

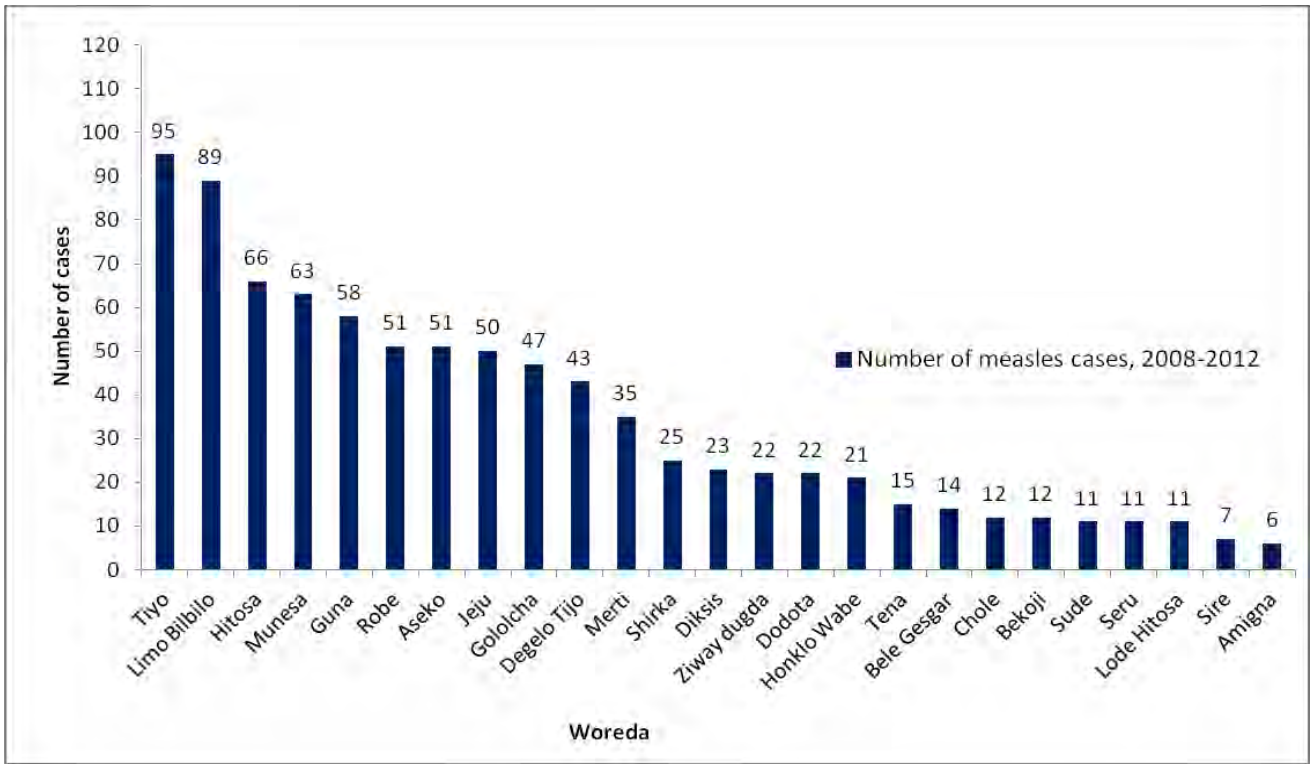

Figure 2.4: Number of measles cases by Wored , Arsi zone, Oromia, 2008 to 2012

2.4.7. Measles secular trend and incidence rate

In the study area among the total patients, high proportion of the cases, 521 (60.8%) developed the disease from January through June in each consecutive years (2008-12) (Fig.2.5).

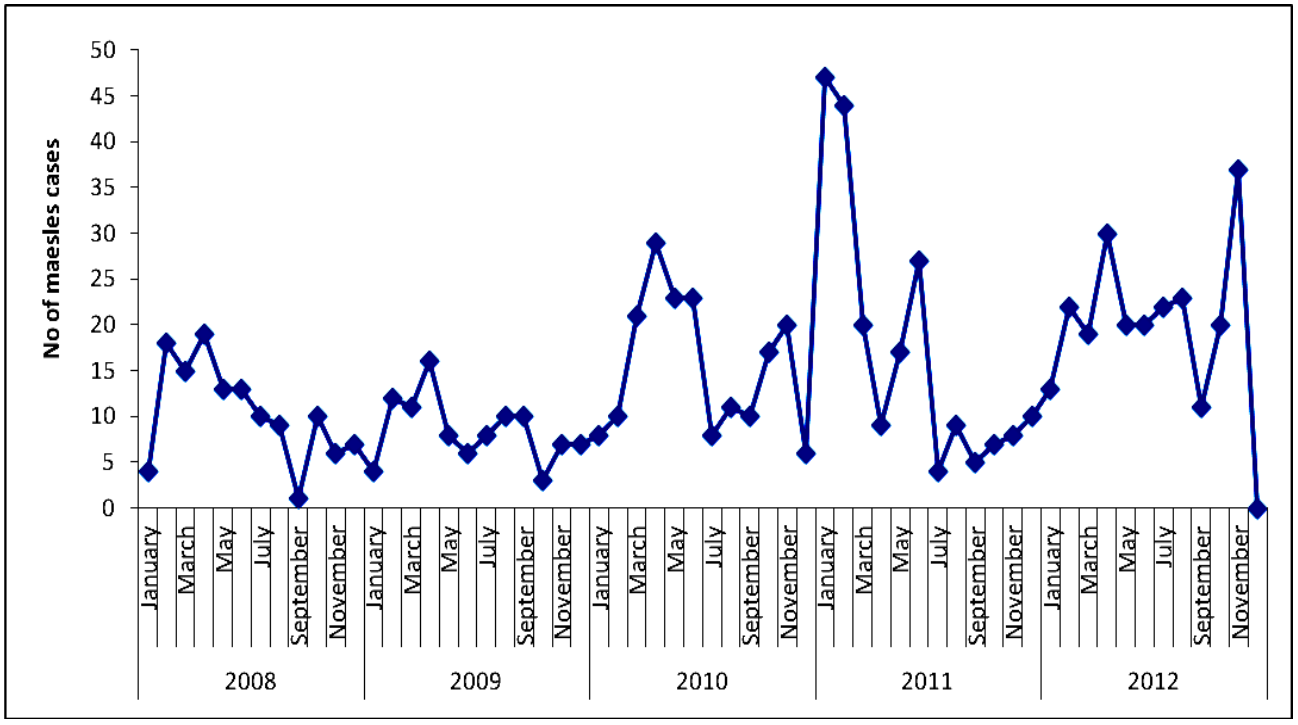

Figure 2.5: Measles cases secular trend by month and year in Arsi zone, Oromia, 2008-2012.

The incidence rate of the disease increased from 2009 to 2012 with the magnitude of 3.7/100000 population in 2009 to 7.8/100000 population in 2012. (Fig.2.6).

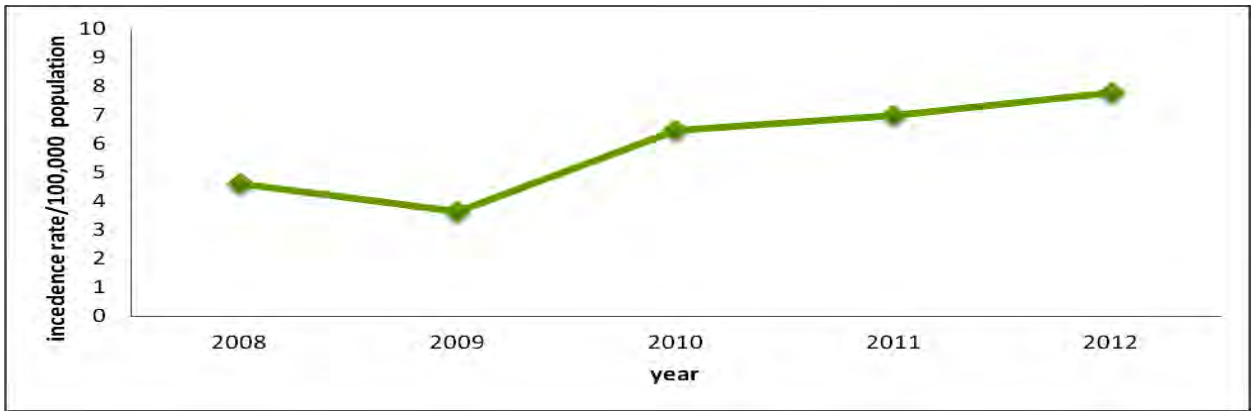

Figure 2.6: Measles incidence rate by year in Arsi zone, Oromia, 2008-2012.

2.4.8. Measles out break

In the study zone, from 2008 through 2012(except 2009), twenty six outbreaks were identified from the report, those outbreaks identified in our finding was based on outbreak definition of WHO and FMOH measles guideline. Of those outbreaks, one death was reported from Tiyo woreda in 2012. Among the total number of out breaks, 12(46.2%) occurred in 2012. The outbreak occurred in 14(56%) woredas of Arsi zone. The number of affected woredas increased from 2009 to 2012. (Table.2.4)

Table 2.4: Number of out breaks related to affected woredas-Arsi zone, 2008-2012

	Variables		
Year	# of outbreak	# of affected woredas	Total death
2008	6	2	0
2009	0	0	0
2010	2	2	0
2011	6	5	0
2012	12	12	1
Total	26	21	1

2.5. Discussion

The surveillance data revealed that, there was an increased in measles routine immunization coverage from 2008 -2012. There was an occurrence of measles cases in the study area, which increased from 2009 to 2012. Regarding to vaccine coverage, different studies showed that an increase percentage of measles routine immunization coverage, decreases the occurrence of the disease (6, 7). However, due to accumulation of susceptible individuals in the community and nonexistence of second opportunity for vaccine leads to occurrence of the disease (8, 9).

The other finding of the analysis indicates that 47% of measles patients were in the age category of 5-14 years (Fig.2.2). Previously younger age group were attacked by the disease due to the rate of decline of protective maternal antibodies, the amount of contact with infected people and the level of measles vaccine coverage. Previous study indicated that as measles vaccine coverage increases, or population density decreases, the age distribution shifts towards older children. As vaccination coverage, and thus population immunity, increases further, the age distribution of

cases might shift into adolescence and adulthood. The upward shift in the age of measles cases to older age groups with increasing administrative vaccine dose one coverage is well documented. For example, toward the end of endemic measles virus transmission in the Americas, outbreaks in Argentina, Bolivia, Brazil, Canada, Venezuela, and the Dominican Republic included cases among young adults. In 1997, the last large measles outbreak that occurred in the Americas in Sao Paolo, Brazil, included >42,000 cases and was caused by an accumulation of susceptible young children, because of suboptimal Measles routine immunization coverage and a delay in implementing a follow-up SIA, together with an accumulation of susceptible young adults who had escaped both natural measles infection and measles vaccination (9). Similar fact indicated in our finding, that of accumulation of susceptible individuals in the community and due to nonexistence of supplementary immunization activities leads to an occurrence of the disease in the study area and related to this conditions the secular trend of the disease increased from 2009-2012.

The case fatality rate of our finding was 0.001%, while compared to the estimated value it was insignificant and showed less mortality in the study area. Previous study showed that the case fatality from measles is estimated to be 3 – 5% in developing countries but may reach more than 10% in outbreaks especially when it is compounded by malnutrition. In Ethiopia, the expected case-fatality rate is between 3% and 6%; the highest case-fatality rate occurs in infants 6 to 11 months of age, it aggravated by malnutrition. But in our finding the mortality rate was very low and it indicated that there was low or no complication developed in Measles- infected individuals, because mostly death from measles is due to measles complications. Throughout the study period there was 26 confirmed measles outbreaks occurred in the study area, based on the guidelines. Confirmed measles outbreak means an occurrence of three or more laboratory confirmed (IgM positive) measles cases in one month in a defined geographic area such as a kebele, woreda or health facility catchment area (10).

There is a seasonal pattern for an occurrence of the disease mainly from January to June for each consecutive year of the study period, previous study revealed that dry season and an occurrence measles disease was related and so it was similar to our finding (11).

2.6. Limitation:

On the case based report format, there were no variables like sex, so it was difficult to analyse the data based on sex and the study did not include line listing data.

2.7. Conclusion:

This measles case based surveillance data analysis indicates that, the administrative vaccine coverage of Arsi zone was increased throughout the study period (2008-2012). However, there was an increase of measles incidence rate from 2009-2012. Regarding to age category of cases, children whom age from 5-14 years old were more affected compared with other age categories, it showed that there was age shifted from young to older children. Majority of patient's vaccination status was unknown, it may be either more community did not recall the vaccination status or there was inadequate information gave to the community from the health providers. Regarding of seasonal variation of the disease, more cases occurred from January to June in the consecutive years of the study period. In general the study indicates, unless measures should be taken, it will be continue an episode of the disease in near future in the study area.

2.8. Recommendations:

There were susceptible accumulation of children in the zone; therefore supplementary immunization activities (SIA) should be implemented for those at risk to prevent an occurrence of the disease. Follow up should be mandatory for woredas whose administrative vaccine coverage and more cases were reported. During filling the case based form, variables like sex should be recorded on the report format. Prevention of the disease should be implemented throughout the year; especially more focus should be given on dry season.

2.9. References

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Chapter III - Evaluation of Surveillance System

3. Health surveillance system evaluation - West Showa Zone, Oromia, 2012/13

Executive summary

Introduction

Public health surveillance is an on-going, systematic collection, analysis, interpretation, and dissemination of data regarding a health-related event for use in public health action to reduce morbidity and mortality and to improve health. We reviewed public health surveillance systems in West Shewa zone.

Methods

A descriptive study design was conducted for the surveillance system evaluation. First we selected West Showa zone by proximity to the Regional health bureau and then among 18 woredas found in the zone, we selected 3(17 %) woreda health offices conveniently (Ambo, Dendi and Tokekutaye). Regarding to health facilities, one hospital was selected by convenient and from those chosen woredas we picked three health centers by simple random sampling method (Meti,Ginci and Goro Sole) and 6 health posts selected from those health centers by lottery method (Amaru ,Awero, Asgori,Gare Arera,Kole Berode and Timay). Totally we incorporated four health offices and 10 health facilities in the surveillance system evaluation and interviewed the assigned focal person and consequently observed system related documents.

Results

The population under surveillance in the Zone was 2,315,784. Standard case definition used for cases and outbreak detection. Regarding to system attributes, the simplicity of surveillance system for all respondents (health facilities other than health post, zonal and Woredas health bureau) agreed upon easy to use for case detection and filling the data by their all level of health professionals. Related to flexibility of the surveillance system, 75 % of the study participants reported that the current reporting formats be used for other newly occurring health event (disease) without much difficulty and 87.5% of the respondents reported that public health surveillance reporting format was easy to add new variable. All respondents agreed on the system which integrated to other systems. On the surveillance report form, we observed, on average 15/66(23%) blank responses to variables in the majority, 12/14(86%) of the respondent reports. In relation to acceptability of the system (the zonal health office, three woredas, three health centers and one hospital PHEM focal persons were interviewed), 87.5% participants

responded that the health workers used the standard case definition to detect cases and outbreaks. Among eight respondents, 62.5% participants reported that all health professionals in their working place are aware about the surveillance system and fully participated in the surveillance system. All respondents sent reports by using the current and appropriate surveillance reporting format. Concerning to representativeness the health service coverage of West Shewa zone was 93%, the health service coverage of the districts were 65%, 75% and 83% for Dendi, Ambo and Toke Kutaye, ,respectively. All surveillance system evaluation respondents agreed that the system enabled to follow the health and health related events in the community, and the populations under surveillance have good health seeking behaviour for the diseases. About 87.5% of the respondents also agreed that rural and urban communities are equally benefited in surveillance system. The completeness the reports by the woredas and hospitals participated in the study were 51.8% and 52.8%, respectively.

The completeness of the weekly report of the Zone in the year 2012/13 was 71.2%, while the weekly report completeness of Ambo woreda from March to May 2005 E.C. (WHO week from week 12-23) was 86%, which was continuous throughout twelve weeks. And the completeness of weekly report of Dendi woreda from March to May 2005 E.C. (WHO week 12-23) was 63%, which was interrupted from week 16-19, and Toke Kutaye woreda from March to May 2005 E.C. based on WHO week from week 12-23 was 79%, which was interrupted for two weeks out of 12 weeks.

According to Ethiopia PHEM guideline there is scheduled time to report for each level of reporting site to the next level. Thus the three woredas, three health centers and four health posts reported based on the guideline and act in accordance with the timeliness, but two health posts did not follow the guideline. In relation to system stability, 87.5% of the respondents reported that, any new restructuring in the system did not affect the procedures and activities of the surveillance of the diseases. Based on the report of one participant, there was time or condition interruption for some period due to lack of commitment. About 62.5% of respondents described about lack of resources, which challenged the surveillance system, but they used other alternatives to solve the problem.

Conclusion and recommendation

Public health surveillance system is crucial for population wellbeing. According to the evaluation, the system is in place and help full for detection of the diseases and outbreaks. The main public health problem of the Zone was malaria; however, it had low capability of detecting the disease related to case definitions. Measles was the second public health concern within the Zone and affected more than 180 people in one woreda. The other selected diseases, AFP/polio and meningitis were not significant compared with malaria and measles. Concerning to the guidelines, reporting format other than weekly report form, case based report form, line list report form and log books were found adequately. Majority of respondents have updated guidelines, standard case definitions, adequate drugs and vaccines. Regarding to training on surveillance, majority of the respondents were trained, but there are also non trained PHEM focal persons in the health facilities and office. Concerning to epidemic preparedness, there was no preparedness plan in place but whenever an outbreak is emerged it is responded reactively.

On the issue of completeness and timeliness of reporting, the Zone and its Woredas did not perform well and below the target. Therefore to strengthen the surveillance system the assigned PHEM focal persons should be received reports from public and private sectors, then analysing data and interpretation. They should prepare proactive plan and also create awareness for the health providers about the surveillance system through training and supportive supervision.

3.1. Introduction

3.1.1. Public health surveillance system

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

Public health surveillance systems have been developed to address a range of public health needs. In addition, public health information systems have been defined to include a variety of data sources essential to public health action and are often used for surveillance. These systems vary from a simple system collecting data from a single source, to electronic systems that receive data from many sources in multiple formats, to complex surveys. The number and variety of systems will likely increase with advances in electronic data interchange and integration of data, which will also heighten the importance of patient privacy, data confidentiality, and system security. The evaluation of public health surveillance systems should involve an assessment of system attributes, including simplicity, flexibility, data quality, acceptability, sensitivity, predictive value positive, representativeness, timeliness, and stability. (2)

Communicable disease surveillance is the continuous monitoring of the frequency and the distribution of disease, and death, due to infections that can be transmitted from human to human or from animals, food, water or the environment to humans, and the monitoring of risk factors for those infections(3)

The data and information flows routinely transfer from the ground level (community) up to the higher level FMOH/EHNRI, which starts from health post to health center then passed to woreda health bureau afterward passed to Zonal health department. The Zone PHEM departments after compiled the data send to Regional Health Bureau PHEM core process. In turn the Regional Health Bureau PHEM unit sends the compiled data and information to the EHNRI/PHEM. The data and information flows process is carry out based on Ethiopia PHEM guideline schedule. (Table 3.1)

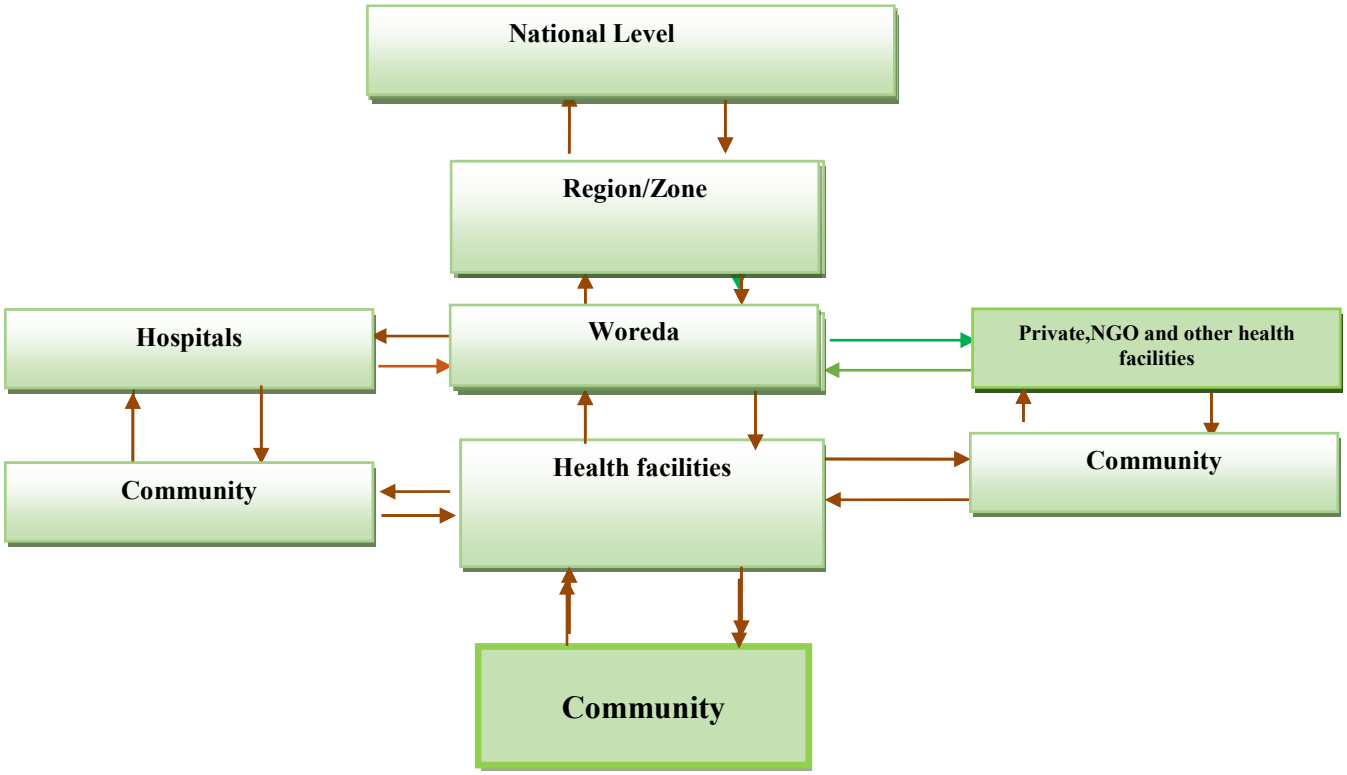

Figure 3.1: Data and information flows for public health surveillance activities

3.1.2. Back ground

West Shewa zone is one of the 18 Zones which found in the Oromia regional state; it has 18 woredas and one town administrative. Ambo is the capital town of the Zone. Regarding to health facilities, it has 3 hospitals, 73 health centers and 540 health posts. The health service coverage of this Zone reached to 93% in 2013.

The Zone is bordered on the south by the Southwest Shewa Zone and the Southern,Nations,Nationalities and People Region(SNNPR), on the southwest by Jimma, on the west by East Wollega, on the northwest by Horo Guduru Wollega, on the north by the Amhara Region, on the northeast by North Shewa zone, and on the east by Oromia Special Zone Surrounding Finfine, the area of the zone is 14,921 square km. Its highest peak is Mount Wenchi (3386 mt); other notable peaks include Mount Mengesha and Mount Wechecha.

Based on the 2007 Census, the Zone has a total population of 2,315,784 of whom 1,156,503(49.9%) were males. The two largest ethnic groups reported in West Shewa were the

Oromo (93.82%) and the Amhara (5.15%); all other ethnic groups made up 1.03% of the population. Oromiffa are spoken as a first language by 94% and 5.5% speak Amharic; the remaining 0.55% speak all other primary languages. Majority of the inhabitants are followers of Ethiopian Orthodox Christianity, (with 53.84% of the population), while 32.93% of the population are followers Protestantism and 9.85% follow traditional beliefs.

The purpose of evaluating public health surveillance systems is to ensure that problems of public health importance are being monitored efficiently and effectively. Public health surveillance systems should be evaluated periodically, and the evaluation should include recommendations for improving quality, efficiency, and usefulness. In West Showa Zone there were no documents about surveillance system evaluation at zone level and the surveillance system not done in the area previously.

Figure 3.2: Map of West Shewa zone, Oromia, Ethiopia

3.2. Objectives

3.2.1. General objective:

- To evaluate the surveillance system of West Shewa zone.

3.2.2. Specific Objectives:

- To assess the core activities such as case detection, reporting analysis and response of the surveillance system in West Shewa Zone.
- To assess the usefulness of surveillance system in early detection of diseases and outbreaks.
- To assess the usefulness of surveillance system in decreasing morbidity and mortality.
- To describe the linkage of Zone PHEM department with the woreda and regional PHEM departments on emergency and reporting times.
- To identify the strong and weak parts of the system in the Zone and to provide recommendation based on the findings.

3.3. Methods and materials

3.3.1. Study Area:

The study area is West Showa zone, one of the 18 Zones in Oromia Regional State. The zone is located at a distance of 114 Km West from Addis Ababa. This zone is selected for its easy accessibility and the surveillance system evaluation of the Zone was not done before.

3.3.2. Study Subjects:

The study subjects are Health offices (the Zonal Health office, Woreda Health office) and health facilities (Hospital, Health Centers, and Health Posts).

3.3.3. Sample Size and Sampling:

First we selected West Showa zone by proximity to the Regional health bureau and then from the zone among 18 woredas we selected 3(17 %) woreda health office conveniently (Ambo, Dendi and Tokekutaye). Regarding to health facilities, one hospital selected by convenient among a total of three hospitals, from those woredas we selected three health centers randomly (Meti, Ginchi and Goro Sole) and six health posts selected from those health centers by lottery method (Amaru, Awero, Asigori, Gare Arera, Kole Berode and Timay). Totally we included 14 participants in the surveillance system evaluation.

3.3.4. Data collection:

Data collection was done by face to face interview using questionnaire/checklists. Answers from respondents (health office head and/or PHEM officers) were also checked by observing some tools for surveillance by the principal investigator. Record review was also one part of the data collection system so, we reviewed reports of four diseases.

3.3.5. Data Analysis:

Data collected by interview and record review processed by using the Microsoft Excel and Epi-info version 7.1.0.6

3.4. Results

3.4.1. The surveillance system in place

The PHEM focal persons assigned in health office and facility were interviewed. Among the total 14 PHEM focal persons participated in the evaluation, eight (57.1%) were trained on surveillance, but 6(42.9)were not trained. Of the six none trained PHEM focal persons, five were from health posts and one from Woreda health office. Health extension workers assigned as focal persons found in health posts were 250, trained focal persons found in health center were 42, focal persons found in woredas including town administrative were 19 and focal persons found in hospital and zone were 3 and 2 ,respectively. The Zonal health department PHEM unit targeted and engaged in activities on 20 priority diseases (13 immediately and 7 weekly reportable diseases), similar to that of Regional and National levels, (Table3.1). The data flows routinely transfer from health post to health center then passed to woreda afterward passed to Zonal health department.

Table 3.1: List of PHEM immediately and weekly reportable diseases

Immediately reportable diseases	Weekly reportable diseases
1. Acute Flaccid Paralysis (AFP) /Polio 2. Anthrax 3. Avian Human Influenza 4. Cholera 5. Dracunculosis / Guinea worm 6. Measles 7. NNT 8. Pandemic Influenza A 9. Rabies 10. Smallpox 11. SARS 12. VHF 13. Yellow fever	14. Dysentery 15. Malaria 16. Meningococcal Meningitis 17. Relapsing fever 18. Severe Malnutrition 19. Typhoid fever 20. Typhus + Maternal death after verbal autopsy completed.

3.4.2. Usefulness of the Surveillance System

All respondents agreed upon the usefulness of the surveillance system; because it detects the diseases early as possible and alert the epidemic response team on time for the subsequent action based on findings. According to the respondents (Zonal, Woredas and health facilities PHEM focal persons) report, the surveillance system is used to measures the magnitude of morbidity and mortality and help for preparedness in logistics, finance, human resource and other related conditions. Based on the on-going collected data and refined information the health office and health facilities execute prevention and control programs. The respondents also used the surveillance system for observing the trend of diseases and help to predict the future condition of the priority diseases.

3.4.3. Core functions of the surveillance system

3.4.3.1. Case detection

One of the core functions of the surveillance system is case detection, which is the process of identifying cases and outbreaks. Case definition is vital for cases and outbreaks detection. In relation to case detection, among 14 respondents, 11(78.6%) had the standard case definition and that the case definitions were posted in their working place, but the rest three (21.4%) had no post the case definition in their working area, rather they memorized the case definition and use as a tool.

Malaria

A total of 700,686 confirmed and clinical malaria cases were reported from all zones and towns to the Oromia Regional Health Bureau/PHEM unit in 2005EFY, when compared with 2004EFY, it exceed by 4.6%. From total cases reported, there were 46 deaths with case fatality rate of 0.007%. Concerning malaria species, 61.1% of cases were due to plasmodium falciparum. In 2005 EFY West Shewa zone reported a total of 49,526 (7.1%) confirmed malaria cases and one death to the Region. Of total malaria confirmed cases, 26901(54%) were plasmodium falciparum and 22625(46%) were plasmodium vivax. Among total cases reported from the zone, 14 were managed in the in-patient department. The highest confirmed cases were recorded in WHO Epid. Week 39 (September 24-30/2012). The trend of the disease in the zone is indicated on fig 3.3.

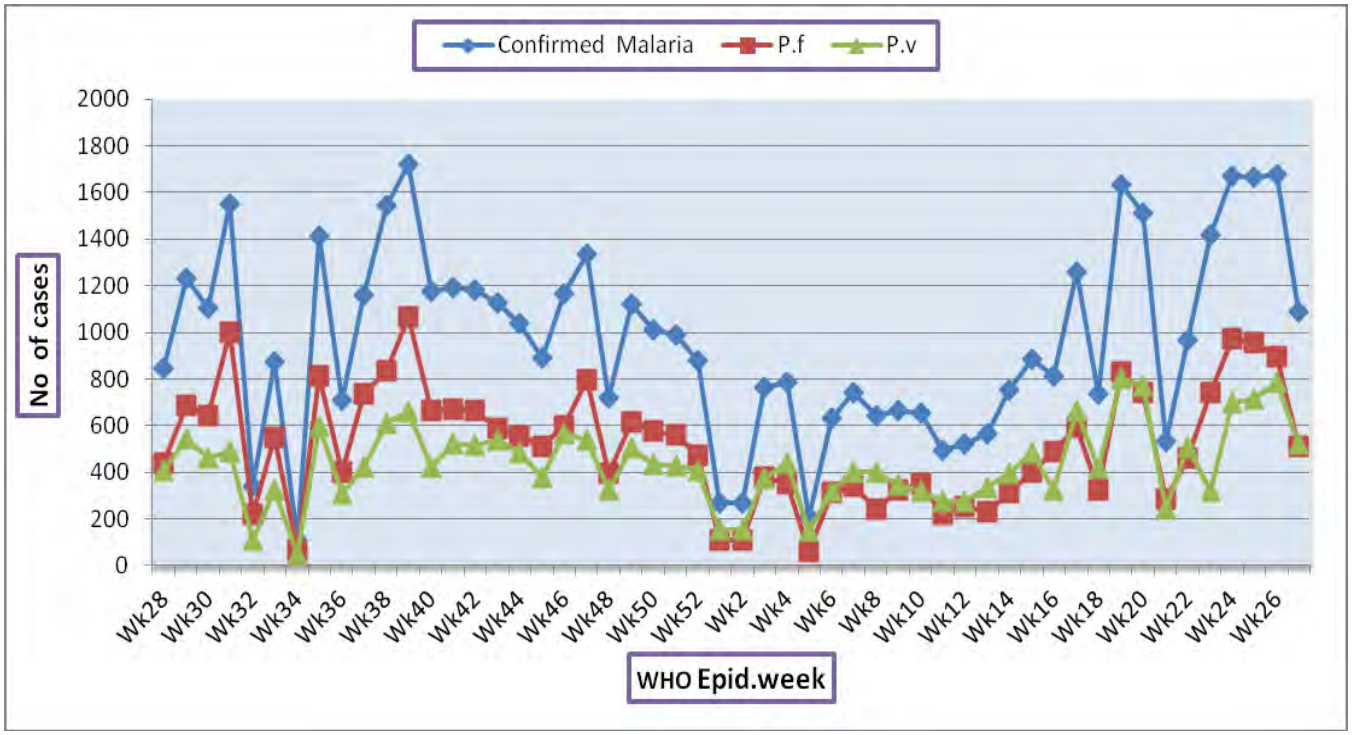

Figure 3.3: Confirmed malaria cases trend in West Shewa zone, Oromia, 2005 EFY

The trend of malaria among the participant woredas was not significant compared with hot spot woredas of the Zone. There are three malaria hot spot woredas found in the Zone, namely Bako Tibe, Ilugelan and Nono.

Bako Tibe woreda reported a total of 8,813 confirmed malaria cases in 2005 Ethiopian Fiscal Year. Of the total confirmed cases, 5139 (58.3%) were plasmodium falciparum species. The peak of the cases were reported from 16-22/11/2004E.C.The trend of the disease is indicated on Fig. 3.4.

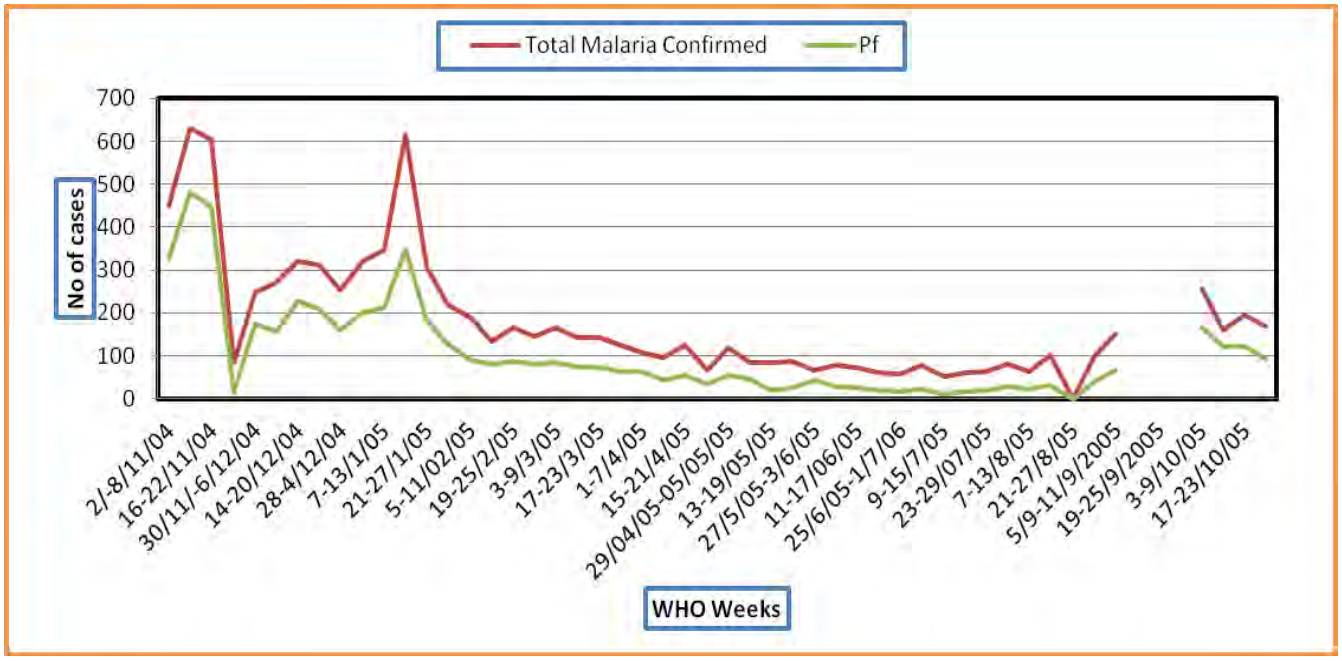

Figure 3.4: Confirmed malaria case trend at Bako Tibe woreda, W/Shewa zone, Oromia, 2012/13

Illu Gelan woreda is one of the hot spot malaria woreda which found in the West Shewa zone. The Woreda reported a total of 8243 confirmed malaria cases in the Ethiopian Fiscal Year of 2005. Among cases, 5629(68.3%) were plasmodium falciprum. the maximum number of cases (604) was reported in week 31(23-29/11/2005E.C). The trend of the cases is indicated on Fig.3.5.

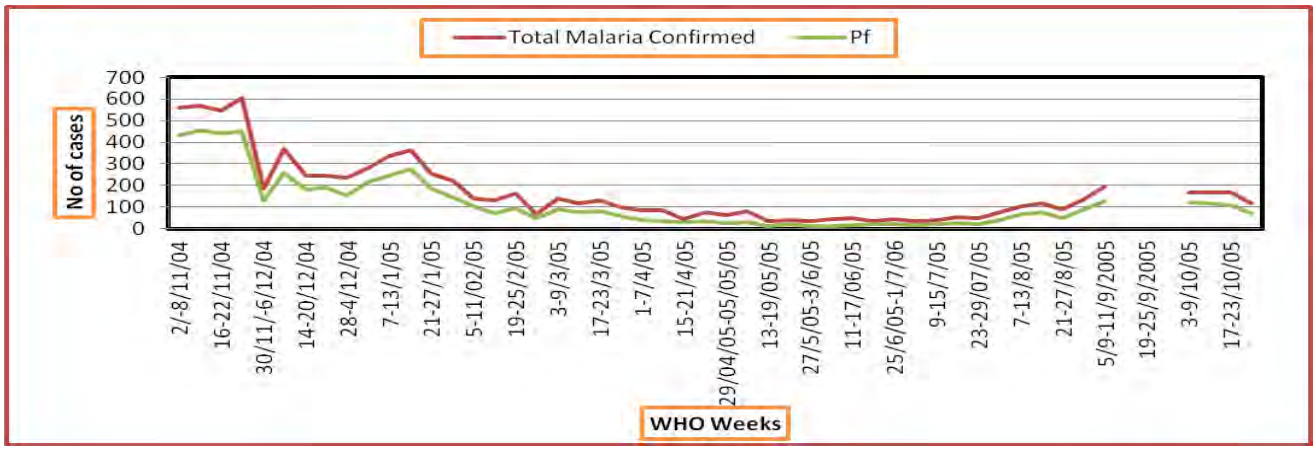

Figure 3.5: Confirmed malaria case trend at Illu Gelan woreda, W/S zone, Oromia, 2012/13

Nono woreda is one of the malaria hot spot woreda. In 2005 EFY, a total of 12,431 confirmed malaria cases were reported to Zone and then to the Region. Among the reported cases, 7446(60%) were infected by plasmodium falciparum. The highest numbers of cases (795) were

reported in WHO week 28/2012, which was on 2-8/2005E.C. Nono woreda malaria report exceeded by 29% and 34% compared with reports came from Bako Tibe and Illu Gelan, respectively. Trend of malaria in the district is indicated on Fig. 3.6.

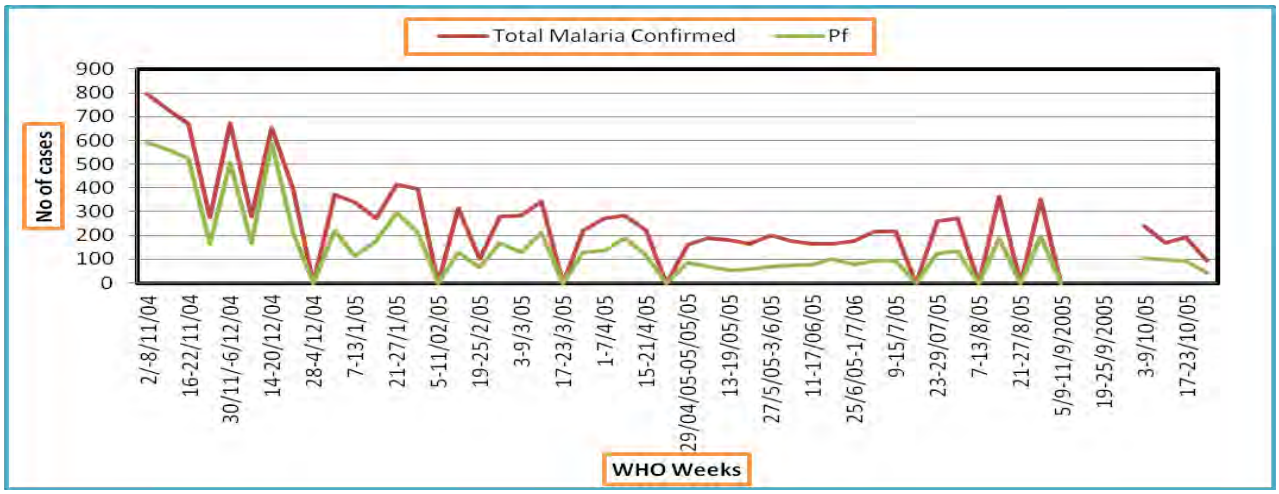

Figure 3.6: Confirmed malaria cases trend at Nono woreda, W/S zone, Oromia, 2012/13

Measles

Measles is one of the immediately reportable diseases. In the region a total of 4,331 suspected cases were reported from different zones and towns in 2005 EFY; among those cases eight deaths were registered. West Shewa zone reported 262 suspected measles cases to the Regional Health Bureau in the above mentioned fiscal year (Figure 3.7).

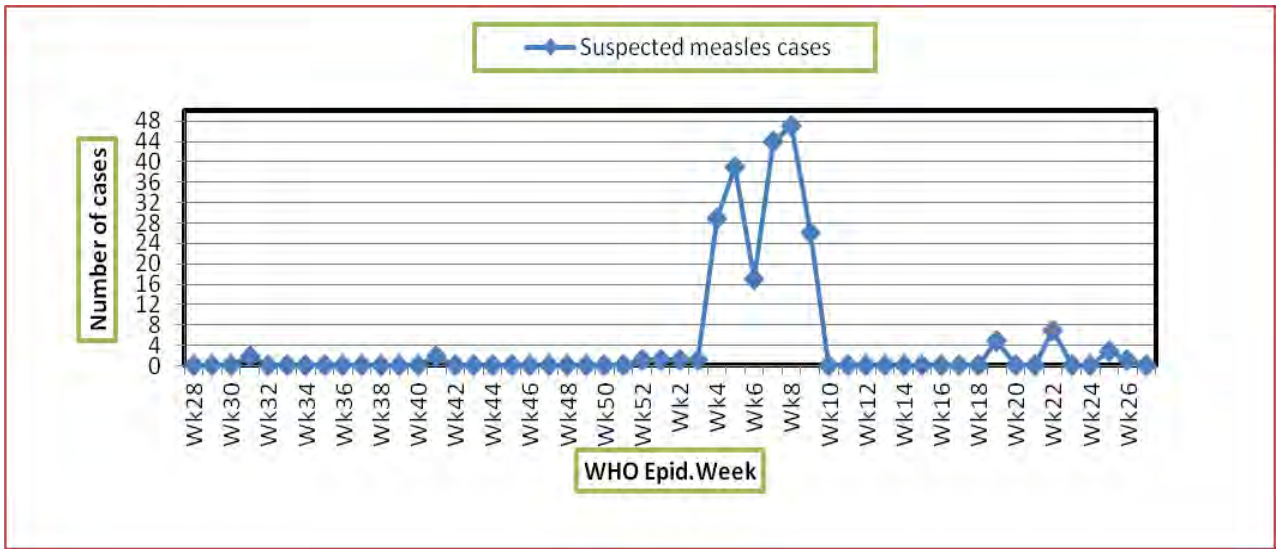

Figure 3.7: Suspected measles cases trend in west Shewa zone, Ormia, 2005 EFY

Among the total suspected measles cases of the Zone, 181(69.1%) were reported from Meta Robi Woreda. The distribution of cases by date of onset was done from 23/01/2013 to 28/02/2013 and the suspected cases were line listed. There was no death due to measles. Among the reported cases from Meta Robi woreda, five cases were IgM positive. The distribution of cases by date of onset is indicated on Fig.3.8.

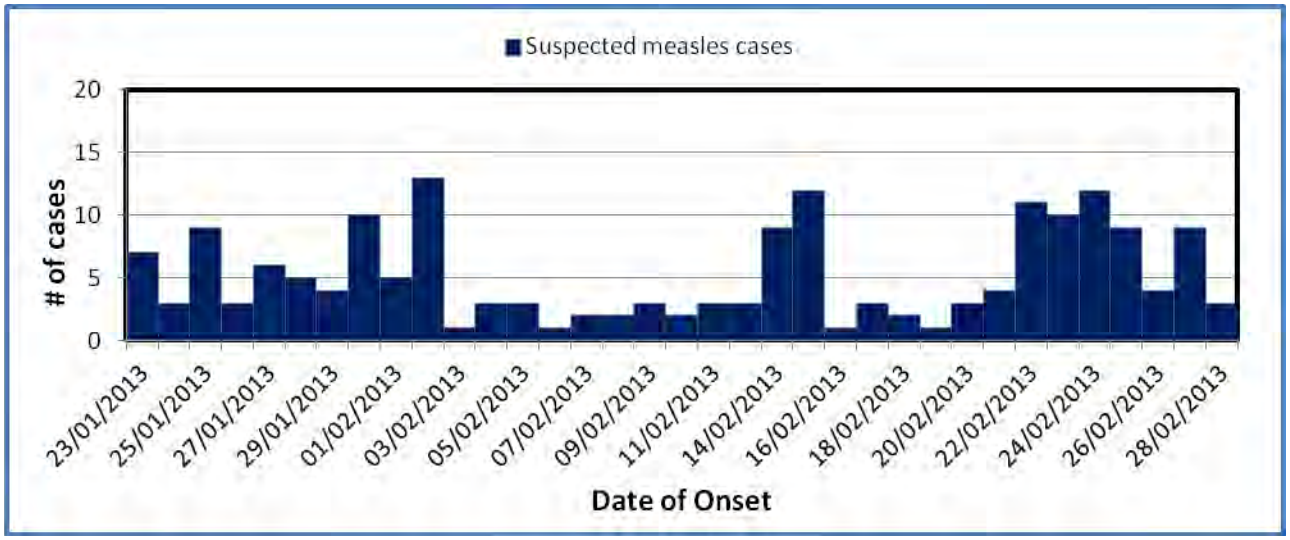

Figure 3.8: Measles epidemic in Meta Robi woreda, W/S zone, Oromia, Jan.23-Feb28/2013

AFP/Polio

At the Regional level, totally 284 suspected AFP/polio cases were reported from zones and towns in 2005 EFY. Among the total AFP suspected case, 13 were reported from West Shewa Zone, of whom 3 suspected cases were from those respondent woredas: (two cases from Dendi and one case from Ambo woreda).

Meningitis

Meningitis is one of the weekly reportable diseases. At the Region, it occurred as an outbreak mainly in Horo Guduru Wollega, west Arsi,and Guji zones from January 23/13-July 31/13. Totally, 528 suspected cases and 13 deaths were reported. Horo Guduru Wollega zone is one of the adjacent boundaries of West Shewa zone. Due to the occurrence of outbreak in H/G/Wollega zone the Regional Health Bureau suspected for the incidence of cases, but fortunately no meningitis case was detected in the Zone during the fiscal year.

3.4.3.2. Case registration

Case registration is the process of recording the cases identified based on the standard case definitions. Concerning case registration all respondents recorded cases in their registration books.

3.4.3.3. Case confirmation

Case or outbreak confirmation refers to the epidemiological and laboratory capacity for confirmation. Having the capacity for appropriate specimen collection, packaging and transportation is mandatory for case confirmation. In this surveillance system evaluation, among the 14 participants 4 were responsible for case confirmation (one hospital and three health centers).Therefore, all of them were able to collect sputum, stool and blood/serum sample and specimen, but none of them were able to collect cerebro spinal fluid samples. Regarding to materials required to collect specimens, all respondent have materials to collect the specimens except for cerebro spinal fluid. All participants have the capacity to handle and transportation of the specimens to central reference laboratory.

3.4.3.4. Reporting

Reporting is the process by which surveillance data moves through the surveillance system from the point of generation. The national PHEM guideline should be implemented in reporting data and information. Based on the national PHEM guideline, among 14 the participants, 12(85.7%) reported on their assigned scheduled day, but two (14.3%) did not report according to the guideline. All participants agreed that Federal or Regional health bureaus are responsible for providing surveillance forms. Relating to lack of surveillance forms in the past six months earlier to this evaluation, 9(64.3%) respondents were not experienced lack of surveillance forms, but 5(35.7%) were experienced shortage of surveillance report forms, especially weekly report form. Of 14 PHEM focal persons who participated in the surveillance system evaluation, 12(85.7%) respondents have contact address of the nearest assigned PHEM focal person to transfer and receive data and information. According to the evaluation, there were no immediately reportable diseases one month prior to this evaluation, but if there is immediately reportable diseases, all respondents answered that they should use phone to report the cases or outbreak. In weekly reportable diseases, 8(57.1%) respondents used hard copies, 3(21.4%) used mobile phones and 3(21.4%) used fixed (wired) phones to transfer data or information to the next level.

3.4.3.5. Data analysis and interpretation

Surveillance data should be analysed routinely and the information interpreted for use in public health action. The data analysis is used for alert and epidemic threshold values for the priority diseases in the country. In the surveillance system evaluation, data analysis and interpretation was not well conducted. Among 14 respondents, 10(71.4%) of them did not conduct data analysis and interpretation, but 4(28.2%) of respondents conducted data analysis partially, because mostly, they analysed data by place and time regardless of person.

3.4.3.6. Epidemic preparedness

Epidemic preparedness is the existing level of preparedness for potential epidemics and availability of preparedness plan. In the evaluation of the surveillance system, eight participants except health posts were included. Among eight, three (37.5%) of respondents had prepared plans for epidemic response and preparedness, five (62.5%) had no prepared plan. Regarding to stock of drugs and supplies for emergencies, 2/8(25%) had drugs and supplies for emergencies, 6/8(75%) had no stock of drugs and supplies for emergencies; rather they prepared themselves for asking to the higher level. All study participated Woredas and Zone have rapid response team. There was no budget for epidemic response.

3.4.3.7. Epidemic response and control

Public health surveillance systems are useful if they provide data for appropriate public health response and control. Fortunately there were no outbreak in 2005 EFY in the participant woredas; but based on their previous experience; all of them did not use outbreak checklist during outbreak investigation. At the zonal level, there was measles epidemic at Meta Robi woreda and the Zone actively participated in the epidemic response and control. Concerning laboratory confirmation, all respondents sent the specimen to EHNRI following the specimen collection, packaging and transportation procedures. About 87.5% of the participants had implemented prevention and control measures based on their local data for at least one epidemic prone disease.

3.4.3.8. Feed back

Feedback is an important function of all surveillance system. In this surveillance system evaluation we observed documents regarding to receiving feedback from the higher level, among 14 participants, 11(78.6%) received minimum of two feedbacks from higher level for further

enhancing their strong side and to improve their weak portion. There were no complaints raised on the feedback. The Zone was not supervised by higher level in 2005 EFY.

3.4.4. Supportive functions of surveillance systems

3.4.4.1. Standards and guidelines

Standards and guidelines are mandatory for implementing the surveillance system. A comprehensive surveillance guideline should define the priority diseases for surveillance. Among 14 participants, 9(64.3%) respondents have recently updated guidelines like PHEM guideline 2012, Measles guideline 2012 and others, but with 5(35.7%) participated facilities, there were no available of national manual or guidelines for the surveillance system.

3.4.4.2. Training

Training refers to the needs for capacity building to enhance the quality of the surveillance system through knowledge and skill transfer. Among 14 study participants, 8(57.1%) were trained in surveillance and assigned focal persons, 6(42.9%) were not trained in surveillance but act as focal persons. Regardless of the turnover, within the Zone, there are 250, 42, 19 and 3 trained PHEM focal personnel in health posts, health centers, woredas and hospitals, respectively.

3.4.4.3. Supervision

Supportive supervision helps to strengthen the capacity of health staffs and ensure that the right skills used appropriately ensure that all necessary things are in place and that planned activities are implemented based on the schedule. In this surveillance system evaluation, among 14 study participants, 12(85.7%) were supervised by higher level in 2005 EFY and 2(14.3%) were not supervised. The frequency of supervision varies from zero to six times within the year.

3.4.4.4. Communication facilities

Communication facilities facilitate the reporting and feed back in any surveillance system. We reviewed that, among the 14 participants, 8/14(57.1%) were using hard copies, 3/14(21.4%) mobile phones and 3/14(21.4%) used fixed (wired) phones as a communication material. There was a complaint on communication facilities especially in telephone users due to network interruption.

3.4.4.5. Resources

Surveillance and response activities can be performed if appropriate financial, logistics and human resources are in place. In this surveillance system evaluation, all respondents except health posts (Zonal health department, woredas health office, hospital and health centers) have motor bicycle, computer, printer and electrical power supply. The details of the logistics resources indicated below (Table 3.2).

Table 3.2: Logistics resources in the surveillance system evaluation participant health office and health facilities, West Shewa zone, Oromia, May.2013

Offices/Health Facilities	Logistics resources					
	Vehicle	Motor cycle	Electricity	Computer	Printer	Fixed Tel
West Shewa Zone	√	√	√	√	√	√
Ambo Woreda	–	√	√	√	√	√
Dendi Woreda	–	√	√	√	√	√
TokeKutaye Woreda	–	√	√	√	√	√
Ambo hospital	√	√	√	√	√	√
Meti HC	–	√	√	√	√	–
Ginchi HC	–	√	√	√	√	–
Goro Sole HC	–	√	√	√	√	–
Amaru HP	–	–	√	–	–	–
Awaro HP	–	–	√	–	–	–
Gare Arera HP	–	–	–	–	–	–
Asgori HP	–	–	√	–	–	–
Kole Beredo HP	–	–	–	–	–	–
Timay HP	–	–	–	–	–	–
Total	2	8	12	8	8	5

√ Present – Not present

3.4.5. Describing surveillance system attributes

3.4.5.1. Simplicity of the system

Regarding to the simplicity of surveillance system, all respondents (health facilities other than health post, zone and Woredas health offices) agreed that the system is easy to use for case detection and filling the data by all levels of health professionals. Based on response of participants in this evaluation; the surveillance system helps to record and report the data on time. On average it had taken 10-15 minutes for filling the data. Relating to data analysis the respondents received aggregated data which were not segregated by variables like sex, age and other variables. The absence of these individual variables makes the report less problem-solving

on who is affected more by age, sex, and others. Concerning laboratory result notification after sending the specimen had taken different time duration for different specimen. Based on the respond of zonal PHEM focal person the result notification for measles had taken one month to three months and AFP/polio had taken one month to six months.

3.4.5.2. Flexibility of the surveillance system

Flexibility refers to the ability of the system to be adapted to changing needs like removal or inclusion of additional diseases, modification of the reporting frequency, data requirement needs and others. The flexibility of the surveillance system in this evaluation indicated that 6(75 %) of the study participants reported that the current reporting formats be used for other newly occurring health event (disease) without much difficulty and 2(25%) of respondents said that any change in the existing procedure of case detection and reporting formats made it difficult to implement. Among the respondents,7(87.5%) reported that the public health surveillance reporting format was easy to add new variable and all respondents agreed on the system which integrated other systems.

3.4.5.3. Data Quality of the system

Data quality reflects the completeness and validity of the data recorded in the public health surveillance system. During our surveillance system evaluation, we observed the previous one month weekly reports prior to this evaluation (May, 2013) at zone level, in three woredas and three health centers. On average there were 15 unknown or blank responses to variables in the weekly report form. The Zonal health office and one health center filled all variables response on the report forms. The reports of two health centers and three woredas were 80-90% completed. 5(62.5%) respondents were supervised regularly and 3(37.5%) respondents were not supervised regularly. In 2012/13 one of the respondent woreda did not kept back up of reports by hard copy. This was one of the drawbacks of reporting of data to higher level and it leads to difficult to retrieve the previous data.

3.4.5.4. Acceptability of the system

Acceptability of the system is a reflection of the willingness of the surveillance personnel to implement the system. Relating to acceptability of the system, one zone health office, three woredas, three health centers and one hospital PHEM focal persons were interviewed. Of whom 7(87.5%) responded that the health workers in their working place were used the standard case definition to detect cases and outbreaks. Among eight respondents, 5(62.5%) reported that all

health professionals in their working place are aware about the surveillance system and fully participated in the surveillance system. All respondents sent their report by using the current and appropriate surveillance reporting format.

3.4.5.5. Representativeness

Representativeness is the degree to which the reported cases reflect the occurrence and distribution of all the cases in the population under surveillance. One of the indicators of representativeness is health service coverage, and the health service coverage of West Shewa zone was 93%. The health service coverage of the districts were 65%, 75% and 83% for Dendi, Ambo and Toke Kutaye, respectively. All respondents agreed that the system enabled to follow the health and health related events in the whole community and the populations under surveillance have good health seeking behaviour for the diseases. About 87.5% of respondents also agreed that rural and urban communities were equally benefited from surveillance system, but 12.5% respondents did not agreed on equal benefited from the system because of the presence of areas which are hard to reach.

3.4.5.6. Completeness of reporting sites

It is the proportion of reporting sites that submitted the surveillance report irrespective of the time when the report was submitted. We reviewed the 2005 EFY reporting completeness of the zone health office, Woredas and health centers. Regarding to review the completeness of reports of 18 woredas, one town administrative and three hospitals that report to Zonal health office including late reports indicated below (Table3.3). Completeness of woredas report to the zone was 51.8% and completeness of hospitals was 52.8%. Completeness the weekly reports by both groups were under the target.

Table 3.3: Weekly reports received from woredas and town, W/Shewa Zone,oromia.

WHO epid. wk	Nº of woredas expected to report	Nº of woredas that report (including late report)	Nº of Hospitals expected to report	Nº of hospitals that report (including late reports)
13	19	19	3	3
14	19	8	3	2
15	19	18	3	2
16	19	18	3	1
17	19	18	3	1

18	19	18	3	1
19	19	17	3	2
20	19	19	3	2
21	19	14	3	1
22	19	19	3	2
23	19	19	3	2

The zone received weekly report from 18 woredas and one town. Those woredas and town had received the report from different health facilities excluding private clinics. The zone reported weekly report to the Regional Health Bureau. The completeness of the weekly report by the Zone in the year 2012/13 was 71.2%, which was still below the target. (Figure 3.9).

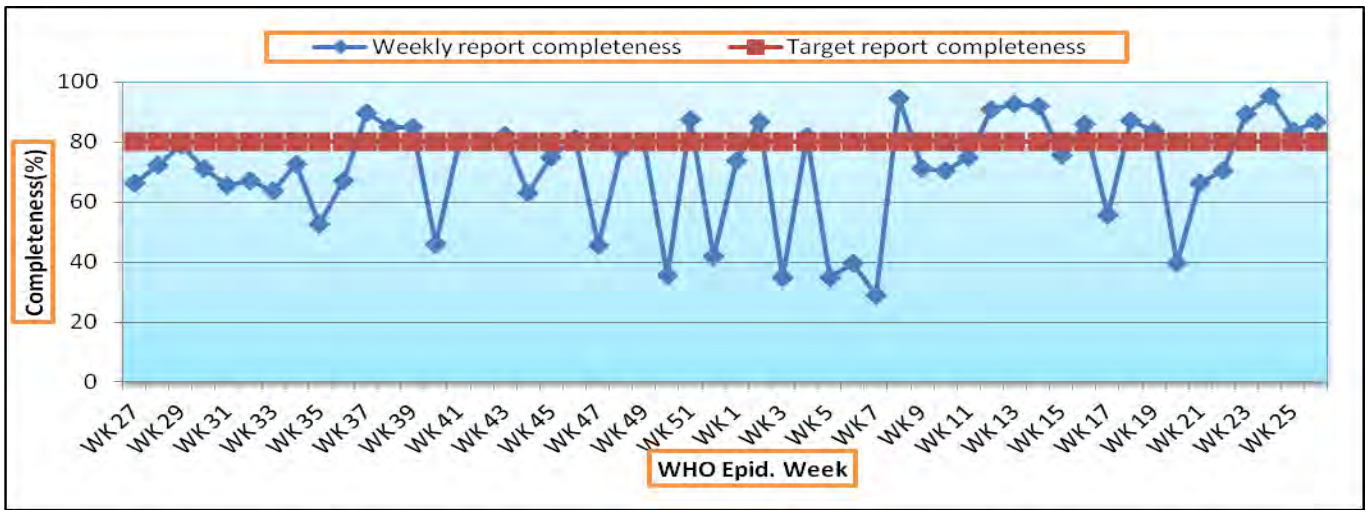

Figure 3.9: Report completeness of West Shewa Zone, Oromia in 2005E.C (2012/13).

The completeness weekly report by Ambo woreda from March to May 2005 E.C. (WHO week from week 12-23) was 86%, which was greater than the target. (Figure 3.10)

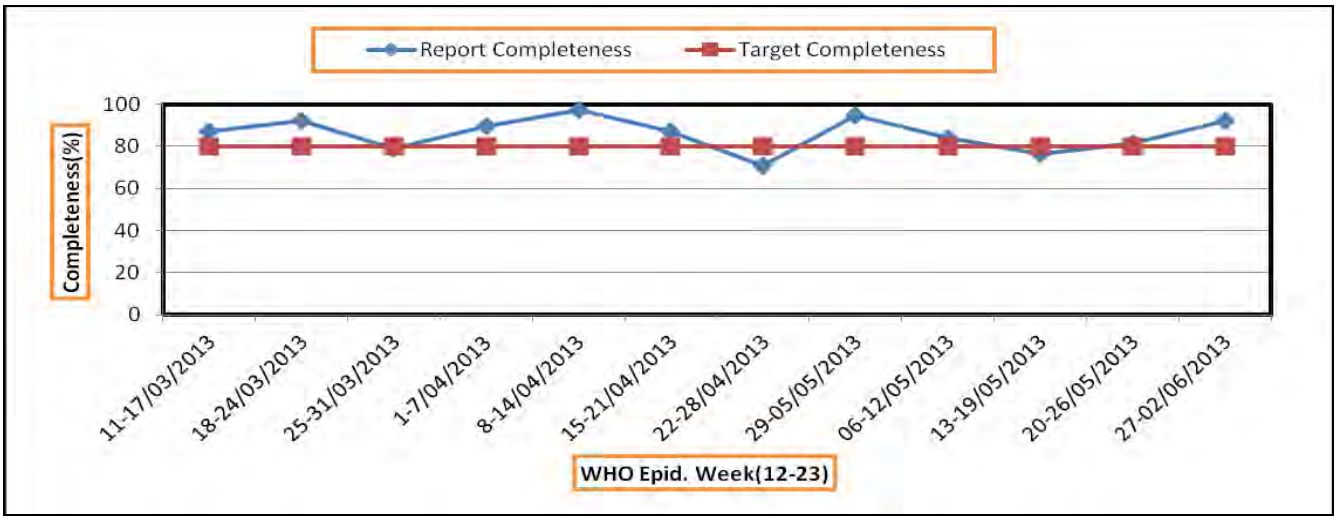

Figure 3.10: Report completeness by WHO week, Ambo woreda , West Shewa zone, Oromia

The completeness weekly report by Dendi woreda from March to May 2005 E.C. (WHO week from week 12-23) was 63%, which was below the target. (Figure 3.11).

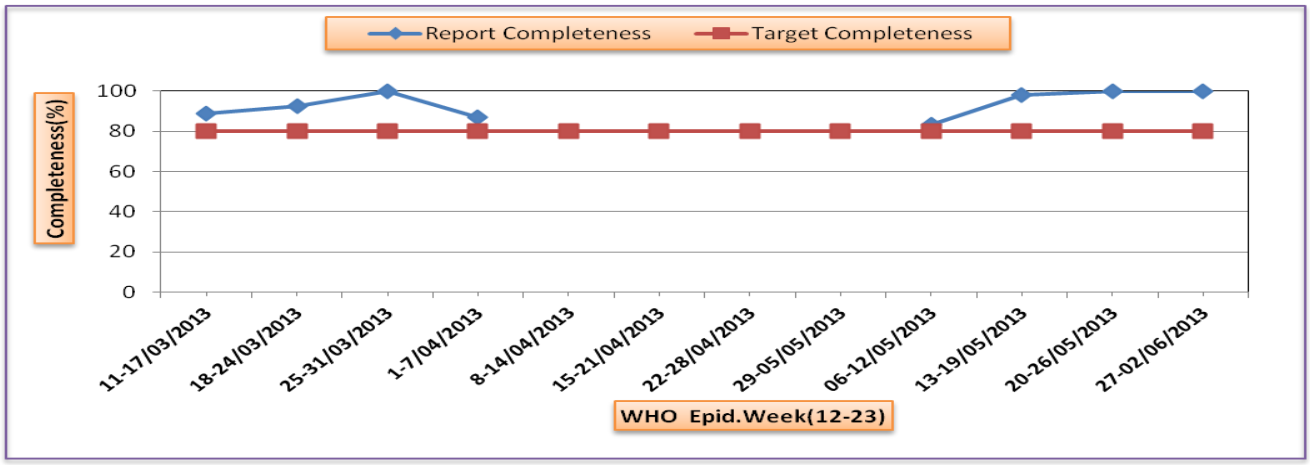

Figure 3.11: Report completeness by WHO week Dendi woreda , West Shewa zone, Oromia

The completeness weekly report by Toke Kutaye woreda from March to May 2005 E.C. (WHO week from week 12-23) was 79%, which was below the target. (Figure 3.12).

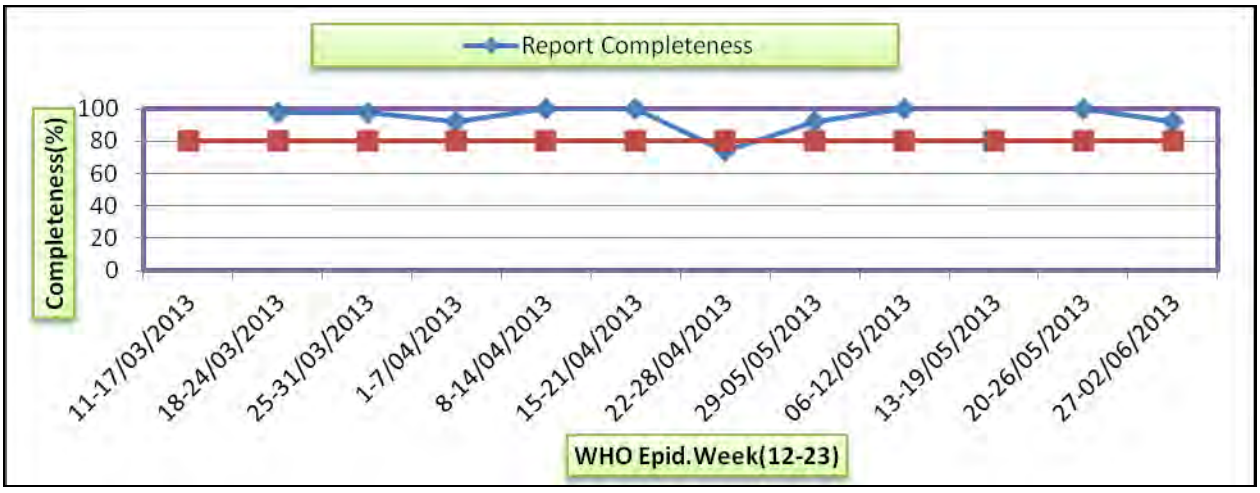

Figure 3.12: Report completeness by WHO week Toke Kutaye woreda , West Shewa zone, Oromia

3.4.5.7. Timeliness of reporting

The most important measures of timeliness are whether data is submitted in time to begin investigation and implement control measures. According to Ethiopia PHEM guideline there is scheduled time to report for each level of reporting site to the next level. Thus in the evaluation of three woredas, three health centers and four health posts show that they have reported based on the guideline and act in accordance with the timeliness, but two health posts did not follow the guideline . The reporting sites which send the report in accordance with the timeliness to the Zone is indicated on Table 3.4.

Table 3.4: Weekly health facilities reports received in time, 2005 E.C by WHO epidemic week (July 2012—June, 2013) at West Shewa zone, Oromia.

WHO Week	N^{O} of Hospitals expected to report	N^{O} of Hospitals that report on time	N^{O} of HCS expected to report	N^{O} of HCs that report on time	N^{O} of HPs expected to report	N^{O} of HPs that report on time	% of timeliness
1	3	2	73	64	540	389	66.6
2	3	3	73	70	540	462	73.8
3	3	3	73	26	540	188	29.3
4	3	2	73	65	540	438	67.7
5	3	1	73	22	540	192	23.3

6	3	1	73	23	540	220	24.4
7	3	1	73	21	540	157	22.3
8	3	2	73	69	540	511	71.8
9	3	0	73	57	540	382	57.6
10	3	2	73	53	540	381	55.6
11	3	3	73	56	540	403	59.7
12	3	2	73	69	540	490	71.8
13	3	3	73	69	540	502	72.8
14	3	2	73	72	540	493	74.8
15	3	2	73	61	540	404	63.7
16	3	1	73	68	540	461	69.7
17	3	1	73	46	540	296	47.5
18	3	1	73	68	540	468	69.8
19	3	2	73	72	540	444	74.7
20	3	2	73	28	540	216	30.4
21	3	1	73	52	540	357	53.6
22	3	2	73	52	540	380	54.6
23	3	2	73	72	540	479	74.8
24	3	1	73	76	540	511	77.8
25	3	2	73	67	540	448	69.7
26	3	2	73	65	540	470	67.8
27	3	1	73	47	540	360	48.6
28	3	2	73	58	540	384	60.6
29	3	1	73	62	540	422	63.7
30	3	2	73	56	540	380	58.6
31	3	1	73	61	540	342	62.6
32	3	1	73	48	540	364	49.6
33	3	1	73	54	540	339	55.6
34	3	2	73	57	540	389	59.6
35	3	0	73	48	540	276	48.4
36	3	1	73	40	540	372	41.6
37	3	2	73	71	540	479	73.8
38	3	0	73	65	540	456	65.7
39	3	0	73	68	540	453	68.7
40	3	1	73	26	540	256	27.4
41	3	1	73	61	540	426	62.7
42	3	2	73	61	540	434	63.7
43	3	0	73	64	540	442	64.7

44	3	0	73	66	540	321	66.5
45	3	1	73	60	540	400	61.6
46	3	1	73	68	540	431	69.7
47	3	1	73	35	540	246	36.4
48	3	1	73	62	540	414	63.7
49	3	0	73	68	540	418	68.7
50	3	1	73	18	540	200	19.3
51	3	1	73	61	540	475	62.8
52	3	0	73	27	540	228	27.4

Timeliness = No of health facilities reported on time in 52 weeks *100%, 22794/32032*100% = 71.2 %

No of HCs expected to report on time in 52 weeks

3.4.5.8. Stability

Stability refers to the reliability that is the ability to collect by manages, and provides data properly without failure and availability, which is the ability to be operational when it is needed for the public health surveillance system. About 87.5% respondents reported that, any new restructuring in the system did not affect the procedures and activities of the surveillance of the diseases. Based on the report of one participant, there was time or condition in which the surveillance is not fully operating for some period due to lack of commitment. About 62.5% respondents described the lack of resources, which challenged the surveillance system, but they used other alternatives to solve the problem.

3.5. Discussion

We intended to evaluate the surveillance system of West Shewa zone in 2005EFY by describing and measuring the core and supportive function of surveillance system and surveillance system attributes.

The core functions of the system includes case detection, case registration, case confirmation, reporting, data analysis and interpretation, epidemic preparedness, epidemic response and control and feedback. one of the core function of the surveillance system is case detection. So related to case detection the evaluation assessed how the participant health facilities use the case definition to detect diseases and outbreaks. The evaluation revealed that, majority of the respondents were used the case definitions of different priority diseases by posting in their working place. Even though while we measured the capability of case detection of confirmed malaria by using the case definition was below 50%, but here the reasons for the low outcome

may not be only due to case definition but also with the reasons like improper functioning of the rapid diagnostic test or the knowledge and skill of the health provider or other reasons. Related to surveillance data analysis and interpretation, it should be analyzed routinely and the information interpreted for use in public health action and disease control program. This data analysis used for alert and epidemic threshold values for those priority diseases in the country and to characterize trends in disease or injury. But in this surveillance system evaluation the participants did not perform well the data analysis and interpretation as needed ,because more than 70% of participant health facilities and offices were not conduct data analysis. Epidemic preparedness is one of the core function of the system used to indicate the existing level of preparedness for potential epidemics and availability of preparedness plan. The finding of the evaluation revealed that more than 60% of respondents were not prepared epidemic plan and had no stock of drugs and supplies for emergency, rather they prepared themselves for asking to the higher level health bureau. The other emphasized core function of the system is epidemic response and control, thus Public health surveillance systems are use full if they provide data for appropriate public health response and control. As zonal level there was measles epidemic at Meta Robi woreda and the zone actively participated in the epidemic response and control within twenty four hours after the occurrence of the epidemic and then there was routine information exchange on daily base. But for those surveillance system evaluation participated woredas, there was difficult to look their epidemic response in the 2005 Ethiopia fiscal year due to a fortunate absence of epidemic occurrence in their areas.

We also emphasized on the surveillance system attributes by measuring the simplicity, flexibility, data quality, acceptability, representativeness, completeness, timeliness and stability of the system. The simplicity of the surveillance system was received by all respondents as it is easy to use for case detection and filling the data by their all level of health professionals. Based on response of participants in this evaluation; the surveillance system help to record and report the data on time. On average it had taken 10-15 minutes for filling the data. Even though there was difficulty due to the respondents received aggregated data and which did not segregated by variables like sex, age and other variables. The absence of these individual variables makes the report non problem-solving questions like who is affected more by age, sex, and others. Data quality is one of the system attributes which reflects the completeness and validity of the data recorded in the public health surveillance system. In our surveillance system evaluation, we

observed the previous one month weekly reports prior to this evaluation as zonal level, in three woredas and three health centers. On average there were fifteen unknown or blank responses to variables in their weekly report form. Majority of respondents weekly report variables responses were above 80% accomplished. Among these attributes, related to completeness and timeliness zonal report completeness was 71.2% and that was below the target report completeness, but it was above the report completeness of the region (68%). The report completeness of 12 weeks report prior to the surveillance system evaluation (WHO Week 12-23) in Ambo, Dendi, and Toke Kutaye woredas were 86%, 63% and 79%, respectively. Among these participated woredas, Dendi and Toke Kutaye report completeness were below the target. Concerning to timeliness, it is the most important measures of timeliness are whether the data is submitted in time to begin investigation and implement control measures. According to Ethiopia PHEM guide line there is scheduled time to report for each level of reporting site to the next level. Thus majority of the respondents were reported based on their time schedule with that of national PHEM guideline, but the timeliness of reporting was below the target. Among the system attributes, we also discussed on stability of the system, it refers to the reliability that is the ability to collect, manage, and provide data properly without failure and availability, which is the ability to be operational when it is needed for the public health surveillance system. More than 87% of respondents reported that, any new restructuring in the system did not affect the procedures and activities of the surveillance of the diseases, because if any change in the format will be perform by professional experts and not done in non-systematic way. Thus in general the system attributes are related to each other, if the data is in poor quality leads to the system less acceptable and less representativeness of the population under surveillance and vice versa.

3.6. Conclusion

Public health surveillance system is crucial for population well-being. According to the evaluation, the system is in place and help full for detection of the diseases and outbreaks. If there was epidemic it helps to give response early as possible. The main public health problem of the Zone was malaria. Greater part of the malaria cases were reported from malaria hot spot woredas. Majority of the cases were infected by Plasmodium falciparum. In most of the woredas, large numbers of malaria cases were reported from July to November, even though its distribution continued throughout the year. Measles was the second public health concern within

the Zone and affected more than 180 people in one woreda. The other selected diseases, AFP/polio and meningitis were low in number compared with malaria and measles.

Concerning to report forms, the respondents have adequate numbers of different guidelines, log books, case based and line list report forms. Majority of the respondents have updated guidelines, standard case definitions, adequate drugs and vaccines. Regarding to surveillance training, majority of the respondents are trained, but there are also non trained PHEM focal persons assigned in the health facilities and health office. In concern to epidemic preparedness majority of the respondents did not have proactive plan instead they respond reactively whenever the outbreak arise.

In some respondent health facilities, there were shortage of weekly report form, but they used copy of the form, which showed the commitment for the surveillance system, even though there were interruption of reports in different weeks and a problem of not having the back hard copy after sent the report. On the issue of completeness the Zone and its Woreda did not perform well, which was below the target.

3.7. Recommendations

- Based on the surveillance system evaluation the following activities should improve the public health surveillance system for achieving health promotion, disease prevention and control and also for early warning, preparedness and quick response for out breaks.
- The zonal health office should be facilitate training for those non trained PHEM focal persons.
- The zone should receive report from the private health sectors to fill gaps.
- The zone should strengthen the timeliness and completeness of report and it should evaluate the interruption of the reports
- The zone should strengthen the supervision and quick feed back to woredas and health facilities
- Allocating budget for PHEM should be strengthen the surveillance system
- Creating awareness for all level of health professionals about the use of surveillance system should strengthen the surveillance system.
- The zone and Woredas should ask the specimen result on time.
- The use of case definition to detect confirmed malaria disease was below 50%, therefore it should needs further investigation, why it occurred.

3.8. References

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Annex 3 Questionnaires for health system evaluation

REGIONAL /ZONAL LEVEL QUESTIONNAIRE

Identifiers:

Assessment team Respondent

Date

Surveillance System Interviewer

General

I. Availability of a National Surveillance Manual

1. Are there a national manual/ guideline for surveillance? ☐ Yes ☐ No
2. If yes, describe (last update, diseases included, case definitions, surveillance and control, integrated or different for each disease):

_____

_____

II. Case Detection and Registration

3. Do you have standard case definitions for the Country's priority diseases like AFP (polio), malaria, and measles?
   Yes ☐ No ☐ Unknown ☐ Not applicable ☐
   If the answer is yes for Q #3, observe the presence of the standard case definition for each priority disease. Yes ☐ No ☐ Unknown ☐ Not applicable ☐

III. Data reporting::

Presence of recommended reporting forms in the zone at all times over the past 6 months

Are the Federal/ Regional health bureau responsible for providing surveillance forms to the health facilities? Yes ☐ No ☐ Unknown ☐ Not applicable ☐

If yes, have you lacked appropriate surveillance forms at any time during the last 6 months? Yes ☐ No ☐ Unknown ☐ Not applicable ☐

4. What are the reporting entities for the surveillance system?
   a. Public health facilities
   b. NGO health facilities
   c. Military health facilities
   d. Private health facilities
   e. Others_____

5. Was there any report of the immediately reportable diseases in the past 1 month? Yes/ No
6. If yes, for Q 8, with in what time is the report received after detection of the diseases?
   a. Less than 1 hour
   b. 2-24 hour
   c. 1- 2 days
   d. 3- 7 days
   e. After 1 week

7. Percent of districts that have means for reporting to next level by e-mail, telephone, fax or radio_____
8. How do you report weekly, monthly and other formations to higher level?
   a. Mail
   b. Fax
   c. Telephone
   d. Radio
   e. Electronic
   f. Other
9. Did you have address of regional PHEM officers? Yes /No
10. How frequently are you communicating with the regional PHEM officers on emergencies and other daily activities? A) Daily

    B) Weekly
    C) Every 2 week
    D) Monthly
    E) Quarterly
    F) Every 6 month
    G) Yearly
    H) Others_____

Did you have address of woredas/health facility PHEM officers? Yes/ No (if yes observe the lists and their address of woreda and H.F PHEM officers)

11. How frequently are you communicating with the woredas/health facility PHEM officers on emergencies and other daily activities?
    A) Daily
    B) Weekly
    C) Every 2 week
    D) Monthly
    E) Quarterly
    F) Every 6 month
    G) Yearly
    H) Others_____

12. When are you expected to send weekly report to the Regional PHEM unit? Every ☐ Monday
    ☐ Tuesday
    ☐ Wednesday
    ☐ Thursday
    ☐ Friday
    ☐ Saturday
    ☐ Sunday
    ☐ I don't know

13. When are you expected to receive weekly report from woredas /health facilities?

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

How is the Zone communicating the woredas/health facility PHEM officers in case of immediately reportable diseases?

☐ By e-mail
☐ By phone
☐ By fax
☐ Regular weekly report
☐ Others----------

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

14. If answer for Q 16 is yes to whom did you send?

_____
_____

15. If you faced any problems on communicating and reporting, list them_____
_____
_____
_____

16. How do you manage the problem you faced?

_____
_____

IV. Data analysis

1. Had you trained on surveillance system? Yes ☐ No ☐
2. If answer for Q 1 is yes a) when_____ b) Topic_____
   c) For how long_____
3. Did you give any onsite training / orientation about surveillance system for the woredas or health facility PHEM focal persons? Yes/No (if yes observe any documents)
4. How many woredas have permanently assigned surveillance officer or focal person? ___
5. How many of them trained on surveillance and epidemic management? _____
6. If Q #4 is no, how surveillance activates were done at woreda level? _____
   _____
7. Was data compiled and registered? Yes/ No (if yes observe documents)
8. Did you have computer on your department (PHEM unit)? Yes ☐ No ☐

9. What is the data entry and compilation instrument?

   A) Manual
   B) Computer
10. Other_____
11. Did you have computer skill on A) Ms word B) Ms excel C) MS power point D) Epi-info
12. Did you analyze data of the surveillance system (cased based, routine, outbreak ….)? Yes ☐ No ☐
13. If answer for Q 11 is yes, observe whether or not data is analyzed by time, place and person
14. If you analyze surveillance data how frequently? A) weekly B) every two week C) Monthly D)quarterly E) every 6 month F) annually G) No regular time
15. Did you perform trend analysis for priority diseases? Yes/ No
16. If yes for Q #10, observe and list the diseases which has line graph

    _____
17. Did you have denominators for data analysis? A) T. population B) male C) female D) U 5 E) pop. By woreda E) hard to reach area pop.
18. Did you notify the results of your analysis to the higher level PHEM? Yes/ No
19. Did you notify the results of your analysis to the lower level PHEM? Yes/ No
20. If answer for Q #8 is No, what is the reason?
    ☐ Lack of knowledge
    ☐ Shortage of time

☐Less attention to data analysis
☐ Shortage of materials
☐Analysis is not familiar
☐ Negligence
☐ Other----------

V. Outbreak Investigation

1. How many outbreaks were occurred in 2004 EFY? _____
2. How many of them were investigated _____ list the diseases _____
3. Did you have outbreak investigation check list? Yes ☐ No ☐
4. If the answer no for Q #2 how did you know possible factors for the outbreak?

   _____
5. Where was laboratory confirmation of cases done?

☐ Regional laboratory
☐ Hospital
☐ EHNRI
☐ Health center
☐ Contracted private laboratory
☐ Other----------

6. Who was responsible to investigate an outbreak? ☐ rapid response team ☐ HEW ☐ staffs of woredas health office ☐ experts organized randomly ☐ health facility staffs ☐ other_____
7. Fill the table below for question #2

S. NO	Name of out break	Place(Kebele/woreda	NO of cases			NO of deaths			Start date of the out break	Investigation date	Remark
1			M	F	U5	M	F	U5			
2											
3											
4											
5											

8. Had you faced any challenge in outbreak investigation in 2004/05 EFY? Yes ☐ No ☐
9. If answer for Q 8 is yes, a) list the challenges_____
   _____
   b) List the alternatives that you take to tackle the challenges._____
   _____

VI. Epidemic preparedness(relevant for epidemic prone diseases)

1. Did you have plan for epidemic response and preparedness? Yes ☐ No ☐ (if yes observe)
2. Was there emergency stocks of drugs and supplies at all times in the past 1 year? Yes ☐ No ☐ (if yes observe any document for evidence)
3. If answer for Q 2 is No, how did you control epidemics? ----------
   ----
4. Had you experienced shortage of drugs, vaccines and supplies in 2004 EFY? Yes ☐ No ☐
5. Was an epidemic management committee established at zonal level? Yes ☐ No ☐
6. Did the epidemic management committee have regularly scheduled meeting time? Yes ☐ No ☐ (if yes observe minute book)
7. How many woredas are established epidemic management committee and meet regularly? __
8. Was Rapid response team established at zonal level? Yes ☐ No ☐
9. Did the Rapid response team have regularly scheduled meeting time during epidemics? Yes ☐ No ☐ (observe minute book or other document)
10. How many woredas have established Rapid Response Team? _____

11. Did you have case management protocol for epidemic prone diseases? Yes ☐ No ☐ Not applicable ☐ (check)
12. Do have multi sectoral emergency preparedness and response task force committee? Yes ☐ No ☐ Not applicable ☐
13. If Yes for Q 12, in what frequency did the task force meet during outbreaks? _____
14. Were partners working together with your office on emergencies? Yes ☐ No ☐
15. If answer for Q 14 is yes, what type of supports did they give to your office? _____ _____
16. Was there a budget for epidemic response in the last year? Yes/No
17. Had you a car assigned for emergencies (PHEM)? Yes ☐ No ☐ Not functional ☐
18. If answer for Q 17 is NO, how did you address emergencies? _____ _____
19. Had you faced any Challenges on epidemic response and preparedness in 2004 EFY? Yes ☐ No ☐
20. If answer for Q 19 is yes,
    a) List the challenges _____ _____
    b) What measures did you take to tackle the challenges? _____ _____

VII. Response to epidemics

1) Does the zonal health office responded or epidemics within 48 hours of notification of most recently reported outbreaks? Yes ☐ No ☐ (observe any documents)
2) Are epidemic management committee evaluate their epidemic preparedness and response activities during the past year? Yes ☐ No ☐ (check written document)

VIII. Supervision and Feedback

1. Did you have supervision plan in 2004 EFY? Yes ☐ No ☐ (check documents)
2. If answer for Q 1 is No, how did you supervise? _____ _____
3. If Q #1 is yes, did you supervise the woredas and health facilities? Yes ☐ No ☐
4. If Q #3 is No, what is the reason? _____
5. If Q #3 is yes, how many times did you supervise each woredas and health facilities in 2004 EFY? Woreda----------. Health facility----------
6. Had you received supervision from regional PHEM unit of FMOH in the past year or currently? Yes ☐ No ☐
7. If Q #6 is yes, how many times in 2004 EFY? ----------
8. Did you have regular supervision checklist? Yes ☐ No ☐
9. If Q #8 is No, how did you supervise the woredas and health facilities? _____

10. Did you send feedback of your supervision findings to the woredas and health facilities which commenting/indicating their strong and weak sides? Yes ☐ No ☐ (check)
11. If Q #10 is No, why? _____
12. If answer for Q #10 is yes, for how many woredas and health facilities and sessions did you send a feedback in 2004 EFY? Woreda_____ health facilities_____
13. Had you received feedback from higher level supervisors in 2004 EFY? Yes ☐ No ☐
14. If Q #13 is yes, how many feedbacks did you received in 2004 EFY? _____
15. Had you faced any challenge on supervision and feedback in 2004 EFY? Yes ☐ No ☐
16. If answer for Q #15 is yes,
    a) List the challenges._____
    _____
    _____

    b) List the measures that you take to tackle the challenges _____
    _____
    _____

IX. Resources

Percent of sites that have:

17. Data management
    - Computer
    - Printer
    - Photocopier
    - Data manager

    Statistical package Communications
    - Telephone service
    - Fax
    - Radio call
    - Satellite phone
    - Computers that have modems

18. Budget line _____
19. Logistics _____

X. Surveillance

20. Do you have a computerized surveillance network at this level?
    Yes ☐ No ☐ Not applicable ☐
    Budget for surveillance
    Is there a budget line for surveillance in the zonal Health office budget?
    Yes ☐ No ☐ Not applicable ☐
21. If yes, what is the proportion: _____ %
22. How could surveillance be improved?
    _____
    _____

Questionnaire for Attributes and level of Usefulness:

1. Total population under surveillance_____ 2012
2. What is the incidence / Prevalence of 2012 -in your area/region
   - Malaria _____cases _____Death _____
   - AFP(polio) _____cases _____Death_____
   - Measles _____cases _____Death _____
   - Meningitis_____cases_____Death_____

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

Does the surveillance system help?

1. To detect outbreaks of priority diseases early on time to permit accurate diagnosis? Yes ☐ No ☐
2. To estimate the magnitude of morbidity and mortality related to these diseases, including identification of factors associated with these diseases? Yes ☐ No ☐
3. Permit assessment of the effect of prevention and control programs? Yes ☐ No ☐
   Observe (confirmation):
   1. interventions and diseases trends analyzed ---Available //Not available

II. Describe Each System Attributes:

A. Simplicity:

1. A. Is the case definition of the priority diseases (malaria, measles, AFP….) easy for case detection by all level health professionals? Yes ☐ No ☐
2. B. The surveillance system allow all levels of professionals to fill data? Yes ☐ No ☐
3. Does the surveillance system help to record and report data on time?
4. Does the surveillance system (Reporting format) have necessary information for investigation? Yes ☐ No ☐
5. How long it takes to fill the format? a, <5 minute b-10-15 minutes c- >15 minutes
6. How long does it take to have laboratory confirmation of
   A. Measles
   B. AFP (Polio)
   C. Malaria
   D. Others _____

Flexibility:

1. Can the current reporting formats be used for other newly occurring health event (disease) without much difficulty? Yes ☐ No ☐
2. Do you think that any change in the existing procedure of case detection and reporting formats will be difficult to implement? Yes No
   Comment:_____
   _____
   _____
3. Is the system easy to add new variables? Yes ☐ No ☐

4. Is the surveillance system easy to integrate with other systems? Yes ☐ No ☐
5. Is the surveillance system easy to add new disease on report? Yes ☐ No ☐
6. Is the system easy to add new information technology? Yes ☐ No ☐

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

1. Are the reporting site / data collectors trained/ supervised regularly? Yes ☐ No ☐
2. Observe: Review the last months report of these diseases
   a) Average number of unknown or blank responses to variables in each of the reported forms

      _____

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

      _____

3. Are all woredas reporting (including late report)? ☐ Yes ☐ No
4. Percent of woredas that send report of each week in 2005 EFY. ----------
5. Are all hospitals reporting? ☐ Yes ☐ No
6. Percent of hospitals that send report of each week in 2005 EFY. ----------

Total weekly reports received from woredas/Hospitals (including late reports, from July 2012—June, 2013) (for Zonal health desk)

WHO epid. Wk	N^{O} of woredas expected to report	N^{O} of woredas that report (including late report)	N^{O} of Hospitals expected to report	N^{O} of hospitals that report (including late reports)	WHO epid. Wk	N^{O} of woredas expected to report	N^{O} of woredas that report (including late report)	N^{O} of Hospitals expected to report	N^{O} of hospitals that report (including late reports)
1					27				
2					28				
3					29				
4					30				
5					31				
6					32				
7					33				
8					34				
9					35				
10					36				
11					37				
12					38				
13					39				
14					40				

15					41				
16					42				
17					43				
18					44				
19					45				
20					46				
21					47				
22					48				
23					49				
24					50				
25					51				
26					52				

D. Acceptability:

1) Do you think all the reporting agents accept and well engaged to the surveillance activities? Yes ☐ No ☐

2) If yes, how many are active participants (of the expected including all private clinics)? __/__

3) If No for Q #1, 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:_____

_____

4. Were all participants using the standard case definition to identify cases? Yes/ No
If yes, what is your evidence _____?

5. Were all the reporting agents send their report using the current and appropriate surveillance reporting format? Yes ☐ No ☐ (if yes observe the documents)

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

E. Representativeness:

1. What is the health service coverage of the district/ zone/ region? _____%
2. Do you think, the populations under surveillance have good health seeking behavior for these diseases? Yes ☐ No ☐
3. Was the surveillance system enabled to follow the health and health related events in the whole community? Yes ☐ No ☐

4. If answer for Q 3 is no, who do you think is well benefited by the surveillance system?
☐ The urban ☐ the rural ☐ both

5. If yes for Q 4, do you think that rural and urban communities are equally benefited in surveillance system? Yes ☐ No ☐, if no why _____
6. Are all the Socio demographic variables included in the surveillance reporting format? Yes /No
7. If the answer for Q 6 is No, which a) Sex---------- b) age group----------C) ethnic group---------- d) religion---------- is less represented?

Timeliness: 1. Are all woredas /health facilities reporting on time? Yes ☐ No ☐
2. Percent of woredas that report on time. ----------
3. Are all Hospitals reporting on time? Yes ☐ No ☐
4.Percent of hospitals that report on time. ----------

Weekly Zonal reports received on time for 2005 EFY report by WHO epidemic week (July 2012—June, 2013) (to be field at Zonal health department)

WHO epid wk	N^{O} of woredas expected to report	N^{O} of woredas that report on time	N^{O} of Hospitals expected to report	N^{O} of Hospitals that report on time	WHO epid wk	N^{O} of woredas expected to report	N^{O} of woredas that report on time	N^{O} of Hospitals expected to report	N^{O} of Hospitals that report on time
1					27				
2					28				
3					29				
4					30				
5					31				
6					32				
7					33				
8					34				
9					35				
10					36				
11					37				
12					38				
13					39				
14					40				
15					41				
16					42				
17					43				
18					44				
19					45				
20					46				
21					47				
22					48				
23					49				
24					50				
25					51				
26					52				

G. Stability:

1. Was any new restructuring affected the procedures and activities of the surveillance of these diseases? Yes ☐ No ☐
2. Was there lack of resources that interrupt the surveillance system? Yes / No if yes what was it and how do you solve it_____
3. Was there any time /condition in which the surveillance is not fully operating? Yes/ No
4. If the answer yes for Q #3 When/what is the condition that talks the system not to function properly?----------
5. Is there a surveillance officer or focal person (PHEM unit)? Yes / No Number _____

DISTRICT (INTERMEDIATE LEVEL) QUESTIONNAIRE

Identifiers

Assessment team	District
Date	region/province
Interviewer	country
Respondent	surveillance system

General

XI. Availability of a National Surveillance Manual

1. Is there a national manual/ guideline for surveillance system?
   Yes / No / Not applicable / Unknown
2. If yes, describe (last update, diseases included, case definitions, surveillance and control, integrated or different for each disease):
   _____
   _____

XII. Case Detection and Registration

3. Do you have standard case definitions for the Country's priority diseases like AFP (polio), malaria, and measles?
   Yes ☐ No ☐ Unknown ☐ Not applicable ☐
4. If the answer is yes for Q #3, observe the presence of the standard case definition for each priority disease. Yes ☐ No ☐`
5. If answer for Q 4 is No, for which disease(s) did you lack the case definition? _____

XIII. Data reporting

Presence of recommended reporting forms in the woreda at all times over the past 6 months

6. Is the Federal/ Regional health bureau responsible for providing surveillance forms to the health facilities? Yes No Unknown Not applicable
7. If yes, have you lacked appropriate surveillance forms at any time during the last 6 months? Yes No Unknown Not applicable
8. What are the reporting entities for the surveillance system?
   a. Public health facilities
   b. NGO health facilities

c. Military health facilities
d. Private health facilities
e. Others_____

9. Was there any report of the immediately reportable diseases in the past 1 month? Yes/ No
10. If yes, for Q 9, with in what time is the report received after detection of the diseases?
    a. Less than 1 hour
    b. 2-24 hour
    c. 1- 2 days
    d. 3- 7 days
11. After 1 weekPercent of health facilities that have means for reporting to next level by e-mail, telephone, fax or radio_____

12. How do you report weekly, monthly and other formations to higher level?

a. Mail
b. Fax
c. Telephone
d. Radio
e. Electronic
f. Other

13. Did you have address of Zonal PHEM officers? Yes /No
14. How frequently are you communicating with the Zonal PHEM officers on emergencies and other daily activities?
    ☐ Daily
    ☐ Weekly
    ☐ Every 2 week
    ☐ Monthly
    ☐ Quarterly
    ☐ Every 6 month

☐ Yearly
☐ Others----------

Did you have address of HC/HP PHEM focal persons? Yes /No

15. How frequently are you communicating with the HC/HP PHEM focal persons on emergencies and other daily activities?
    ☐ Daily
    ☐ Weekly
    ☐ Every 2 week

☐ Monthly
☐ Quarterly
☐ Every 6 month

☐ Yearly

☐ Others----------

16. Did you have case based reporting formats for out breaks? Yes ☐ No ☐ Not Applicable☐
17. Was there guideline for specimen collection, handling and transportation to the next level? Yes/No ☐ Not Applicable
18. Did you have line list for reporting outbreaks? Yes ☐ No ☐ Not Applicable ☐
19. Did you face shortage of surveillance reporting and recording formats? Yes ☐ No ☐ If yes, which form _____
20. When are you expected to send weekly report to the Zonal PHEM unit?

☐ Monday ☐ Tuesday ☐ Wednesday ☐ Thursday ☐ Friday ☐ Saturday ☐ Sunday

☐ I don't know

21. When are you expected to receive weekly report from HCs/HPs?

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

22. How is the woreda communicating the HCs/HPs PHEM officers in case of immediately reportable diseases? ☐ by e-mail ☐ by phone ☐ by fax ☐ regular weekly report ☐ others
23. Did you send summary or short report to the administrative /program leaders or other responsible organs on planning, prevention and control activities addressing Important issues at community level that have arisen through the surveillance system? Yes ☐ No ☐
24. If answer for Q 24 is yes to whom did you send? _____

_____

25. If you faced any problems on communicating and reporting, list them_____

_____

26. Mention the alternative solutions that you take to tackle the problems you listed on the above? _____
27. Do you have assigned surveillance officer for PHEM activities and working on? Yes /No If no, who is responsible for PHEM activities?

_____

28. If yes for Q 28, did he trained on surveillance system? ☐ Yes ☐ No
29. If answer for Q 29 is yes a) when---------- b) Topic----------c) For how long? ----------

30. Did you conducted any onsite training / orientation about surveillance system for the HC and HP PHEM focal persons? Yes ☐ No ☐
31. Was data compiled? Yes ☐ No ☐
32. Did you have computer on your office? Yes ☐ No ☐
33. Did you have computer on your department (PHEM unit)? Yes ☐ No ☐
34. What is the data entry and compilation instrument? ☐ Manual ☐ Computer ☐ other----------
35. Did you have computer skill on ☐ MS word ☐ MS excel ☐ MS power point ☐ Epi-info
36. Did you analyze the data collected from surveillance system? Yes ☐ No ☐
37. If answer for Q 37 is yes, did you described data by, ☐ time ☐ place ☐ person
38. If yes for Q 38, for which disease _____
39. Did you have denominators for data analysis? ☐ total population ☐ male ☐ female ☐ under five
40. Please indicate the frequency of your data analysis.
    - ☐ Weekly
    - ☐ Every two week
    - ☐ Monthly
    - ☐ Quarterly
    - ☐Every 6 month
    - ☐ Annually
    - ☐ No regular time
41. Did you notify the results of your analysis to the higher level PHEM? Yes/No
42. Did you notify the results of your analysis to the lower level PHEM? Yes/No
43. If answer for Q 38 is No, what is the reason?
    - ☐ Lack of knowledge
    - ☐ Shortage of time
    - ☐ Less attention
    - ☐ Shortage of materials
    - ☐ Analysis is not familiar
    - ☐ Negligence
    - ☐ Other----------
44. How can reporting system be improved?

    _____

    _____
45. Do you have an action threshold for any of the country priority diseases?
    Yes No I don't know
46. If yes, what is it? _____cases _____% increase _____rate (Ask for 2 priority diseases)_

    _____

I. Epidemic preparedness

47. Did you have plan for epidemic response and preparedness? Yes ☐ No ☐
48. Did you have emergency stocks of drugs and supplies? Yes ☐ No ☐

49. If answer for Q 49 is No, how did you control epidemics? _____
50. Had you experienced shortage of drugs, vaccines and supplies in 2004 EFY? Yes / No
51. Was woreda epidemic management committee established? Yes ☐ No ☐
52. Did the epidemic management committee have regularly scheduled meeting time? Yes ☐ No ☐
53. Was Woreda Rapid response team established? Yes ☐ No ☐
54. Did the Rapid response team have regularly scheduled meeting time during epidemics? Yes ☐ No ☐
55. Did you have case management protocol for epidemic prone diseases? Yes ☐ No ☐
56. Did your PHEM have multi sectoral emergency preparedness and response task force committee? Yes ☐ No ☐
57. In what frequency did the task force meet during outbreaks? _____
58. Were partners working together with your office on emergencies? Yes ☐ No ☐
59. If answer for Q 59 is yes, what type of supports did they give to your office? _____
_____
60. Was there a budget for epidemic response? Yes ☐ No ☐
61. Had you a car assigned for emergencies (PHEM)? Yes ☐ No ☐ Not functional ☐
62. If answer for Q 62 is NO, how did you address emergencies? _____
_____
63. Had you faced any Challenges on epidemic response and preparedness in 2004 EFY? Yes ☐ No ☐
64. If answer for Q 18 is yes, a) list the challenges_____
b) What measures did you take to tackle the challenges? _____

II. Outbreak investigation

65. Had you investigated any outbreak in 2004 EFY? Yes ☐ No ☐
66. Did you have outbreak investigation check list? Yes ☐ No ☐
67. If answer for Q 67 is No, how did you know possible factors for the outbreak? ----------
---
68. Where was laboratory confirmation of cases done?

☐ Regional laboratory
☐ Hospital
☐ EHNRI
☐ Health center
☐Contracted private laboratory
☐ Other----------

69. Who was responsible to investigate an outbreak?

☐ Rapid response team
☐ HEWs
☐ Staffs of woreda H.O
☐ Experts organized randomly
☐ Health facility staffs
☐ Other----------

70. If answer for Q 66 is yes how many out breaks did you investigated in 2004 EFY? ____

S. NO	Name of out break	Place (Kebele/woreda)	NO of cases			NO of deaths			Start date of the out break	Investigation date	Remark
			M	F	U5	M	F	U5			
1											
2											
3											
4											

71. Had you faced any challenge in outbreak investigation in 2004 EFY? Yes ☐ No ☐
72. If answer for Q 72 is yes, a) list the challenges_____
_____
_____

b) List the alternatives that you take to tackle the challenges._____
_____

III. Responses_____

73. Has the district implemented prevention and control measures based on local data for at least one reportable disease or syndrome?
    Yes ☐ No ☐ Unknown ☐ Not applicable ☐
74. Does the district responded within 48 hours of notification of most recently reported outbreak (from written reports)
    Yes ☐ No ☐ Unknown ☐ Not applicable ☐
75. Does the district achieved an acceptable case fatality rate for most recent outbreak (Observe from outbreak report)
    Yes ☐ No ☐ Unknown ☐ Not applicable ☐
76. Has epidemic management committee evaluated their preparedness and response activities during the past year? (observe written report to confirm)
    Yes ☐ No ☐ Unknown ☐ Not applicable ☐

IV. Supervision and Feedback_____

77. Did you have supervision plan in 2004 or 2005 EFY? Yes ☐ No ☐
78. If answer for Q 78 is No, how did you supervise? _____-
_____
79. If answer for Q 78 is yes, did you supervise the health centers (HCS) and health posts (HPs) according to your plan in 2004 or 2005 EFY? Yes ☐ No ☐
80. If answer for Q 80 is No, what is the reason? _____-
_____
_____
81. If answer for Q 80 is yes, how many times did you supervise each health center (HC) and health post (HP) in 2004 or 2005 EFY? Health center_____ health post_____
82. Had you reviewed about surveillance practice by higher level supervision? Yes /No
83. Did you have regular supervision checklist? Yes ☐ No ☐
84. If answer for Q 84 is No, how did you supervise the health centers and health posts?
_____

85. Were you supervised by higher level officers in 2004 or 2005 EFY? Yes ☐ No ☐
86. If answer for Q 86 is yes how many times in 2004 or 2005 EFY? _____
87. Did you send feedback of your supervision to the health centers (HCS) and health posts (HPs) commenting/indicating their strong and weak sides? Yes /No (observe)
88. If answer for Q 88 is No, why_____
    _____
    _____
89. If answer for Q 88 is yes, for how many HCs and HPs did you send a feedback in 2004 or 2005 EFY? HC---------- and health post----------
90. Had you received feedback from higher level supervisors in 2004/ 2005 EFY? Yes/ No
91. If answer for Q 91 is yes how many feedbacks did you received in 2004 or 2005 EFY? _
92. Had you faced any challenge on supervision and feedback in 2004/05 EFY? Yes/No
93. If answer for Q 93 is yes a) list the challenges_____
    _____
    _____
    b) List the measures that you take to tackle the challenges_____
    _____
    _____

V. Training_____

94. Have you been trained in disease surveillance?
    Yes ☐ No ☐ Unknown ☐ Not applicable ☐
95. If yes, specify when, where, how long, by whom?
    _____
96. What percent of your personnel in the district have been trained in surveillance and epidemic management? _____

VI. Resources_____

97. I. Percent of sites that have:
    Logistics
    a. Electricity
    b. Bicycles
    c. Motor cycles
    d.Vehicles
    Data management
a. Stationery

b. Calculator

c. Computer

d. Printer
e. Statistical package
98. Communication
    a. Telephone service
    b. Fax

c. B radio
d. Computers that have modems

99. Information education and communication materials
a. Posters
b. Megaphone
c. Flipcharts or Image box
d. VCR and TV set
e. Generator
f. Screen
g. Projector (Movie)
h. Other:

VII. Satisfaction with surveillance system_____
with surveillance system

100. Are you satisfied with the surveillance system?
Yes ☐ No ☐ Unknown ☐ Not applicable ☐ If no, how can the surveillance system be improved?

_____

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

_____
_____

Questionnaire for Attributes and level of Usefulness:

_____

1. Total population under surveillance_____ in 2005 EFY
2. What is the incidence / Prevalence of 2005 -in your area/region
   - Malaria _____cases _____Deaths _____
   - AFP(polio) _____cases _____Deaths _____
   - Measles _____cases _____Deaths _____
   - Meningitis_____cases_____Deaths_____

III. Level of Usefulness of the Surveillance System for these selected priority disease
3. Does the surveillance system help? Yes ☐ No ☐
4. To detect outbreaks of priority diseases early on time to permit accurate diagnosis?
   Yes ☐ No ☐
5. To estimate the magnitude of morbidity and mortality related to these diseases, including identification of factors associated with these diseases? Yes ☐ No ☐
6. Permit assessment of the effect of prevention and control programs? Yes ☐ No ☐
   Observe (confirmation):
   1. interventions and diseases trends analyzed ---Available //Not available

IV. Describe Each System Attributes:
A. Simplicity:

2. Is the case definition of the priority diseases (malaria, measles, AFP….) easy for case detection by all level health professionals? Yes ☐ No ☐
3. The surveillance system allow all levels of professionals to fill data? Yes/No
4. Does the surveillance system help to record and report data on time?
5. Does the surveillance system (Reporting format) have necessary information for investigation? Yes ☐ No ☐
6. How long it takes to fill the format? a, <5 minute b-10-15 minutes c- >15 minutes
7. How long does it take to have laboratory confirmation of

A. Measles
B. AFP (Polio)
C. Malaria
D. Others _____

B. Flexibility:

8. Can the current reporting formats be used for other newly occurring health event (disease) without much difficulty? Yes ☐ No ☐
9. Do you think that any change in the existing procedure of case detection and reporting formats will be difficult to implement? Yes ☐ No ☐

Comment:

_____

_____

10. Is the system easy to add new variables? Yes ☐ No ☐
11. Is the surveillance system easy to integrate with other systems? Yes ☐ No ☐
12. Is the surveillance system easy to add new disease on report? Yes ☐ No ☐
13. Is the system easy to add new information technology? Yes ☐ No ☐

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

14. Are the reporting site / data collectors trained/ supervised regularly? Yes ☐ No ☐
15. Observe: Review the last months report of these diseases
16. Average number of unknown or blank responses to variables in each of the reported forms _____
17. Percent of reports which are complete(that is with no blank or unknown responses) from the total reports _____
18. Are all health facilities reporting (including late report)? ☐ Yes ☐ No
19. Percent of health facilities that send report of each week in 2004 EFY. --------

Total weekly reports received from Health centers/health posts (including late reports. from July 2011—June, 2012) (for woreda health office)

WHO epid. wk	Nº of HPs that report	Nºof HPs that do not report	Nº of HCs that report	Nºof HCs that do not report	WHO epid. wk	Nº of HPs that report	Nºof HPs that do not report	Nº of HCs that report	Nºof HCs that do not report
1					27				
2					28				
3					29				
4					30				
5					31				
6					32				
7					33				
8					34				
9					35				
10					36				
11					37				
12					38				
13					39				
14					40				
15					41				
16					42				
17					43				
18					44				
19					45				
20					46				
21					47				
22					48				
23					49				
24					50				
25					51				
26					52				

D Acceptability:

1. Do you think all the reporting agents accept and well engaged to the surveillance activities? Yes/No
2. If yes, how many are active participants (of the expected including all private clinics)? _____/_____
3. If No for Q #1, 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:

_____

_____

4. Were all participants using the standard case definition to identify cases? Yes/ No
If yes, what is your evidence? _____
5. Were all the reporting agents send their report using the current and appropriate surveillance reporting format? Yes/ No (if yes observe the documents)
6. Were all the health professionals aware about the surveillance system? Yes/No (if yes how they awared)

E. Representativeness:

1. What is the health service coverage of the district? _____%
2. Do you think, the populations under surveillance have good health seeking behavior for these diseases? Yes / No
3. Was the surveillance system enabled to follow the health and health related events in the whole community? Yes /No
4. If answer for Q 3 is no, who do you think is well benefited by the surveillance system? ☐ The urban ☐ the rural ☐ both
5. If yes for Q 4, do you think that rural and urban communities are equally benefited in surveillance system? Yes/ No , if no why

   _____
6. Are all the Socio demographic variables included in the surveillance reporting format? Yes ☐ No ☐
7. If the answer for Q 6 is No, which a) Sex---------- b) age group----------
   c) ethnic group----- d) religion---------- is less represented?

F. Timeliness:

1. Are all health facilities reporting on time? Yes ☐ No ☐
2. Percent of health facilities that report on time. ----------

Weekly health facilities reports received on time for 2005 EFY report by WHO epidemic week (July 2012—June, 2013) (to be field at woreda health department)

WHO epid wk	N^{O} of HCS expected to report	N^{O} of HCs that report on time	N^{O} of HPs expected to report	N^{O} of HPs that report on time	WHO epid wk	N^{O} of HCS expected to report	N^{O} of HCs that report on time	N^{O} of HPs expected to report	N^{O} of HPs that report on time
1					27				
2					28				
3					29				
4					30				
5					31				
6					32				
7					33				
8					34				
9					35				
10					36				
11					37				
12					38				
13					39				
14					40				
15					41				
16					42				
17					43				
18					44				
19					45				
20					46				
21					47				
22					48				
23					49				
24					50				
25					51				
26					52				

G. Stability:

6. Was any new restructuring affected the procedures and activities of the surveillance of these diseases? Yes/ No

7. Was there lack of resources that interrupt the surveillance system? Yes / No if yes what was it and how do you solve it

_____

8. Was there any time /condition in which the surveillance is not fully operating? Yes/ No
9. If the answer yes for Q #8 When/what is the condition that talks the system not to function properly?----------
---

HEALTH FACILITY QUESTIONNAIRE

Identifiers

Assessment team	Type of health facility
Date	District
Interviewer	Region/province
Respondent	Country
Name of health facility	Surveillance system

---

1. Is there a national manual for surveillance at this site?
   Obs Observe national surveillance manual:
   Yes ☐ No ☐ Unknown ☐ Not applicable ☐

I. Case detection and registration _____

2. Observe the existence of a clinical register
   Yes ☐ No ☐ Unknown ☐ Not applicable ☐
3. Observe the correct filling of the clinical register during the previous 30 days
   Yes ☐ No ☐ Unknown ☐ Not applicable ☐
4. Do you have a standard case definition for: (each priority disease) like AFP (polio), measles, malaria?
   Yes ☐ No ☐ Unknown ☐ Not applicable ☐
5. Observe the standard case definition for: (each priority disease)
   Yes ☐ No ☐ Unknown ☐ Not applicable ☐
6. Observe the respondent correctly diagnosing one of the country's priority diseases using a standard case definition
   Yes ☐ No ☐ Unknown ☐ Not applicable ☐

   (Select one of the priority diseases in the facility's clinical register and ask how they diagnosed it — interviewer should have the standard case definition from MOH)

II. Case confirmation _____

7. Are you able to collect sputum Y N U N/A
   Stool Y N U N/A
   Blood Y N U N/A
   CSF at this facility? Y N U N/A

8. Observe the presence of materials required to collect
   Stool Y N U N/A
   Blood / serum Y N U N/A
   CSF Y N U N/A

9. Do you have the capacity to handle sputum, stool, blood/serum and CSF until shipment at this facility?
   Yes ☐ No ☐ Unknown ☐ Not applicable ☐

10. Observe presence of functional cold chain at health facility
    Yes ☐ No ☐ Unknown ☐ Not applicable ☐

11. Observe presence of transport media for stool at health facility
    Yes ☐ No ☐ Unknown ☐ Not applicable ☐

12. Observe presence of packing materials for shipment of specimens at health facility
    Yes ☐ No ☐ Unknown ☐ Not applicable ☐

III. Data reporting _____

13. Which communication material did you have?
    ☐ E-mail
    ☐ Wired phone
    ☐ Mobile
    ☐ Radio
    ☐ Fax
    ☐ Other----------
    Did you have address of Zonal/woreda PHEM officers? ☐ Yes ☐ No

14. How frequently are you communicating with the Zonal/woreda PHEM officers on emergencies and other daily activities?
    ☐ Daily
    ☐ Weekly
    ☐ Every 2 week
    ☐ Monthly
    ☐ Quarterly
    ☐ Every 6 month
    ☐ Yearly
    ☐ Others----------

15. When are you expected to send weekly report to the Zonal/woreda PHEM unit?
    ☐ Monday
    ☐ Tuesday
    ☐ Wednesday
    ☐ Thursday

☐ Friday
☐ Saturday
☐ Sunday
☐ I don't know exactly

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

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

17. If answer for Q 18 is yes, to whom did you send? ----------
---

18. If you faced any problems on communicating and reporting, list them----------
---
---

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

20. Have you lacked appropriate surveillance forms at any time during the last 6 months?
Yes ☐ No ☐ Unknown ☐ Not applicable ☐

21. Observe 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 U N/A
    b. Obs Malaria Y N U N/A
    c. Obs AFP (polio) Y N U N/A
    d. Obs Meningitis Y N U N/A

22. Percent of sites that reported each reporting period to the next higher level during the past 3 months
Number of reports in the last 3 months compared to expected number
Obs Weekly: /12 times the number of sites
Obs immediately: /-- times the number of sites

23. On time (use national deadlines)
Obs Number of weekly reports submitted on time:-_____ /12 times the number of sites
Obs Number of immediately reports submitted on time: ___/-- times the number of sites

24. How do you report to higher level?
    a. Mail
    b. Fax
    c. Telephone
    d. Radio
    e. Electronic
    f. Other

25. Strengthening reporting

How can reporting be improved?

_____

IV. Data analysis_____

26. Is there assigned focal person for surveillance activities? Yes/ No
27. If no for Q 28 how do you do surveillance activities? _____

_____

28. If yes for Q 28, did he trained on surveillance system? Yes/ No
29. If answer for Q30 is yes a) when----------? b) Topic----------?
    c) For how long? ----------
30. Was data compiled? Yes /No
31. Did you have computer on your office? Yes / No
32. Did you have computer on your department (PHEM unit)? Yes /No
33. What is the data entry and compilation instrument? ☐ Manual ☐ Computer
    ☐ other_____
34. Did you have computer skill on ☐ Ms word ☐ Ms excel ☐ MS power point ☐ Epi-info
35. Did you analyze data of the surveillance system? Yes /No
36. If answer for Q 37 is yes, did you describe data by ☐ time ☐ place ☐ person
37. Did you have denominators for data analysis? ☐ total population ☐ male ☐ female ☐ U5
38. Please indicate the frequency of your data analysis.
    - ☐ Weekly
    - ☐ Every two week
    - ☐ Monthly
    - ☐ Quarterly
    - ☐Every 6 month
    - ☐ Annually
    - ☐ No regular time
39. Did you notify the results of your analysis to the higher level PHEM? Yes /No
40. If answer for Q 41 is No, what is the reason?
    - ☐ Lack of knowledge
    - ☐ Shortage of time
    - ☐ Less attention given
    - ☐ Shortage of materials
    - ☐ Analysis is not familiar
    - ☐ Negligence
    - ☐ Other----------
41. Did you perform trend analysis (Observe the presence of line graph of cases by time)
    Yes ☐ No ☐ Unknown ☐ Not applicable ☐

42. Do you have an action threshold for any of the Country priority diseases?
    Yes ☐ No ☐ Unknown ☐ Not applicable ☐

43. If yes for Q 44, what is it (Ask for at least 2 priority diseases)? _____cases ____ % increase _____rate

V. Epidemic preparedness_____

44. Did you have plan for epidemic response and preparedness? Yes/ No

45. Did you have emergency stocks of drugs and supplies? Yes/ No
46. If answer for Q 47 is No, how did you control epidemics? _____
47. Had you experienced shortage of drugs, vaccines and supplies in 2004 or 2005 EFY?
    Yes No I don't know
48. Did you established epidemic management committee? ☐ Yes ☐ No ☐ Not Applicable
49. Did the epidemic management committee have regularly scheduled meeting time? Yes/ No
50. Did you established Rapid response team? ☐ Yes ☐ No ☐ Not Applicable
51. Did the Rapid response team have regularly scheduled meeting time during epidemics? Yes/No
52. Did you have case management protocol for epidemic prone diseases? ☐ Yes ☐ No ☐
53. Was there a budget for epidemic response? ☐ Yes ☐ No
54. Any Challenges on epidemic response and preparedness in 2004/05 EFY? Yes / No
55. If answer for Q 56 is yes, a) list the challenges_____
    _____
    _____
    b) what measures did you take to tackle the challenges?_____

VI. Epidemic response_____

56. Is there any outbreak occurred in your area in 2004/05 EFY? Yes/ No how many _____
57. If yes for Q 58, how many of them were investigated in 2004/05 EFY? _____

58. Did you have outbreak investigation check list? Yes/ No

59. If answer for Q 59 is No, how did you know possible factors for the outbreak? ----------
    ---

60. Where was laboratory confirmation of cases done?
    ☐ Regional laboratory
    ☐ Hospital
    ☐ EHNRI
    ☐ Health center
    ☐Contracted private laboratory
    ☐ Other----------
61. Has the health facility implemented prevention and control measures based on local data for at least one epidemic prone disease?
    Yes ☐ No ☐ Unknown ☐ Not applicable ☐
62. Did they achieved acceptable case fatality rates (e.g. 10% for Meningococcal CSM 1% for Cholera) during the most recent outbreak
    Observe that the health facility achieved an acceptable case fatality rate for most recent outbreak
    Yes ☐ No ☐ Unknown ☐ Not applicable ☐

VII. Supervision and Feedback_____

63. Were you supervised by higher level (regional, zonal or woreda) officers in 2005 EFY? Yes /No (observe at least one feedback report)
64. If answer for Q 65 is yes, how many times in 2004/05 EFY? ----------
65. Had you received feedback from higher level supervisors in 2004/05 EFY? Yes /No

66. If answer for Q 67 is yes, how many feedbacks did you received in 2004/05 EFY? ----------
67. Had you faced any challenge on supervision and feedback in 2004/05 EFY? Yes /No
68. If answer for Q 69 is yes a) list the challenges.----------
b) List the measures that you take to tackle the challenges. ----------
--
69. How many meetings has this health facility conducted with the community members in the past six months? _____
Observe the minutes or report of at least 1 meeting between the health facility team and the community members within the six months
Yes ☐ No ☐ Unknown ☐ Not applicable ☐

VIII. Resources

70. Logistics
a) Electricity
a) Bicycles
b) Motor cycles
c) Vehicles
71. Data management
a) Stationery
b) Calculator
c) Computer
d) Software
e) Printer
72. Communication
A. Tel. service
B. Fax
C. Radio call
D. Computer with modem
E. Information education and communication materials Posters
F. Megaphone
G. Flipcharts or Image box
H. VCR and TV set
I. Generator
J. Screen
K. Projector (Movie)
L. Other:
73. Protection materials (list) _____ _____ _____

Questionnaire for Attributes and level of Usefulness:

74. Total population under surveillance_____ 2005
75. What is the incidence / Prevalence of 2005 -in your area/region
- Malaria _____cases _____Deaths _____
- AFP(polio) _____cases _____Deaths _____
- Measles _____cases _____Deaths _____
- Meningitis_____cases_____Deaths_____

Level of Usefulness of the Surveillance System for these selected priority diseases
Does the surveillance system help?

76. To detect outbreaks of priority diseases early on time to permit accurate diagnosis? Yes/ No
77. To estimate the magnitude of morbidity and mortality related to these diseases, including identification of factors associated with these diseases? Yes/ No
78. Permit assessment of the effect of prevention and control programs? Yes/ No

Describe Each System Attributes:

A. Simplicity:

1) Is the case definition of the priority diseases (malaria, measles, AFP….) easy for case detection by all level health professionals? Yes/ No
2) The surveillance system allows all levels of professionals to fill data? Yes/No
3) Does the surveillance system help to record and report data on time?
4) Does the surveillance system (Reporting format) have necessary information for investigation? Yes/No
5) How long it takes to fill the format? a, <5 minute b-10-15 minutes c- >15 minutes
6) How long does it take to have laboratory confirmation of
   i. Measles
   ii. AFP (Polio)
   iii. Malaria
   iv. Others _____

B. Flexibility:

1. Can the current reporting formats be used for other newly occurring health event (disease) without much difficulty? Yes/ No
2. Do you think that any change in the existing procedure of case detection and reporting formats will be difficult to implement? Yes /No
   Comment:_____
   _____
   _____
3. Is the system easy to add new variables? Yes /No
4. Is the surveillance system easy to integrate with other systems? Yes /No
5. Is the surveillance system easy to add new disease on report? Yes /No
6. Is the system easy to add new information technology? Yes /No

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

1) Are the reporting site / data collectors trained/ supervised regularly? Yes/No
2) Observe: Review the last months report of these diseases
3) Average number of unknown or blank responses to variables in each of the reported forms
   _____
4) Percent of reports which are complete(that is with no blank or unknown responses) from the total reports _____

D. Acceptability:

1. Were all health workers using the standard case definition to identify cases? Yes/ No
2. If yes, What is your evidence _____
3. Were your health facilities send your report using the current and appropriate surveillance reporting format? Yes/ No (if yes observe the documents)
4. Were all the health professionals aware about the surveillance system? Yes/No (if yes how they awared)

E. Representativeness:

1) What is the health service coverage of the district? _____%
2) Do you think, the populations under surveillance have good health seeking behavior for these diseases? Yes / No
3) Was the surveillance system enabled to follow the health and health related events in the whole community? Yes /No
4) If answer for Q 3 is no, who do you think is well benefited by the surveillance system?
   ☐ The urban ☐ the rural ☐ both
5) If yes for Q 3, do you think that rural and urban communities are equally benefited in surveillance system? Yes/ No , if no why _____
6) Are all the Socio demographic variables included in the surveillance reporting format? Yes /No
7) If the answer for Q 6 is No, which a) Sex---------- b) age group---------- C) ethnic group----- d) religion---------- is less represented?

F. Timeliness:

1. Are you sending report timely? ☐ Yes ☐ No (observe copy of reports)

G. Stability:

1. Was any new restructuring affected the procedures and activities of the surveillance of these diseases? Yes/ No
2. Was there lack of resources that interrupt the surveillance system? Yes / No if yes what was it and how do you solve it

   _____
3. Was there any time /condition in which the surveillance is not fully operating? Yes/ No
4. If the answer yes for Q #3 When/what is the condition that talks the system not to function properly?----------
   ----
5. Opportunities for integration

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

   _____
   _____
   _____

Health Post Level Questionnaire

Identifiers

Assessment team	Type of health facility
Date	District
Interviewer	Region/province
Respondent	Country
Name of health facility	Surveillance system

A. Communication and reporting assessment

1. Which communication material did you have?

☐ E-mail

☐ Wired phone

☐ Mobile

☐ Radio

☐ Fax

☐ Other----------

2. Did you have address of woreda or H.C PHEM officers? Yes /No
3. How frequently are you communicating with the woreda or H.C PHEM officers on emergencies and other daily activities?

   ☐ Daily

   ☐ Weekly

   ☐ Every 2 week

   ☐ Quarterly

   ☐ Every 6 month

   ☐ Yearly

   ☐ Others----------

4. When are you expected to send weekly report to the woreda or H.C PHEM unit?

   ☐ Monday

   ☐ Tuesday

   ☐ Wednesday

   ☐ Thursday

   ☐ Friday

   ☐ Saturday

☐ Sunday

☐ I don't know

5. How are you communicating the woreda or H.C PHEM officers in case of immediately reportable diseases?

   ☐ By e-mail

   ☐ By phone

   ☐ By fax

   ☐ Regular weekly

   ☐ Others----------

6. If you faced any problems on communicating and reporting, list them----------

   ---

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

B. Assessment of availability of Surveillance Documentation, Registers, and Forms

1. Was there national manual for surveillance? ☐ Yes ☐ No ☐ Not Applicable
2. Did you have standard case definition for all country priority diseases? Yes/ No
3. Was the case definition posted? ☐ Yes ☐ No
4. If answer for Q2 is No, for which disease(s) did you lack the case definition?----------
5. Did you have case reporting formats for out breaks?☐Yes ☐ No ☐ Not Applicable
6. Was there guideline for specimen collection, handling and transportation to the next level? ☐ Yes ☐ No ☐ Not Applicable
7. Had you line list format for reporting outbreaks? ☐ Yes ☐ No ☐ Not Applicable
8. Was there a clinical register/logbook in your health post? ☐ Yes ☐ No ☐ Not Applicable
9. Did you face shortage of surveillance reporting and recording formats? Yes/ No
10. If answer foe Q9 is yes, which form? ----------

C. Data analysis and training assessment

1. Had you trained on surveillance system? Yes/ No
2. If answer for Q1 is yes a) when----------? b) Topic----------?
   c) For how long? ----------
3. Did you analyse data? ☐ Yes ☐ No

D. Outbreak investigation and case confirmation assessment

1. Was there any outbreak in your Kebele in 2004/05 EFY? Yes/ No
2. If your answer for Q1 is yes, what did you do?
   - ☐ Reported to the woreda PHEM
   - ☐ Reported to administrative leaders
   - ☐ We investigated
   - ☐ Cases referred to health center/hospital
   - ☐ Other----------
3. Where was laboratory confirmation of cases done? _____
4. Who was responsible to investigate an outbreak? _____
5. If answer for Q1 is yes how many out breaks were occurred in your Kebele in 2004 EFY? Fill the table below
6. Had you faced any challenge in outbreak investigation in 2004/05 EFY? Yes/ No
7. If answer for Q 6 is yes, a) list the challenges----------
   b) List the alternatives that you take to tackle the challenges. ----------

F. Supervision and feedback

1. Were you supervised by higher level (regional) officers in 2005 EFY? ☐ Yes ☐ No
2. If answer for Q1 is yes how many times in 2005 EFY? ----------
3. Had you received feedback from higher level supervisors in 2005 EFY? ☐ Yes ☐ No

If answer for Q 3 is yes how many feedbacks did you received in 2005 EFY? ----------

Chapter IV - Health Profile Description report

4. Health profile description, Lume woreda, East Shewa zone, Oromia

Executive summary

Introduction

Health profile is a system of collecting and summarizing health and others health related events, demographic, socio-economic, political and cultural aspect of a given district. This summarized and prioritized public health data is important for public health surveillance officials to uses it for planning, implementation and evaluation of public health programs.

Methods

This health profile data collected thoroughly reviewing health and health related data in Lume woreda from different sectors. In addition, the data collected reviewing publications and literature about the area; which was not documented in the offices. The data were collected by using structured and unstructured questionnaires as a tool from March 11-17, 2013. And then processed, organized and analysed by Microsoft excel.

Results

Projections from the 2007 population and housing census the estimated total population for the year 2004 E.C(2011/12) in the district was 101,449 , Of these, 53232(50.5%) were males and 50217(49.5%) were females. The male to female ratio was 1.02 to 1. About 93,291(92%) population live in rural and 8,158 (8 %) in urban. Of the total population, 41,998(41.5%) used electrical power and 90,095(87.7%) of the population had water supply. The Crude Birth Rate of the district was 35/1000 live births. Measles, penta 3, TT2+ NPW vaccine coverage in the study period was 78.1%, 82.4% and 64.6%, respectively.

Acute Upper Respiratory Tract Infection was a top public health problem for adults, which was 16.1 % of the total diseases reported at outpatient visits in 2012. It was also the second top leading causes of morbidity for children under five years of age (17.5%) next to non-bloody diarrhoea (25.6%) at OPD. A total of 6,490 malaria cases were reported at outpatients department, of these, 3496(53.9%) were males and 2994(46.1%) were females and 2533(39%) of cases were diagnosed by laboratory confirmed other than P.f, 2395(36.9%) of cases were diagnosed clinically and 1562(24.1%) of cases were diagnosed by laboratory confirmed with P.f. Regarding to TB, there were 191 TB cases detected, of whom, 114(59.7%) were males and 77(40.3%) were females. Of the total TB cases, 112(58.8%) were pulmonary types of TB and

79(41.4%) cases were Extra PTB. Among pulmonary TB cases, 64(57.1%) were PTB negative, 48(42.9%) were PTB positive.

Among PTB positive cases, 36(75%) were males and 12(25%) were females. Total TB patients screened for HIV were 82, of whom, 66(80.5%) TB patients were sero negative (free from the virus) and 16(19.5%) patients were sero positive (with the virus). A total of 12,109 clients were screened for HIV at VCT, PITC and PMTCT sites, of whom, 7901 (65.3 %) were males and 4208(34.7%) were females.

Conclusion and recommendations

In general, the three top leading diseases in the district, which attacked both adults and children under five years of age by acute upper respiratory tract infection, diarrhoea and acute febrile illness. Most of the diseases were affected the population due to lack of personal and environmental sanitation; so the district health office should strongly work on sanitation to solve future problems of the community. Health education is one of the main tools for prevention of diseases and promotion of health. In the district other health related issues was the participation of females students were low, so the district should work a lot on increasing participation of female students. Regarding to death report, the death rate was not recorded in the district in 2012; because of this it was difficult to measure the death rate. Therefore, it should be report for the sake of improving the health of the community.

4.1. Introduction

Health profile is a system of collecting and summarizing health and others health related events, demographic, socio-economic, political and cultural aspect of a given district in a given period of time. This summarized and prioritized public health data is important for public health surveillance officials to uses it for planning, implementation and evaluation of public health programs. Describing health profile of a particular district is fundamental to describe health status and determine diseases burden to communicate health related information in easy way. During describing the health profile of the district depend on different activity areas like education and school health, health facilities and human resources, health indicators and vital statics, immunization coverage, water supply and sanitation, leading cause of morbidity and mortality, endemic diseases, nutritional status and disaster situation and health budget allocation.

Ethiopia is one the countries on the process of achieving the millennium development goal in 2015. Reducing the child mortality and improvement of the maternal health are included in the millennium development goal, therefore to look their achievement as any level of administrative structure the health profile assessment tools are mandatory.

We done this health profile to assess and describe health and health related issues to identify problems for priority setting of Lume district.

4.2. Objective

4.2.1. General Objective:

- To assess and describe health related issues; about health status, health indicators and to identify problems for priority setting of Lume district

4.2.2 Specific objective:

- To identify the major problem related to communicable diseases
- To identify the health service status of the district.
- To identify and recommend the problem observed in the health care system

4.3 Method and materials

4.3.1. Study area

Lume district, which found in East Shewa zone, Oromia region

4.3.2. Study population

The population who found in the study area in 2012 (Total population 101449(estimated from 2007 population census))

4.3.3 Study period

We reviewed data to prepare health profile about the district in 2012.

4.3.4 Data collection and procedure

This health profile data was collected thoroughly by reviewing available data sources at Lume woreda's different sectors (Health, Administrative, Agriculture, Finance, Revenue, and Education). Besides to the above, the data was collected by reviewing publications and literature about the area; which was not documented in the offices .This data was collected by using semi structured questionnaires as a tool from March 11-17, 2013. And the data was processed, organized and analysed by Microsoft excel.

4.3.5 Data dissemination

Written report (both hard and soft copies) arranged and shared to Addis Ababa University, School of Public Health, EFETP, and Oromia Regional Health Bureau, EPHA and EFETP Resident advisors and coordinators.

4.4. Results

4.4.1. Historical Background

Lume district is one of the 11 districts, which is found in the East Shewa zone, Oromia region. Regarding about the naming of the district, there was no written document, but elder individuals, who live in the district, said that the current name of the district was taken from an old person's name '**Lumee Mi'eecha',** who lived in the district in the reign of Minilik II. There is no information about the exact established period of the district. However, the district was structured in new form after 1983 E.C.

4.4.2. Geography and Climate

The district is found 70 Km far from Addis Ababa, the capital city of Ethiopia, at East direction 25 Km far from Adama, the major town of East Showa zone. Its altitude ranges from 1500mt - 2300mt above sea level and contains some mountains and plateaus at southern part of the district. It has found at geographical coordination of 8^0 12'- $8^0$50' latitudinal from North to South and 39^0 01'- 39^0 17 longitudinal to East to West. Total area of the district is around 720 Sq.Km; the average annual rain fall ranges from 800ml-1200ml/yr. The average annual temperature of the district was 28^0C. It has three climatic zone.' kola', 'Weina dega' and 'Dega'. 'Kola' encompasses 25% (9 kebeles), 'Weinadega' encompasses 45 %(16 kebeles) and Dega encompasses 30 %(10 kebeles)

4.4.3. Administrative setup

Lume district has 35 rural and 2 urban kebeles. There were 25 sectors found in the district and their offices were found in Mojo town. The district has boundaries, in the north with Gimbichu district and Minjar/Arerti woreda (Part of Amhara region), in the south with Bora district, in the east with Adama district and in the west with Adaa and Liben districts. See the map of Lume district on (fig.4.1).

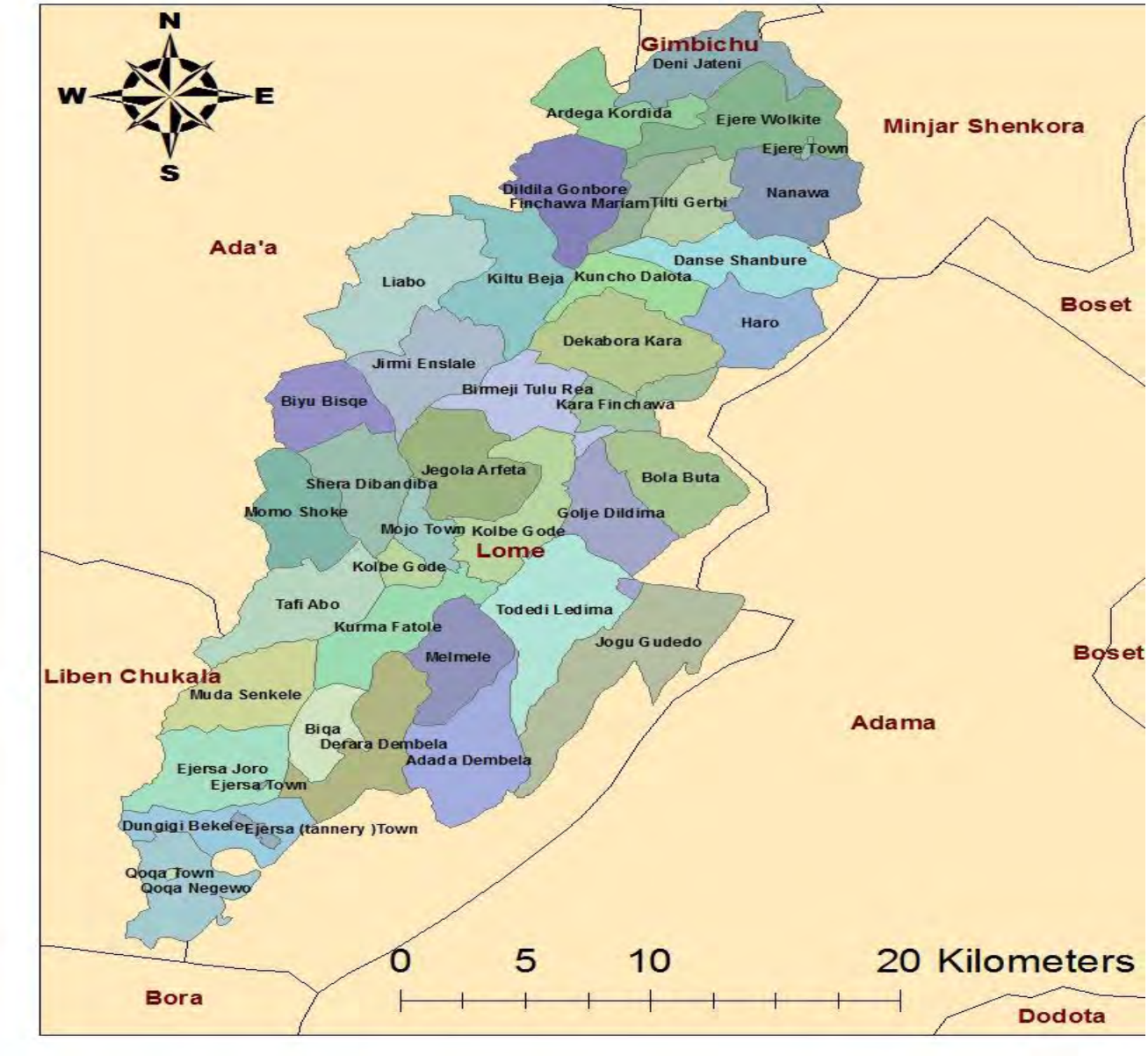


Figure 4.1: Map of Lume woreda with its kebeles and boundary districts, E/Shewa, Oromia

4.4.4. Demographic Information

Projections from the 2007 population and housing census estimate the total population for the year 2004 E.C (2011/12) of the district to be 101,449. Of these, 51232(50.5%) were males and 50217(49.5%) were females. The male to female ratio was 1.02 to 1. About 8,158 (8 %) population live in urban and 93,291(92%) population live in rural. The pyramidal age structure

of the population has remained predominately young with 47.6% under the age of 15 years, and 28.1% of the population in the age group of 15 and 65 years. The age group above 65 years accounts 4.7% of the total population (Fig.4.2). The reproductive age group of women were 18.4% of the population.

Of the total population, 91,304(90%) of the population are Oromo ethnically and spoke oromifaa, the rest 10,145(10%) of the population to be Amhara, Gurage and others. In the district, 91,304(90%) of population follow orthodox Christian, 5072(5%) population were protestant, 3043(3%) were Muslim and 2029(2%) other religious.

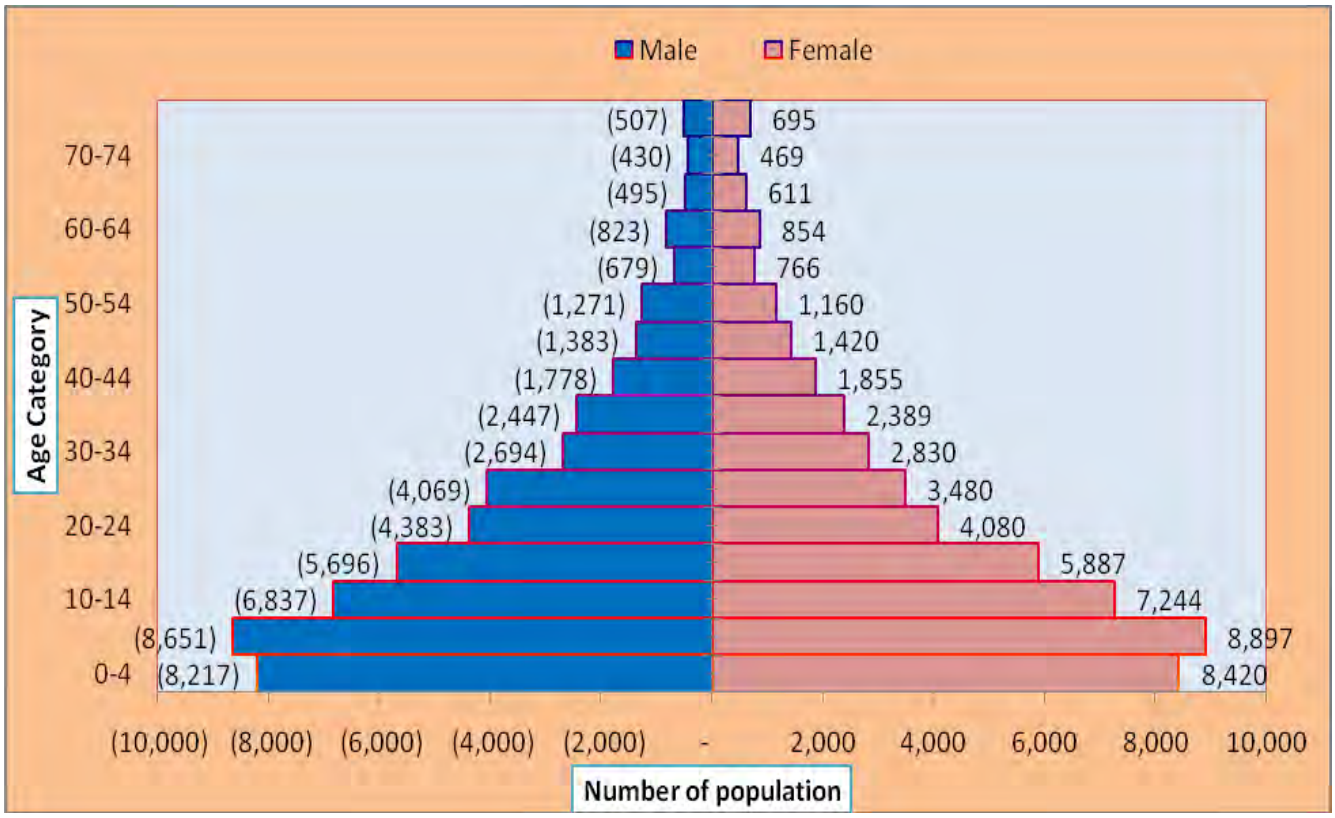


Figure 4.2: Population distribution by age and sex-Lume district, 2012

4.4.5. Productivity and income

In the Lume district the main income of population is based on agriculture, cattle breeding and small business which was 33580(33.1%), 21812(21.5%) and 15826(15.6%), respectively. The rest 30232(29.8%) of the population have income sources of different income generating activities. The district had 44,454 hectare land, which used for agriculture purposes in the fiscal year. About 1,338,072.5 kuntal production of wheat,"Teff" and other cereals was produced. The total income of the population in 2012 was 23,700,000.00 Birr.

There was 1207 government employee found in the district, of those, 727(60.2%) were males and 480(39.8%) were females. About 11419 were employed in different factories. Among whom, 5007(43.8%) were males and 6412(56.2%) were females. According to Labor and Social affairs office, 1824 productive individuals were unemployed, of these, 1472(80.7%) were males and 352(19.3%) were females.

4.4.6. Education and school health

Lume district has 63 schools, out of which, 39 were primary schools grade 1-4, grade 5-8 and one high school grade 9-10. There were no preparatory and college in the district. A total of 11659 students were enrolled at different level of schools, of whom, 8376(71.8%) were males and 3283(28.2%) were females. The male to female ratio of school attendance was about 2.5 in 1.From total schools, 21(33.3%) had water supply, 16(25.4%) had functional latrine for both sexes and 24(38.1%) schools had HIV and other health clubs.

4.4.7. Facilities

In the district there were asphalt roads in different directions, which pass across different kebeles, beside to the asphalt roads, there were gravel roads which connect kebeles to kebeles. Regarding communication, 76087(75%) of the population were used mobile telephone, but no one uses fixed telephone in the district. Of the total population, 41998(41.5%) have access and use electrical power.

Lume district has five health centers and 35 health posts. The health centers are Koka, Biyo, Tede, Dakaborra and Ejerre. Among the five health centers, four have water and electrical power supply. But Biyo and Tede health centers have not use water and electric power supply, respectively. Only Koka health center has fixed telephone. Two health center, Koka and Biyo have incinerator. All health centers have an access of transportation for their catchment population, on average 45- 60 minutes takes to reach the health facilities. Besides to government health facilities, there are different private health facilities in the district which gives a health service to the community (Table.4.1)

Table 4.1: Number of health facilities in lume district, East Shewa zone, Oromia, 2012

Type of Health facility		Number	Remark
Health Center		5	
Health posts		35	
Private H.Fs (clinics/diag. lab/drug stores/pharmacy)	Clinics (all type)	7	
	Diag. Lab.	1	
	Drug vender	2	
Other Gov. Organization	Clinics	5	4 small level and 1 middle level clinics
Traditional healer		1	

The district governmental health sectors had about 127 health professional and 21 supporting staffs. (Table.4.2). The health center to population ratio was 1: 20290, HO to population ratio was 1:20290, Nurse to population ratio was 1:2818, Midwife to population ratio was 1:11272, and HEW to population was 1:1663. There was no physician in the government health facilities. The district health office facilitates health and health related activities by organizational hierarchy (fig 4.4).

Table 4.2: Human resource for health sector, Lume woreda, E/Shewa zone, Oromia, 2012/13

Profession type	Educational level	No of professionals		
		Deployed		
		M	F	Total
Nurse	Degree	2	6	8
	Diploma	12	16	28
Laboratory	Degree	4	0	2
	Diploma	1	1	4
Pharmacy	Degree	0	0	0
	Diploma	3	1	4
Health officer (HO)		4	1	5
Environmental Health	Degree	3	1	4
	Diploma	0	0	0
Midwife	Degree	0	0	0
	Diploma	1	8	9
Applied Biology	Degree	1	0	1
HIT	Diploma	0	1	1
HEW		0	61	61
Supporting staffs		12	9	21
Total		43	105	148

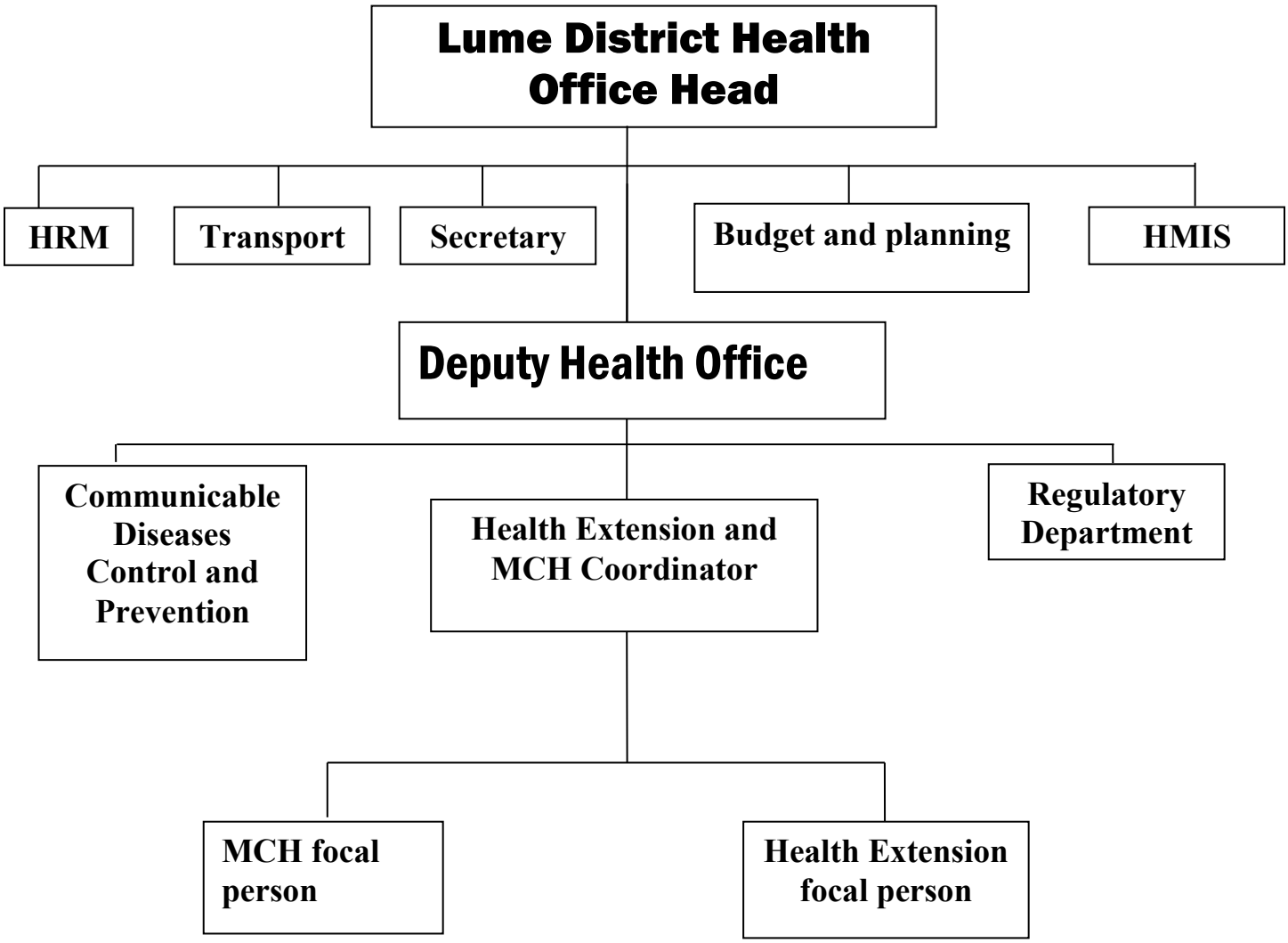


Figure 4.3: Health organization of Lume district, East Shewa zone, Oromia

4.8. Health indicators and vital statistics

Health indicators and vital statistics are crucial to estimation of the health service and indicate the health status of the community in the country, Region, Zone, District or Kebele. In Lume district, there were no data of mortality, like Infant Mortality Rate, Child Mortality Rate, Crude Death Rate and Maternal Mortality Rate (Table4.3).

Table 4.3: Vital statistics data in Lume woreda health office, 2012/13

S.No.	Parameter	Number (%)
1.	Total population	101449(100)
2.	Male	51232(50.5)
3.	Female	50217(49.5)
4.	Under 1 years old	3551(3.5)
5.	Under 5 years old	19854(19.6)
6.	Under 15 years old	48300(47.6)
7.	Female 15-49 years old	18667(18.4)
8.	Pregnancy	3855(3.8)
9.	Average house hold size	4.6
10.	Dependency ratio	110%
11.	CBR	35
12.	IMR	No Data available
13.	Under 5 Mortality Rate	No Data available
14.	CDR	No data available

4.9. Immunization coverage

The district had 33 EPI outreach sites and seven EPI static sites. There were conducted an immunization program for children < 1 year and women in reproductive age group in the district. BCG immunization coverage was 71%, OPV3 immunization coverage was 82.4%, Penta valent 3 immunization coverage was 82.4%, PCV10-3 immunization coverage was 43.5% and routine measles immunization coverage was 78.1%. The details of immunization figure indicated on Table 4.4.

Regarding about vaccine antigen protection, the health facilities had 32 refrigerators, of these, 21(65.6%) were functional and 11(34.4%) were non-functional. All functional refrigerators worked with electrical power supply and kerosene.

Table 4.4: Distribution of immunization coverage for children <1 year and women in reproductive age group in Lume district, 2012

Types of vaccine	No (%)
BCG	2736(71)
OPV1	2672(75.2)
OPV2	2423(68.2)
OPV3	2925(82.4)
Measles	2773(78.1)
Penta1	2672(75.2)
Penta 2	2423(68.2)
Penta 3	2925(82.4)
PCV10-1	1772(49.9)
PCV10-2	1690(47.6)
PCV10-3	1609(43.5)

4.10. Maternal Health

In the district, in 2012 there were 20,556 a short term family planning users, among these, 13760(73%) were used dipo provera and 2245(12%) used pills. Regarding ANC services, There were 3855 pregnant women in the district ,of these ,2637(68.2%) were used the ANC service in the health facilities. regarding delivery service,1331 women delivered by attended skilled birth attendants, health extension workers and traditional birth attendants. Of the total delivered mothers, 685(67%) were attended by traditional birth attendants, 320(26.6%) were attended by health extension workers and 126(7.1%) were attended by skilled birth attendants. In the district during the study period 1509(42.9%) of delivered mothers were used the post natal care (Table 4.5).

Table 4.5: Distribution of Maternal health indicators in Lume district, 2012

S/N	Health Indicators	N (%)
1.	Contraceptive acceptance rate	20527(110)
2.	Antenatal Care	2637(68.4)
3.	TT2+PW	2253(61)
4.	Deliveries attended by SBAs	126(7.1)
5.	Deliveries attended by HEWs	320(26.6)
6.	Deliveries attended by TBA	685(66.3)
7.	Crude Birth Rate	3551(3.5)
8.	Post natal care	1509(42.9%)
9.	TT2+NPW	12056(64.6)

4.11. Water supply and Sanitations

In the district, 90,095(87.7%) of the population have water supply. But there were five kebeles without water supply, namely, Harro Yohannis, Ejere Wolkite, Koka Negawo, Momo Shoke, and Biyo Biseke. Majority of the community used hand pump water.

Regarding to sanitation, from the total 21850 households, 20350(93.1%) of households constructed and use latrine in their compound. In the district there was no open defecation free kebeles. Two solid disposal sites were found in Ejere and Koka. The district had 7 Hotels, 11 Restaurant, 14 Butchers and 11 Groceries, all of them are inspected regularly based on check list. During the study period 2 Hotels and 1 Butcher were closed due to lack of sanitation.

4.12. Health education

The health facilities provided health education to patients and clients on communicable disease, sanitation, immunization and family planning, ANC and other health related issues, but there was not data for each specific portion and the duration it used.

4.13. Top ten leading causes of outpatients visit (Morbidity)

4.13.1. Top ten causes of morbidity for adult

There were different diseases occurred in the district in 2012, the ten top diseases are listed below for adults. In the list of top ten diseases totally 21179 patients were recorded. Of these, acute upper respiratory infection accounted for 16.1% of patients followed by acute febrile illness (15.8%) and non-bloody diarrheal disease (14.7%) was the third among the top ten causes of morbidity for adults. (Table 4.6)

Table 4.6: Top ten causes of morbidity in Adult OPD - Lume district, 2012

Rank	Diagnosis	# of case	%
1	Acute Upper Respiratory Infections	3404	16.1
2	Acute Febrile Illness	3353	15.8
3	Diarrhoea(Non-bloody)	3123	14.7
4	Malaria(confirmed with species other than P.f)	2533	12.0
5	Malaria (clinical)	2395	11.3
6	Malaria confirmed with P.f	1562	7.4
7	Pneumonia	1433	6.8
8	Disease of the musculoskeletal system	1274	6.0
9	Trauma	1114	5.3
10	Helmenthiasis	988	4.7
	Total	21179	100.0

4.13.2. Top ten causes of morbidity for under 5 children

A total of 5118 under 5 year children visited health facilities in 2004 EFY. Of these, 1310(25.6%) of the children come because of non-bloody diarrheal disease followed by Acute Upper Respiratory Infections, 894(17.5%) and then acute febrile illness (12.9%).All top ten diseases is listed on Table.4.7.

Table 4.7: Top ten causes of morbidity in < 5 year children - Lume district, 2012(2004EFY)

Rank	Diagnosis	# of case	%
1	Diarrhoea(Non-bloody)	1310	25.6
2	Acute Upper Respiratory Infections	894	17.5
3	Acute Febrile Illness	658	12.9
4	Pneumonia	537	10.5
5	Malaria (clinical)	462	9.0
6	Malaria(confirmed with species other than P.F)	346	6.8
7	Malaria confirmed with P.F	317	6.2
8	Diarrhoea with blood(dysentery)	298	5.8
9	Others or unspecified diseases of the eye	178	3.5
10	Common cold	118	2.3
	Total	5118	100.0

4.14. Community Health services

In the district community health services were provided by TBAs/TTBA, CHWs, HEWs and others. In 2012, totally 72 TBAs are registered in the district, (two TBAs per each kebele) and the responsibility of TBAs was promote safe delivery. There are 315 CHWs (now changed to WDA) in the district and their responsibility was social mobilization in the community for the sake of development. There are 61 HEWs in the district and they executed health extension program included in the package for achieving the Millennium Development Goal.

4.15. Endemic diseases

4.15.1. Malaria

Malaria is an endemic disease of malaria endemic kebleles in the district throughout the year. Twenty eight (76.7%) of the kebeles in the district are malaria endemic with about 80,304(79.2%) population at risks of being infected by malaria. Among outpatient department visited cases, malaria attacked about 17% of children aged 0-4, 16.9% aged 5-14 years and 65.8% adults aged 15 years and above in 2012. A total of 6,490 malaria cases were reported at outpatient departments, among whom, 3496(53.9%) were males (Table4.8). Regarding about methods of malaria diagnosis, 2533(39%) of cases were laboratory confirmed other than P.f.

2395(36.9%) of cases were diagnosed clinically and 1562(24.1%) of cases were laboratory confirmed with P.f. (fig.4.4).

Table 4.8: Number of malaria cases by age and sex, Lume district, 2012

Variables	# of case	%
Age		
0-4 year	1125	17.3
5-14	1095	16.9
≥15	4270	65.8
Sex		
Male	3496	53.9
Female	2994	46.1

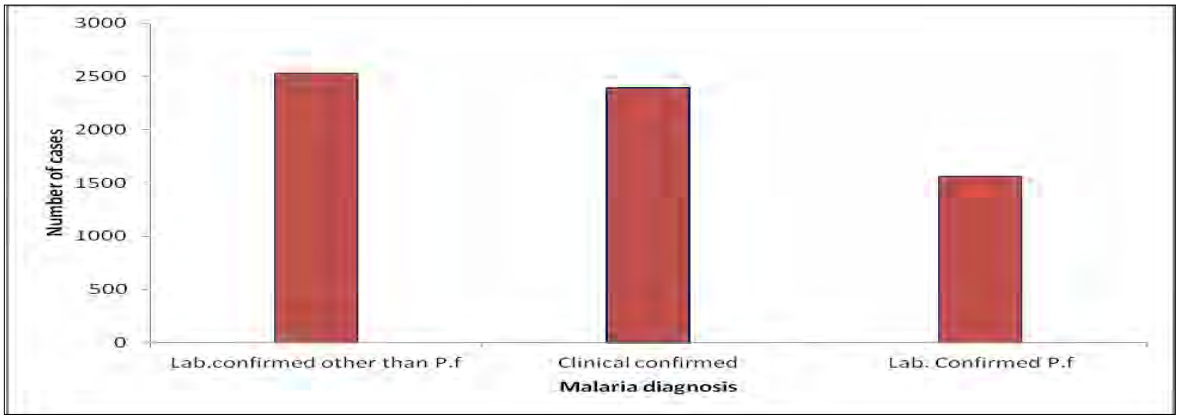


Figure 4.4: **Malaria cases confirmed by laboratory and clinical-Lume district, 2012**

Concerning on prevention and treatment of malaria, Insecticide Treated Nets (ITNs) coverage has improved up to 100 % in the district for the year of 2004EFY. The district used malaria supplies like, coartem tablet (200 box(1box/30 strip(1 strip=12 tablets)),120 box(1 box/40 test) RDT,9 tin chloroquine(1 tin/1000 tabs),7 tin quinine(1 tin 300tabs) and 140 bottle chloroquine syrup. The district has no shortage of coartem, RDT and other malaria prevention and treatment supplies.

4.15.2. Tuberculosis and Leprosy

TB is one of the major health problems worldwide. In developing countries it is still one of the major causes of morbidity and mortality. The combination of HIV infection and TB has become very important public health problem. Antibiotic resistance to anti-TB drugs is another important problem.

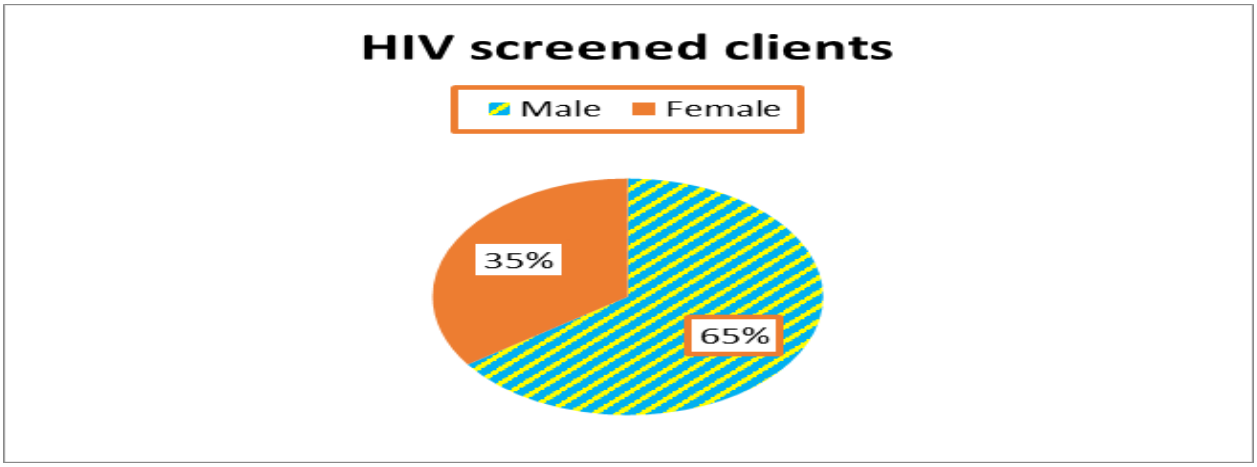
In the district, there were 191 total TB cases detected in the 2004EFY, of these, 114(59.7%) were males and 77(40.3%) were females. Of the total TB cases, 112(58.8%) were pulmonary types of TB and 79(41.4%) cases were Extra PTB. From those pulmonary TB cases, 64(57.1%) cases were PTB negative and 48(42.9%) of cases were PTB positive. Among PTB positive cases, 36(75%) were males and 12(25%) were females. The TB detection rate of the district is 29/100000, TB treatment completion rate was 44%, TB cure rate was 65.6%, TB treatment success rate were 68.8%, TB defaulter 9.3/1000 and death among TB treated was 10.9/1000. Total TB patients screened for HIV were 82, of these, 66(80.5%) TB patients were sero negative (free from the virus) and 16(19.5%) patients were sero positive (with the virus).Those TB and HIV co-infected patients were linked to the nearest ART clinic, which is found in Mojo health center. In the district there was one leprosy case detected and put under treatment (Table 4.9).

Table 4.9: Data about tuberculosis in Lume district in 2012

S. No	Indicators	Number	%
1	Total TB cases	191	
2	PTB positive	48	
3	PTB Negative	64	
4	EPTB	79	
5	TB case detection rate		29
6	TB treatment success rate		68.8
7	TB treatment cure rate		65.6
8	Defaulters		9.3
9	Deaths on treatment		10.9
10	New MB Leprosy case detected	1	
11	New MB Leprosy cases Treatment completed	1	
12	TB cases screened for HIV	82	
13	TB cases screened for HIV and HIV positive	16	
14	TB cases screened for HIV and HIV negative	66	

4.15.3. HIV/AIDS

A total of 12109 clients were screened for HIV in the last one year at VCT, PITC and PMTCT service sites, of these, 7901 (65.3 %) clients were males and 4208(34.7%) clients were females



(fig.4.5). Of the total screened clients, 41 clients were positive for HIV, of whom, 22(53.7%) were females and 19(46.3%) were males.

Figure 4.5: Total clients screened for HIV by sex in Lume district, 2012

Of the total clients screened for HIV, 1048(8.6%) were screened at PMTCT site, among these screened clients, six were HIV positive and they were linked to ART clinic. The district has five VCT and two newly established ART sites. During the assessment period, one ART site was fully stored with ARV drugs. In the district there was different activities done regarding to prevention and control of HIV/AIDS through health education, condom distribution, and facilitated income generating activities.

4.16. Nutritional status and disasters

The district has 35 OTP and five SC sites for nutrition. In 2012 a total of 71 under-five children were malnourished. Of these, 9(12.7%) cases were sever acute malnutrition and 62(87.3%) were with moderate malnutrition. There was no admission at SC site in the study period. The district, CBN program working towards improving nutritional status especially in fewer than five children, pregnancy and lactating women. Regarding to disaster, the district had not experienced to an outbreak or disaster in the previous three years.

5. Health budget allocation

In 2004 EFY (2011/2012), a total government budget allocated for the district health office was 2,540,921 ET.Birr. Based on the breakdown for all forms of health related activities, 2,330,921 ETH. Birr was used for salary and 210,000.00 ETH.Birr used for work facilitation. There were no other sources of finance in supporting the district health office.

6. Limitations

There was no compiled deaths report at health facilities and district level; it was difficult to analyse what ever type of mortality rate and case fatality rate.

There was no data on school eligible children in the district; therefore, it was difficult to analyse educational coverage.

Priority setting

To manage the public health and health related problems, putting based on priority is mandatory in resource scarce countries. Criteria like magnitude, severity, concern, and feasibility to solve the problem was used to set the priority. Among the identified problems in the district, we summarized and setting the priority on Table 4.10.

Table 4.10: Problems based on priority criteria, Lume district, East Shewa zone, Oromia in 2012

Problem	Magnitude (5)	Severity (5)	concern (5)	Feasibility and solving(5)	Total(20)	Rank
1.population composition(dependency ratio)	4	3	3	3	13	7
2.Water supply	3	3	4	4	14	6
3.Health facility and acceptability and man power	2	2	3	5	12	5
3.Maternal health coverage(ANC,CPR, Institutional delivery)	4	4	4	3	15	4
4.Child health coverage(immunization, malnutrition)	4	4	3	4	16	3
5.Top diseases	4	5	5	4	18	1
6.Endemic diseases(Malaria, TB,HIV/AIDS)	5	5	3	4	17	2

Estimated magnitude of the problem in % and score 0-20=1, 21-40=2, 41-60=3, 61-80=4, 81-100=5

7. Discussion

Health profile is used for identifying health and health related problems. The estimated population for the year 2011/12(2004 E.C) in the district was 101,449 with male to female sex ratio of 1.02 to 1, which was nearly similar to that of sex ratio(M:F) 1.01 to 1 of Oromia region in 2011. In the district the crude birth rate (CBR) was 35/1000 live births, which was nearly similar to that of the Oromia region 34.7/1000 live births. The age dependency ratio of the district was 110, which was higher than the Oromia region (103.1). Regarding to health profession with population ratio indicated that, HO and Nurse to population ratio of the district were nearly similar to that of the national figures. But mid wife, HEW and Health center to population ratio was higher than that of nation-wide according to health and health related indicators in 2011 (1).

ANC coverage of the district was 68.1%, which is lower than that of Oromia region (79.3%) in 2011. A delivery attended by skilled birth attendants was 7.1%, which was less compared to Oromia region (17.7%) in 2011. But deliveries attended by HEW were more than that of Oromia region deliveries attended by HEW (10.9%). Postnatal coverage of the district was 42.9%, it was similar to Oromia region PNC in 2011.

Acute Upper Respiratory Tract Infection (AURTI) was top among top ten diseases of adults and accounted for16.1 % of the total diseases reported at outpatient department in 2012. It was also the second top leading causes of morbidity for children under five year of age by 17.5% next to non-bloody diarrhoea (25.6%) at OPD. AURTI was the 2nd leading cause of morbidity nationally. Regarding to children less than five years old, non -bloody diarrhoea was the top leading cause of morbidity in the district, it was also the leading cause of morbidity nationally. In general, the top leading diseases in the district for both adults and children under 5 years of age were acute upper respiratory tract infection, diarrhoea and acute febrile illness.

There were 191 TB cases detected, of these, 114(59.7%) were males and 77(40.3%) were females. The proportion of male to female was similar to that of Oromia regional state in 2011. Of the total TB cases, 112(58.8%) cases were developed pulmonary TB and 79(41.4%) cases were developed Extra PTB. Among pulmonary TB cases, 64(57.1%) cases were PTB negative, 48(42.9%) of cases were PTB positive, it was relatively similar to Oromia PTB cases in the year 2011. Regarding about HIV/AIDS, a total of 12109 clients were screened for HIV in 2012 at VCT, PITC and PMTCT sites. Among whom, 7901 (65.3 %) were male and 4208(34.7%) were

females. In the district a total of 71 malnutrition cases were occurred, of these, nine cases were with the condition of sever acute malnutrition.

8. Conclusion and recommendation

According to estimated priority setting criteria, top leading diseases was the main problem in the district followed by endemic diseases. Of these top leading diseases, acute upper respiratory tract infection (AURTI) was the first district public health problem of adults, which was 16.1 % of the total diseases reported at outpatient visited in 2012. It was also the second top leading causes of morbidity for children under five year of age by 17.5% next to non-bloody diarrhoea (25.6%) at outpatient department. The leading diseases were affected the population due to lack of sanitation; so the District health bureau should strongly worked on sanitation to solve future problems of the community. Health education is one of the tools for solving many problems. specially HEWs should worked a lot on health education about communicable diseases, nutrition, sanitation, immunization, family planning and other public health concerns. Other health related issues in the district, found that, 61.9% of the population were without power supply. Therefore, the district administrative office should solve the power supply problem with other stakeholders. Regarding to education sector, the participation of females students were low in relative to males, so the district should worked a lot on increasing participation of female students. Additional problem on education was absence of preparatory school in the district, it leads to either students went to other areas for preparatory level, which is far from their residency area, or discontinue the education totally, so the district health office should take measures to solve the problems. The mortality rate report was not recorded in the district in 2012, but it is one of the vital statistics, therefore, it should be reported for the sake of improving the health of the community.

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Annex 4 Health profile data collection tools

Data Collection Tools

4.1 Historical Aspects of the area (Culture and tourism office).

Woreda Name_____

How and why the name given_____

How and when the woreda was formed_____

Any other historical aspect_____

4.2 Geography and Climate (including map, altitudes, agro ecological zones etc…) Woreda map_____

Location (distance and direction) _____ _____

Altitude _____

Geographical coordinate

Latitude _____ longitude _____

Annual rain fall (average) _____, annual temp (average) _____

Climatic zones_____ (%) _____ (%) _____ (%)

Area of woreda_____SqKm

4.3 Facilities

Accessibility (main roads) _____

Type of road _____

How many kebeles have access to transportation _____

Flow of transportation per day_____

How many people have access to fixed telephone? _____

How many people have access to mobile phone? (Coverage)_____

How many people get power supply_____?

4.4 Administrative setup

Total no. of kebeles: rural_____Urban_____

Woreda boundaries

North_____South_____

East_____ West_____

4.5 Demographic information

Population: Total_____ urban_____.rural_____

Male_____Female_____sex ratio_____

Under1yr_____<5yrs_____<15Yrs_____

≥65years_____ Population pyramid type _____

Age category(Year)	Sex(No)		
	Male	Female	Total
<1			
1-5			
6-14			
15-24			
25-34			
35-49			
50-64			
≥ 65			

Age distribution

Women 15_49 years of age_____Total population by kebele (each kebele pop)_____

4.6 Ethnic/language

Oromo_____ (_____ %), Amhara_____(_____ %),

Tigre_____(_____%),Garage_____(____%)

Others_____ (_____ %)

4.7 Religion

Orthodox _____ (_____ %), Muslim_____ (_____ %),

Protestant_____(_____ %) Other _____ (_____ %)

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

Main income sources

Agriculture_____(No.),Differentbusiness_____(No.),

Employee_____ (No.) Jobless_____ (No.)

Average income per HH/year_____

4.9 Education and school Health

Number of educational institution

College/ TVET_____, High school_____, Medium _____Elementary ___K.G.___

Educational status of the community

Total Educated people_____ Male _____ Female _____

School health activities:

Water supply: schools with water supply_____

Toilets: schools with functional latrines (male and female)_____

Schools with HIV/other Health clubs_____

4.10 Infrastructure for health Facilities (Transport, Telecommunication, Power supply, water supply…)

How many of the health posts have access to:

Transportation_____ (____%), Telecommunication_____ (____%),

Electric power_____ (____%),Water supply _____ (____%)

How many of the health centers have access to

Transportation_____ (____%), Telecommunication_____ (____%),

Electric power_____ (____%) Water supply _____ (____%)

11 Safe water coverage

Kebeles getting safe water_____(_____%)

Population getting safe water_____(_____%)

Main source of water_____

4.12 Health delivery system

4.12.1 District Health Structure

4.12.2 Health Facilities

Type		Number	Total No. of beds
Gov. Hospital			
Gov. Health center	Type A		
	Type B		
Private H.Fs (clinics/diag. lab/drug stores/pharmacy)	Clinics (all type)		
	Diag. Lab.		
	Drug store		
	Pharmacy		
Gov. Health posts			

NGOs	H.Ps		
	H.Cs		
	Hospitals		
	Clinics		

Health institution to population ratio:
Hospital: Pop_____ HC: Pop_____
HP: Pop_____ Health service coverage_____%

4.12.3 Human resource for health sector

Types of Health professional	No.	Remark
Specialist		
G.P		
HO		
Nurses (Deg. and Dip.)		
Mid wife (Deg. and Dip.)		
Lab. (Deg. and Dip.)		
Pharmacy (Deg. and Dip.)		
Env. Health (Deg. and Dip.)		
HIT		
Health education		
HEWs		
Others(Applied biology)		

Nurse: pop. ratio Mid. Wife: pop. Ratio _____HEW: pop. ratio_____

4.12.4 Top causes of morbidity and mortality

Top ten leading causes of OPD visit (morbidity):

Adult		# of cases	%	Pediatrics/ < 5 years	# of cases	%
1						
2						
3						
4						
5						
6						
7						
8						
9						
10						
Others						
Total						

4.12.5 Top ten causes of admissions

`		# of cases	%	Pediatrics/<5 years	# of case	%
1						
2						
3						
4						
5						
6						
7						
8						
9						
10						
Others						
Total						

4.12.6 Top ten causes of deaths (mortality).

Adult		Pediatrics/ <5 years
1		
2		
3		
4		
5		
6		
7		
8		
9		
10		

4.12.7 Vital Statistics and Health Indicators

Infant Mortality Rate (IMR) _____(total <1 yr deaths this 2004 yr_____)

Child Mortality Rate_____(this year's total <15 yr deaths_____)

Crude Birth Rate_____

Crude Death Rate_____ (total deaths 2004 yr____)

Maternal Mortality Rate_____(2004 total maternal deaths_____)

Contraceptive Prevalence rate_____

Contraceptive acceptance rate _____

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

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

Percentage of deliveries attended by skilled birth attendants_____

Percentage of deliveries attended by HEWs_____

Percentage of deliveries attended by TBA _____

4.12.8 Immunization Coverage (for children and Women);

BCG _____(__%). OPV0____(____%), OPV1_____(___%), OPV3_____(___%)

Measles_____(___%). Penta1_____(___%). penta2 _____(___%) penta 3_____(___%)

PCV-10-1_____(__%),PCV-10-3_____(___%),TT2+P.W_____(__%),TT2+

N.P.W_____(___%)

4.12.9 Health budget allocation:

Government

Total budget allocated for the district _____

Total budget allocated for health _____(____%)

Funds from NGO

Total _____ (purpose/programs)_____

4.12.10 Disaster situation in the woreda

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

Any recent disease outbreak/other public health emergency_____

If yes, cases_____ and deaths_____

4.12.11 Community Health Services;

Status of services provided by community health workers namely

No. of TBAs/TTBA_____ and their responsibility

_____

No. of CHWs/CHPs_____ and their responsibility

_____

Responsibility of HEWs_____

Others_____

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

MCH (Delivery, ANC, PNC)

_____

FP(Methods)

_____

EPI (outreach service, cold chain, vaccine):

_____

_____

Environmental Health and sanitation.

Latrine coverage_____ and utilization rate_____

Water supply coverage_____

others_____

Health Education (what, when, where, how and who conducted health education)

_____

_____

_____

4.12.13 Endemic diseases;

Malaria:

Total malarious kebeles_____ and Pop at risk_____

ITNs coverage (including current dist)_____ is there IRS this year(No of kebeles)_____

Total cases/yr_____ deaths/yr_____,<5yr cases_____ deaths_____

Malaria supplies (Coartem, RDT, etc) shortage _____

Other issues_____

TB/Leprosy

Total TB cases_____ PTB negative_____ PTB positive_____ Extra PTB _____

TB detection rate _____

TB Rx completion rate _____ TB cure rate _____

TB Rx success rate _____

TB defaulter_____

Death on TB Rx_____

Total TB patients screened for HIV_____

Total Leprosy cases_____ on Rx_____

HIV/AIDS;

Total people screened for HIV (last one year)_____

VCT_____ PITC_____PMTCT_____

HIV prevalence_____

HIV Incidence (new cases/yr)_____

Total PLWHA_____

On ART_____on Pre-ART_____

Other HIV prevention activities_____

4.12.14 Nutrition (malnutrition related OTPs, SC, TSF, CBN and PSNP activities)/HO and Early warning

Total OTP sites_____, total admissions to OTP/yr_____

Total SC sites,_____, Newly opened/yr_____, total admissions to SC/yr_____

Is there TSF (targeted supplementary feeding) program in the woreda_____

CBN program_____ PSNP_____other_____

General food security condition_____

Essential drugs (shortage):-_____

4.12.15 what do you think the major Health problem/s of the woreda_____

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

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

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Chapter V - Scientific Manuscripts for Peer reviewed Journals

5. Measles outbreak Investigation in Abay chomen woreda, Horo Guduru Wollega zone, Oromia, February, 2014

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Abstract

Introduction

Measles is a highly contagious and the leading causes of death among young children even though a safe and cost-effective vaccine is available. In 2011, there were about 157,000 measles deaths occurred globally. The investigation was carried out to assess the magnitude and risk factors associated to the occurrence of the outbreak in Abay chomen woreda.

Methods: A line listing of suspected cases was used to describe the outbreak and a case control was done to assess associated risk factors. Cases were defined based on national standard measles case definition and control was neighbour of cases who did not have history of signs and symptoms of measles during the same period. Fifty-nine cases and fifty-nine controls were participated in the study. Measles vaccine coverage and other health related data were collected from woreda health office. A face to face interview was conducted using structured questionnaire with adults, and care takers for children <18years of age. Epi info was used to analyse the data.

Results: A total of 87 cases were line listed, among them 48(55%) were females. The age range of cases was from five months to 35 years with mean and median age of 8.1 and 7 years, respectively. The case fatality rate (CFR) was 0%. High proportion, 40(46%) of the cases were in the age category of less than five years. The odds of measles infection was higher for those who had contact history (OR=7.89, 95%CI (3.39, 18.37)), but lower in those who were vaccinated and living in ventilate house OR=0.32, 95% CI (0.15, 0.69) and OR= 0.21, 95% CI (0.09, 0.47), respectively. Measles vaccine coverage of Abay Chomen woreda was 77%.

Conclusion: The outbreak was verified and stayed for three months. During the outbreak high proportion of cases were found in less than five years age. The vaccination coverage of the district was below the target. Being contacted to infected patient, measles vaccination status and nonexistence of window for ventilation were risk factors for the occurrence of the outbreak. The woreda should be strengthen measles routine vaccination and enhance the awareness of the community on epidemic prone diseases.

Key words: Measles, outbreak, Horo Guduru Wollega, Abay Chomen, Oromia.

5.1. Introduction

Measles is a highly contagious and serious disease caused by a virus of the paramyxovirus family genus Morbillivirus. The virus grows in the cells that line the back of the throat and lungs. Measles is a human disease and is not known to occur in animals. The first sign of measles is usually a high fever, which begins about 10 to 12 days after exposure to the virus, and lasts four to seven days. A runny nose, a cough, red and watery eyes, and small white spots inside the cheeks can develop in the initial stage. Serious problems resulting from measles infection include pneumonia, seizures, diarrhoea, ear infections and brain infections (1).

Although measles outbreaks occur worldwide, they become smaller and less frequent in countries and regions get closer to elimination. Outbreaks can be useful to identify gaps in immunization program performance that may not be evident through monitoring vaccination coverage. Immunization program weaknesses can include low coverage, heterogeneity of coverage with pockets of missed children, population movements, community resistance, cold-chain failure, inadequate human resources, poor data collection, and reporting errors(2).

Measles is one of the leading causes of death among young children even though a safe and cost-effective vaccine is available. In 2011, there were 157, 000 measles deaths globally – about 430 deaths every day or 18 deaths every hour. More than 95% of measles deaths occur in low-income countries with weak health infrastructures. However the number of measles deaths globally decreased by 71% between 2000 and 2011, from 542 000 to 157, 000. Over the same period, new cases dropped by 58% from 853, 500 in 2000 to 355, 000 in 2011(3).

Since 2000, with support from the Measles and Rubella Initiative, more than 1 billion children have been reached through mass vaccination campaigns — about 225 million of them in 2011. Despite this global progress, some populations remain unprotected; an estimated 20 million children worldwide did not receive the first dose of vaccine in 2011. More than half of these children live in five countries: the Democratic Republic of the Congo (DRC) (0.8 million), Ethiopia (1 million),India (6.7 million),Nigeria (1.7 million) and Pakistan (0.9 million)(4).

A total of 42,658 suspected cases of measles were reported from the 40 countries of Africa in the network between January 1st

and July 7th, 2011, a total of 18,658 cases were confirmed as measles by lab and epidemiological linkage. Nigeria accounted for 7052 cases while Zambia and Tanzania reported 5339 and 1144 cases ,respectively(5).

Before the introduction of measles vaccination, measles in Africa was primarily a disease affecting young children, and >1 million cases were reported annually. In urban areas, measles epidemics occurred every 1–2 years, and the median age of cases was 1.5–2.5 years; in rural areas, outbreaks occurred less frequently, and the median age was 2.5–5.0 years(6).

Since 2002, Ethiopia adopted these regional goals and strategies and has been taking important steps to control measles. The National Immunization Program was established in the 1980s, and currently delivers service through static and outreach sites nationwide. The current routine immunization schedules recommend a dose of measles vaccination at 9 months of age. The WHO UNICEF coverage estimates for measles vaccination for Ethiopia also indicate an increase from 37% in 2000 to around 80% in 2010(7).

5.2. Background

Abay Chomen woreda is one of the woreda found in the Horo Guduru Wollega zone.

The total population of the woreda is 59,371. The woreda has 20 kebeles. Agamessa kebele is one of the kebele, which found in Abay Chomen woreda and it had been affected by measles.

The kebele is located to the northern direction of the Woreda town (Finchua) with distance of 48 Km (nearest to Finchua Sugar factory). Initially, the suspected measles cases were reported from the woreda health office PHEM department to Zonal health office PHEM department on November 23, 2013.

The suspected measles cases were reported from Agamessa kebele to woreda health office PHEM department. The total population of the kebele is 27,391. The administrative vaccine coverage of Abay Chomen woreda and Agamessa kebele in 2005 EFY was 77% and 83.4%, respectively.

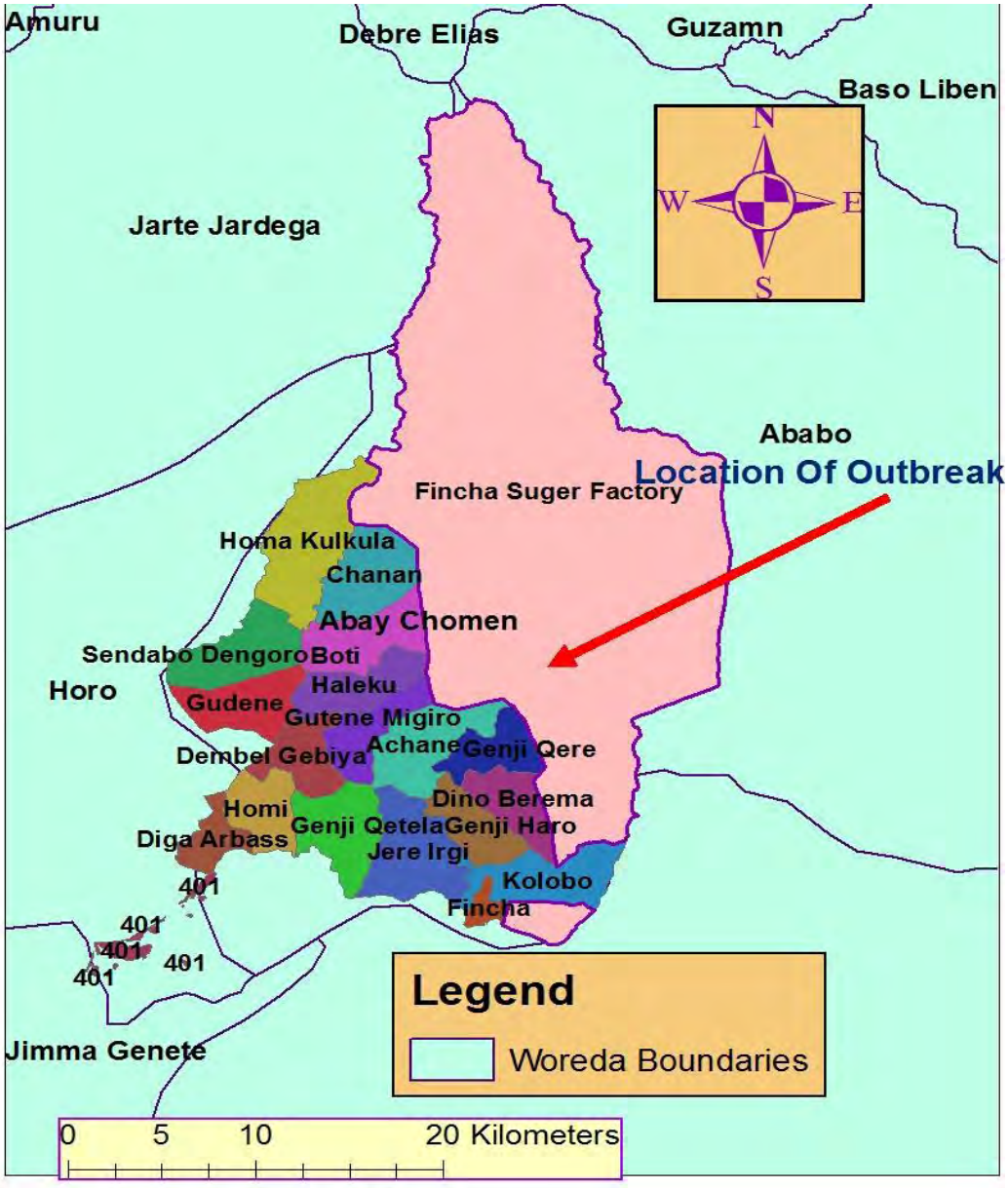

Figure 5.1: Map of Abay Chomen Woreda with outbreak affected kebel, Horo Guduru Wollega Zone, Oromia,February, 2014

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5.3. Methods and materials

5.3.1. Study area

The outbreak investigation was conducted in Agemssa kebele, Abay Chomen Woreda, Horo Guduru Wollega zone, Oromia. Abay Chomen woreda has 20 kebeles with the total population of 59,371. Among the total population, 27,391 are living in Agemssa kebele.

5.3.2. Study Period

Descriptive data was analysed from line listed reported cases since November 23/2013 until the last line listed case reported on February 24/2014. However the case control study began on January 25/2014 and end on February 05/2014.

5.3.3. Study design, sampling and data collection method

A line listing of suspected cases was collected from woreda health office to describe the outbreak by place, person and time. Case control was used to assess associated risk factors for the outbreak. Surveillance reports and records were reviewed. Cases were defined based on national standard measles case definition and a control was a neighbour of cases who did not have history of sign and symptoms of measles during the same period. Fifty-nine cases and fifty-nine controls were participated in the study. A face to face interview was conducted using structured questionnaire with adults, and care takers for children <18years of age. We conducted active case search in the affected site. Measles vaccine coverage and other health related data were collected from woreda health office.

5.4 Case definition

5.4.1 Measles suspected cases at community level:

A community member should report any person with **rash** and **fever** to a health worker and also advise the person to go to a health facility.

5.4.2 Suspected measles case:

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

5.4.3 Confirmed measles case:

Cases with a positive laboratory result for measles specific immunoglobulin (IgM) antibody testing that had not received measles vaccination within the 4 weeks before the specimen collection.

5.4.4 Measles outbreak:

Is laboratory confirmed when 3 or more laboratory confirmed measles IgM

positive cases occur in a health facility or district in a month.

5.4.5 Epidemiologically linked case:

A suspected measles case that has not had a specimen taken for serologic confirmation and is linked (in place, person and time) to a laboratory confirmed case; i.e., living in the same or in an adjacent district with a laboratory confirmed case where there is a likelihood of transmission; onset of rash of the two cases being within 30 days of each other.

5.4.6 Measles death: For surveillance purposes, a measles death is defined as any death from an illness that occurs in a confirmed case or epidemiologically linked case of measles within one month of the onset of rash.

5.5 Operational definition

5.5.1 House ventilation: A living house contain at least one window to use for air ventilation

5.5.2 Knowing modes of transmission: A person respond the mode transmission of measles disease from infected person to the uninfected individual via droplet (sneezing, cough)

5.5.3 Nutritional status: Nutritional status of children aged 6- 59 months was determined by measuring the middle upper arm circumference(less than 12 cm is taken as malnutrition).

5.6 Results

5.6.1 Laboratory:

A total of seven samples were sent to reference lab for serological test, of the total samples, 6(86%) were positive for Measles IgM.

5.6.2 Description of the outbreak

On November 23, 2013 the first case (Index) was registered in the health facility. The Index case was female, 11 years old, primary school student with a previous history of unvaccinated for measles. She had no travel history to other place rather than school before the onset of the illness.

Throughout the outbreak period, totally 87 measles cases were line listed. Among the cases, 48(55%) were females. The age range of cases was from five months to 35 years with mean and median age of 8.1 and 7 years, respectively. The case fatality rate (CFR) of the disease was 0 %. Among the total cases, 42(48.3%) were admitted to the health facility. At the beginning of the outbreak two cases were registered (including the index case) and two weeks later other cases were recorded (Figure 5.2).

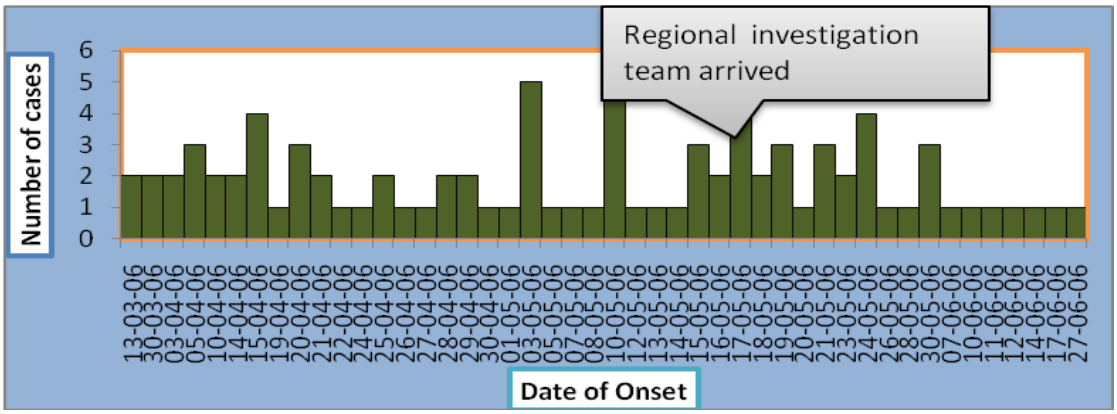

Figure 5.2: Distribution of measles cases by date of onset at Agemessa kebele, 2014

From the total line listed cases, high proportion of the cases were in the age category of less than five years, 40(46%) followed by age category 5-14 years, who comprised 30(34.5%) of the cases (Table 5.1).

Table 5.1: Magnitude of measles cases by age category, Agamessa kebele, Abay Chomen woreda, February, 2014

Age category	Frequency(N=87)	%
Less than 9 months	20	**23.0**
9months-4 years	20	**23.0**
5-14 years	30	**34.5**
15-35 years	17	**19.5**

In relation to the vaccination status, among the total cases, 41(47%) had received measles contain vaccination, 28(37%) had not been vaccinated, and 14(16%) of the cases were with unknown measles vaccination status.

In 2005 EFY measles vaccination coverage of Abay Chomen woreda and Agemessa kebele was 77% and 83.4%, respectively. Based on our observation at the outbreak site, refrigerators uses for vaccine storage are functional and their temperature monitoring chart was registered on daily basis. The attack rate (AR) of the disease at the woreda and Kebele level were 15 and 32 per 10,000 populations, respectively.

5.6.3 Case control study

A case control study design was applied to identify the associated factors in relation to the outbreak. A total of 59 cases and 59 controls were participated in the study. Age and sex matched controls were selected from the same neighbourhoods.

The most frequent reported signs and symptoms during the outbreak were rash and fever 59(100%) each, cough 54(92%) and conjunctivitis 36(61%). The lowest frequent signs and symptoms were diarrhoea and pneumonia 5(8%) each.

The measles vaccination status of the study participants was significantly associated to the occurrence of the outbreak. Twenty four (40.7%) cases and 45(76.3%) controls received measles vaccine with OR= 0.32, 95% CI (0.15, 0.69).

Contact history to an infected patient was one of the associated factors for the outbreak with 48(81.4%) cases and 21 (35.6%) controls and OR= 7.89, 95% CI (3.39, 18.37).

Nonexistence of window for ventilation was one of significantly associated factor for the occurrence of the outbreak with, 59.3 %(35/59) of cases and 23.7% (14/59) of controls, and OR= 0.21, 95% CI (0.09, 0.47). Factors like family size, family educational level and nutritional status and other factors were not associated to the outbreak.

Table 5.2: Association of categorical demographic characteristics and health related factors to measles outbreak in Agamessa kebele, February, 2014.

Variables	Case(n=59)	Control(n=59)	OR(95% CI)
Measles vaccine received			
Yes	**24**	**40**	**0.32 *(0.15, 0.69)**
No	**35**	**19**	
Contact with measles patient	**48**	**21**	**7.89 *(3.39, 18.37)**
Yes	**11**	**38**	
No			
Family Education Level			
Able to read and write	**30**	**36**	**0.66 (0.31, 1.37)**
Unable to read and write	**29**	**23**	
House Ventilated(presence of window)			
Yes	**24**	**45**	**0.21* (0.09, 0.47)**
No	**35**	**14**	

* Significant association

5.7 Discussion

The outbreak began on November 23/2013 and the last case was line listed on February 24/2014. During the outbreak period 87 cases were line listed. There was no death reported. The index case was registered on November 23, 2013. There were different factors which associated to the occurrence of the outbreak.

The measles containing vaccine coverage of the woreda and the Kebele in 2005 EFY was 77% and 83.4%, respectively. These were below the National level routine coverage

(over 90%) for a sustainable reduction in measles morbidity and mortality(10)

During the outbreak period, being unvaccinated against measles was one of the factor for the outbreak and this was below study done at National level (8) and in Zaka,Masvingo Province, Zimbabwe(9). Besides to line listed unvaccinated cases, study subjects of unknown vaccination status (Figure5.3) suggested to be unvaccinated and might be increased the chance of the manifestation of the outbreak in the site.

Among the line listed cases, the high proportion (34.5%) of cases were in the age category of less than five years followed by 5-14 years of age category(32%), this was almost similar to study done in Malawi(10). Based on results from the case control part of this study, subjects who had vaccinated measles containing vaccine were significantly lower chance of acquiring

measles infection when compared to unvaccinated. (Table5.3). Studies done at National level (8) and Zaka,Masvingo Province of Zimbabwe(9) show similar findings to our study.

Having contact with measles patient was one of the associated factors for the occurrence of the outbreak, which was almost similar to study done in India(11) and this is for the reason that measles is highly contagious and the secondary attack rates among susceptible household contacts have been reported to be 75%–90%(10).

During investigated the outbreak the main limitation was delayed of report and subsequently the investigation was not done at the beginning of the outbreak.

5.8 Conclusion

The outbreak was verified and stayed for three months.

A total of 87 cases and zero death were reported throughout the outbreak period. High proportion of cases was found in less than five years age category. Among the woreda kebeles only one kebele was affected by the outbreak. Vaccination coverage of Abay Chomen was below the target. Being contact to infected patient, measles vaccination status and nonexistence of window for ventilation were associated to the occurrence of the outbreak.

5.9 Intervention Activities

Active case searching and early management were our preliminary duty during the outbreak investigation. Identified suspected cases were line listed and sent to the health facility for treatment. Health education was conducted at gathering and house to house to create social awareness about the outbreak in the community. Schools teachers were mobilized to identify and report any suspected cases of measles to the health facilities. We informed to small private health sectors to inform any suspected measles cases to health extension workers. A total of 250 households were actively searched and all their family members that estimated to 1000 were received health education on measles disease.

5.10 Recommendations

The Regional health bureau and Zonal health office should be strengthening the surveillance system.

The woreda health office should be strengthen measles routine vaccination activities with the target of reaching more than 90% infants of 9 months to 11 months of age and the coverage should be monitored accordingly.

The health extension worker in the health post of should enhance the awareness of the community towards measles infection and

other epidemic prone diseases as well. Communities should be ventilating their living house.

Acknowledgment

We would like to say thanks to Mr.Tesfaye H, Mr.Feyissa B, Mr.Amsalu A and Agamessa kebele Health Extension Workers for their strong assistance during the outbreak investigation. We extend our gratitude to Agamessa kebele community for their cooperation and AAU, Oromia RHB and EPHA for their technical support.

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Chapter VI -Abstracts for Scientific Presentation

6.1. Measles surveillance data analysis of 2008 to 2012, Arsi Zone, Oromia Region, Ethiopia, February 2013

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Abstract

Background: Measles is an acute infectious disease caused by measles virus. It is the leading cause of death among young children. Globally, an estimated of 157,700 people died from measles in 2011, mostly children under the age of five. We reviewed data from 2008 through 2012 to analyse the epidemiology of measles in Arsi Zone, Oromia Region.

Methods: We collected case based report and cleaned the aggregate data of suspected measles from 2008 through 2012, and analysed by person, place and time. A suspected measles-infected patient is any person with fever and maculopapular (non-vesicular) generalized rash, and one of the following signs cough, coryza or conjunctivitis.

Result: In the year 2008-12, a total of 26 measles outbreaks were reported, except for the year 2009, as zone level. On these period, a total of 857 cases and 1 death (CFR, case fatality rate = 0.001%) were reported. Of these patients, 211(24.6%) were Laboratory confirmed, 390(45.4%) epidemiologically linked and 256 (29.9%) were clinical. About 242(28.2%) were vaccinated, 202(23.6%) unvaccinated and 413(48.2%) with unknown vaccination status. Nearly 47% (403/857), of patients were 5-14 years of age. Of the total patients, 95(11.1%) recorded at Tiyo and 89(10.3%) at Limo Bilbilo woredas; whereas the average administrative vaccine coverage of these woredas were 88.4% and 97.5%, respectively. High proportion, 60.8% (521/857) of patients developed the disease from January through June in the study period.

Conclusion: The administrative vaccine coverage and episode of disease were increased simultaneously. This is due to accumulation of susceptible persons in the community and nonexistence of second opportunity for vaccination. So action should be implementing to prevent the disease by supplementary immunization activities.

Keywords: Measles, surveillance, outbreak, Arsi, Oromia, Ethiopia

6.2. Measles outbreak Investigation in Liben woreda, Guji zone, Oromia, November, 2013

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Abstract

Introduction: Measles is an acute and highly contagious illness caused by a virus of the family paramyxovirus. It is the leading cause of death among young children globally even in the presence of vaccine. An estimated 157,700 people died from measles in 2011 mostly children under the age of five. The study done to investigate and confirm measles outbreak and assess factors associated with the outbreak in Liben district.

Methods: A line listing was prepared to describe the outbreak by place, person and time. Case control study was used with ratio of 1 to 2 to assess the risk factors. Forty-two measles cases and eighty-four controls were enrolled in the study. Cases are those febrile individuals who present with generalized macula popular rash and one or more of cough, coryza and conjunctivitis. Age and sex matched controls were identified from neighbour of the case but with no any of the signs and symptoms of the disease. A face to face interview was conducted using structured questionnaire with adults, and care takers for children <18years of age. Epi- info used to analyse the data.

Results: A total of 57 cases were line listed during the outbreak, of whom 31(54.4%) were males. The mean and median ages of the cases were 8.2 and 4 years, respectively. Thirty (52.8%) cases were in the age category of less than five years. From total cases, 21.1% (12/57) had not been vaccinated. Based on the case-control finding: being unvaccinated for measles (OR=0.3, 95% CI 0.13, 0.65), and contact to measles patient at neighbour, school and other places (OR= 5.3, 95% CI 2.4, and 11.8) were significantly associated with the outbreak.

Conclusion: Low vaccination coverage was the main contributing factor for the occurrence of the outbreak. In addition to low vaccination coverage, poor cold chain management system may be the cause of the outbreak. Therefore, the woreda health office should strengthen measles routine immunization activities with the target of reaching more than 90% and better cold chain management.

Keywords: Measles, Outbreak, Guji, Oromia, Ethiopia

6.3. Measles outbreak Investigation in Abay chomen woreda, Horo Guduru Wollega zone, Oromia, February, 2014.

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Abstract

Introduction: Measles is a highly contagious and the leading causes of death among young children even though a safe and cost-effective vaccine is available. In 2011, there were about 157,000 measles deaths occurred globally. The investigation was carried out to assess the magnitude and risk factors associated to the occurrence of the outbreak in Abay chomen woreda.

Methods: A line listing of suspected cases was used to describe the outbreak and a case control was done to assess associated risk factors. Cases were defined based on National standard measles case definition and control was neighbour of cases who did not have history of signs and symptoms of measles during the same period. Fifty-nine cases and fifty-nine controls were participated in the study. A face to face interview was conducted using structured questionnaire with adults, and care takers for children <18years of age. Measles vaccine coverage and other health related data were collected from woreda health office. Epi info was used to analyse the data.

Results: A total of 87 cases were line listed, among whom 48(55%) were females. The age range of cases was from five months to 35 years with mean and median age of 8.1 and 7 years, respectively. The case fatality rate (CFR) was 0%. High proportion, 40(46%) of the cases were in the age category of less than five years. The odds of measles infection was higher for those who had contact history (OR=7.89, 95%CI (3.39, 18.37)), but lower in those who were vaccinated and living in ventilate house OR=0.32, 95% CI (0.15, 0.69) and OR= 0.21, 95% CI (0.09, 0.47), respectively. Measles vaccine coverage of Abay Chomen woreda was 77%.

Conclusion: The outbreak was verified and stayed for three months. During the outbreak high proportion of cases were found in less than five years age. The vaccination coverage of the district was below the target. Being contacted to infected patient, measles vaccination status and nonexistence of window for ventilation were risk factors for the occurrence of the outbreak. The woreda should be strengthen measles routine vaccination and enhance the awareness of the community on epidemic prone diseases.

Key words: Measles, outbreak, Horo Guduru Wollega, Abay Chomen, Oromia.

Chapter VII - Narrative summary of disaster situation visited

7. Report on health assessment during pre-harvest term ('meher') in Arsi and Bale zones, south east Oromia, November, 2013

Executive Summary

Health and nutrition need assessment is a tool which used to identify health and health related problems in a given Region or Zone or district

The pre-harvest term ('meher') health and nutrition need assessment was conducted in November 2013 at Arsi and Bale zones. From each zone, three districts were selected by Zone administrative and visited by a multi-agency team members. The multi-agency team comprised from regional and zone disaster risk management food security sector (DRMFSS), RHB, WFP, federal water and energy minister (FWEM), National Meteorology Agency (NMA) and International Risk Committee (IRC). Food and non-food data was collected by using questionnaires, checklists and through field visit and observation.

Diarrheal disease was recorded in the top five leading morbidity in the visited districts. The safe water coverage of Arsi zone and its visited districts, (Amigna, Honkolowabe and Shirka) was 71%, 42%, 79% and 43.3%, respectively. Safe water coverage of visited districts (Gassera, Dawe Serer and Dawe Kachen) from Bale zone was 42%, 0.5%, and 18.5%, respectively.

The zones have functional multi sectoral coordination forum for the health sector, but relevant government, NGOs and UN agencies were not representing in the forum and also had not been conducting frequent of regular meeting. All visited districts have multi sectoral PHEM coordination forum and public health emergency preparedness and response plan, but all had not accessible emergency respond fund.

Routine therapeutic feeding program is established in all districts of assessed zones. In the visited districts, there are 11 establishing centers and 116 outpatient therapeutic program sites. The sites reported a total of 511 SAM cases from June 2013 through October 2013. Based on Arsi zone pre harvest assessment finding, the 'meher' crop production achievement is 97.48% compared with the plan, however in all visited districts there was risk of food security especially due adverse weather condition in the recent year.

During the assessment of visited districts, there was no outbreak which occurs in six months prior to the assessment, however in Bale zone Gololcha district there was a suspected measles outbreak in October 2013. Related to nutrition both Zones manifested adverse weather

conditions (shortage and excess of rain) and which will be prone the visited woreda population in to food insecurity.

The Public health emergency preparedness and response program had been established in Woredas, but it was not execute on regular basis. In conclusion, the public health surveillance should be strengthen at visited district levels. The Zones and visited district should be enhanced health promotion and disease prevention activities. Visited districts should be further strengthen the nutrition program.

7.1 Introduction

Arsi zone is one the zone among 18 zones with in the Oromia region. The zone is found at the south eastern direction of Addis Ababa with a distance of 170 Km. The boundaries of Arsi zone are on the north by East Shewa zone,on the south by Bale zone,on the west by West Arsi zone and on the east by East Shewa and west Harrerge zones. This zone has 24 rural districts and one town administrative. There are 498 rural and 58 urban kebeles found in Arsi zone. The estimated land surface area of the zone is 21,120.28 square kilometer with 145 populations per square kiLumeter. Bale zone is one the zones in the Oromia region. The zone is found at the south eastern direction of Addis Ababa with distance of 430 Km. The zone has an estimated land surface area of 67,329.59 KM^2 with 25 population density. It has 18 rural districts and 3 town administration with 344 rural and 28 urban kebeles.

Based on 2007 population census projection, estimated total population of Arsi and Bale Zones in 2005 E.C were 3,046,060 and 1,708,937, respectively. Among the total populations of Arsi zone, 1,553,489(51%) were female, 96,560 were under one year, 499,553 were under 5 years and 1,449,924 were under 15 years. Among the total population of Bale zone, 857,886(50.2%) were females and 280,267(16.4%) were children under 5 years of age.

The agro_ecolgy zone of Arsi zone is classified in to ‘‘Dega’’ 43.3%,"Weina Dega" 27.3% and "Kolla" 29.4%.In the zone 87% of the population live based on agriculture and the rest are pastoralist and agro pastoralist.

Related to health facilities, Arsi zone has 2 hospitals, 97 health centers and 499 health posts. Within the zone there are three hot spot malaria districts, namely Dodota, Merti and Zuway Dugda. The health service, latrine and safe water coverage of the zone is 86%, 71% and 71%, respectively. Currently the zone has 1029 primary schools, 70 secondary schools and 21

preparatory and colleges. Bale zone has 4 hospitals, 76 functional health centers and 323 health posts. Within the zone there are four hot spot malaria districts, namely Berbere, Dolo Mena,Harena Buluk and Raytu. The health service coverage of by health posts and safe water coverage of the zone is 72% and 71%, respectively.

Health related emergency condition has been affecting the population for the earlier period in the zones, which includes drought, malnutrition, flooding, frost and epidemics like measles, diarrheal diseases and malaria. Especially drought and malnutrition frequently results from inadequate and inappropriate distribution of rainfall and improper feeding habit, respectively.

Multi Agency pre harvest -Assessment was planned to determine level of health related emergency conditions in the zones and estimating humanitarian need that should be provided to zones and to put recommendations based on the findings.

7.2 Objectives

7.2.1. General Objective

- To contribute in ensuring appropriate and effective humanitarian planning and responses that leads to reducing morbidity and mortality in the most vulnerable areas of the assessed zone.

7.2.2. Specific Objectives

- To assess the extent, types, magnitude, severity and likely of the different hazards (drought, human epidemics, sever and acute malnutrition, etc) and risks to the populations in the most vulnerable districts (including to identify the most vulnerable populations) for epidemic prone problems considering health and nutrition emergencies.
- To assess the existing capacity of the health services to address health and nutrition emergencies likely to occur during the second six months of 2014.
- To determine the shortcomings (gaps) in the capacity of the existing health services to address health and nutrition emergencies likely to occur between January and June 2014.
- To identify areas where health and nutrition emergency assistance might be needed during the coming six months due to acute problems and come up with reasonable estimates of the size of the population needing emergency assistance.

7.3 Assessment Methods

Pre harvest humanitarian needs assessment was conducted in the Arsi and Bale zones in November 2013 by the multi_agency team. The multiagency team comprising of experts from RHB, WFP, Regional and Zonal DRMFSS, Regional Water Office, National Meteorology Agency and IRC. The assessment was cross-sectional survey with objective of identifying humanitarian need for the second 6 months of 2014. The assessment was conducted in six selected districts. The districts were Amigna, HonkoloWabe,Shirka, Gassera, Dawe Serer and Dawe Kachen.

The procedures of assessment by the multi-agency team are indicated below:

- Briefing was conducted at Zonal and each assessed Districts
- Primary and secondary data were collected using checklists
- Formal discussion and interview was made with respective officers
- Community Interviews and observations was conducted
- Debriefing was made on assessment findings at visited Zone and Districts
- Before departure to the pre-harvest assessment, the multiagency team briefed on Regional DRMFSS on pre harvest assessment findings, which done prior to this assessment and also taken orientation on the purpose of the pre-harvest assessment and its tool. At zonal and selected districts level, there was a briefing on findings of the pre harvest assessment. After briefing, the zone selected six districts for visit. A face to face interview with structured questionnaires was used to collect data, from zone and district health offices.

  This non-food summary report submitted to Arsi and Bale Health and Nutrition Needs Assessment team leader. The final regional summary report would be prepared by compiling the zonal summary reports.

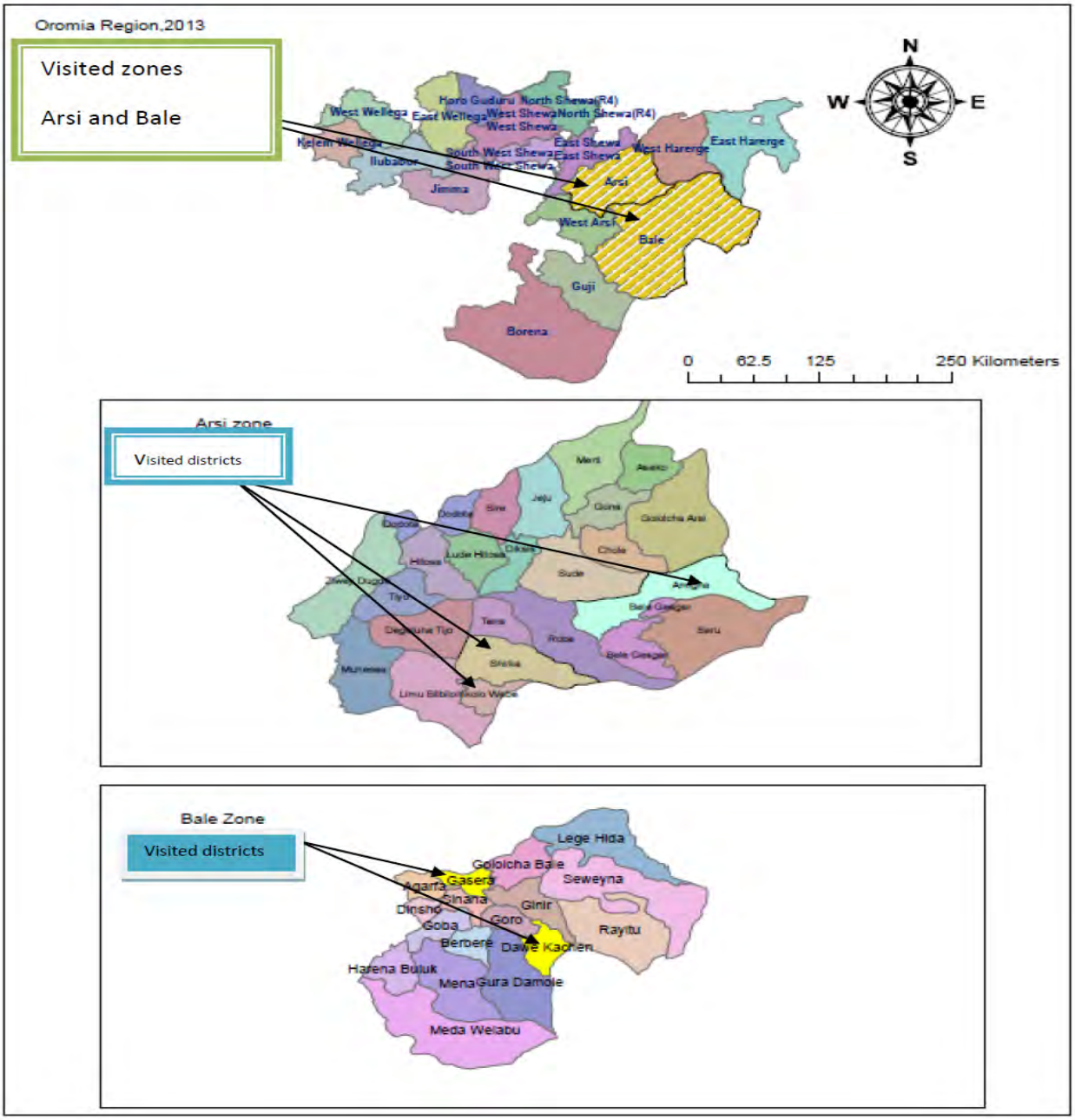


Figure 7.1: 'Meher' assessment in visited districts at Arsi and Bale zones, South east Oromia,November 2013.

7.4 Findings

7.4.1. Socio demographic profile

Based on 2007 population census projection, estimated total population of Arsi and Bale Zones in 2005 E.C were 3,046,060 and 1,708,937, respectively. The estimated number of population in the visited districts is indicated below (Table 7.1).

Table 7.1 : Socio-demographic profile of visited districts in Arsi and Bale zones, Oromia, 2013

S.No.	District	Total Population			Under 5 Children
		Male	Female	Total	
1	Amigna	44,479	44,460	88,939	14586
2	Honkolo Wabe	35,515	36,965	72,480	11,887
3	Shirka	97,910	100,865	198,775	32,599
4	Gassera	48,298	46,404	94,702	15,531
5	Dawe Serer	25,859	26,066	51,925	8,516
6	Dawe Kachen	18,520	18,668	37,188	6,099

7.4.2. Coordination

The zones have functional multi sectoral coordination forum for the health sector. In Bale zone relevant government, NGOs and UN agencies were representing in the forum but not in Arsi zone. Both Zones had not been conducting frequent of regular meeting. All visited districts have multi sectoral PHEM coordination forum and public health emergency preparedness and response plan, but all of them had not accessible emergency respond fund.

7.4.3. Report of top five morbidity

The top five causes of morbidity in the year 2005 E.C (2012_13 G.C) in the visited districts of Arsi zone (Amigna, HonkoloWabe and Shirka) were recorded based on the age categories. The age category includes below five and above five year. The visited districts of Arsi zone had been recorded diarrheal disease on both age categories, and Pneumonia was recorded in the age category of below five year (Table 7.2).

Table 7.2: Top five causes of morbidity in the year 2005 E.C at Amigna, Honkolowabe and shirka districts, Arsi zone,Oromia

Districts	Rank	Morbidity below 5 year	Rank	Morbidity above 5 year
	1	Diarrhoea	**1**	Blunt injury
	2	No pneumonia	**2**	AFI
	3	Pneumonia	**3**	UTI
	4	Conjuctivitis	**4**	Gastritis
Amigna	**5**	Skin infection	**5**	Diarrhoea
	1	No pneumonia	**1**	AFI
	2	Diarrhoea	**2**	RTI
	3	Pneumonia	**3**	Intestinal parasite
	4	Tonsillitis	**4**	Diarrhoea
Honkolo Wabe	**5**	Intestinal parasite	**5**	Rheumatic disease
	1	Pneumonia	**1**	ARI
	2	Helimentiasis	**2**	UTI
	3	Moderate malnutrition	**3**	Pneumonia
	4	URTI	**4**	Intestinal parasite
Shirka	**5**	Non bloody diarrhea	**5**	Skin infection

The top five causes of morbidity in the year 2005 E.C in the visited districts of Bale zone (Gassera, Dawe Serer and Dawe Kachen) were recorded without classification of age categories. The visited districts had been recorded diarrheal diseases, intestinal parasite and URTI in the list of top five leading causes of morbidity (Table 7.3).

Table 7.3:Top five causes of morbidity in the year 2005 E.C at Gassera, Dawe Serer and Dawe Kachen districts, Bale zone,Oromia,2013

Districts	Rank	All age category
Gassera	1	Pneumonia
	2	Intestinal parasite
	3	Diarrhea
	4	Gasritis
	5	URTI
Dawe Serer	1	Pneumonia
	2	Anemia
	3	Typhoid fever
	4	Trauma
	5	Intestinal Parasite
Dawe Kachen	1	URTI
	2	Rheumatic disease
	3	AFI
	4	Intestinal parasite
	5	Diarrhea

7.4.4 Review on report of selected diseases

In the visited districts, we reviewed some selected diseases report, these diseases were Acute Watery Diarrhoea (AWD), malaria, measles and meningitis. All visited districts, did not report the above diseases and death from June 2013 through October 2013, but confirmed malaria cases were reported from visited districts. In the districts there was zero report of death from malaria. The trend of the diseases is indicted below (Figure 7.2).

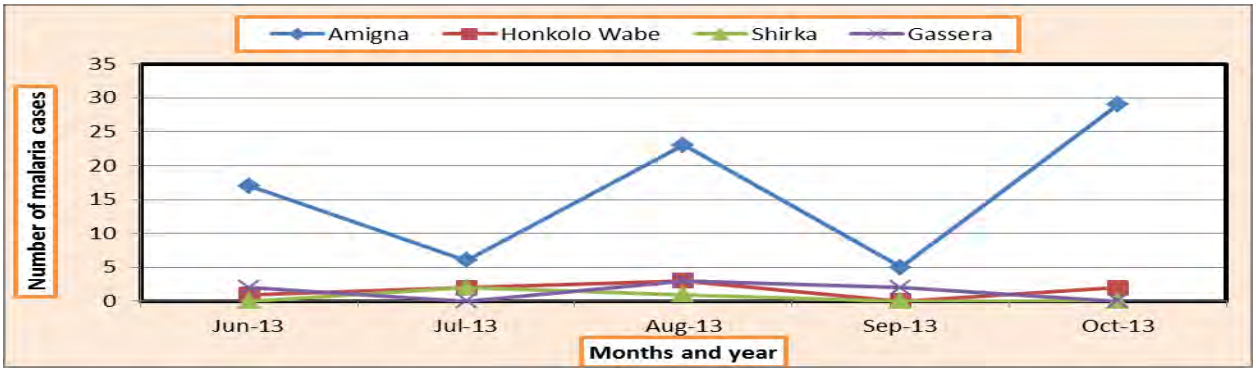


Figure 7.2: Magnitude of confirmed malaria cases in 'meher' visited districts,Arsi and Bale zones,Oromia,2013.

7.4.5 Report of out breaks

In all visited districts, there was no any outbreak in the last five months prior to this assessment. However in Bale zone, Gololcha woreda there was a suspected measles outbreak in October 2013.

7.4.6 Public health emergency drugs and supplies preparedness

In the visited districts majority of emergency drugs and supplies are available and also adequate for one month; however in all visited districts supplies like RDT (pastorex) and LP set for meningitis, and CTC kit for AWD were not available. All visited districts suggested that materials like tent, mattress, plastic sheet, and plastic buckets with covers are mandatory for rapid response of mass treatment in case of AWD. From visited districts, 4/6(67%) had no budget, which allocated for emergency rapid response by the district administrative. Requirement, availability and gaps of drugs and medical supplies in Arsi zone were not available due to data incompleteness in the zone pharmacy department.

Table 7.4: List of emergency drugs and supplies at visited districts, Arsi and Bale zone, Oromia, 2013

Emergency drugs and supplies available and enough for 1 month(Yes/No)	List of districts						
	Amigna	Honkolo Wabe	Shirka	Gassera	Dawe Serer	Dawe Kachen	%
Ringer Lactate (to treat AWD cases)	Yes	Yes	Yes	Yes	No	Yes	83
ORS (to treat AWD cases):	Yes	Yes	Yes	Yes	Yes	Yes	100
Doxycycline *(to treat AWD cases)*:	Yes	Yes	Yes	Yes	No	Yes	83
Syringes, Gloves *(for AWD management):*	Yes	Yes	Yes	Yes	Yes	Yes	100
Amoxil susp (to treat measles complication)	Yes	Yes	Yes	Yes	Yes	Yes	100
***Tetracycline ointment (to treat measles complication)**	Yes	Yes	No	Yes	Yes	Yes	83
Vit A (to treat measles complication)	Yes	Yes	No	Yes	Yes	Yes	83
Coartem for Malaria	Yes	Yes	Yes	Yes	No	Yes	83
RDT for Malaria	Yes	Yes	Yes	Yes	Yes	Yes	100
RDT (pastorex) for Meningitis	No	No	No	No	No	No	100
LP set	No	No	No	No	No	No	100
Number of CTC kit available: (for AWD)	No	No	No	No	No	No	100

Table 7.5: Requirement, availability and gaps of drugs and medical supplies in Bale zone, Oromia, 2013

Drugs and Medical Supplies			Unit	Total requirement	Available	Gaps
Drugs	Coartem		Box 6X1	180 Box	0	180 Box
	Coartem		Box6X2	250 Box	0	250 Box
	Coartem		Box6X3	500 Box	0	500 Box
	Coartem		Box6X4	750 Box	16 Box	734 Box
	Amoxil suspension		Box	150	0	150
	Tetracycline ointment		Tube	2000	0	2000
	Vit A		Tin	*-	03Tin	-
	Cotrimoxazole suspension		Box	150	0	150
	Oily CAF		Box	50 Box	0	50 Box
	Doxcycline		Box	50 Box	0	50 Box
	Ringer lactate		Bag	3000 bag	0	3000 bag
	ORS		Box	20	0	20
Lab Supplies	RDT (Malaria)		No.	10,000 tests	4800 tests	5200 tests
	Pastorex (Meningitis)		No.	-	0	-
	LP set		Each	500	0	500
	TI bottle		No.	100	0	100
CTC Kit (AWD)			No.	-	-	-
Medical Supplies		Gloves	Box	30	0	30
		Syringes	Box	20	0	20
		PPE	Kit	200	0	200
Plumpy net			Carton	200	684	200

***- No data available**

7.4.7 Risk factors for occurrence of epidemic

In the visited districts there are risk factors for the occurrence of epidemics due to diseases like malaria, acute watery diarrhoea (AWD), measles and meningitis.

In related to malaria disease, the districts are malaria endemic areas, presence of malaria transmittable mosquito breeding sites, and availability of interrupting rivers are the main once. Regards to malaria endemic kebeles: Amigna district has 7 malaria endemic kebeles with 17,048 populations, Honkolowabe district has 4 malaria endemic kebeles with 17,500 populations and Shirka district has 15 malaria endemic kebeles with 58,560 populations.

Concerned to AWD in the visited districts, there was no epidemic in the last three years however, the districts have risk factors like low latrine coverage, latrine utilization coverage, and inadequate safe water coverage, which prone to occurrence of epidemic (Table 7.6)

Table 7.6: Latrine coverage, utilization and safe water coverage of visited districts in Arsi and Bale zones, Oromia, 2005 E.C

S.No	District	Latrine Coverage (%)	Latrine Utilization (%)	Safe Water Coverage (%)
1	Amigna	**29**	**29**	**42**
2	Honkol.Wabe	**89**	**79**	**79**
3	Shirka	**93**	**60**	**47.3**
4	Gassera	**67**	**67**	**42**
5	Dawe Serer	**71**	**66**	**0.5**
6	Dawe Kachen	**47**	**40**	**18.5**

Measles vaccination coverage in 2005 E.C and the last five months measles vaccination performance prior to this assessment are indicated on Table 7.7. Besides to routine measles vaccine, all visited districts conducted measles vaccination campaign (SIA) in May 2013 and September 2013 with target age group of 6-59 months. The number of vaccinated children during the measles vaccination campaign (SIA) at Shirka was very low and at Dawe Kachen the numbers of children who received the vaccine were not recorded (Table7.7).

Table 7.7: Measles Vaccination indicators in visited districts in Arsi and Bale zones, Oromia, 2013.

Health related indicators	List of districts					
	Amigna	HonkoloWabe	Shirka	Gassera	Dawe Serer	Dawe Kachen
Number of Children < 5 years of age	14,586	11,887	32,599	15,531	8,516	6,099
Measles vaccination coverage in 2005 E.C	76%	83%	89.5%	78%	94%	96%
Measles vaccination coverage June_ Oct 2013	67%	94%	113%	74%	88%	109%
SIA conducted in 2005/06 E.C (Yes/No)	Yes	Yes	Yes	Yes	Yes	Yes
Number of children vaccinated during SIA	12482	9966	4456	13,500	7,357	?

Regarding to meningitis, there was no epidemic in the last three years from the two zones in general and specifically from all visited districts. However, the population in the two zones did not receive meningitis vaccination in the past three years.

7.4.8 Nutrition

In Arsi zone cereals like wheat, teff, barley, maize, millet and sorghum are used as main food sources for the population and in Bale zone wheat, barley, and milk are the main food sources. Children whose middle upper arm circumference (MUAC) measurement below 11cm are categorized as sever acute malnutrition (SAM) and include in the therapeutic feeding program. Routine therapeutic feeding program is established in all visited districts of the two Zones. In the visited districts 11 establishing centers and 116 outpatient therapeutic program sites are found. The sites were reported a total of 511 SAM cases from June 2013 through October 2013. High proportion (75.3%) of the cases were reported from visited districts of Arsi zone. Based on Arsi zone pre harvest assessment finding, the crop production achievement was 97.48% compared with the plan. However, in all visited districts of Arsi and Bale zones there was risk of food security especially due to adverse weather condition in 2013/14.

The therapeutic Feeding Program (TFP) admissions at the visited districts are shown below.

Table 7.8: Monthly new TFP admissions, from OTP and SC sites and therapeutic supplies in Amigna district, Arsi zone from June to October 2013.

Month/2013	Total new SAM cases	Total number of		Total number of OTP/SC reported		Therapeutic supplies		
		OTP	SC	OTP	SC	RUTF	F100	F75
June	59	20	1	64	4	10 carton	1 sachet	1 sachet
July	25	20	1	57	4	200 carton	2 sachet	2 sachet
August	16	20	1	51	4	40 carton	1 sachet	1 sachet
September	36	20	1	61	4	30 carton	1 sachet	1 sachet
October	33	20	1	55	4	47 carton	1 sachet	1 sachet
Total	**169**							

Table 7.9: Monthly new TFP admissions, from OTP and SC sites and therapeutic supplies in Honkolo Wabe district, Arsi zone from June to October 2013.

Month/2013	Total new SAM cases	Total number sites		Total number of OTP/SC reported		Therapeutic supplies		
		OTP	SC	OTP	SC	RUTF	F100	F75
June	5	11	2	40	8	50 carton	31 sachet	126 sachet
July	48	11	2	39	8	150 carton	90 sachet	120 sachet
August	14	11	2	23	8	140 carton	100 sachet	236 sachet
September	5	11	2	20	8	140 carton	100 sachet	230 sachet
October	2	11	2	26	8	140 carton	100 sachet	230 sachet
Total	**74**							

Table 7.10: Monthly new TFP admissions, from OTP and SC sites and therapeutic supplies in Shirka district, Arsi zone from June to October 2013.

Month/2013	Total new SAM cases	Total number sites		Total number of OTP/SC reported		Therapeutic supplies		
		OTP	SC	OTP	SC	RUTF	F100	F75
June	24	33	5	124	20	300 carton	0 sachet	0 sachet
July	34	33	5	120	20	0 carton	0 sachet	0 sachet
August	18	33	5	112	20	0 carton	0 sachet	0 sachet
September	36	33	5	72	20	0 carton	120 sachet	120 sachet
October	30	33	5	132	20	0 carton	45 sachet	45 sachet
Total	**142**							

Table 7.11: Monthly new TFP admissions, from OTP and SC sites and therapeutic supplies in Gassera district, Bale zone from June to October 2013.

Month/2013	Total new SAM cases	Total number of		Total number of OTP/SC reported		Therapeutic supplies		
		OTP	SC	OTP	SC	RUTF	F100	F75
June	16	25	1	47	4	29 carton	20 sachet	20 sachet
July	12	25	1	39	4	0	0	0
August	14	25	1	44	4	0	0	0
September	0	25	1	56	4	0	0	0
October	14	25	1	59	4	0	0	0
Total	**56**							

Table 7.12: Monthly new TFP admissions, from OTP and SC sites and therapeutic supplies in Dawe Serer district, Bale zone from June to October 2013.

Month/2013	Total new SAM cases	Total number sites		Total number of OTP/SC reported		Therapeutic supplies		
		OTP	SC	OTP	SC	RUTF	F100	F75
June	0	12	0	ND*	NA**	0	0	0
July	1	12	0	ND	NA	20 carton	0	0
August	1	12	0	ND	NA	30 carton	0	0
September	6	12	0	ND	NA	0	0	0
October	15	12	0	ND	NA	0	0	0
Total	**23**							

* No data, ** Not Applicable

Table 7.13: Monthly new TFP admissions, from OTP and SC sites and therapeutic supplies in Dawe Kachen district, Bale zone from June to October 2013.

Month/2013	Total new SAM cases	Total number sites		Total number of OTP/SC reported		Therapeutic supplies		
		OTP	SC	OTP	SC	RUTF	F100	F75
June	ND*	15	2	ND	ND	ND	ND	ND
July	14	15	2	29	8	35 carton	1 carton	1 carton
August	22	15	2	28	8	5 carton	10 sachet	10 sachet
September	11	15	2	30	8	46 sachet	1 sachet	1sachet
October	10	15	2	37	8	13 carton	5 sachet	7 sachet
Total	**47**							

* ND= No Data available

Regards to preparedness on the therapeutic food supplies, 3/6(50%) visited districts had relatively adequate therapeutic food supplies in their stock at the district level.

7.5 Summary of health risks and population at risk in Arsi and Bale zones

Table 7.14: Number of Woredas and type of health and health related risks in Arsi zone, Oromia, 2013

S.No	Type of Health Risk	Woreda At Risk	Number of Population At Risk
1	Malnutrition	Dodota	79,910
2	Malnutrition	Guna	92,574
3	Malnutrition	Amigna	88,939
4	Measles	Gololcha	207,499
5	Measles	Honkolo Wabe	71,334
6	Measles	Lemu Bilbilo	196,697
7	Malaria	Ziway Dugda	127,238
		Total	**864,191**

Table 7.15: Number of Woredas and type of health and health related risks in Bale zone, Oromia, 2013

Type of Health Risk	Woreda at Risk	At risk Population (6month to 5 years)
Malnutrition/Measles	Agarfa	18,678
Malnutrition/Measles	Berbere	16,463
Malnutrition/Measles	Dello Mena	16,389
Malnutrition/Measles	Ginnir	22,174
Malnutrition/Measles	Gololcha	18,300
Malnutrition/Measles	Goro	15,162
Malnutrition/Measles	Harena Bulk	14,798
Malnutrition/Measles	Lege Hida	11,317
Malnutrition/Measles	Sewena	11,953
	Total	**145,234**

7.6 Conclusion

During the pre-harvest assessment period in visited districts there was no any outbreak which occurs either three month prior to the assessment however, in Bale zone Gololcha district there was a suspected measles outbreak in October 2013. Diarrheal disease was one of the top five leading cause of morbidity in visited districts. There was a problem in recording data in both zones. In related to nutrition both Zones were manifested adverse weather conditions (shortage and excess of rain) and which prone the visited woreda population to food insecurity. The Public health emergency preparedness and response program was established, but it did not execute on regular basis. In both zones around 1,009,425 population were prone to different health risks.

7.7 Recommendations

- The public health surveillance should be strengthen at visited district level especially in Dawe kachen woreda.
- Reported data should be kept in proper manner especially in Dawe Serer and Dawe Kechan woredas.
- Public health emergency preparedness and response program should be well coordinated at zonal and district level. Budget should be allocated for emergency response.
- Diarrheal diseases (including AWD/cholera), malaria, measles and malnutrition were the most epidemic prone diseases in Arsi and Bale zones. Prevention and control activities should be given emphasis on these priority diseases.
- Public health risk factors which prone to occurrence of epidemic diseases should be minimized by enhancing prevention and control activities.
- Management of SAM cases is supposed to be addressed in routine nutrition program. However, ensuring availability of SAM management drugs and supplies (Mainly Plumpy Nut, F75, F100 and associated routine drugs) for SAM cases in the coming 6 months is recommended.

Annex 7-1: 'meher' 2013 Assessment- tool

Health Sector. Region/Zone

Interviewer name_____		Institution:_____	
Interview Date: (dd) ____/(mm)_____/2013		Region:_____Zone:_____	
Main contact at this location:	Name:_____	Position:_____	Tel:_____
COORDINATION			
Is there a functional multisectoral coordination forum for the health sector?		Yes□	No□
Are all relevant government, NGOs and UN agencies represented?		Yes□	No□
Frequency of regular meeting? (Weekly, Every 2 weeks, monthly…..)_____			
Outbreak?			
Was there any outbreak in the last 3 months?		Yes□	No□
If yes, specify the name of disease outbreak			
Disease outbreak _____# of cases : _____Deaths _____(time period)_____			
Disease outbreak _____# of cases : _____Deaths _____(time period)_____			
Disease outbreak _____# of cases : _____Deaths _____(time period)_____			
Mention anticipated epidemics_____,_____,_____			
If yes please indicate Zone/Woreda at risk and risk population per anticipated risk: *(Use the back side)*			
Public Health emergency Management			
Is there a Public Health Emergency Preparedness and Response plan?		Yes□	No□
If yes, is the plan budgeted/ funded?		Yes□	No□
Is there a trained staff on PHEM (Regional/Zonal/Woreda/HFs)		Yes□	No□
If yes specify number of trained personnel per level: **Region:** Female _____Male_____**Zone:** Female_____Male_____**Woreda**:			

Female_____Male_____					
Is there a Regional trained Rapid Response team (RRT)? Yes□ No□					
Are there trained staff on Minimum Initial Service Package for RH Yes□ No□					
If yes specify number of trained personnel per level: **Region:** Female _____Male_____**Zone:** Female_____Male_____**Woreda**: Female_____Male_____					
	Drugs and medical supplies		Total requirement	Available	Gap
	Meningitis vaccine				
	Drugs:	Coartem			
		Artesunate (rectal)			
		Artesunate (Inj)			
		Artemether IM			
		Quinine (PO)			
		Quinine (IV)			
		Chloroquine			
		Ceftriaxione			
		Oily CAF			
		Doxcycline			
		Ringer lactate			
		ORS			
		Vit A.			
	Lab supplies	RDT (Malaria)			
		Pastorex (Meningitis)			
		LP set			
		TI bottle			
	CTC Kit (AWD)				
	Medical Supplies	Gloves,			
		Syringe			
		PPE			

Summary: Requirements/Needs/ 2014

Region	Zone	Woreda at Risk	Type of Risk	At risk Population

Comments:_____

_____

'meher' Assessment- Health Sector: Woreda level Questionnaire 2013

Serial No.

Interviewer name _____ Interview Date: (dd) ____/(mm)____/2013

Region:_____ Zone:_____Woreda_____

Main contact at this location: Name:_____ Position:_____ Tel:_____

SECTION I: SOCIO- DEMOGRAPHIC PROFILE				
Woreda total population:	M:_____F:_____	Under 5_____	Total:____	
	No. of women of reproductive age (age 15-49 yrs.):_____			
	No. of pregnant women :_____			
	No. of lactating women:_____			
	Total no. of PLW :_____			
Special Population *(if any):*	Pastorals____	Refugees____	IDPs____	Migrant Workers___

SECTION II: HEALTH PROFILE	
2.1. Coordination	
Is there a functional multi sectoral PHEM coordination forum?	Yes□ No□
Is there a PHE preparedness and response plan?	Yes□ No□
Is there accessible emergency response fund	Yes□ No□
Is there fund allocated for Preparedness activities	Yes□ No□

2.2. Morbidity (List top 5 causes of Morbidity) in the year 2005 EC (Meskerem to Megabit) (2012-2013 GC)

Morbidity below 5 years	Morbidity above 5 years
1.	1.
2.	2.
3.	3.
4.	4.
5.	5.

2.3. List number of cases/deaths from Sene 2005 to Tikimit 2006 (June–October 2013)

Month	AWD		Malaria		Measles		Meningitis		Other(specify)	
	Cases	Deaths	Cases	Deaths	Cases	Deaths	Cases	Deaths	Cases	Deaths
June 2013										
July 2013										
August 2013										
September 2013										
October 2013										

NB: Number of cases and deaths of the specific disease could be total case reported by the routine surveillance system during the period and not necessarily outbreak report

2.4. Outbreak?

Was there any outbreak in the last 3 months? (August- October)	Yes□ No□
If yes, specify the disease: Disease outbreak _____# of cases : _____ ___Deaths _____(time period DD/MM/YY))_____	
Disease outbreak _____# of cases : _____Deaths _____(time period DD/MM/YY)_____	
Is there any ongoing outbreak of any disease?	**Yes□ No□**
Disease outbreak _____# of cases : _____Deaths _____(Start date)_____	
Disease outbreak _____# of cases : _____Deaths _____(Start date)_____	
Disease outbreak _____# of cases : _____Deaths _____(Start date)_____	

2.5. Preparedness: Is there emergency drugs and supplies enough for 1 month? Or easily accessible on need? *(NB: Use the stock matrix to calculate this)*

Ringer Lactate (to treat AWD cases)	Yes□ No□
ORS (to treat AWD cases):	Yes□ No□
Doxycycline *(to treat AWD cases)*:	Yes□ No□
Consumables : Syringes, Gloves *(for AWD management):*	Yes□ No□
Amoxil susp (measles)	Yes□ No□
Tetracycline ointment (measles)	Yes□ No□
Vit A (measles)	Yes□ No□

Coartem for Malaria		Yes□ No□
Artesunate (rectal) for Malaria		Yes□ No□
Artesunate (Injection) for Malaria		Yes□ No□
Artemether IM for Malaria		Yes□ No□
Quinine (PO) for Malaria		Yes□ No□
Quinine (IV) for Malaria		Yes□ No□
Chloroquine for Malaria		Yes□ No□
Ceftriaxione (Meningitis)		Yes□ No□
Lab supply: RDT for Malaria		Yes□ No□
Lab supply: RDT (pastorex) for M eningitis LP set		Yes□ No□ Yes□ No□
Number of CTC kit available: (for AWD)		Yes□ No□
SECTION III: RISK FACTORS		
Diseases	**Risk factors for epidemics to occur**	
Malaria	Malaria endemic area	Yes□ No□
	Presence of malaria breeding site	Yes□ No□
	Interrupted or potentially interrupting rivers	Yes□ No□
	Unprotected irrigation in the area	Yes□ No□
	LLINs coverage <80%	Yes□ No□
	Indicate the coverage of IRS 2005_____	
	Depleted prevention and control activities	Yes□ No□
	Malaria Guideline (new)distributed to all Health facilities	Yes□ No□
	Health workers trained on the new Malaria guideline	Yes□ No□
	Number of malarious kebeles and total population in these Kebeles	Keb _____ Pop(F)_____(M)_____
Meningitis	Was there Meningitis epidemic in the last 3 years (If yes specify year)_____	
	Has vaccination been conducted in the past 3 years	Yes□ No□
	If yes : Indicate the date and number of people vaccinated	Date____ No_____
	Is there Meningitis outbreak control Guideline	Yes□ No□
	Are health workers trained on Meningitis outbreak management	Yes□ No□
AWD	Was there AWD epidemic in the last three years (If yes specify date)_____	Yes□ No□
	Latrine coverage	
	Latrine utilization	
	Safe water coverage	
	Is Cholera outbreak control Guideline distributed to all HFs	Yes□ No□

Measles	Is there ongoing measles outbreak	Yes□ No□
	What is the measles vaccination coverage of 2004, less than one year (Hamle 2003-Sene 2004)	
	Is Measles Guideline distributed to all Health facilities?	Yes□ No□
	Are health workers trained on Measles	Yes□ No□
	Has SIA been conducted in 2004 EFY	Yes□ No□
	If yes, Indicate the month and number of children vaccinated including the age group	Month_____
		No. Vaccinated_____
		Age group_____

Any other observations you made or any risks of epidemics?

_____

What were the major challenges in your Epidemic response experience?

_____

Section IV: Nutrition - TFP admissions at woreda level June to October 2013

Month	Total new SAM Cases	Total No of TFP (OTP/SC) in the woreda	No of SC.	Number of OTP.	Total Number of OTP/SC reported.	Therapeutic Supplies Y/N			Children Discharged from TFP referred to SFP Y/N
						RUTF	F100	F75	
June 2013									
July 2013									
August 2013									
September 2013									
October 2013									

Therapeutic Supplies enough for the next 1 month: YES_____; NO_____

Any comment

_____

_____

Chapter VIII - Protocol/Proposal for Epidemiologic research project

8. Assessment of ownership and utilization of insecticide treated nets at house hold level in malaria endemic kebeles, Lume Woreda, East Shewa zone, Oromia.

Executive summary

Background: Malaria has been a major cause of morbidity and mortality in Ethiopia in general and Oromia Regional State in particular. ITNs utilization has shown a reduction in the incidence of malaria, however, ownership and coverage of ITNs was not well studied in the region.

Purpose: The main purpose of the study will be to assess the magnitude of ownership and factors associated with utilization of insecticide treated nets (ITNs) in Lume woreda, East Shewa zone, Oromia

Methods: A community based cross sectional design will be conducted by using interviewer administer questionnaire to assess the magnitude of ownership and factors associated with utilization of insecticide treated nets (ITNs). Direct observation will be used to assess the actual utilization of ITNs. The sample size of the study will be determine by using Epi info stat calc. function with assumptions of single population Proportion sampling method and taking 55 % proportion of ITNs utilization in Oromia (Ethiopia MIS, 2011) with marginal error of 4.5% and confidence interval of 95%. Assuming 10% none response rate and by using the design effect 2, total sample size required will be 1032 households. The study units will be selected by systematic sampling method. The data will be entered in Epi Info version 7.1.0.9 and analyse by using SPSS version 16. Statistical significance of the variables will be evaluated by logistics regression analytical tests by using Odds ratio (OR), p-value of 0.05 and confidence interval 95%.

Work plan: The project work proposal will be completed in April 2014. Data collection will be started in September 2014 and dissemination of the study result will be finalized in October 2014.

Budget: The total estimated budget for this project will be **57,812.25** ETH Birr. It includes transportation, Personal perdiem, stationaries and training lodge.

8.1 Introduction

8.1.1 Back Ground

Malaria is caused by infection of red blood cells with protozoan parasites of the genus Plasmodium. The parasites are inoculated into the human host by a feeding female anopheles mosquito. The four Plasmodium species that infect humans are P. falciparum, P. vivax, P. ovale and P. malariae. The first symptoms of malaria are nonspecific and similar to the symptoms of a minor systemic viral illness. They comprise: headache, lassitude, fatigue, abdominal discomfort, and muscle and joint aches, usually followed by fever, chills, perspiration, anorexia, vomiting and worsening malaise(1)

Global incidence of malaria is estimated to be 250 million clinical cases annually leading to approximately 1 million deaths mostly of children under 5 years of age. Plasmodium falciparum causes most of the deaths in sub-Saharan Africa(2, 3)

Malaria is a preventable and treatable mosquito-borne disease, whose main victims are children under five years of age in Africa. The World Malaria Report 2012 summarizes data received from 104 malaria-endemic countries and territories for 2011. Ninety-nine of these countries had on-going malaria transmission. According to the latest WHO estimates, there were about 219 million cases of malaria in 2010 and an estimated 660 000 deaths. Africa is the most affected continent: about 90% of all malaria deaths occur there(4).

Malaria has been a major challenge to both public health and socio-economic development particularly in countries sub-Saharan African. The nature of the topography, variations in climatic conditions and concentration of populations in highland, malaria free areas indicates the long history of malaria in Oromia and the country a whole. Recognizing the disease as a priority health problem, organized intervention efforts were initiated during the late 1950s. Since then, strong malaria prevention and control activities have been carried out, and significant achievements were made through malaria control(5).

Malaria has been a major cause of both morbidity and mortality in Oromia Regional State, and primarily occurs in epidemic forms from the months of September to December, peaking in October and November. Rainfall, temperature and humidity play a significant role in the transmission of malaria, and temperature is the most important factor in the highlands while rainfall and humidity determine its transmission in midland and lowland areas of the Region(5)

Ethiopia is among the few countries with unstable malaria transmission. Consequently, malaria epidemics are serious public health emergencies. In most situations, malaria epidemics develop over several weeks, allowing some lead-time to act proactively to avoid larger numbers of illnesses and to prevent transmission. Approximately 52 million people (68%) live malaria-endemic areas in Ethiopia, chiefly at altitudes below 2,000 meters. Malaria is mainly seasonal in the highland fringe areas, and of relatively longer transmission duration in lowland areas, river basins and valleys. Although historically there have been an estimated 10 million clinical malaria cases annually, cases have reduced since 2006(6).

8.1.2 Statement of the problem

Malaria is a parasitic infectious disease caused by protozoan parasites which is transmitted by four mosquito species such as: Anopheles arabinoses, Anopheles pharoensis, Anopheles funestus and Anopheles nili. The protozoan parasite called plasmodium is divided in to four species that are known as plasmodium falciparum, plasmodium vivax, plasmodium ovale and plasmodium malaria which infects human being. Among this species plasmodium falciparum and plasmodium vivax are the most common causes of malarial disease in Ethiopia. Malaria is characterized by recurrent symptoms of chills, fever and generalized body pain. Malaria is a complex and deadly disease that puts approximately 3.3 billion people at risk in 109 countries and territories around the world. As different study paper shows, in 2000, there were between 350 and 500 million cases of malaria and at least one million deaths world-wide, of which most of them occur in African children. In addition, in 2009 Malaria caused some 225 million cases with up to 781 000 deaths in which approximately 85% of cases and 90% of deaths occur in Africa while the remaining cases and deaths occur mainly in the South-East Asia and Eastern Mediterranean Regions with children under five years of age and pregnant women being most severely affected(7).

Coverage with ITNs has increased rapidly in some Countries of sub-Saharan Africa, with household ITN ownership reaching 50%. Global control efforts have resulted in a reduction in the incidence of malaria and malaria specific mortality rates in WHO African Region. According to WHO reports 2011 Ethiopia is one of the WHO African Region which shows reduction by 25%–50% in either confirmed malaria cases or malaria admissions and deaths in recent years. The decreases are associated with intense malaria control interventions in the country(8).

Despite different preventive measures taken, the magnitude of the disease has remained the leading cause of morbidity and mortality in Lume Woreda of East Shewa zone especially with children under five years of age and pregnant women being most severely affected. Locally, there is a serious lack of information and knowledge about current level of ITN coverage by household in the district. Specially, data about ITNs utilization rate and factors affecting utilization and demand of the households were remained unassessed in the study area. In addition, these were identified as a knowledge gap at all levels including, Regional, Zonal, Woreda Health Office and Federal Minster of Health of Ethiopia to be filled by researchers. In line with this particular study will try to elicit the gap that influence factors associated with insecticide treated nets among households in Lume woreda of East Shewa zone.

8.1.3 Literature review

Among the preventive measures, use of Insecticide treated nets (ITNs) remain effective tools for malaria prevention and can significantly reduce severe disease and mortality due to malaria, especially among the two most vulnerable groups/ under-five children and pregnant women(9).

The Ethiopia National Malaria Strategic Plan recognizes use of LLINs as a cornerstone for malaria disease prevention in the country. The key strategy used by the country is a rolling periodic (every three years) free distribution of LLINs to all population groups living in endemic, high and moderate malaria risk areas of Ethiopia. Two LLINs per household was used as an operational guideline until 2011. That policy was then changed and, currently, Ethiopia aims to achieve universal coverage by distributing one LLIN per 1.8 persons through mass, free distribution campaigns at the community level through the HEWs and/or health facilities. Ethiopia has distributed about 52 million LLINs since 2005. Usually, ITNs are distributed by periodic mass campaigns that occur about every three years in rotation using micro planning data. The FMOH generally does not support routine ITN distribution by ANC or EPI clinics(10).

The recent MIS showed significant improvements in LLIN household ownership in malaria risk areas from 3.4% in 2005 (DHS 2005) to 65% in 2007 and 55% in 2011 (MIS 2007, 2011). The proportion of children under five year of age who used an LLIN the previous night living below 2,000 meters increased from 1.6% in 2005 (DHS) to 42% in 2007 and 38% in 2011(10).

Nationally, progress has been observed in terms of net use among children U5 in households that owned nets. The percentage of childrenU5 who had slept under a mosquito net the night preceding the survey was 60.2% in 2007, increasing to 64.5% in2011. Tigray demonstrated the

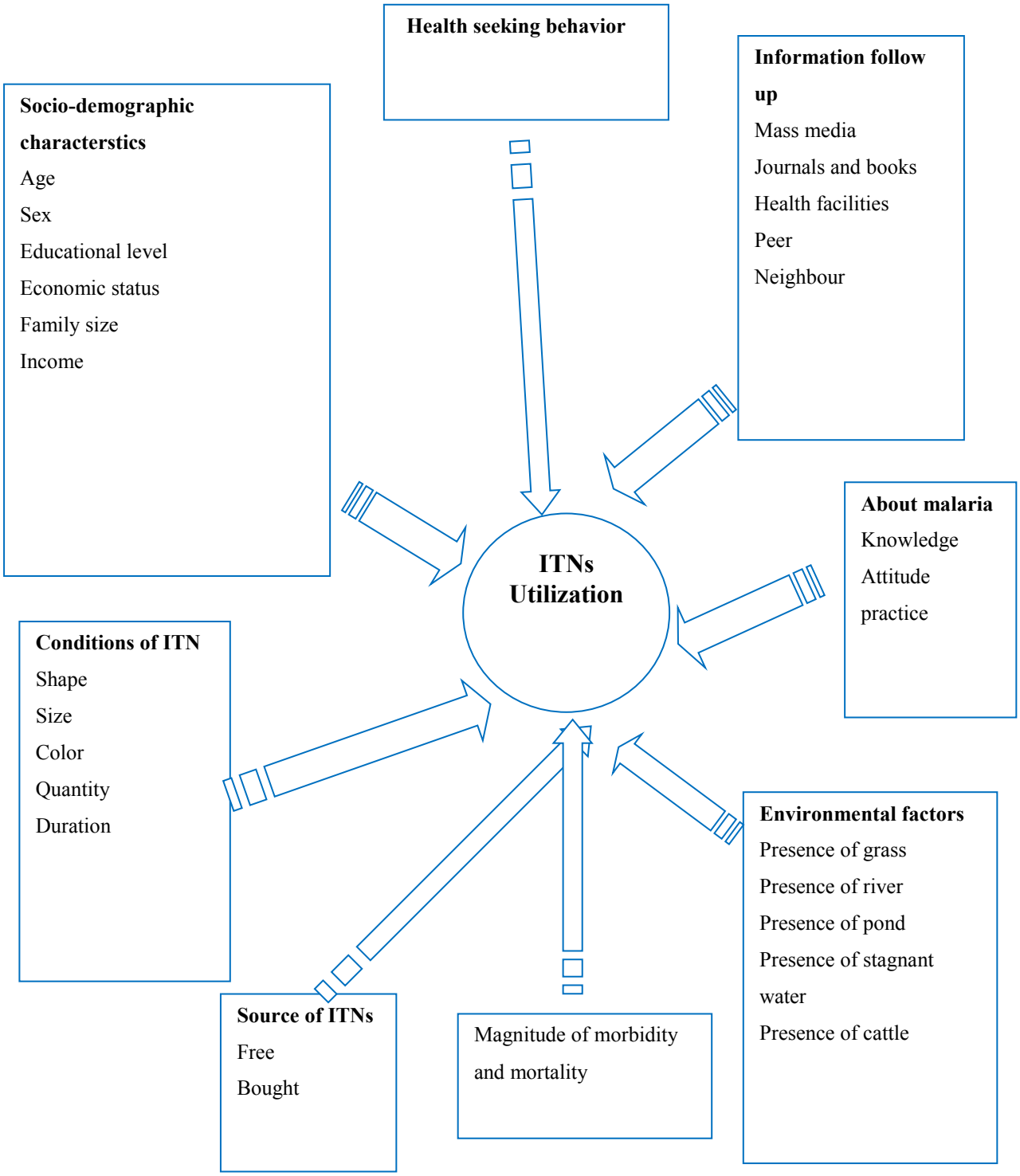
highest increase, with 47.3% in 2007 and 67.7% in 2011. Oromia showed a decrease in net use by children under five year(11).

Study done in Oromia and Amhara region, 63% of study subjects owned more than one ITN. The mean number of ITNs owned by ITN-owning households in Amhara was 1.85 (95% CI 1.78 - 1.91) and in Oromia 1.78 (95% CI 1.72 - 1.83)(12).

8.1.4 Significant of the study

Malaria is an endemic disease in high proportion of the kebeles of the district throughout the Year. Twenty eight (76.7%) of the kebeles in the district are malaria endemic and about 80,304(79.2%) populations are living at risk. In 2012 malaria was one of the top ten leading cause of morbidity in the district. However, in the same year (2012) the district insecticide treated nets (ITNs) coverage had improved up to 100 %. There was a discrepancy between coverage of ITNs and an occurrence of the malaria disease. Though the discrepancy would be improved by identifying factors associated to no utilization of ITNs and creating awareness of the population to use ITNs appropriately.

8.1.5 Conceptual framework



8.2 Objectives

8.2.1 General objective

- To assess the magnitude of ownership and utilization of insecticide treated nets (ITNs) in Lume woreda, East Shewa zone, Oromia.

8.2.2 Specific Objectives

- To assess the magnitude of house hold level ownership of insecticide treated nets
- To determine the utilization of insecticide treated nets in house hold level for those malaria risk groups.
- To identify factors associated with utilization of insecticide treated nets.

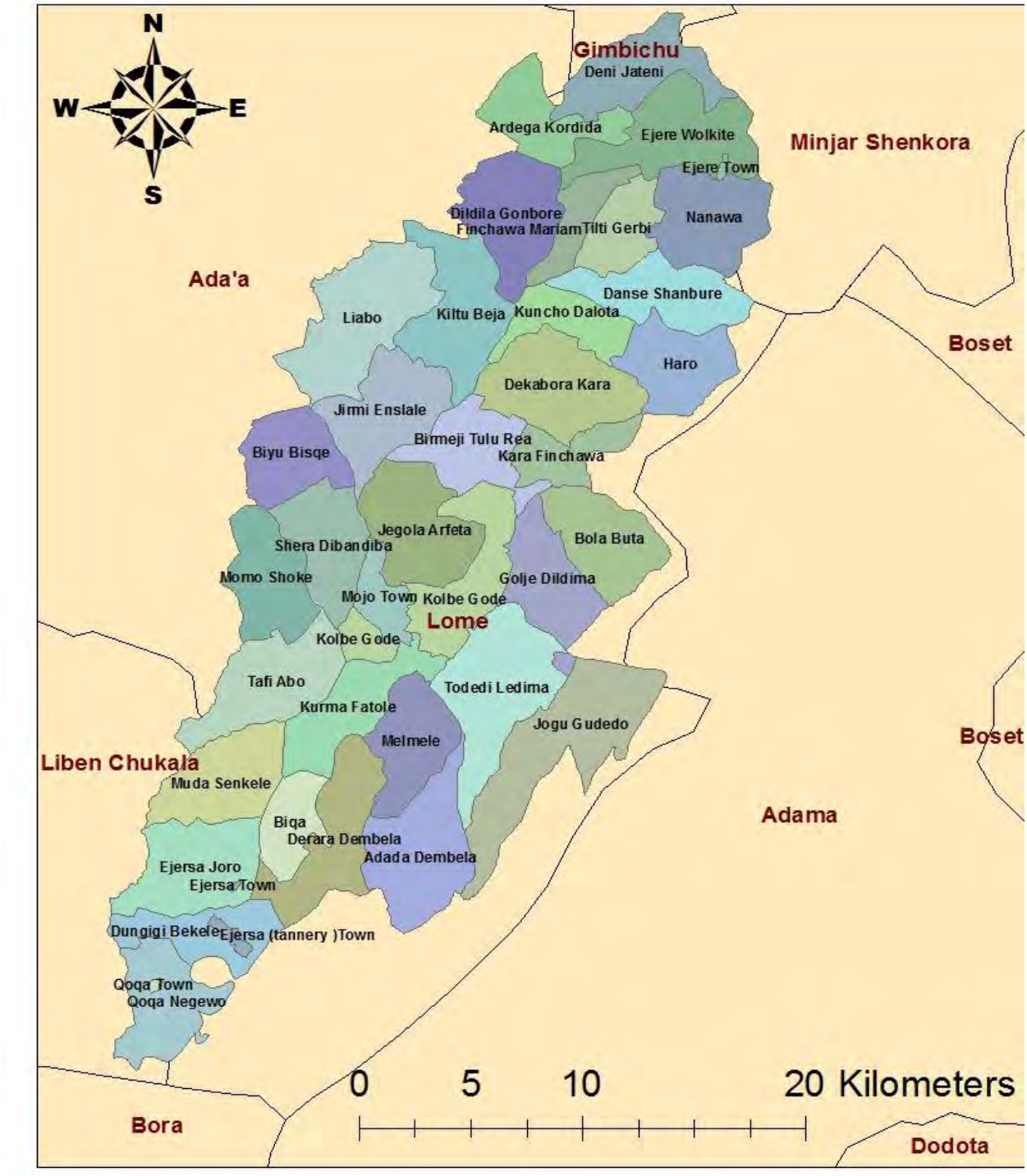


Figure 8.1: Map of Lume district, East Shewa Zone,Oromia.

8.3 Methods and materials

8.3.1 Study design

A community based cross sectional design will be conducted by using interviewer administer questionnaire to study the magnitude of ownership and utilization of insecticide treated nets (ITNs). Direct observation will be used to assess the actual utilization of ITNs.

8.3.2 Study period

Data collection will be started in September 2014 and the final study finding will be submitted in October 2014.

8.3.3 Setting

8.3.3.1 Study area:

Lume district is one of the 11 districts which is found in the East shewa zone, Oromia Region. The district is located 70 Km far from Addis Ababa at east direction. Total area of the district is 720 square km. The range of altitude and average annual rain fall is 1500meter to 2300meter above sea level and 800ml to 1200ml per year, respectively. The average annual temperature is 28^0C. The district has three climatic zone.' kola', 'Weina dega' and 'Dega'. 'Kola' encompasses 25% (9 kebeles), 'Weinadega' encompasses 45 % (16 kebeles) and Dega encompasses 30 %(10 kebeles). Projections from the 2007 population and housing census estimated total population for the year 2006 E.C (2013/14) in the district to be 107,457. Of these, 54,266(50.5%) were males.

8.3.3.2 Source population:

All people living in malaria endemic kebeles of Lume woreda.

8.3.3.3 Study population:

All systematic selected households living in malaria endemic kebeles of Lume woreda.

8.3.4 Sample Size Determination

The sample size of the study will be determine by using Epi info stat calc. function with the following assumptions: By taking the single population Proportion sampling method and taking 55 % proportion of ITNs utilization in Oromia (Ethiopia MIS, 2011) with marginal error of 4.5% and confidence interval of 95%. Assuming 10% none response rate and include in the sample unit=469*10%= 47 then 469+47=516. By using the design effect 2, total sample size required will be, 516*2=1032 households.

8.3.5 Sampling technique

Among the 28 malaria endemic kebeles, we will select eight malaria endemic kebeles by simple random sampling method. Then we will distribute the total sample size to each selected kebeles according to the number of households. Finally, we will select the study households by systemic sampling method based on house hold registry which found at kebele administrative office.

8.3.6 Data quality

Quality of data will be assure by giving a three days training for the data collectors and supervisors towards the objective of the study, the right and benefit of the study participant, how to fill data on hard copy and daily supervision activities . Data collectors will be enrolled from the study woreda and who have diploma and working experience on health data collection and supervisors will be also recruited based on their educational back ground(BSc and above) with supervising experience. We will use semi structured questionnaires which consist of socio economic questions and determinant risk factors associated with utilization of insecticide treated nets (ITNs). The data will be collected thoroughly from systematic selected house hold by interviewing the house hold head. There will be daily supervision for the data collectors in their daily activities from the beginning up to the end of data collection period.

8.3.7 Data collection tool

We will use the National Malaria Indicator Survey semi structured questionnaire and we will be translate the English version in to the local language (Afan oromiffaa) then back to the origin version to maintain its reliability. The questionnaire consists socio-demographic and variables related to ITNs utilization.

8.3.8 Data collection procedure

Initially the data collectors and supervisors will be taking three day training on their specific duties. Then the study team will be deployed to the study sites to collect the data from the selected study units by following the data collection procedures (Express greeting-take verbal consent- collect the data based on the questionnaire - express thanks).

8.3.9 Data analysis

Data will be cleaned and analysed with associated factors by triangulate to utilization of insecticide treated nets (ITNs). The data will be entered by data clerk using Epi Info version 7.1.0.9 and analyse by using SPSS version 16. Statistical significance of the variables will be

evaluated by logistics regression analytical tests by using Odds ratio (OR), p-value of 0.05 and confidence interval 95%.

8.3.10 Ethical Considerations

The study will be conducted following permission which will be obtained from Institution of research board (IRB) and support letter will be requested from the Regional Health Bureau, zonal and woreda health offices accordingly. During data collection period, informed consent will be taken from each study subject. Through the consent the autonomies, privacy and justice about the individual will be addressed.

8.3.11 Inclusion /exclusion criteria

8.3.11.1 Inclusion criteria: All households living in the malaria endemic kebele of Lume woreda will be included in the study.

8.3.11.2 Exclusion criteria- The house hold heads do not volunteer for interview and absent during visiting and revisiting period.

8.3.12 Variables

8.3.12.1 Dependent variables Insecticide treated nets utilization

8.3.12.2 Independent variables

- Age
- Sex
- Setting (Urban, rural)
- Occupation
- Marital status
- Religion
- Educational status
- Income
- Family size
- Composition of the family
- Presence of pregnant woman
- Distance from health facilities
- Prior history of illness due to malaria
- Prior information on ITNs

- cause of malaria
- Source of information on ITNs
- Ownership of ITNs at least one
- Number of ITNs received
- Shape of ITNs
- Colour of ITNs
- Number of ITNs hanged(One, two or more)
- Condition of ITNs (torn out, Have Holes, No holes)
- Age of ITNs(less or greater than Three years)
- Types of house
- Number of rooms in a house (sleeping places)
- Season of malaria transmission
- Presence of stagnant water
- Presence of water source
- Presence of grass and vegetables
- Presence of river in one kilo meter radius
- Number of women development army(WDA) available
- Number of functional women development army

8.3.13 Operational definitions

8.3.13.1 Malaria risk groups: Pregnant woman and under five years children

8.3.13.2 Insecticide treated nets utilization: is defined as having slept under a treated net during the night preceding the data collection date.

8.3.13.3 Presence of river: A river found in one kilo meter radius of the living house

8.3.13.4 Presence of stagnant water: Collected water which is motionless and having an unpleasant smell found around the living house.

8.3.13.5 Types of house: A house different to each other by their upper covering materials either made from grass or tin.

8.3.14 Data dissemination

The study result will be disseminated to Addis Ababa University, School of Public Health, Ethiopia Field Epidemiology Training Program. And also the study result will be submitted to Oromia RHB,East Shewa Zone Health Office and Lume woreda health office . A one day briefing will be prepared at Lume woreda health office in related to the study result.

8.4 Work plan

Schedule for the Assessment of magnitude of ownership and factors associated with utilization of Insecticide treated Nets (ITNs) in malaria endemic kebele of Lume Woreda, East Shewa zone, Oromia.

S.No	Activity	Responsibility	Time schedule												Remark
			April 2014				September 2014				October 2014				
			Wk 1	Wk 2	Wk 3	Wk 4	Wk 1	Wk 2	Wk 3	Wk 4	Wk 1	Wk 2	Wk 3	Wk 4	
1	Proposal writing	PI													
	Ethical clearance	PI													
2	Travel to the Zone ,then woreda	PI													
3	Discussing with Zonal and woreda health office and select data collector	PI													
4	Travel to woredas	PI													
	Training will give to data collectors	PI													
	Data collection	DC													
6	Entering data to the computer	DCL													
7	Data analysis	PI													
8	Finalizing document and sending 1st draft	PI													
9	Revision of 1st draft after comment	PI													
10	Submission of final documents	PI													

PI=Principal Investigator, S=supervisor, DC=Data Collector, DCL= Data Clerk

8.5 Budget

S.No	Budget Category	Item /Personnel	Unit cost (birr)	Multiplying factor	Total cost
1		Transportation fee	150	2*14	4200
	Sub Total			Transport total	4200
2	Perdiem	Principal investigator	400	1*15*400	6,000
		Supervisor	300	2*15*300	9,000
		Data collector	150	10*15*150	22,500
		Data Clerk	150	1*7*150	1,050
	Sub Total			Personnel Total	38,550
3	Supplies	Pen	20	20*5	100
		Pencil	40	40*2	80
		Eraser	20	20*5	100
		Sharpener	15	15*5	75
		Flip chart	3	3*120	360
		Paper	5	5*110	550
		Photo copy	1300	1300*4 page*0.75	3900
		Marker	10	10*12	120
		Printing paper	120	120*2	240
		Printing, copying and binding	170	170*6	1020
	Sub Total			Supplies Total	6,545
4	Training lodging	Refreshment	150	150*16*2	4800
5		Hall rent		1500*2	3000
	Sub Total			Training Total	7800
Grand Total				**57,095birr**	

Amount estimated contingency of supplies and training logging (5%) =Tot. Budget= **57,812.25** Eth.birr

8.6 References

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Annex 8-1 INFORMED CONSENT

Hello. My name is _____ we are conducting a survey about ownership and factors associated to utilization of insecticide treated nets in this woreda. The information we collect will help the government to plan the health services. Your household is selected for the survey. The survey usually takes about 15 to 25 minutes. We do not write your name, all of the answers you give will be confidential and will not be shared with anyone. You have to right to disagree on the survey, but we hope you will agree to answer the questions since your views are important. If I ask you any question you don't want to answer, just let me know and I will go on to the next question or you can stop the interview at any time. Do you have any questions?

May I begin the interview now?

RESPONDENT AGREES TO BE INTERVIEWE_____

RESPONDENT DOES NOT AGREE TO BE INTERVIEWED_____

If agreed continue,

Signature of interviewer: _____ Date: _____

If not agreed, say thanks and go to the next selected house hold.

Annex 8-2. Questionnaires for Assessment of ownership and utilization of insecticide treated nets at house hold level in Lume Woreda, East Shewa zone, Oromia

I Socio-demographic Characteristics

101	Place of resident 1=Urban 2=Rural
102	Woreda; Lume
103	Kebeles _____Got/village_____
104	House number code in CSA_____
105	Sex of the respondent Male=1 Female=2
106	Age of the respondent_____
107	Ethnicity 1= Oromo 2= Amhara 3= Tigre 4= Other
108	Educational level 1= Unable read and write 2= Able to read and write 3= Elementary 4= Secondary 5= Above secondary
109	Occupation 1=Farmer 2=House wife 3=Student 4=Daily labourer 5=Merchant 6=Government 7= Unemployed 99=Other (specify)_____
110	Religion 1=Orthodox 2=Muslim 3= Protestant 4= Catholic

	99= Others, specify_____
111	Marital status of the respondent 1=Single 3=Divorce 2=Married 4= widowed
112	Responsibility of the respondent in the house 1=Husband 3= Wife 2=Child 99= Other
113	How many people live in the house?_____
114	Estimated Monthly income. 1= <150 Birr 2= 151-450 Birr 3= 451-1500 4= 1500 and above
115	Are there pregnant woman in the house? 1= Yes 2= No
116	Are there children less than 5 years of age? 1=Yes 2= No
117	If the response is yes for Q.115and 116 How many pregnant woman/women_____ How many child/children below 5 years ____
118	Does your household have? A radio? 1=yes 2=No A television? 1= Yes 2= No A fixed telephone? 1=yes 2=No A mobile telephone 1= yes 2= No

II. Risk Factors

201	Does your household have any mosquito nets in the last three years? 1= Yes 2= No If 'No' skip to part III
202	If Q201 is Yes, Where did you obtain the net? 1= One 2= Two 3= Three 4= greater than three
203	If Q201 is Yes How many mosquito nets does your household get? 1= One 2= Two 3= Three 4= greater than three

204	Observe how many of the LLITNs were there in the household? 1= One 2= Two 3= Three 4= greater than three
205	If the Observed is less than expected (Q203<Q204) Reasons for unavailability of ITNs? 1=sold 2= used for other purpose 3= give for others 4= stolen
206	If Purchased in Q201, how much did you pay for the net? If Q 205 is Yes, 1=< 50 Birr 2=50- 100 Birr 3= >100 Birr
207	Please observe or ask the general Conditions of the net. 1= Good (no holes) 2= Fair (no holes that fit a torch battery) 3= Poor (1-4 holes) 4=Unsafe (>5 holes that fit a fit a torch battery 5= Unused (still in package 98= unknown
208	How long ago did your household obtain the mosquito net? 1= less than 3 years ago 2= More than three years ago
209	Did anyone sleep under this mosquito net last night (at least one of the available ITNs)? 1=Yes 2= No
210	If Yes in Q209 Who was slept under ITNS? 1= elderly people 2=head of household 5= who obtained / bought the net 3= young children 4= pregnant woman 6= people who contribute the most money 99= I do not know
211	. Frequency of using their ITNs? 1=Always 2=sometimes 3=If Mosquitoes is seen In the house 4=if somebody was sick 5=during transmission season 99=other (specify)
212	If Q209 is No, Why did no-one sleep under this mosquito net last night? 1= no malaria 5=suffocation / too hot 9= Absence of bed 2= No nuisance/Insect 6=difficult hanging net 10=color 3= No space for net 7=shape 98=don't know 4=irritation due to chemical of ITNs 8= Absence from home 99=other (specify)
213	How many separate rooms are in this household? Include all rooms, including kitchen, toilet, sleeping rooms, salon, etc.?_____

214	How many rooms in this household are used for sleeping? Include only rooms which are usually used for sleeping._____
215	How many sleeping rooms were ITNS hanged? _____
216	Is there interrupted river around your village 1= Yes 2= No
217	Is there bushy grass and vegetables including 'inset' around your house? 1= Yes 2. No
218	Is there stagnant water nearby to your house? 1= Yes 2= No

III. Knowledge and Practice question

301	Main transmission mechanism of malaria? 1= eating immature sugarcane 2= Mosquito bite 3=cold or changing weather 4= Drinking dirty water hunger 5= (empty stomach) 99=Other (Specify)
302	Have you ever caught malaria in the past two year? 1=Yes 2=No
303	Did anyone in your family travel away from home in the last one month? 1=Yes 2=No
304	If Yes, Did she/he use ITN while on travel? 1= Yes 2= No
305	How can we prevent malaria infection? 1= DDT spray 3= Drugs (prophylaxis) 5= Not known 99= If other, specify 2= Source reduction 4= ITN s utilization 6= drink alcohol
306	Do you think that sleeping under ITN have benefit. 1=Yes 2= No
307	If yes in Q306 what is the benefit? 1=Don't get bitten by mosquito 3=Don't get malaria 99=Other 2=Don't get bothered by other insects 4=To get warmth
308	Do you believe that sleeping under ITN has problem? 1= Yes 2=No
309	If Q308 is yes Problems associated with sleeping under ITN 1= Difficult to get up at night 4=No enough air when sleeping under 2= It is too hot 5=it Mosquito can still bite through ITN 3= It takes time to tuck a net each night 6=No comfort
310	How does ITNs prevent malaria transmission? 1= Physical barriers 2=Kills mosquito 3= irritate mosquito 4= Not known 5= If other, specify_____
311	Ever heard/seen education messages about ITNs? 1= Yes 2= No
312	If Q311 is Yes Source of information for ITN 1= Mass media 2= Health Extension Workers 3=Kebele leader 4=Neighbourhood 5=Other
313	Did they Wash the ITNS in the last One year? 1= Yes 2=No
314	If Yes, frequency of Washing per year? _____
315	What colour of ITNs do you prefer for use? 1=White 2= Blue 3=whatever colour

316	What shape of ITNs do you prefer for use? 1=conical 2= rectangular 3= whatever shape

CHEKLIST FOR DIRECT OBSERVATION

S.No.	Category	Response
401	Number of beds or places of sleep	1= One 2=Two 3= Three and above
402	Number of bed nets observed in the Household	1=One 2=Two 3= Three and above
403	Number of beds /places of sleep observed with bed nets	1 = One 2= Two 3=Three and above
404	The type of bed net that household owned	1=Re treatable 2=Permanently treated
405	Is the bed net hanged(placed) properly over the bed or sleeping area	1=Yes 0=No 99= Other
406	Is there any hole(throne) in the bed net	1=yes 0=No
407	Did the child found sleeping under the net?	1=yes 0=No
408	Did the pregnant woman slept under the net?	1=yes 0=No

Checked by supervisor

Name of supervisor_____

Signature of supervisor: _____ Date: _____

Chapter IX -Other additional output report

9. Narrative summary of PHEM training, which given to Zone, town and woreda PHEM focal persons at Shashemane, April 2-6/ 2014.

Executive summary

PHEM is the process of anticipating, preventing, preparing for, detecting, responding to, controlling, and recovering from the consequences of public health threats in order that health and economic impacts are minimized. The PHEM core process is used the surveillance system as major tool to accomplish the health service activities in standardize way .especially it emphasized on the selected priority diseases. Therefore Oromia Regional Health Bureau PHEM core process collaborates with WHO prepared training for PHEM focal persons to strengthen the surveillance system through training to build capacity for better health service achievement.

The Regional Health Bureau used different learning and teaching methods to transfer the National PHEM guideline. The methods were lectures, group discussion and demonstration. During the training program, Oromia RHB PHEM experts and Field epidemiology residents (cohort IV found in Oromia field base) were participated as trainer.

About 120 PHEM focal persons were trained at Shashemane training venue. The trainees divided into two rooms (A and B). Our team especially assigned in Room 'A' which had 57 trainees. All trainees had taken pre and post-test to evaluate the gaps and look that expected outcomes were achieved or not. Based on the finding during the pre-test the maximum test result was 96% and the minimum 40% with mean score 72.6%. During the post test the maximum score was 100% and the minimum score was 60% with mean score of 88%. Based on the T test result there were a significant association between post and pre test scores.

In conclusion the expected outcomes were achieved, which was expressed by the post test scores. Based on the post test score all trainees got more than 60%. There was change before and after the training. Finally, the trainees had received recommendation to extent their expected outcomes in the future carrier.

9.1 Introduction

The Federal Ministry of Health and its Agencies identified 7 core processes that will enable the fulfilment of sectoral visions and missions. Public Health Emergency Management (PHEM) is one of the core processes identified. PHEM is the process of anticipating, preventing, preparing for, detecting, responding to, controlling, and recovering from the consequences of public health threats in order that health and economic impacts are minimized.

PHEM is designed to ensure rapid detection of any public health threats, preparedness related to logistic and fund administration, and prompt response to and recovery from various public health emergencies, which range from recurrent epidemics, emerging infections, nutritional emergencies, chemical spills, and bioterrorism. The activities under this core process are to be implemented by appropriately trained and capable professionals. This core process is comprised of four sub-processes which are: Public Health Emergency Preparedness, Early Warning, Response, and Recovery (PHEM guideline 2012).

The PHEM core process is used the surveillance system as major tool to accomplish the health service activities in standardize way .especially it emphasized on the selected priority diseases. Therefore Oromia Regional Health Bureau PHEM core process collaborates with WHO prepared training for PHEM focal persons. Based on this initiation woreda, zone and town PHEM focal persons had been acquired refreshment training courses on PHEM overview, Public Health surveillance, early warning, preparedness and response, sever acute malnutrition (SAM), Oromia region 2013 Meningococcal meningitis over view, Epidemiology, Prevention and Control of Malaria, AFP/polio, Measles, Neonatal Tetanus surveillances, Meningitis surveillance and case management, Epidemiology of AWD, AWD case management, Hygiene and CTC establishment and water treatment. All courses adopted from National PHEM guideline and WHO guidelines.

The PHEM focal persons come from different zones, woredas and towns. A total of 120 trainees were trained on PHEM.

9.2. Objectives

9.2.1. General objectives

- To strengthen the surveillance system through training to build capacity for better health service achievement at zone, woreda and towns level.

9.2.2. Specific objectives

- To enables participants describe the priority diseases based on the national PHEM and WHO guidelines
- To enables participants to acquire knowledge and skill on data analysis and interpretation
- To evaluate the prior surveillance activities after looking the gaps(report completeness, and timeliness)

9.3. Methods

9.3.1 Teaching Methods

- Pre and post-test evaluation
- Lectures with power point
- Group discussion
- Demonstration

9.3.2 Teaching materials

- Lap tops and LCD (liquid-crystal display)
- Flip chart
- Markers
- CD(Compact disc)
- Bucket, Water, Bishan gari

9.4 Findings

A total of 120 PHEM focal personnels were participated on the PHEM training at Shashemane town from April 2-6/2014. Before the training started, the trainees and trainer divided into two separate rooms (Room A and B). Our team was on room ''A''. In room ''A'' total of 57 trainees were participated.

During the training period there was pre and post-test evaluation. The maximum score of pre-test in room A was 96% and the minimum was 40%. The mean, median and mode of the pre-test result were 72.6%, 76% and 76%, respectively. The standard deviation from the mean value was 13.21

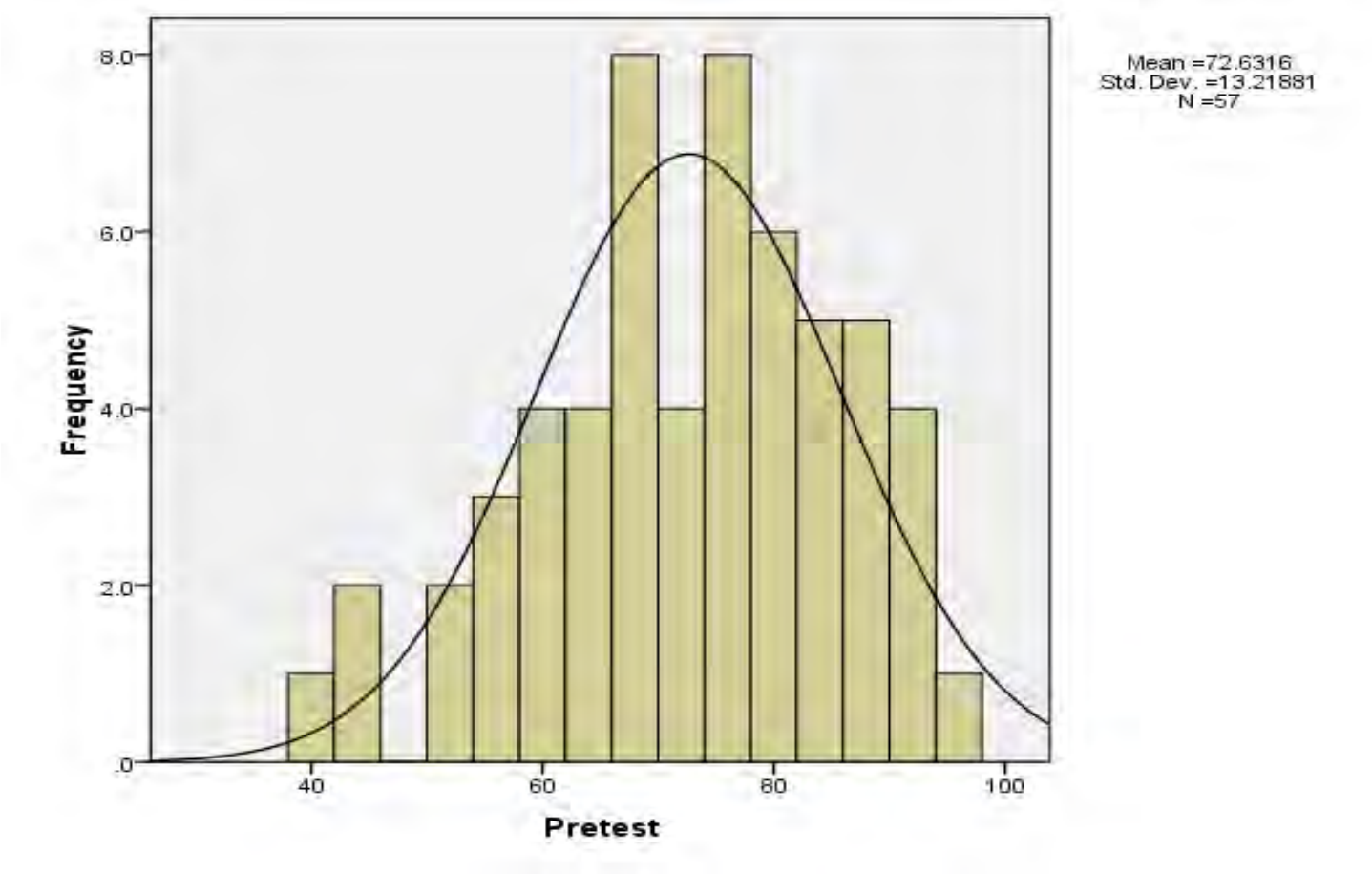

Figure 9.1: Distribution of score during pre test

The post test scores revealed that maximum score was 100% and minimum score was 60%. The mean, median and mode of the post-test result were 86.8%, 88% and 88%, respectively. The standard deviation from the mean value was 9.2

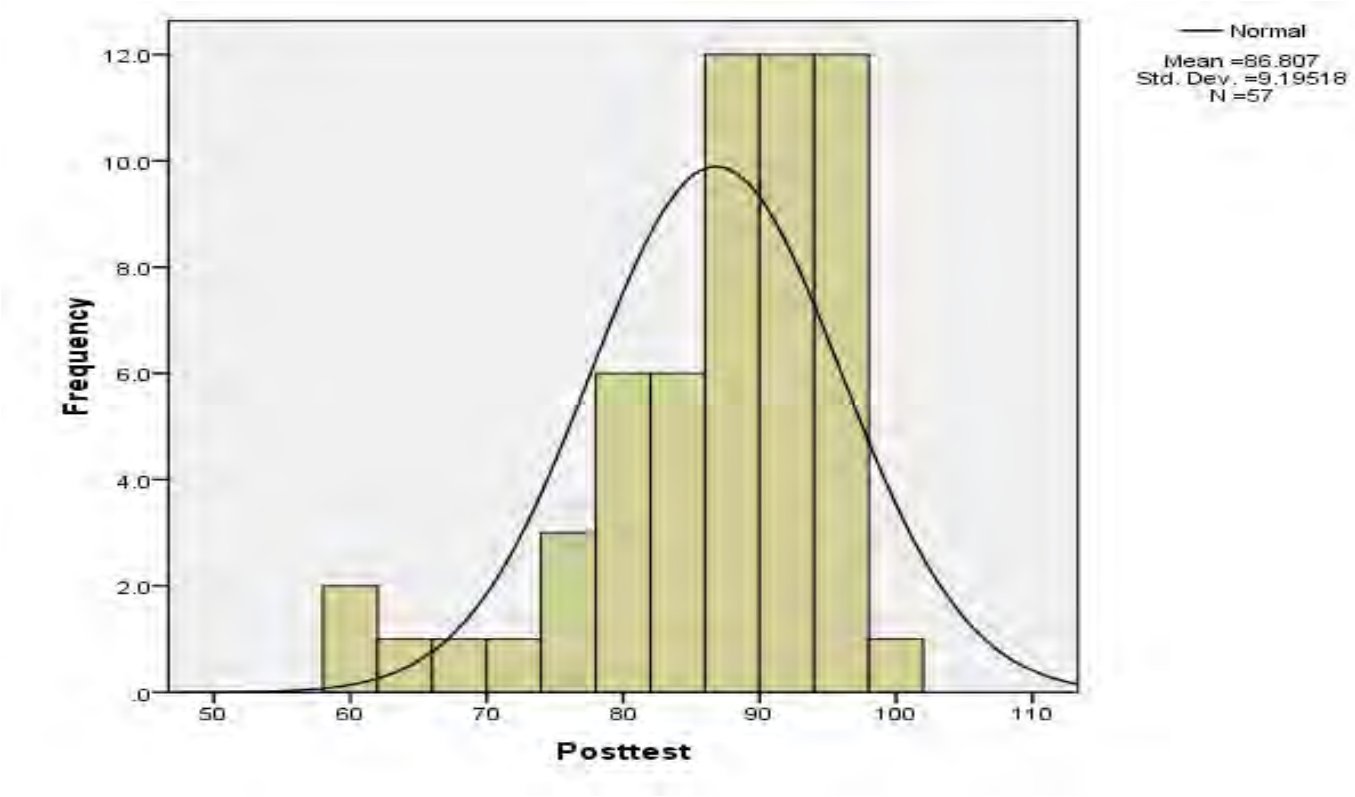

Figure 9.2: Distribution of post test scores

9.5 Discussion

The training was prepared to make a change, to fill gaps and to enhance the capacity of the trainees to strengthen the surveillance system, therefore stand from this expectation we compare the post test scores to pre-test scores. There was a difference. The maximum score during pre-test was 96% and during post-test was100%, it was increased by 4%. Regards to the minimum value at pre and post-test was 40% and 60%, respectively. The post-test minimum score was increased by 20%, this indicates all participants score were fall in 60% and above. There was no under 50% score the test given after the training (post-test).

9.6 Limitations:

The training room was no comfortable for participants. It had not contained arm chair or chair with adequate tables, lack of adequate ventilation and light. Indeed participants had taken soft copies of the training materials; however it was difficult to refer the reading material for those who have not computer.

9.7 Conclusion:

The training was given based on its schedule. There was active participation. All participants obeyed by their defined ground rules. The training was filled a gaps, because there was obvious change in post and pre-test evaluation. Most of the participants had got additional knowledge and relative similar understanding on national PHEM guideline for strengthens the surveillance system.

9.8 Recommendation:

The assigned training facilitator zone should be prepared comfortable rooms. The RHB should be prepared and gave hard copy reference materials to those who have not computer in their site. Future follow up should be mandatory to evaluate the training outcomes in day to day health surveillance activities. The participants should be applied their knowledge in to practice and they should be teach other PHEM focal persons by supportive supervision or any accessible means.

Annex 9-1 Test prepared for pre and post evaluation during PHEM training.

Code: ----------

Test on Selected Epidemic diseases for PHEM focal persons, By PHEM Core process, ORHB, April 2014

Instruction: Choose the best answer from the given options in the space provided.

_____1. Which of the following is true statement regarding standard case definition?
A) A standard case definition is an agreed upon set of criteria used to label an individual as having a disease of interest or not
B) A standard case definition does not help to identify cases of interest
C) A standard case definition facilitates screening of many sick persons in a short period of time D) B and C are true E) A and C are true

_____2. Currently how many diseases/conditions are reported under IDSR in Ethiopia?
A)19 B) 21 C) 22 D) 23

_____3. Which of the following condition is currently added under reportable?
A) Cholera B) Meningitis C) NNT D) Maternal death E) None of the above

_____4. One of the following is an activity in Integrated Disease Surveillance and Response?
A) Detecting and reporting priority diseases B) Evaluation of disease control program C)Provision of feedback D) A and E) All of the above

_____5. Cholera is caused by shigella characterized by sudden onset of profuse painful watery diarrhoea or rice-water like diarrhoea, often accompanied by vomiting and may end up in severe dehydration and death. A) True B) False

_____6. Which of the following AWD case management at CTC is appropriate?
A. Patients those who come to CTC with some dehydration needs to have IV fluids.
B. Patients those who come to CTC with severe dehydration needs to have IV fluids.
C. Patients those who come to CTC with No dehydration need to have Rehydration.
D. Patients those who come to CTC with some dehydration needs to have antibiotics.

_____7. 2% chlorine solution is used for:
A. Disinfection of corpses (dead bodies), waste and Excreta
B. Disinfection of floors, objects, beds, footbath and clothes
C. Disinfection of hands and skin D) None of the above

_____8) which of the following are the recommended measles control strategies?
A)Improved immunization coverage B) measles surveillance
C) Case management including Vit.A supplementation D) Measles SIAs
E) All of the above F) None of the above

_____ 9. What is the temperature range that is ideal for storing measles vaccine in a refrigerator?
A) 0 to 8 degree cet. B) 2 to 8 degree cet.
C) 2 to 10 degree cet. D) It varies from vaccine to vaccine

_____ __10. What is the efficacy of measles vaccine given at the age of 9 months?
A) 85% B) 90% C) 95% D) 100%

_____ 11. Which of the following are recommended for polio eradication strategies?
A) Routine immunization B) Polio SIAs C) AFP surveillance
D) Mopping up activities in the areas of low coverage E) All of the above

_____ 12) If you are working in the OPD which one of the following cases will you suspect as a case of AFP?
A) person who has weakness of one leg due to injection to the buttock
B) Person who has fever, weakness of both legs and swelling over the back due to Tuberculosis
C) Person who claims to fall down suddenly while playing and has weakness of one arm
D) All of the above E) none of the above

_____ 13. Which of the following statements are good qualities of AFP surveillance?
A. Non-polio AFP rate of at least 2/100,000 in children under 15 years of age per annum
B. At least 80% of AFP cases have adequate stool specimen
C. Two stool specimens collected within 14 days of paralysis onset, at least 24 hours apart and received in the lab in good condition
D. Appropriate geographic representation E) All of the above F) None of the above

_____14. Neonatal Tetanus is not an immediately reportable disease in Ethiopia.
A) True B) False

_____ 15. What is the dose of Vitamin A for Measles case management to children of 6 to 11 months of age? A) 50,000 IU B) 100,000 IU C) 200,000 IU D) None

_____ 16. In nutritional screening
A) Nutrition screening should be done for all children 6-59 months, pregnant women and lactating mothers
B) Check for bilateral oedema in children 6-59months.
C) Take the MUAC measurement to children with and without oedema.
D) A and B are correct E) All are correct

_____17. It is true that Malnutrition is caused only due to food insecurity
A) True B) False

_____18. Anthropometric indices is not necessary to identify SAM; it is possible to identify child with Malnutrition by looking at the face/body A) True B) False

_____19. The alert threshold level for meningococcal meningitis for a population of 30,000-100,000 per Week is
A) 5 cases/100,000 population B) 2 cases /100, 000 population
C) 15 cases /100.000 population D) 3 cases /100,000 population E) All

_____20. The three pillar strategies for epidemic meningococcal meningitis control
A) Surveillance B) Early case detection treatment and patient care
C) Vaccination D) All are the answer E) AandB are the answer

_____21. The most common serotypes of meningococcal meningitis in Africa are
A)Serotype A B) Serotype B C) Serotype C D) Serotype W135 E) AandC

_____22. People who are at risk for severe malaria include:
A)Children under the age of five years B) Pregnant women C) People living with HIV
D) All members of the population in areas of unstable malaria transmission E) All

_____23. One is not true about malaria epidemiology in Ethiopia?

A) Adults are not at risk to develop severe malaria B) Transmission is seasonal and unstable C) Major epidemics occurre every 5-8 years D) P. vivax and P.falciparum are the two dominant species E) Transmission coincides with agricultural activity and it affects the economy

_____24. Malaria control prevention and elimination strategy of Ethiopia include:

A) Community empowerment and mobilization

B) Diagnosis and treatment of malaria within one week of onset of symptoms

C) Provision of ITN to only children and pregnant women

D) Indoor residual spraying all over the country

E) Less attention to health system strengthening

_____25. The Gold standard test for the diagnosis of malaria is

A) Giemsa stained blood film (examined by light Microscope)

B) Molecular test

C) Rapid diagnostic test

D) A and B

E) None

Declaration

I, the undersigned, declare that this is my original work and has never been presented by another person in this or any other University and that all the source materials and References used for this thesis have been duly acknowledged.

Name: **Abushet Asnake Shibeshi**

Signature: _____

Place: Oromia Regional Health Bureau/PHEM

Date of Submission: May 16/2014

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

Name of advisor: **Dr. Fikre Enqusilassie**

Signature: _____

Date: _____