Addis Ababa University, College of Health Sciences,
School of Public Health

Ethiopia Field Epidemiology Training Program (EFETP)

Compiled Body of Works in Field Epidemiology

By

Getahun Bahiru

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

May, 2015

Addis Ababa, Ethiopia

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Approved by Examining Board

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Chairman, School Graduate Committee

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Advisor

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Examiner

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List of Abbreviations

AAU-SPH	Addis Ababa University School of Public Health
ACT	Artemisinin-Based Combination Therapy
AFENET	African Field Epidemiology Network
AFI	Acute Febrile Illness
AFP	Acute Flaccid Paralysis
AIDS	Acquired Immune Deficiency Syndrome
ANC	Antenatal Care
ART	Antiretroviral Therapy
aVDPVs	Ambiguous Vaccine Drive Polio Virus
AWD	Acute Watery Diarrhea
BCG	Bacillus Calmette Guerin
CFR	Case Fatality Rate
CHD	Child Health Development
CHW	Community Health Worker
CNS	Central Nerve System
CPR	Contraceptive Prevalence Rate
CSA	Central Statistics Agency
CTC	Cholera Treatment Center
cVDPVs	Circulating Vaccine Drive Polio Virus
CVS	Cardio Vascular System
DPT	Diphtheria, Pertussis, and ,Tetanus
E.C	Ethiopian Calendar
EFETP	Ethiopia Field Epidemiology Training Programme
EFY	Ethiopian Fiscal Year
EOS	Enhanced Outreach Strategy
EPHA	Ethiopian Public Health Association
EPHI	Ethiopian Public Health Institute
EPI	Expanded Program on Immunization

ETB	Ethiopian Birr
FGD	Focal Group Discussion
FMoH	Federal Ministry of Health
GIS	Geographic Information System
GPI	Gender Parity Index
GUS	Genito Urinary System
HC	Health Center
HEENT	Head, Eye, Ear, Nose and Throat
HEWs	Health Extension Workers
HF	Health Facility
HH	House Hold
HIT	Health Information Technology
HIV	Human Immune deficiency Virus
HP	Health Post
IDSR	Integrated Disease Surveillance and Response
IEC	Information, Education, Communication
IHR	International Health Regulations
IRS	Indoor Residual Spray
ITN	Insecticide Treated Net
iVDPVs	Immunodeficiency Vaccine Drive Polio Virus
K.G	Kinder Garten
K.M	Kilo Meter
LLINs	Long Lasting Insectide Nets
LLITN	Long Lasting Insecticide Treated Nets
MCH	Mother and Child Health
MCP	Malaria Control Program
MSS	Musculo Skeletal System
MUAC	Mid-Upper Arm Circumference
NGO	Non Government Organization
NID	National Immunization Day
OPD	Outpatient Department

OPV	Oral Polio Vaccine
OR	Odds Ratio
ORS	Oral Redehydration Solution
OTP	Outpatient Therapeutic Programme
PHEM	Public Health Emergency Management
PLW	Pregnant and Lactating Women
PLWHA	People Living With HIV/AIDS
PMTCT	Preventing Mother To Child Transmission
PNC	Postnatal Care
PPE	Personal Protective Equipment
PPV	Predictive Positive Value
RDT	Rapid Diagnostic Test
REC	Reach Each Child
RHB	Regional Health Bureau
RI	Routine Immunization
SC	Stabilizing Centers
SIA	Supplementary Immunization Activity
SNNPR	South Nation Nationality of People Region
STI	Sexually Transmitted Infection
TB	Tuberculosis
TBA	Traditional Birth Attendant
TEPENET	Training Programs in Epidemiology and Public Health Network
TFP	Therapeutic Feeding Program
TT	Tetanus Toxoid
TTBA	Traditional Trained Birth Attendant
TTC	Tetracycline
UNICEF	United Nation International Children‟s Emergency Fund
VAPP	Vaccine-Associated Paralytic Poliomyelitis
VCT	Voluntary Counseling and Tasting
VDPV	Vaccine Drive Polio Virus
WHO	World Health Organization

WPV	Wild Polio Virus
ZHD	Zonal Health Department

Preface

The Ethiopia Field Epidemiology Training Program (EFETP) is an in-service training program in field epidemiology adapted from the United States Centers for Disease Control and Prevention (CDC) Epidemic Intelligence Service (EIS) program. The Program is designed to assist the Ethiopian Ministry of Health in building or strengthening health systems by recruiting promising health workers and building their competencies through on-the-job mentorship and training. Field epidemiology training resembles a traditional medical residency program, because trainees spend an extended period of time practicing and developing their skills in a "hands on" manner. For this reason program trainees are referred to as "residents".

Ethiopia adopted the Field Epidemiology Training Program to help improve leadership within Public Health Emergency Management. The EFETP provides residents a Master of Public Health Degree in Field Epidemiology after they complete two years of supervised work in applied or field epidemiology.

The goal of the EFETP is to strengthen the Ethiopian Public Health Emergency Management system by: Improving public health event detection and response; creating a robust disease surveillance system; Building capacity in field epidemiology and public Health; Enhancing evidence-based decision making for public health practice; and Reducing morbidity and mortality associated with priority diseases.

EFETP field bases have been established within the PHEM center at EPHI and at five Regional Health Bureaus: Amhara, Oromia, SNNPR, Tigray and Somali. These bases provide opportunities for field experience in epidemiology for the residents. The EFETP program has two main components, each of which contributes to the award of the Master Degree. The Program is predominantly field-based with residents spending 75% of their time in the field. Residents build their competency in the field and frequently travel for supervised investigations and special epidemiologic projects. Each resident has a Field Supervisor, usually the head of the resident"s field placement site and an academic supervisor based at AAU-SPH. The EFETP Resident Advisor(s) and Program Director also provide guidance and support. The field experience provides a balance between training and service. Each resident is expected to have opportunities to participate in field investigations, program evaluations, and analysis of data sets,

surveillance and control activities, scientific report writing, oral presentations, and other public health activities at various levels of the health system.

Residents are expected to prepare and submit this body of work which will be assessed and evaluated by examiners to make sure that resident has acquired the expected level of competencies during his/her residency. Therefore, this body of work summarizes the required field residency‟s outputs accomplished at field base during residency. It has nine chapters. The first eight sections are mandatory outputs during the residency time to full fill the academic requirements; such as Outbreak Investigation, Surveillance Data Analysis Report, Evaluation of the Surveillance System, Health Profile Summary Report, Scientific Manuscript for peer review journals, Abstract submission and presentation in different scientific conferences, Writing Protocol/Proposal of Epidemiologic Research Project and a Summary of Disaster Situation Visited/Risk Assessment and in last section Other Additional works are also included. In order to accomplish all the above outputs of residency and other additional works, different techniques and methods were utilized.

The two year‟s field residency outputs in the program are presented in a summarized way as follows:

The first chapter includes two outbreak investigation, one on Measles Outbreak in Addis Ababa Gulele Sub-City, Kbebe Tsehay Orphanage Camp and another on Polio Outbreak in Nogob Zone Ethiopian Somali Region; five years Surveillance Data Analysis of Human and Animal Anthrax Data in Ethiopia; Surveillance System Evaluation in Gonder Town Amhara Region; Health Profile Description of Fentale Woreda Oromia Region and Disaster Risk Assessment on Prioritized District of Gamu-Gofa and Wolaita Zones and Alaba Special Woreda report are discussed in detailed in chapter two, three, four and seven respectively.

In addition to those, scientific manuscripts for peer reviewed journals are found in chapter five and abstracts which resulted from measles outbreak investigation and surveillance data analysis are included in chapter six. An Epidemiologic research project entitled, An Assessment of Bed Nets Utilization among under Five Children and Pregnant Women in Pastoralist Area Fentale Woreda, East Shewa, Oromia Region, Ethiopia is included in chapter eight. In last chapter, one additional output designated as Basic level field epidemiology training included.

Chapter-I Outbreak/Epidemic Investigations

I. Measles Outbreak in Kbebe-Tsehay Orphanage, Gulele Sub City, Addis Ababa, Ethiopia-2014

Abstract

Background: Measles is one of the most communicable infectious diseases with greater than 90% attack rate on susceptible persons. Although efforts have been made to improve vaccination coverage, there have been encounters of outbreaks here and there in Ethiopia. On September 8, 2014 unknown cause of respiratory disease outbreak was reported from Kbebe-Tsehay Orphanage, Addis Ababa the Capital City of Ethiopia. We investigated to confirm the outbreak, identify risk factors and implement control measures.

Methods: Both descriptive and unmatched case-control study, using two controls was `conducted in Kbebe-Tsehay Orphanage. Patient observation was made at Health-Care Facilities. Suspected Cases were defined as: Children with fever and cough and with or without diarrhea, vomiting, respiratory distress and coryza. Controls were defined as any children living in Kbebe-Tsehay orphanage without sign and symptom of the disease. A suspected case with laboratory confirmation (positive IgM antibody) or epidemiological link to confirmed cases in an epidemic. We reviewed Hospital records where patients were admitted (Girum, Betsega, St.Yared, Yekatit12 Hospitals and Kbebe-Tsehay Orphanage Clinic) and line list was also prepared to gather information about new cases which was maintained until the end of the outbreak. We interviewed cases and controls using a questionnaire through their Guardian and the camp nurses. Five blood samples were collected for laboratory confirmation. We used Epi Info version 7.3.1 and micro- soft excel for data entry and analysis.

Results: Three of five blood samples tested positive for measles IgM antibodies. A total of 22 measles cases with one death were reported starting August 25, 2014 to September 10, 2014. The overall attack rate (AR) and Case Fatality Rate (CFR) were 14.7/100 population and 4.5% respectively. From all cases (22), none developed clinical sign of rash. Among all, the total numbers of measles cases were higher in females 13 (59.1 %) than males 9 (40.9 %). The median age of cases was 7 months and controls 48 month. Only 9 (40.9%) of the cases were vaccinated and 13 (59.1%) were not vaccinated, whereas 9 (20.5%) of the controls had recorded measles

vaccination history and 35 (79.5%) had no vaccination cards. From the study groups 22 (100%) cases and 9 (20.5%) controls had contact history to a suspected case. Sharing a bed with two or more children (OR: 8.11; 95% CI: 2.5 – 26.6) and the new children admitted to the dorms (OR: 13.2; 95% CI: 3.8 – 45.6) were found to be significantly associated with the disease.

Conclusion: A measles outbreak without rash was confirmed with one death (CFR 4.5%). Sharing a bed with more than one child and being a new child in the orphanage were noted to be significant risk factors for developing the disease. Therefore, using a separate bed and knowing the vaccination status of new children admitted into the orphanage are recommended as mechanisms to limit transmission of measles epidemic.

Key Words: Measles: Outbreak: Case Control: Kbebe-Tsehay Orphanage.

1. Introduction

Measles is one of the most contagious diseases known to mankind[1]. The name measles is derived from the latin, misellus, meaning miserable[2]. It is an RNA virus with only one serotype, classified as a member of the genus Morbillivirus of the family Paramyxoviridae. There are numerous distinct genotypes[3]. Humans are the only natural hosts of measles virus[4]. Transmission is person-to-person, airborne, by direct contact with nasal or throat secretions of an infected person, and less commonly, indirectly by articles freshly soiled with nose and throat secretions[4]. Measles is one of the most communicable infectious diseases with a greater than 90% attack rate on susceptible persons[5]. The incubation period is approximately 7– 18 days, usually 10 days from exposure to fever, and 14 days until the rash appears, rarely as long as 19 – 21 days[4].

All persons who have not had measles disease or have not been successfully immunized are susceptible[5]. Measles infection appears to confer lifelong immunity[6]. Infants whose mothers have had measles are protected against the disease for approximately 6 – 9 months or more depending on the amount of residual maternal antibody at the time of pregnancy[5]. Children born to mothers with vaccine-induced immunity receive fewer antibodies and may be susceptible at an earlier age[5]. Immunization at 12 – 15 months induces immunity in 95% or more of vaccine recipients. The second dose increases immunity levels to almost 100 %[7].

Generally, persons born prior to 1970 can be assumed to have acquired natural immunity to measles[7]. Individuals born in or after 1970 are considered susceptible unless there is serological proof of immunity or documented history of 2 doses of measles-containing vaccine as recommended in the Alberta Immunization Policy (AIP)[7].

Disease in an immunocompromised individual can be severe and have a prolonged course. It may occur without the typical rash[8]. Complications are more common among children under five years of age and individuals 20 years of age and older[5]. The most common causes of death are pneumonia in children and acute encephalitis in adults[5]. It often occurs in explosive epidemics characterized by high fever of 38oC or more; plus the appearance of maculopapular rash of about 3 days or more; with one or a combination of coryza, cough, conjunctivitis and

Koplik spots in the oral mucosa of measles‟ victims[9]. Measles produces significant illness, death, and disability[10]. In 1980, before widespread vaccination, measles caused an estimated 2.6 million deaths each year. It remains one of the leading causes of death among young children globally, despite the availability of a safe and effective vaccine[5].

In spite of the progress achieved over the past few decades in eliminating and controlling the disease from many parts of the world through immunization, regions of high measles transmission still exist. Global migration and international travel to and from such regions pose a constant threat of re-introduction of virus transmission in regions that have eliminated measles[5].

Measles has continued to cause large outbreaks all over the world even in countries that have achieved high vaccination coverage with a single dose strategy[11]. Estimated global coverage with a first dose of vaccine increased from 72% in 2000 to 84% in 2011[12]. The number of countries providing the second dose through routine services increased from 97 in 2000 to 141 in 2011. An estimated 20 million children worldwide did not receive the first dose of vaccine in 2011[13]. More than half of those children lived 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). In 2011, large measles outbreaks were reported in all those countries and several others: in DRC (134,042 cases), Ethiopia (3,255 cases) India (29,339 cases), Nigeria (18,843 cases), Pakistan (4,386 cases) France (14,949 cases), Italy (5,189 cases), and Spain (3,802 cases). Most of these countries are in WHO regions which have committed to eliminate measles by 2015 or 2020[13].

Measles infection prevention and control intervention have been undertaking strongly in Ethiopia. The national measles vaccination coverage in 2006 E.C was 86.5 % as reported from the Federal Ministry of Health[14]. Improving routine vaccination coverage, providing a second opportunity for measles vaccination through supplementary immunization activities (SIAs), improving measles-case management, and establishing case-based measles surveillance are among the core activities implementing regarding prevention and control of measles in the country.

In 2012 and 2013, Addis Ababa Administrative City reported sporadic measles cases from different sub-cities. As part of it Kbebe -Tsehay Orphanage found in Gulele Sub-City of Addis Ababa reported the cases starting August 25, 2014. The cases increased and spread in the camp. The camp Health Department put in place prevention and control measures by itself; but they could not control the cases and they referred the cases to several different Hospitals found in the city for better treatment. Based on the information and request, the Ethiopian Public Health Institute organized a team with the objective of identifying the cause and determining the magnitude of the outbreak and finally to recommend prevention and control measures.

2. Methods and Materials:

2.1 Case definition:

- **Suspected Case:** Children found in Kbebe -Tsehay Orphanage Camp from August 25, 2014 with fever and cough and with or without diarrhea, vomiting respiratory distress and coryza.
- **Confirmed Case:** Any child found in Kbebe -Tsehay Orphanage Camp from August 25, 2014 presenting with above features with laboratory confirmation of presence of measles IgM or epidemiologically linked to confirmed cases in an outbreak.
- **Controls:** Any child found in Kbebe -Tsehay Orphanage without sign and symptom of the disease

2.2 Investigation Area:

Addis Ababa is the capital city of Ethiopia, geographically located at 9:03N degree 38.74E degrees and divided into ten sub cities. Kbebe -Tsehay Orphanage is found in one of the Sub-Cities known as Gulele. The Orphanage has a maximum capacity of holding 150 children, coming from different regions of the country and we took those 150 children as dominators.

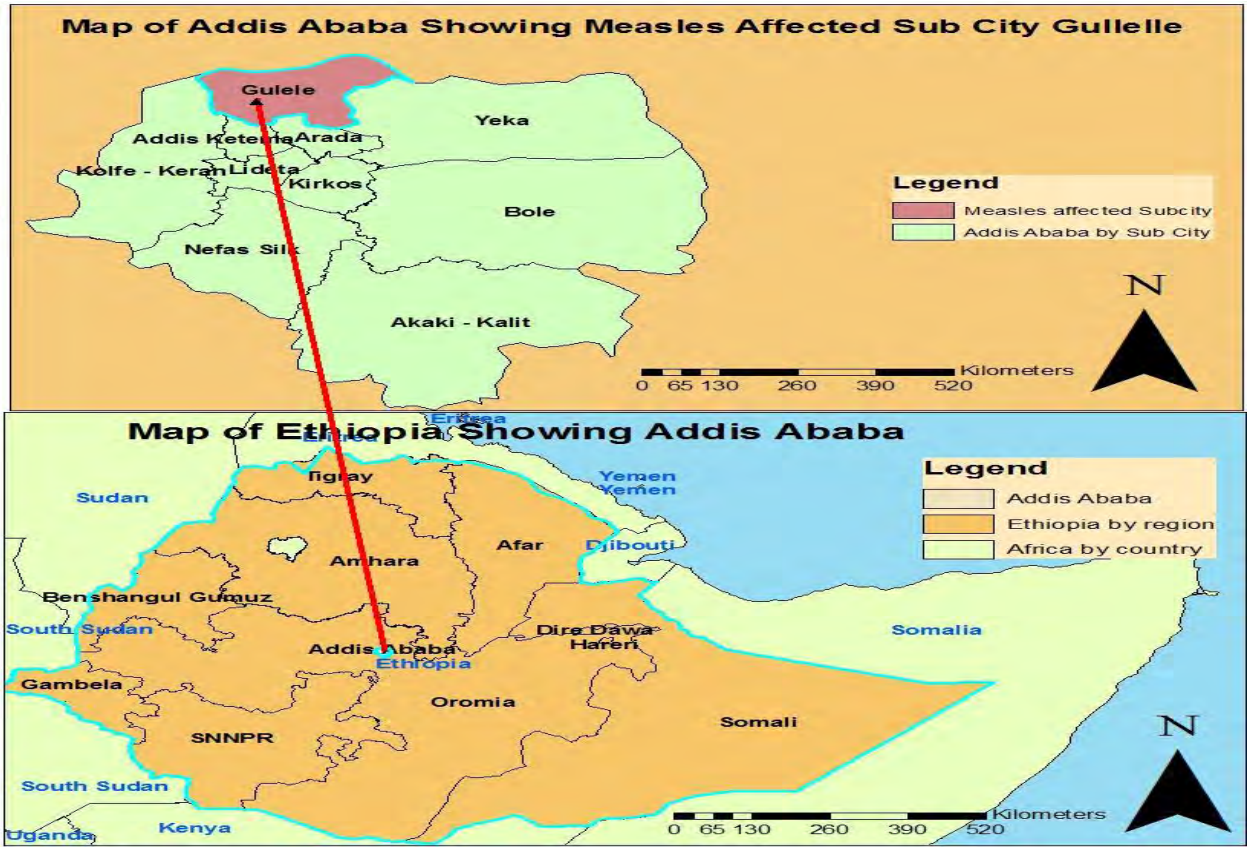

Figure 1: Map of Addis Ababa City Administration and Ethiopia, 2014

2.3 Data collection:

Surveillance reports were assessed and reviewed. Regular contact was maintained throughout the outbreak period in the Kbebe -Tsehay Orphanage, and additional cases were verified by daily communication with the head nurse in the camp using telephone.

For each case who fulfilled the case definition investigators interviewed, the cases through their care givers/nurses using a structured questionnaire developed for the investigation; We reviewed Hospital records where patients were admitted (Girum, Betsega, St.Yarid, Yekatit12 Hospitals and Kbebe-Tsehay Orphanage clinic) and line list was also prepared to gather information about new cases and was maintained until the end of the outbreak.

Individuals were considered to be vaccinated only if vaccination was documented in their log files. Children, who had no record of vaccination on logbooks, were considered to be unvaccinated or unknown.

2.4 Study design:

A case-control study together with descriptive study was implemented to investigate the outbreak. Unmatched case-control study design in the ratio of 1:2 (22 cases and 44 controls) was carried out for the determination of the risk factors. Data from questionnaires were entered and analyzed into a computerized data base using Epi Info version 7.3.1 and micro- soft excel. During the analyses, P-value and /or 95% confidence interval (CI) for OR (odds ratio) were used in judging the significance of the associations. P-value less than 0.05 were taken as significant association.

2.5 Data quality assurance:

Two people (the investigator and one field Epidemiologist) collected the data. There were detailed discussions on the question and the collected data were checked on daily basis during the investigation. Data cleaning were done using Epi Info version 7.3.1, by the principal investigator.

2.6 Laboratory investigation:

During the outbreak investigation, five throat swab samples were collected and send to the National Influenza Laboratory to assess influenza and corona virus. Blood samples were collected and CBC was done and also five serum samples were sent to the National Measles and Polio Laboratory for confirmation of measles. In addition, chest X-Ray was taken at hospital level for those admitted cases. Other cases were epidemiologically linked with laboratory confirmed cases.

2.7 Environmental Investigation:

Generally, the orphanage environmental condition, including housing condition, sleeping rooms, housing ventilation, the availability of toilets and hygienic condition of the cases and controls was observed.

2.8 Ethical issue:

Verbal consent was obtained from all respondents before starting interview and all agreed to participate.

3. Result:

3.1 Descriptive results

A total of 22 cases with median age of 7 month were registered from August 25, 2014 to September 10, 2014 in Kbebe-Tsehay Orphanage, Gulele Sub City Addis-Ababa Ethiopia. Of which three of the cases were confirmed by laboratory and the rest 19 cases were epidemiological linked. The overall attack rate was 14.7/100 population with one death (CFR 4.5 %). Among the total number of measles cases, 13 (59.1 %)) and 9 (40.9 %) were females and males respectively. However, the percentage of the case by age group in, 0 to 5 months was 18.2%, 6 to 9 months was 59.1% and it was 22.7% in age group 10 to 12 months. There were no measles cases above 12 months (see table 1).

Table 1: Measles Cases by Age Group, Kbebe-Tsehay Orphanage, Addis Ababa, Ethiopia, 2014

Age Group	N^{o} of cases	percent
0 to $\geq$ 5 month	4	18.2%
6 to $\geq$ 9 month	13	59.1%
10 to $\geq$ 12 month	5	22.7%

The distribution of the diseases in relative to cases dormitory were 77.3% (17 cases) in 0 –1year dormitory and in reception room were 22.7% (5 cases).

Of the total investigated cases, 22 (100%) had fever and cough; 13 (59.1%) had vomiting; 8 (36.4%) had diarrhea, 9 (40.9%) had nasal discharge; 3(13.6%) cases had conjunctivitis; 15 (68.2%) had respiratory distress; 1(4.5%) case had sleep long time; 2(9.1%) cases had grunting; and 2(9.1%) cases had loss appetites. (See table 2 below)

Table 2: Measles Sign and Symptoms in Kbebe-Tsehay Orphanage, Addis Ababa, Ethiopia, 2014

Sign and Symptoms	Number (N=22)
Fever	22(100%)
Cough	22(100%)
Vomiting	13(59.1%)
Diarrhea	8(36.4%)
Nasal Discharge	9(40.9%)
Conjunctivitis	3(13.6%)
Respiratory Distress	15(68.2%)
Grunting	2(9.1%)
Loss of Appetites	2(9.1%)
sleep long time	1(4.5%)

From patients who received antibiotics treatment, 1 (4.5%) did not respond, but others 21 (95.5 %) improved from their illnesses.

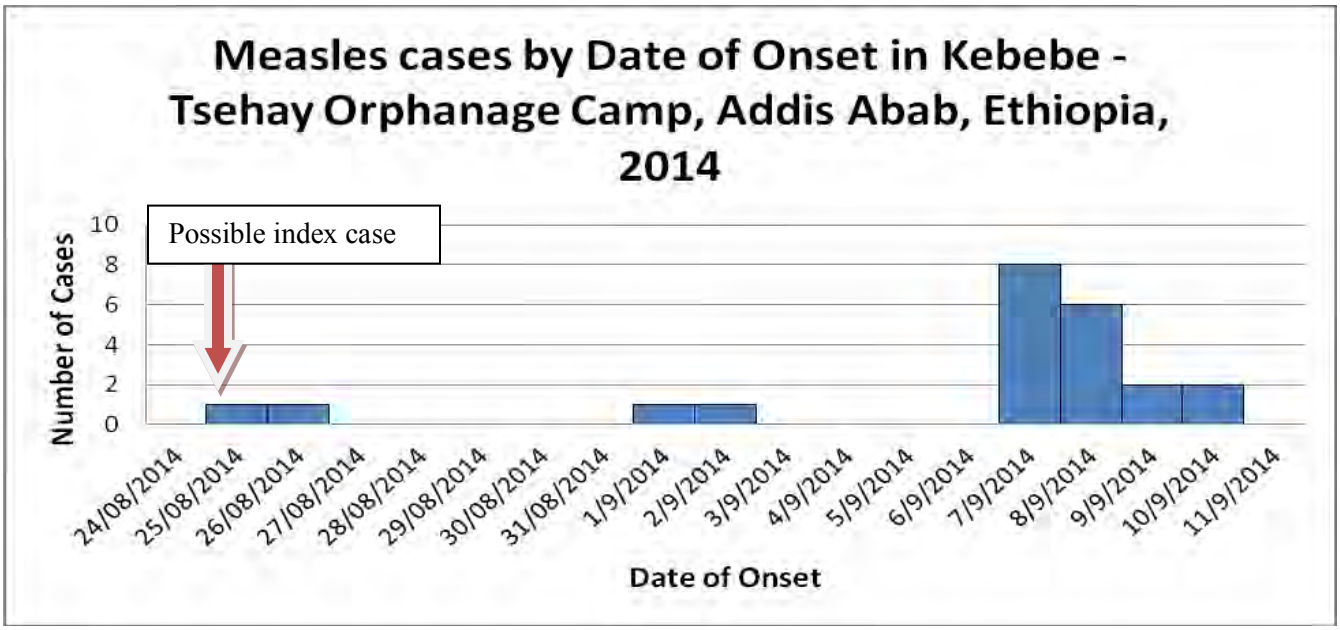

Figure 2: Measles cases by Date of Onset Kbebe -Tsehay, Addis Ababa, Ethiopia 2014.

The outbreak spanned over a period of 17 days (from August 25, 2014 – September 10, 2014). Majority of the cases 8 (36.7%) occurred on September 7, 2014 and six cases were reported the next day. The last two cases were detected in the day of September 9, 2014 and September 10, 2014 respectively. The possible index case was reported on August 25, 2014 and was from the reception room. The subsequent cases were reported from the dormitory room where 0 – 1 year housed indicating spread of disease.

3.2 Case –Control Study Results:

We compared 1:2 ratios of 22 cases (median age of 7 month) and 44 controls (median age of 48 month). From the total variables considered as risk factors for developing measles cases, sharing one bed for two or more children (OR: 8.11; 95% CI:2.5 – 26.6; P-Value: 0.000024) and admission of the new child in the dorms (OR: 13.2; 95% CI: 3.8 – 45.6; P-Value: 0.0000009) were associated with more likely development of the disease. However, the OR of vaccination status was 0.37 with 95% CI: 0.12 – 1.14 and P-Value 0.079 was not significantly associated with protection from contracting measles.

From the study groups (case-control) 22 (100%) cases and 9 (20.5%) controls had contact history to the suspected measles cases. Only 9 (40.9%) of the cases were vaccinated and 13 (59.1%) were not vaccinated, whereas 9 (20.5%) of the controls had recorded measles vaccination history and 35 (79.5%) had no vaccination cards.

Table 3 : Crude Analysis of Cases & Controls by Different Variables, Addis Ababa, Ethiopia, 2014

Sr. No	Variables	Cases	Controls	OR(95% CI)	P- Value	Remark
1	Share one bed for two or more child	**Yes 17** **No 5**	**Yes 13** **No 31**	8.1(2.46-26.62)	0.000024	Statistically significant
2	New child join the dorm	**Yes 17** **No 5**	**Yes 9** **No 35**	13.2(3.84–45.57)	0.000009	Statistically significant
3	Vaccination status	**Yes 9** **No 13**	**yes 9** **No 35**	0.37(0.12 – 1.14)	0.079	Statistically insignificant

3.4 Laboratory Investigations:

Five throat swabs were collected from those patients admitted at Kbebe-Tsehay clinic and tested at the National Virology Laboratory for all respiratory viral infection in the EPHI lab (Influenza A, Influenza B, Respiratory Syncytiaal virus, Parainfluenza 1, Parainfluenza 2, parainfluenza 3, human metapneumo and MERS-cov.) and all tested negative for those virus. And from all patients (22) blood samples were collected at different Health- Care Facilities where patients were admitted and tested negative for bacterial infections. Of five serum samples send and tested at national polio and measles laboratory, three were positive for measles IgM. We found that all cases which occurred in the Orphanage were epidemiologically linked with laboratory confirmed cases since they shared a lot of things.

3.5 Radiological finding:

The doctors handling inpatient thought that 15 patients may have pneumonia and imaging tests were ordered to evaluate for pneumonia. And 11 chest x-ray examinations were conducted and 9 (81.8%) of them had pneumonia and 2 (18.1%) had normal finding.

3.6 Response activities:

During the outbreak period, case management was given for all cases in their admitted health-care facilities. Finally, vaccination was given for all children age group $\geq$ 6 month to control and prevent transmissions.

4. Discussion:

This investigation revealed a confirmed measles outbreak in Kbebe-Tsehay Orphanage in Gulele Sub-City, Addis Ababa, Ethiopia. The observed clinical picture of this outbreak did not full fill the typical clinical sign of measles. From the total of 22 cases, none of them developed rash, this result is supported by measles in an immunocompromised individual can be severe and have a prolonged course and it may occur without the typical rash[8]. Measles Complications are more common among children under five years of age [5]. The most common causes of death due to measles complications are pneumonia in children[5]. In this study, there were 15 patients with pneumonia and one death due to this complication.

Majority of the cases (77.3%) occurred in the dormitory of 0-1 years relative to the other dormitory (reception room).This is the dorm where more children (up to 39 children) live together compared to other eight dormitories found in the Orphanage.

The use of measles vaccine in infant immunization programs globally has lead to significant reduction in measles cases and deaths. Despite the availability of an effective measles vaccine for almost 40 years, the disease still causes a considerable burden in many countries especially in the developing countries primarily due to under utilization of measles vaccine[15]. In this study, less number, 9 (40.9%) of the cases were vaccinated than in the control group, Females were more affected than males with the ratio of 1 male to 1.2 female. In this outbreak, the minimum age group of the case was 3 months which is unexpected age group affected by measles and the maximum age group was 12 months Infants whose mothers have had measles are protected against disease for approximately 6 – 9 months or more depending on the amount of residual maternal antibody at the time of pregnancy[5]. Children born to mothers with vaccine-induced immunity receive fewer antibodies and may be susceptible at an earlier age[5].

This investigation found that an important contributing factor in this outbreak was sharing one bed for two or more children (OR: 8.11; 95% CI: 2.5 – 26.6; P-Value: 0.000024). In addition to this, the new entrants to the orphanage (OR: 13.2; 95% CI: 3.8 – 45.6; P-Value: 0.0000009) constituted a key contributing factor for this outbreak. There were new children admitted in the orphanage before the start and during the outbreak period.

5. Limitation of the Study: As the sample size was very small, the study might miss important factors that had contributed for the outbreak. Information was found through children guardian and Orphanage nurses who may create information bias.

6. Conclusion: A confirmed measles outbreak occurred without a typical clinical sign of rash and with a high complication rate in Kbebe-Tsehay Orphanage, in Addis Ababa, Ethiopia. The analytical result indicating that using one bed for more than one child and the admission of new children in to the orphanage were the risk factors to enhance the spread of the disease

7. Recommendation: use one bed for one child and know the vaccination statuses of new children admitted into the orphanage, in addition to that, supplementary immunization activity should be encourage.

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II Assessment of Outbreak of Type II Vaccine-Derived Poliovirus in Fik District, Nogob Zone, Ethiopian Somali Region, 2015

Abstract

Background: A vaccine-derived polio virus (VDPV) is a rare strain of polio virus, genetically mutated from the strain contained in widely used oral polio vaccines (OPV). VDPV typically appears in locations where children remain under immunized with OPV. Acute Flaccid Paralysis (AFP) case was identified on November 10, 2014 by active AFP surveillance in the Fik District in Eastern Ethiopia with fever that persisted overnight and followed by sudden onset of paralysis of both lower limbs associated with difficulty in moving and walking. A response team was deployed to investigate, determine if additional cVDPVs cases were present, determine the source of infection, and to provide guidance and recommendations on correct control measures.

Methodology: A descriptive – case study design was employed. Microsoft Excell and Epi-Info 7.3.1 was used to do data analysis.

Results: One clinical compatible VDPV case was found in Dhala Village, Fik District Ethiopian Somali Region. The patient was not fully and by schedule immunized child who was four years old. A Health Worker identified this suspected case of AFP on November 10, 2014 with fever, followed by sudden onset of paralysis of both lower limbs. The patient with paralytic poliomyelitis was identified through clinical examination by nationally established team. The investigation revealed no additional AFP case in the area and there was an immunization gap in the District. Of the 25 children those living in the case village, 8 (32%) were not vaccinated, 3 (12%) took only one dose, 4 (16%) had two and more doses and 10 (40%) were with unknown vaccination status. There was no evidence of circulating vaccine derived type 2 transmissions in the village. The source of the outbreak (VDPV type 2) was not known and categorized under ambiguous VDPV.

Conclusion: The investigation identified the existence of paralysis case and low levels of OPV immunization in the area which was the possible cause of the case.

Recommendation: There is an urgent need for high quality supplemental immunization activities to be undertaken in the District. A thorough assessment is needed to establish a more accurate estimate of OPV coverage in the District.

Keywords: Polio, vaccine-derived polio outbreak, Fik District

1. INTRODUCTION

The words polio (grey) and myelon (marrow, indicating the spinal cord) are derived from the Greek words. It is the effect of poliomyelitis virus on the spinal cord that leads to the classic manifestation of paralysis[1]. Polio virus is a member of the enterovirus subgroup, family Picornaviridae. There are three poliovirus serotypes (P1, P2, and P3). There is minimal heterotypic immunity between the three serotypes. That is, immunity to one serotype does not produce significant immunity to the other serotypes[2]. The polio eradication initiative is the largest public health initiative in history. In 1988, the World Health Assembly passed a resolution to eradicate polio from the globe by the year 2000[3-5].

The oral poliovirus vaccine (OPV) developed by Albert Sabin and colleagues is nearly ideal for use in polio eradication[6]. This inexpensive vaccine is easily administered by mouth, facilitating its widespread use. OPV virus can spread to and immunize unvaccinated contacts of vaccine recipients, increasing the impact of OPV beyond its recipients. Through effective use of this excellent vaccine, the World Health Organization‟s (WHO‟s) Global Polio Eradication Initiative has brought wild polioviruses to the threshold of eradication[7, 8].

Despite its many advantages, use of OPV carries certain liabilities[7, 9]. The first, the rare occurrence of cases of vaccine-associated paralytic poliomyelitis (VAPP) among OPV recipients and their contacts, was recognized soon after licensure and widespread use of OPV in the early 1960s[10].The second, recognized more recently [11-14] is the emergence of genetically divergent vaccine-derived polioviruses (VDPVs), either during prolonged infection in persons with primary immunodeficiency disorders or during outbreaks in settings with low rates of OPV coverage [9, 15, 16].

VDPVs are of particular interest because of their implications for current and future strategies for global polio eradication [9, 15, 17, 18]. VDPVs can cause paralytic polio in humans and have the potential for sustained circulation. The clinical signs and severity of paralysis associated with VDPV and wild poliovirus infections are indistinguishable. VDPVs resemble wild polioviruses phenotypically [9, 15, 19] and differ genetically from the majority of vaccine-related poliovirus isolates. In this brief review, we describe the categories of VDPVs, update current knowledge of

VDPV infections and outbreaks of VDPV infections, and consider the WHO strategy to mitigate current and future risks of VDPV emergence.

VDPVs are categorized as 1) cVDPVs, when evidence of person-to-person transmission in the community exists; 2) immunodeficiency-associated VDPVs (iVDPVs), which are isolated from persons with primary immunodeficiencies who have prolonged VDPV infections; and 3) ambiguous VDPVs (aVDPVs), which are either clinical isolates from persons with no known immunodeficiency or sewage isolates whose source is unknown[20].

In April 2012, the World Health Assembly declared the completion of polio eradication a programmatic emergency for global public health[21]. In 2012, transmission of indigenous wild polio virus has continued uninterrupted in three countries (Nigeria, Afghanistan, and Pakistan) [22]. In 2013, the Center for Disease Control received reports of 183 cases of polio in Somalia,14 in Kenya and eight cases in the Somali Region of Ethiopia[23]. In Syria, the civil war has led to a return of polio. Doctors and international public health agencies report more than 90 cases of polio in Syria, with fears of contagion in rebel areas from lack of sanitation and safe-water services[24]. In May 2014, the World Health Organization declared polio's renewed spread a world health emergency[25].

Table 4: Wild Polio Virus type1 and Circulating Vaccine-Derived Polio Virus Cases globally, 2015

Total cases	Year-to-date 2015		Year-to-date 2014		Total in 2014	
	WPV	cVDPV	WPV	cVDPV	WPV	cVDPV
Globally	7	0	18	3	359	54
- in endemic countries	7	0	18	3	340	51
- in non-endemic countries	0	0	0	0	19	3

Source: www.polioeradication.org.

Rationale of the study

In the spirit of and in compliance with:

- Because it is a public health emergency of international concern, the investigation has to be undertaken and completed as soon as possible.
- For preparing a national emergency response action plan.
- Implementation of the IHR Temporary Recommendations under the IHR (2005) to reduce the international spread of polio
- The international requirement for notification of the partner through the International Procedures after thorough investigation.
- The certification requirement /Standard operating procedures, not fulfilled by the initial investigation carried out by Fik Woreda, Nogob Zone.
- Polio Eradication and Endgame Strategic Plan 2013–2018, calling for a polio-free world by 2018.

To fulfill the above mentioned requirements, the PHEM in collaboration with partners carried out an investigation from 15-29 January 2015. Thus, this report summarizes the investigation output.

2. OBJECTIVE

General Objective

- To describe the epidemiology of VDPV case, and to recommend appropriate control strategies as to prevent the continuation of the outbreak.

Specific objectives

- To clinically evaluate the reported VDPV2/poliomyelitis case
- To document epidemiological and social factors associated with the case.
- To identify the possible extent of poliovirus transmission and/or risks of further spread
- To assess gaps (on immunization, surveillance) that may have contributed to case occurrence

3. Methods and Materials

3.1 Study area and period

The Ethiopian Somali Region is located in the East and Southeast part of Ethiopia; it has borders with Oromia Regional in the West and Southwest, and Afar National Regional State in the Northeast. Internationally, it has borders with Kenya in the South, Somalia in the East, and Djibouti in the Northwest. It is the second largest regional state, which contributes 25% of the total land mass of the country with an estimated area of about 250,000 square kilometers. Somali Region consists of nine administrative zones namely Afder, Dollo, Fafan, Jarar, Korahe, Liban, Nogob, Shabele and Siti Zones.

Nogob Zone is one of nine administrative zones of the Somali Regional State, which located approximately 202 kms south west of Jijiga and 125km from the main road to Addis Ababa. It consists of nine districts namely, Fiq, Hamaro, Dhune, Salahad, Laghida, Qube, Mayu muluka, Garbo, and Sagag woredas.

The investigation was carried out in Fik District of Nogob Zone in Somali Region**.** This District is the seat of zonal administration of Nogob Zone, 125 km from the main road to Addis Ababa and 202 km from Jijiga.

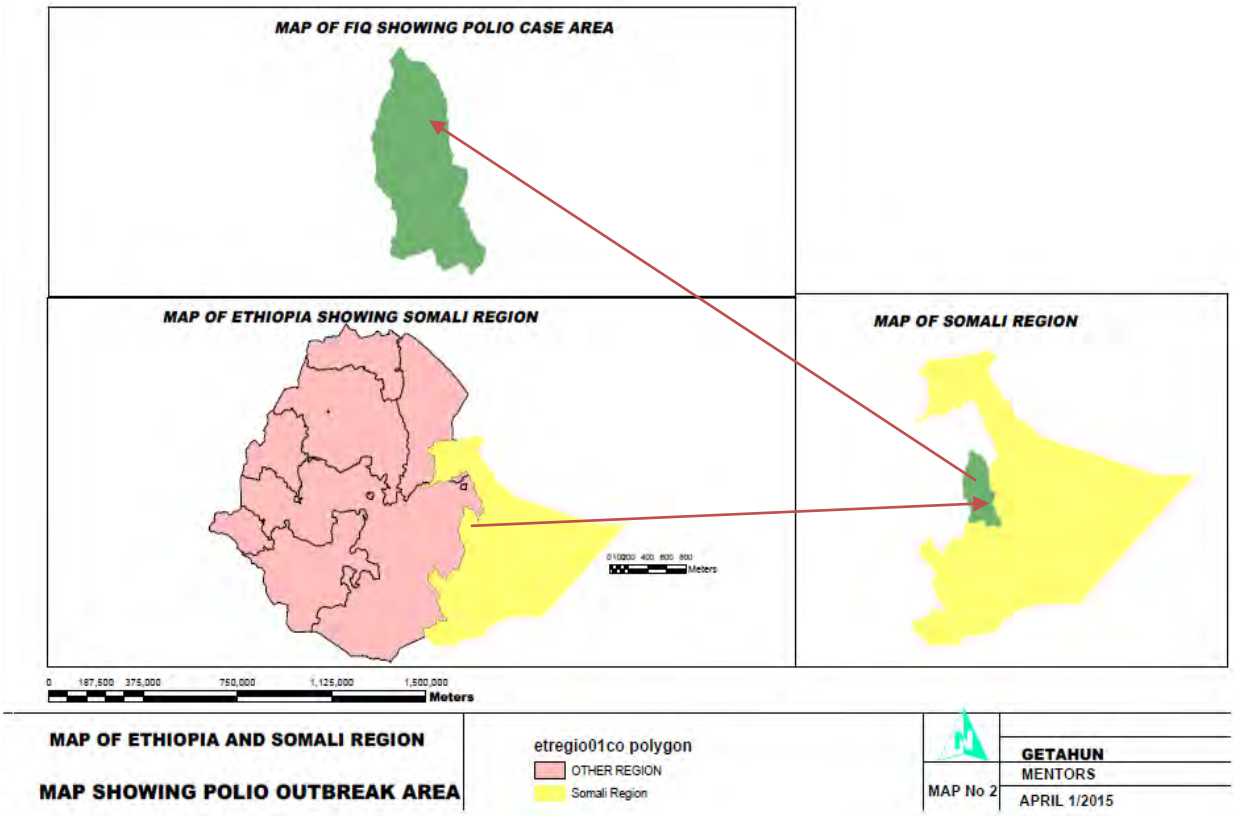


Figure 3: Map of Ethiopian Somali Region Showing Site of Polio Outbreak, Ethiopia, 2015

The study was conducted from January 15 – 29, 2015 to clinically evaluate the reported case and to determine if additional cVDPVs cases were present, assess OPV vaccination coverage of children in the immediate area and evaluate AFP surveillance.

3.2 Study Design

A descriptive –cross sectional case study designs were employed to investigate the outbreak

3.3 Population

Based on the 2007 population census, the population of Ethiopian Somali Region is estimated to be 5 million and the Fiq District is composed of 17 main kebeles and 32 sub kebeles, the total population of the District is estimated to be 106,541, the majority of who are pastoralists and agro-pastoralists.

3.4 Sampling Method

Simple random sampling was used to collect stool samples from suspected contacts children in the affected area and to assess Immunization Coverage in the area.

3.5 Case definition

Suspected AFP: any child under 15 years of age with sudden onset of weakness or floppiness of one or more limbs or any person of any age in whom a clinician suspects poliomyelitis.

Hot AFP case: An AFP case likely to be paralytic polio, either on clinical grounds (Age less than five years, asymmetric paralysis, fever at the onset, incomplete OPV doses, rapid progression of paralysis) and/or AFP case with direct contact to a confirmed case or a case from endemic area. Investigation, stool collection and laboratory processing of specimen should prioritize for hot cases.

Confirmed polio case: A suspected case with wild poliovirus/VDPV isolation from stool sample

3.6 Data collection and Analysis

Semi-structured questionnaire was used to interview the patient/ informant and key informants from the Region, Zone, District, and Health Facilities. Zonal and District surveillance data, the investigation report by the District & Health Facilities records were reviewed to complement the direct interview of the case mother and key informants. Standard WHO active case search form was used for case search. Photo camera was used to take the picture of the patient.

Mycroft excel, Epi- Info 7.3.1 and Arc-GIS was used for data analysis

Field investigations: These were conducted in each of the communities with poliovirus case. The field investigation involved the following assessment levels:

To explain causes and determinants of the polio outbreak, we conducted a rapid epidemiological assessment in the case area; routine immunization and cold chin status were assessed in the village and at nearby health institutions. Active case search was conducted for cases of acute flaccid paralysis. Attitudes and practices of health care providers and child caretakers were assessed in affected communities. We assessed the EPI coverage in the affected district for both

the routine and SIA coverage, by considering under five years old children in the village of the confirmed case. In the surveyed community, focus group discussions (FGD) were conducted to assess the awareness and attitudes of the community members toward conditions of poliomyelitis illness. We assessed the awareness of health workers and caretakers. Records were reviewed in all nearby health facilities. The investigators inspected and took notes on the status of the cold chin system in all health facilities of the affected area. During our investigations, we conducted these assessments: Clinical and physical evaluations were completed on the confirmed polio case.

4. Results

The ETH-SOM-NOG-2014-1011 coded patient was a 04 yrs old Male child who was born from 33 years old housewife mother. The case detected in Dhala Village of Simane Kebele, Nogob Zone, Ethiopian Somali Region. On 10th of November 2014, the patient developed fever followed by sudden onset of paralysis of both lower limbs associated with difficult to moving and walking. The patient was not hospitalized and reported as having AFP on November 14, 2014 by the Simane Health Center Surveillance Focal Person. The first investigation was conducted by Nogob Zone WHO Surveillance focal officer and two adequate stool specimens were obtained from the patient on November 15, 2014 and 16, 2014.The specimens were sent to National Polio Laboratory on November 17, 2014 for conformation. The result of the initial test in National Polio Laboratory was polio virus positive. For further conformation and virus strain characterization, the specimens were sent to South Africa. The confirmed result of virus DNA sequencing from South Africa was VDPV2.

4.1 Case ascertainment:

The patient with paralytic poliomyelitis was identified through clinical examination by investigator team. The team found out the following clinical presentation of the patient

- The bulk of the muscle was equal
- The power of right lower limp was decreased (3/5)
- Muscle tone and deep tendon reflex decreased,
- Sensation intact and
- Babinski (plantar) reflex in the right side downward
- Normal urinary function
- HEENT /CVS/Chest/Abdomen/GUS/Integumentary system: - No abnormality detected
- CNS: - Conscious
- MSS: - The patient has residual paralysis in the right lower limp and limping while walking.
- The left lower limb is completely improved

Figure 4: Investigation of Polio Patient, Fiq District, Ethiopian Somali Region, 2015

The patient had no history of illness and injection before paralysis. The patient had taken one dose of polio vaccine before paralysis at the age of two years, but has no vaccination card. The patient took one and two doses of OPV after paralysis during NID and outreach respectively. The mother of the patient has four children (the eldest 6 and 10 years and the youngest 8 months old baby and 4 years old the patient himself).There was no evidence that the eldest brother and sister have been vaccinated since they had no vaccination cards. The youngest sibling, 8 months old was immunized as per schedule.

4.2 Active case search:

Active search was carried out with the intention to establish whether or not local transmission is occurring/ or missed case in the District. Only the affected District was actively searched due to time and logistic constraints; pastoralist life style of the community, and accessibility and security reasons. However, the searchers were able to cover all households of the village of the patient and at the same time conducted focal group discussion. Additionally, 10 Health Professionals working in HC and Hospital, three District staff; head of the District Health Office and surveillance and EPI officers and WHO Surveillance Officer were interviewed in the area. Similarly, District and Zonal Administrative staffs were also interviewed. All the respondents except the three district staffs and WHO Surveillance Officer confirmed that there was no person

reported with AFP or reported having seen a person with AFP in the other villages of Fik District in the past one year, but the district staffs and WHO Surveillance Officer respond that there were eight AFP cases reported in the past eight months.

4.3 AFP surveillance

The network of surveillance system in the District as well as in Zone at large including the health facilities and community volunteers and community healing units, such as traditional healers and private drug vendors are not networked, and there are no identified or listed priority sites for active surveillance and hence there are no planed active surveillance visits.

The investigation team has identified that in the affected districts the momentum of vigorous case search for AFP cases is loosen by the absence of periodical supervisory visit, training of health workers as well as absence of case definition in some visited health centers, absence of regular active case search and poor supportive supervision at all levels. Community structures and networks for surveillance are not well utilized for active AFP case searching, particularly with clan leaders and HEWs. The team conducted house-to-house case search, reviewed records in the health units and interviewed health workers in all the study sites about AFP cases. Regarding active case search and sensitization, it was run only by the WHO surveillance officer, but he made irregular visits and search to accessible areas. For the last one year, AFP detection rate in Nogob Zone was 15 / 100000 children < 15 years of old according to Nogob Zone WHO Surveillance Officer. In Fik District Health Office, there were no documented neither six months nor annual surveillance reports for EFY of 2006 and 2007, but there were surveillance tools like investigation and reporting forms in the District. According to Somali Regional WHO Office, stool adequacy rate was >80%.

4.4 Assessment of Vaccination Coverage:

After confirmation of VDPV case, the OPV coverage and supplementary immunization activities were assessed for samples of 25 children aged under five from the affected village. OPV immunization status was determined by checking health facilities records or immunization cards and related information from caregivers was also collected.

Of the 25 children, 8(32%) were not vaccinated, 3(12%) took only one dose, 4(16%) took two and more doses and 10(40%) had unknown status.

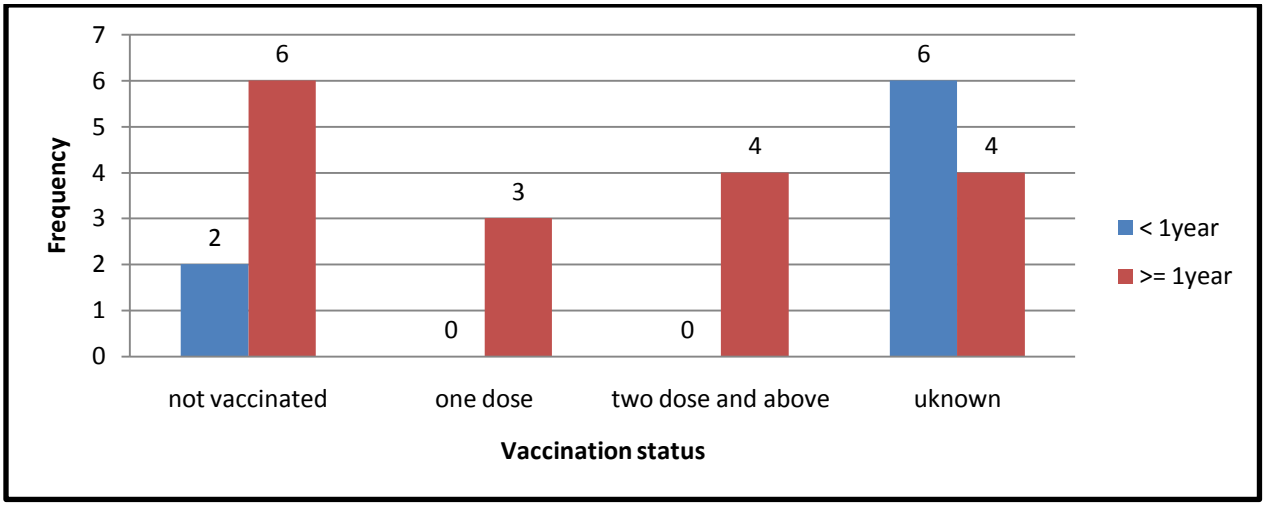


Figure 5: Age and SIA Distribution in Dhala Village, Nogob Zone Ethiopian Somali, 2015

A total of 12 rounds of SIA were conducted in the Ethiopian Somali Region from June 2013 to December 2014 including preventive SIAs in response to confirmed cases in Somalia and Kenya. Documented data of vaccination coverage for both RI and SIAs were not found in the District for the last three years. In this district there were three static and nine outreach sites. The SIA were carried out only in limited area of Fik District due to security reason. The Dhala village communities were resettled from the push to the current area before five months (in September 2014).

We assessed the SIAs vaccination status of 25 sample children in close proximity to the confirmed polio case prior to last round and at last round. Of the 25 children, 5(20%) and 4 (16%) were not vaccinated both prior to last and the last SIA, 8(32%) and 6(24%) were vaccinated prior to last and the last round of SIAs respectively and 12(48%) and 15(60) did not know their prior last and the last SIAs vaccination status (see Fig.6).

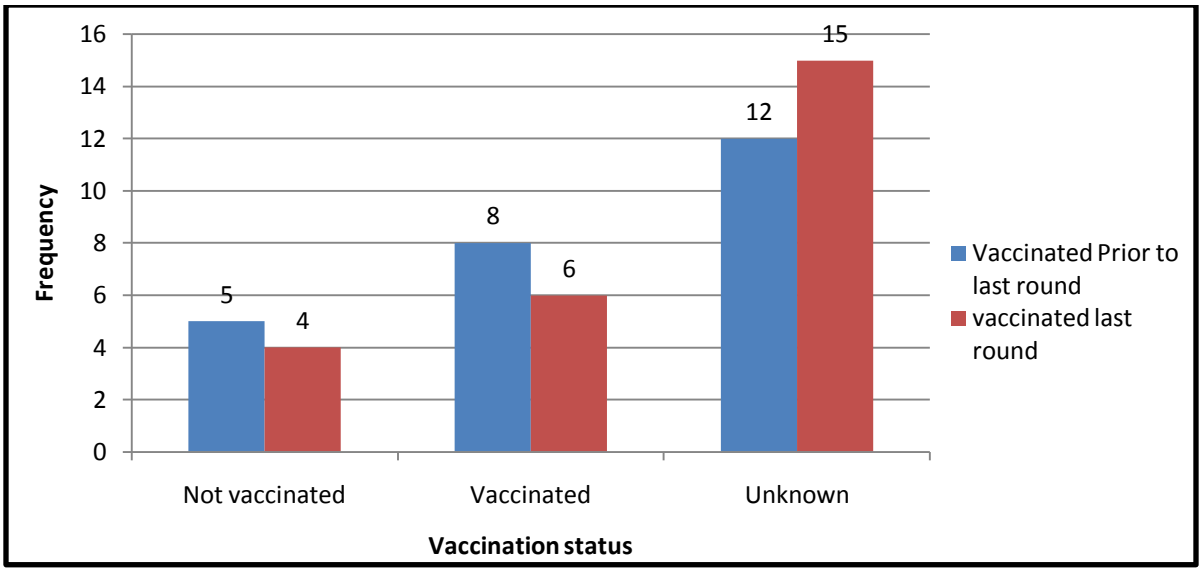


Figure 6: Vaccination Status in Last and Prior to Last Round in Dahala Village, Ethiopian, 2015

There was EPI focal person at the District Health Office and he had taken EPI training. There was budget, vehicle, and manpower problem to conduct immunization. There were no quarterly and annual plan and report for routine immunization service coverage. There was no documented micro-plan in the District. There was security problem.

The cold chain system in the Health Facilities and Woreda Health Office were compromised by the frequent failure of maintenance, Electric power interruption, and inappropriate usages (other drug put in it) were noted. All those indicate that there were no strong supervision and monitoring mechanism of the immunization service.

4.5 Epidemiological investigation on close contacts:

The contacts of VDPVs case, including children who lived in the same household and neighbors were also investigated. Demographic characteristics, immunization records, and contact information were collected. Stool specimens were collected from 25 children who might have contacts with the case and sent to the National Polio Laboratory. The National Polio Laboratory then reported that the laboratory test results were negative.

Both the mother and father of the case were illiterate and living with low socioeconomic status. The mother had no any history of chronic illnesses. The father of the patient was cattle keeper who was 36 years old. The father frequently traveled to cattle market within the District. The

case before 30 days prior to the onset of paralysis did not have history of travel outside his village and had no contact history with AFP/Polio suspected or confirmed case. No visitors came to the home of the case before paralysis. However; after onset of paralysis, the case went to Babile District, Cobasha village for traditional treatment.

4.6 Community knowledge, Awareness and perception

In general, the health awareness and perception of affected families and communities in this newly resettled pastoralist community were very low. The people interviewed in this kebele said, they have no any source of information about polio and health related issues.

The study also disclosed that majority of the child caretakers in the affected areas frequently consulted traditional healing units. This contributed to late investigation of AFP cases. Modern health care systems were least cited as the location where children with paralysis would be taken first.

4.7 Hygiene and environmental sanitation

Poor sanitation and proper hygienic practice, severe water shortage and long distance to collect water for house hold use inadequate and crowded living conditions characterized the affected communities.

4.8 Public Health Intervention

Federal Ministry of Health in collaboration with the partners conducted National Polio Immunization throughout the country from February 6 to 9/2015.

5. Discussion

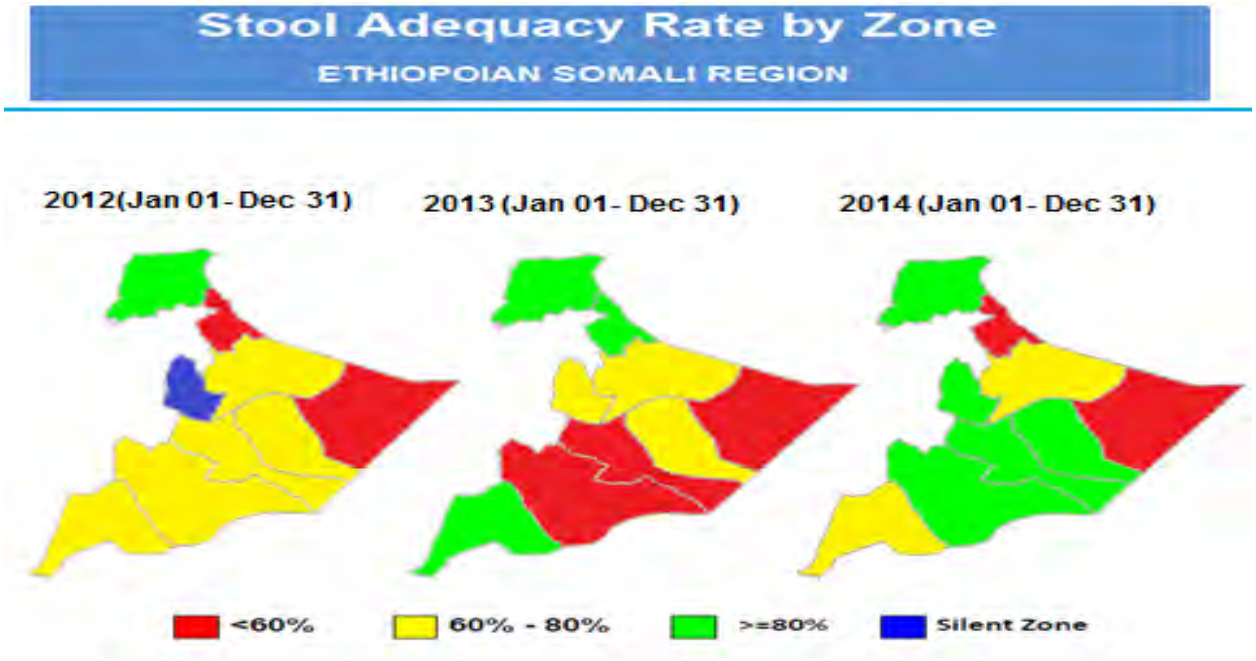
Finding from the present investigation of the polio outbreak in Ethiopia showed that single case, aged less than 5 years, was paralyzed as a result of infection with VDPV type 2. According to the national laboratory results, there was no evidence of circulation of VDPs in Fik District of Nogob Zone. Given the detected case is only one; there could not have been a missed/undetected case which could have favored indigenous transmission. Furthermore, the mother of the patient has no history of chronic disease which causes immunodeficiency, as result this VDP could not be immunodeficiency-associated VDPVs (iVDPVs). The source of this VDPv type2 outbreak was not possible to be known and the outbreak is categorized under ambiguous VDPV.

High-quality surveillance is important for early detection and timely response to WPV and VDPV cases. AFP surveillance should satisfy the international criteria for sensitivity and timeliness with appropriate geographic representation. The quality of AFP surveillance should be monitored at sub national level and ensured in border areas and in those with refugees and high-risk populations. AFP surveillance is the foundation that guides and directs immunization activities and the tool to determine the extent of virus circulation and the impact of control measures. It is also important because it documents the cessation of transmission and excludes the re-establishment of virus circulation. While Ethiopian Somali Region has not achieved standards for surveillance at the zonal and district level, gaps still exist, especially in hard-to-reach and border areas like Fiq District.

In the affected District, irregular active case search was conducted by District focal persons. Community surveillance networks had not been optimally utilized for active AEP case search, particularly the community health workers (community health agents, and traditional birth attendants) and traditional healing units of the affected district and communities. Crowded living conditions of the settlers in the affected area, lack of adequate clean water supply, and lack of adequate sanitation were characteristics noted in affected areas.

There was persistent low stool adequacy rate at regional level and zonal level, and the progress in this regard was slow. The achievement in 2012, 2013 and 2014 only one, three and five zones achieved the stool adequacy rate respectively, and based on this surveillance sensitivity it is difficult to exclude undetected circulation of WPV and VDPV. From the map below, it is

possible to depict the improvement of stool adequacy rate compared to 2012, but the progress is very slow given the current circumstances.



Source: WHO Somali Regional Office

As of the compilation of this investigation report, according to the Federal Ministry of Health the national non-polio AFP rate was 2.7 with stool adequacy of 88%. Nonetheless, the Non polio entro-virus isolation rate, which is both a field and lab indicator, remains the biggest challenge in AFP surveillance system in the Country.

High levels of population immunity are required to prevent the introduction and spread of WPV or cVDPV. A good routine immunization programme that achieves OPV3 coverage in over 80% of children and high coverage of supplementary OPV preventive campaigns in countries with lower routine OPV3 coverage are often adequate to maintain high levels of population immunity, but this fact was not on ground in the affected area.

Focus needs to be directed to strengthening immunization systems and improving routine vaccination coverage rates, especially in the affected District. Increasing immunization coverage will have several direct benefits for polio eradication efforts, including minimizing the risk, rate and extent of polio outbreaks. In addition, high immunization coverage is the best strategy for reducing the risk of VDPV emergence.

The emergence of VDPVs has important implications for current and future polio immunization policies [9, 18, 26]. Since 1999, all poliomyelitis cases associated with poliovirus type 2 have been associated with the continued use of tOPV. Similarly, the current VDPV type 2 is expected to be due to the fact that the Ethiopian Somali Region has conducted multiple campaigns because of the importation of wild polio virus in 2013. However; all rounds conducted in Ethiopian Somali Region have used bOPV for reasons of boosting population immunity as soon as possible, and as a result in all rounds only typ1 and type3 polio virus population immunity were built, while type 2 remains the same or probably decreased.

From the community discussion we extracted that the people had understood the importance of immunizing their children due to the current outbreak which they clearly stated that children are crippled because of not vaccinating their children. The participants also stressed that such a huge mobilization effort of the community by the government and the partners towards the importance of the child vaccination is vital. The opinion leaders of the community also added that the community's understanding and attitude towards vaccination of the children is in its good status since they have seen the impact of not vaccinating their children. They added to sustain, there must be routine health service delivery facility which can provide routine immunization service and other health related problems.

Basic sanitation and proper hygienic practices coupled with clean water supply are necessary to interrupt polio transmission. Ethiopian Somali Regional State population is 85% pastoralist which adapted nomadic way of living moving from place to place in search of pasture and water for themselves and for their livestock. Severe water shortage and long distance to collect water for house hold use were also among major problems (i.e. the nearest water point is 8 km far from the village and takes 3 hours for round trip). As we observed during our field visit, there were no latrine facilities in the village for the households and often people defecate on open field.

6. Conclusion

In conclusion, the polio outbreak in Fik District, Ethiopian Somali Region provides lessons on the possible risks for VDPV type2 outbreak was as a result of the low immunization status of the child. Furthermore, the virus not circulating in the affected village and not immunodeficiency-associated VDPV and hence was categorized under ambiguous VDPV since its source was not known.

Absence of regular active case search, lack of documentation, lack of community involvement in the surveillance activities, poor environmental sanitation, absence of clean water near by the village were the observed problem of the affected area.

7. Recommendations

Therefore, it is highly recommended,

1. Conduct a high quality campaign and repeat the same type of antigen in one month interval in the area.
2. Because VDPVs is type 2, the World Health Organization calls for coordinated worldwide replacement of trivalent OPV with bivalent OPV containing poliovirus types 1 and 3 should implement as soon as possible in the country as well as in the affected Region.
3. Improve routine immunization program in the Region at large and affected areas. The Regions vaccination program should adopt and expand the Reaching Every Child approach (REC) to all Districts in Nogob Zone.
4. Improve the surveillance activities by conducting periodic active case search
5. Vaccine stock management should urgently be established for proper monitoring of vaccines in all health facilities, District and zonal stock in the area.
6. Two rounds of high quality nationwide immunization campaigns should be implemented annually for Somali Region in Fiq District.

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Chapter II- Surveillance Data Analysis

Human and Animal Anthrax in Ethiopia: A retrospective record review 2009-2013

Abstract

Background: Anthrax is a Zoonotic disease, caused by a gram-positive, none- motile and spore forming bacteria, Bacillus anthracis. Globally, 10-100 thousand human anthrax incidences occur annually with significant number of cases from Chad, Ethiopia, Zambia, Zimbabwe and India. Ethiopia as one of the countries with high burden of the disease has been experienced recurrent wave of hyper endemic/ epidemic for many years. Even though Anthrax is one of the reportable diseases in Ethiopia, available data have not been analyzed and interpreted so far. We conducted this analysis to determine the magnitude and trends of the disease in Ethiopia.

Methods: Five years, 2009-2013, human and animal anthrax surveillance data were officially requested and received from the Ethiopian Public Health Institute and the Ministry of Agriculture respectively. The data were analyzed by time and place using Epi.info.7.3.1 and Microsoft Office Excel 2007. Arc Geographic Information System (GIS) was used to determine the relationship between human and animal anthrax cases.

Results: A total of 5,197 human and 26,737 animal anthrax cases (human to animal ratio 1:5) were reported from 2009 to 2013 with 86 human anthrax deaths (CFR:1.7%). The National human prevalence was found to be 1.3 per 100,000 populations per five years, while it was 6.7, 2.3, 1.5 and 0.2 in Tigray, Amhara, SNNP and Oromia regions respectively. Zero human case was reported from pastoralist regions with 55-216 animal cases (Afar, Somali and Benshangul Gumuz). The human prevalence was high in May followed by February (0.20 and 0.15 per 100,000 populations per year respectively).

Conclusion: This data analysis revealed that, less number of Human anthrax cases are reported than Animal cases in Ethiopia. The pastoralist areas where humans and animals co-exist closely did not report a single human case for the last five years.

Recommendation: To determine the magnitude of anthrax in Ethiopia both human and animal surveillance system should be strengthened giving due attention to pastoralist areas. Prevention intervention should be in place in areas where the prevalence of the disease is high.

Key Word: Anthrax, *Bacillus*, Human, Animal, Ethiopia

1. Introduction

Anthrax is an acute spore forming warm blooded animal‟s disease including human beings caused by a gram-positive, non-motile bacillus anthracis [1]. The name of the bacterium is derived from “anthrakis”, the Greek word for coal, because anthrax in humans causes black, coal-like lesions on the skin at the site of inoculation.

Herbivorous and wild mammals are most commonly infected by Anthrax through ingestion or inhalation of spores while grazing. Ingestion is thought to be the most common route by which herbivores contract anthrax. Carnivores living in the same environment may become infected by consuming infected animals[2]. Human cases usually develop after exposure to infected animals and their tissues. In most countries, human anthrax occurs infrequently and sporadically, mainly as an occupational hazard among veterinarians, agricultural workers and workers who process hides, hair, wool and bone products. Human-to-human transmission has not been documented. In humans, cutaneous, gastrointestinal and inhalational are the three forms of anthrax. The incubation period in humans is usually 1 to 7 days, but varies with the form of the disease [3].

Anthrax is globally distributed disease, reported by all continents that are populated heavily with animals and humans. Animal Anthrax outbreaks have been recorded in nearly 200 countries by The World Anthrax Data Site, a World Health Organization Collaborating Center for Remote Sensing and Geographic Information Systems for Public Health [4]. The data types recorded by The World Anthrax Data Site are: country-of-origin, anthrax status, vaccination program, species affected, year of outbreak, number of outbreaks during the year, number of cases, number vaccinated and total livestock population. The anthrax status of a given country may be classified into one of the six categories: hyper endemic/epidemic, endemic, sporadic, probably free, free and unknown. The countries with hyper endemic/epidemic status are frequently in Africa, like Zimbabwe, from 1978-1980; where an epidemic infected nearly 10,000 humans and took 151 lives although the status of Egypt is “Probably free”. Examples of regions with unknown anthrax status are the polar extremes, the Arctic and the Antarctic [5, 6].

Animal anthrax is an endemic disease in Ethiopia which occurs in May and June every year (anthrax season) in several farming localities of the country, although suspected cases of

livestock anthrax are reported from several districts, few of those are officially confirmed [7].The common use of traditional medicine for anthrax in Ethiopia [8-10] indicates that the disease is well recognized by rural communities but little is known about its prevalence, epidemiology and public health significance. In the Ethiopian fiscal year 2003, according to the Fedral Democratic Republic of Ethiopia Ministry of Health surveillance data, a total of 1,096 suspected human anthrax cases and 16 deaths (with a CFR of 1.5%) were reported from four regions (Tigray, Amhara, Oromia, and SNNPR) [11]. The highest number of cases were reported from Tigray (396), followed by SNNPR (340), Amhara (296), and Oromia (64), while the highest number of deaths (9) were reported in SNNPR (56% of the total deaths), with Oromia accounting for 5 deaths (31%) and Tigray for 2 (13%). In 1993 there were 305 cases reported and none in 1994[12-14], indicating that the surveillance system is developing recently but surveillance data of anthrax is not analyzed and communicated to concerned bodies regularly. So, the main propose of this analysis was to assess the five years anthrax trend in order to get valuable inputs and recommend evidence based interventions.

Rationale of the study

Zoonoses are diseases transmissible between animals (domestic and wildlife) and humans. It has been estimated that 60% of all human diseases and around 75% of emerging infectious diseases are zoonotic among which ***A***nthrax is a serious zoonotic disease that can affect most mammals and several species of birds [15]. In Ethiopia, anthrax is endemic so it is an important public health issue and there is an apparent need for accurate information through a strong surveillance system to warrant evidence based action. Therefore, analyzing anthrax data from 2009 to 2013 can be used to assess the five year trend of anthrax in Ethiopia and determine the distribution of cases. This helps to identify areas of hyperendemnicity, and figure out the completeness of the reporting system to engage in corrective actions.

2. Objective

General Objective

- To assess the magnitude and trend of anthrax in Ethiopia from 2009-2013.

Specific Objectives

- To describe the magnitude of anthrax
- To assess trend and seasonality of anthrax in Ethiopia
- To identify the limitation of anthrax surveillances data.

3. Materials and Methods

3.1 Study area, population and period

Ethiopia is found in Eastern Africa, between 3 and 15-degree North latitude and 33 and 48-degree East longitude. Djibouti, Eritrea, the Republic of the Sudan, and the Republic of the Southern Sudan, Kenya, and Somalia border the country with a total area of 1,104,300 sq km. Ethiopia is the second most populous country in sub-Saharan Africa after Nigeria, with estimated population of 85 to 90 million in July 2011. Five year anthrax data were analyised (January 27-February 21/2014)

3.2 Source of Data

Secondary data from EPHI/PHEM data base from 2009-2013 were used to review human anthrax and animal anthrax data were abstracted from the Ministry Of Agriculture.

3.3 Study Design

Descriptive method of study was carried out. The trend and distributions of anthrax cases by place and time was presented using graphs, tables and map.

3.4 Sample Size and Sampling Method

All anthrax data reported between 2009 and 2013 in EPHI/PHEM and from the Ministry of Agriculture were included in this analysis.

3.5 Statistical Analysis

Descriptive statistical analysis were made using Epi. Info 7.3.1 and Microsoft Excel

3.6 Case Definitions

According to Public Health Emergency Management Guideline, a suspected case of anthrax was any person with acute onset of disease characterized by several clinical forms which include:

1) **localized form**:

Cutaneous: skin lesion evolving over 1 to 6 days from a popular through a vesicular stage, to a depressed black Escher invariably accompanied by edema that may be mild to extensive.

2) **Systemic forms: Gastro- intestinal**: Abdominal distress characterized by nausea, vomiting, anorexia and followed by fever

Pulmonary (inhalation): brief prodrome resembling acute viral respiratory illness, followed by rapid onset of hypoxia, dyspnea and high temperature, with x-ray evidence of mediastinal widening

Meningeal: acute onset of high fever possibly with convulsions, loss of consciousness, Meningeal signs and symptoms; commonly noted in all systemic infections and has an epidemiological link to confirmed or suspected animal cases or contaminated animal products.

4. Results

A total of 5197 and 26737 cases and 86 and 8523 deaths of human and animal anthrax respectively were documented the last five years (2009-2013) nationally. Cases and deaths were reported in weekly summary report, not accomplished with line list. The human anthrax cases annual prevalence was 1.31/100,000 population per year. All human cases were reported during the specified period on weekly summary format.

The human and animal anthrax cases load was 10(0.01 per 100,000 population) human and 5393 animals) in 2009, 1773(2.2 per 100,000 population) in 2010, but animal cases (8187) in 2011.In 2012, 1407(1.7 per 100,000 population and 5639) and in 2013, 1066(1.3 per 100,000 population) and 4038 both human and animals cases respectively. See fig 7

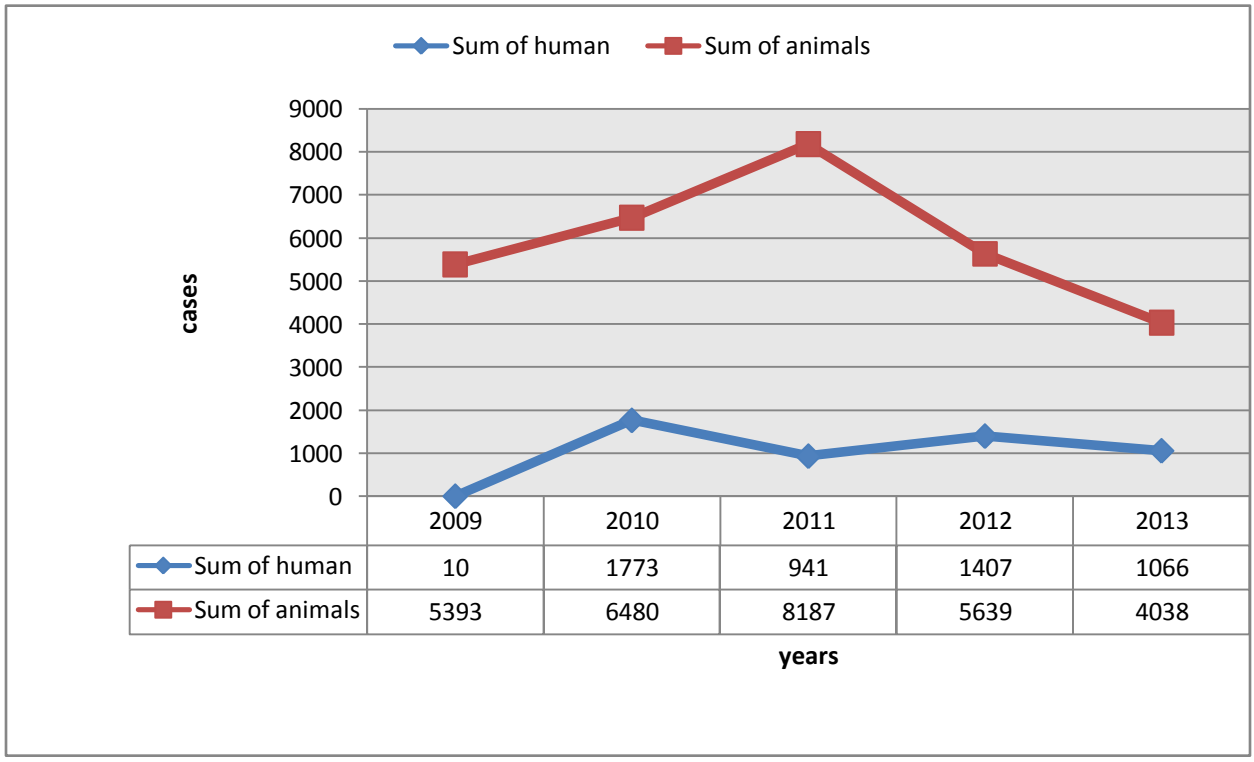

Figure 7: Human and Animal Anthrax Cases by year (2009-2013), Ethiopia 2014

As seen in fig.8, human cases in May were 796 and in animals, 3083 and 3205 in May and October respectively. Two thousand four hundred fifty four (47.2%) human cases were reported from February to May; 2149(41.4%) from June to November; 594(11.4%) from December to January and regarding animals 10061(37.6%) cases were reported from March to June; 6111(22.9%) from September to October; and the load from November to February was 3271(12.2%).

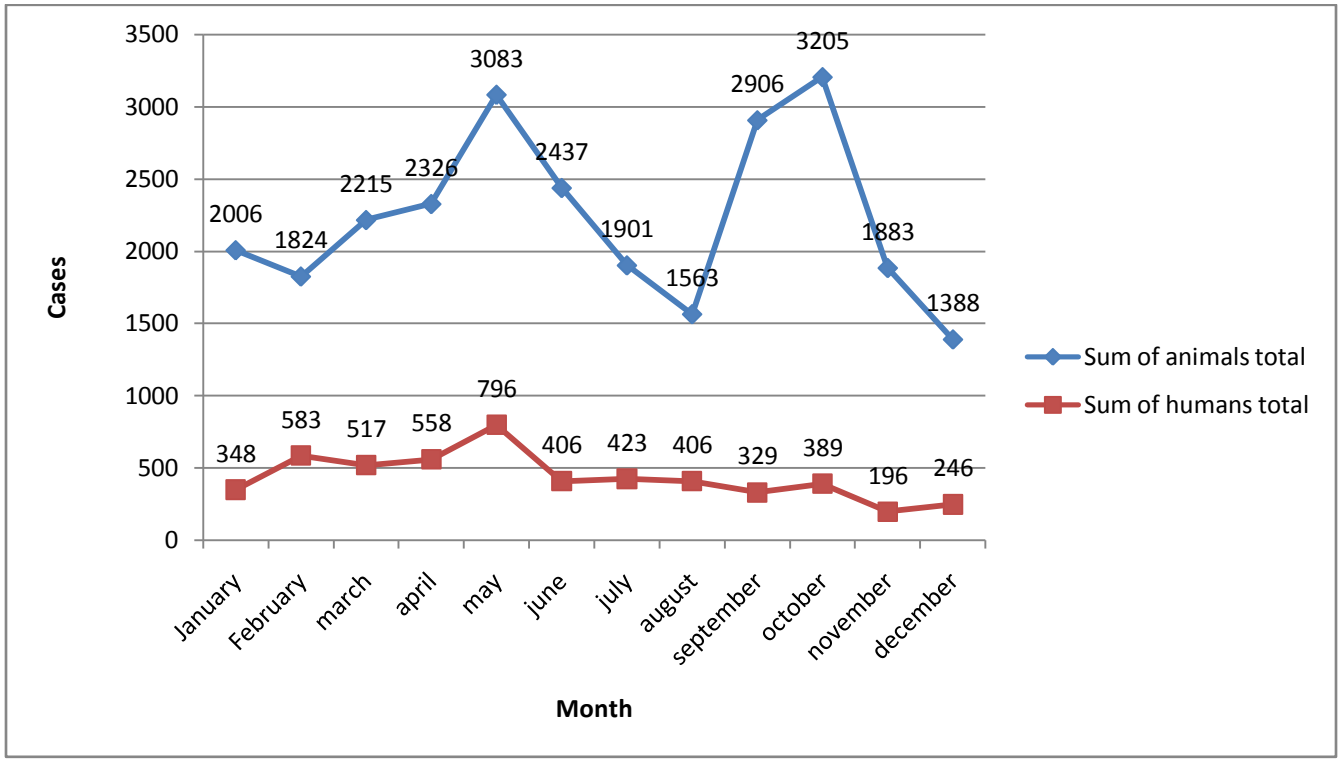

Figure 8: Human and Animal anthrax cases by month from 2009-2013, Ethiopia 2014

Table 5: indicates that the number of human cases in different regions, range from Zero to 2107. The majority of the cases were reported from Amhara, Tigray, SNNPR, and Oromia. Of which Amhara reported 2107 cases (40.5%), Tigray1602 (30.8%), SNNPR 1224(23.7%) and Oromia 262(5%), while 1 was observed from Addis Ababa and Gambella and no cases were reported from Afar , Somali, B-Gumuz , Harari, and Diredawa regions. Prevalence of human cases by region was (Tigray: 6.7, Amhara: 2.3, SNNPR: 1.5, Oromia: 0.18, Gambella: 0.06, Addis Ababa: 0.007, and Afar, Somali, B-Gumuz, Harari, Diredawa: 0 per 100,000 population). During 2009-

2013, human anthrax case fatality rate (CFR %) seen (6.1%) in Oromia, (3.3%), in SNNP, (0.9%), in Tigray, (0.7%), in Amhara.

The Human: Animal anthrax case ratio by region was (Tigray: 2:1, SNNPR: 1:1, Amhara: 1:6, Addis Ababa: 1:12, Oromia: 1:44, and 0:55, 0:216, 0:140 in Afar, B-Gumuz, and Somali regions respectively and no animal case was reported from Dire Dawa and Harari). The data disaggregated in zonal level the ratio 73:1 Bench Maji, 6:1 Central Tigray from SNNPR and Tigray regions respectively.

Table 5: Human anthrax cases, deaths, incidence and CFR and human to animal anthrax case ratio

Administrative &Region	Human cases	Human death	Incidence/ 100,000 population/year	CFR (%)	Animal cases	Human/Animal case ratio
Amhara	2107	15	2.3	0.7%	12577	1:6
Tigray	1602	14	6.7	0.9%	665	2:1
SNNPR	1224	41	1.5	3.3%	1333	1:1
Oromia	262	16	0.2	6.1%	11639	1:44
Addis Ababa	1	0	0.01	0.0%	12	1:12
Gambella	1	0	0.1	0.0%	100	1:100
Afar	0	0	0.0	0.0%	55	0:55
B. Gumuz	0	0	0.0	0.0%	216	0:216
Dire Dawa	0	0	0.0	0.0%	-	-
Harari	0	0	0.0	0.0%	-	-
Somali	0	0	0.0	0.0%	140	0:140
Grand Total	5197	86	1.3	1.7%	26737	1:5

Table 6: Prevalence of human anthrax cases the top 14 Zones and their Human/Animal ratio

Region	Zone	Number of Human Anthrax Cases (Incidence Rate 100,000 population)						Average human/animal
		2009	2010	2011	2012	2013	Average	
Amhara	Wag Himra	0(0.0)	54(12.0)	103(22.6)	451(97.3)	458(97.2)	213(46.8)	1.4(1:1)
SNNPR	Konso	10(4.0)	143(55.9)	76(28.8)	61(22.5)	38(13.6)	66(24.9)	*
SNNPR	Bench Maji	0(0.0)	217(30.2)	180(24.4)	325(42.7)	7(0.9)	146(19.7)	72.9(73:1)
Tigray	Central	0(0.0)	762(56.8)	89(6.5)	98(7.0)	58(4.0)	201(14.6)	6.3(6:1)
Tigray	North West	0(0.0)	237(29.9)	64(7.9)	58(7.0)	28(3.3)	77(9.5)	*
Amhara	North Gonder	0(0.0)	76(2.5)	57(1.8)	52(1.6)	170(5.3)	71(2.3)	0.1(1:7)
Tigray	Eastern	0(0.0)	42(5.2)	7(0.8)	30(3.5)	8(0.9)	17(2.1)	0.7(1:1)
Amhara	South Gonder	0(0.0)	16(0.7)	85(3.9)	59(2.6)	53(2.3)	43(1.9)	0.1(1:15)
Tigray	Western	0(0.0)	26(6.8)	1(0.3)	7(1.7)	4(1.0)	8(1.9)	0.3(1:3)
Amhara	South Wollo	0(0.0)	85(3.2)	59(2.2)	58(2.1)	42(1.5)	49(1.8)	0.5(1:2)
SNNPR	Keffa	0(0.0)	1(0.1)	34(3.4)	17(1.7)	32(3.1)	17(1.7)	1.8(2:1)
Tigray	Southern	0(0.0)	40(3.0)	17(1.3)	13(0.9)	13(0.9)	17(1.2)	0.3(1:3)
Oromia	West Arsi	0(0.0)	0(0.0)	38(1.7)	53(2.3)	10(0.4)	20(0.9)	0.2(1:7)
Amhara	East Gojam	0(0.0)	15(0.7)	13(0.6)	32(1.4)	29(1.2)	17.8(0.8)	0.0(1:20)
National	National	10(0.01)	1773(2.2)	941(1.2)	1407(1.7)	1066(1.3)	1039.4(1.3)	0.2(1:5)

Key= * 0 animal case report

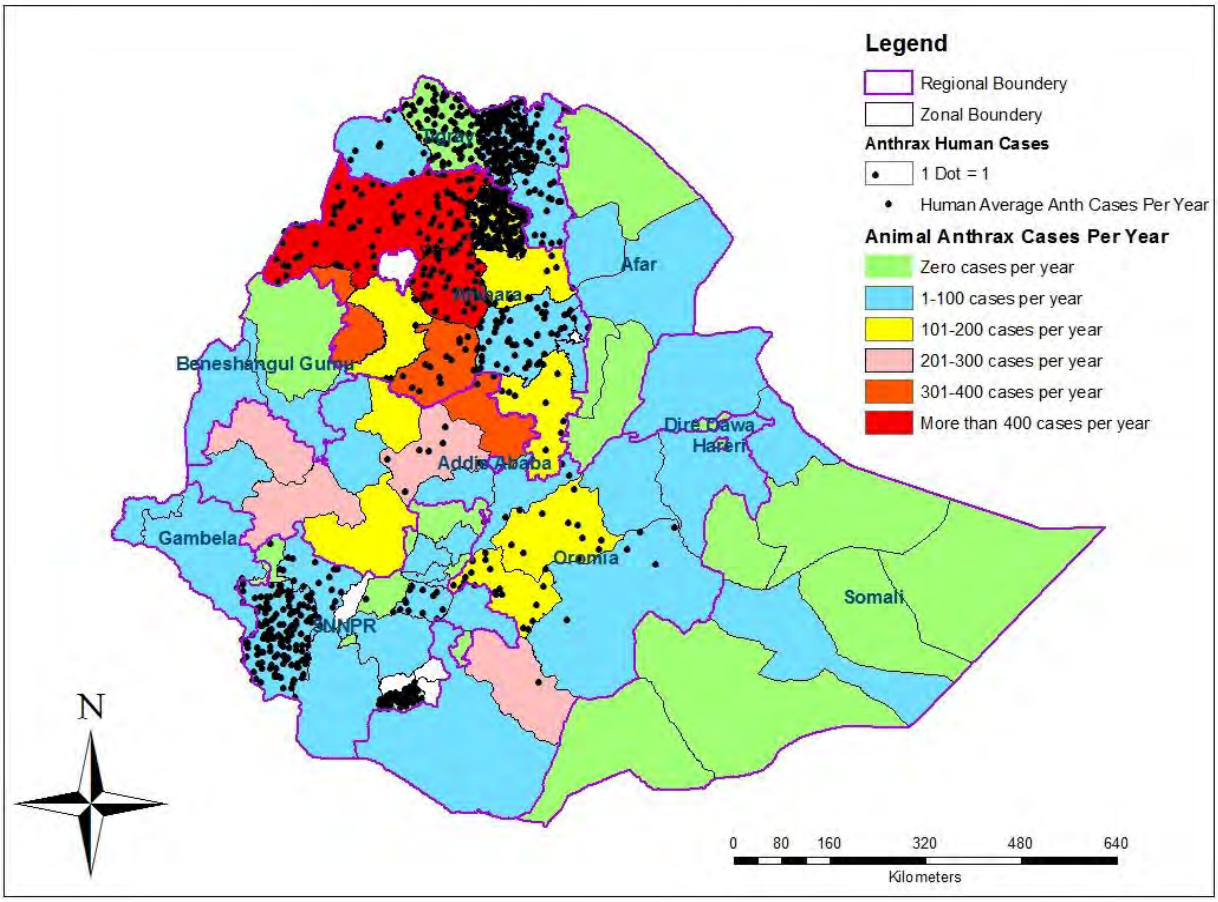

Figure 9: Human and Animal anthrax cases distribution between 2009 and 2013, Ethiopia

5. Discussion

This data analysis uncovered the prevalence of Human and Animal anthrax between 2009 and 2013in Ethiopia. The prevalence of human anthrax cases in Ethiopia was 1.3/100,000. In addition to that, the fatality of the cases was lower (CFR 1.7%) compared to Zambia [16]. This might be due to the under reporting of the cases in Ethiopia.

As the national FMoH and FMoA surveillance data from 2009-2013 indicates, more cases of human and animal anthrax were reported from four big regions which have comparatively good surveillance system and trained manpower. The four big regions Amhara, Oromia, SNNPR, and Tigray reported a total of 5195 (99.9%) human and 26214 (98%) animal anthrax cases. The highest human case prevalence was in Tigray followed by Amhara, SNNPR, Oromia, Gambella and Addis Ababa. Only animal cases without human cases were reported from Afar, Somali, and B-Gumuz. This is due to the difference in surveillance system strength. Regions with strong surveillance system reported highest number of both human and animal‟s cases compared to regions with poor surveillance system. More over the strength of surveillance system of FMoH and FMoA at federal level has significant impact on the result.

Both suspected human and animal anthrax cases were reported in larger number in the month of May and also larger numbers of animal cases were reported in October. This is dry season, during this time the grass is short and animals are, forced to graze very close to the ground. This increases chances of animals picking up anthrax spores in areas whose soils and pastures are contaminated with the spores[7]. Therefore, case of anthrax in animals is very common during this time increasing risk of human anthrax exposure.

Out of the total human cases were reported between 2009 and 2013 only, 10(0.2%) of the cases and Zero case fatality were notified in 2009.

In 2010, the number of reported human cases increased by 33.9% and there was an increase of the CFR by 0.9%, compared with 2009. In 2011, the case fatality rate increased by 0.8%, while, the number of human reported cases failed by 16% compared with 2010.The occurrences of human anthrax cases reported in 2012 and 2013 increased by 9% and 3.4% respectively and in 2012 the case fatality rate increased by 0.9%, while, in 2013 the case fatality decreased by 0.1% compared with the previous year.

The human: Animal case ratio from the surveillance data was 1:5. This is opposite to Northern Europe, 1:10 and 10:1 in Africa and Asia [16]. This human to animal ratio reflect country‟s economic condition, quality of surveillance, social traditions and dietary behavior[16]. Therefore the result of the five years surveillance data Human and Animal anthrax case ratio (1:5) was might be the quality of surveillance system of the country.

Most of the suspected human cases and deaths were reported in weekly summary report, not accomplished with line list. This reporting system lack detail information that help to analyzed the case by different variables. Therefore variables like age, sex, urban and rural case distributions were not analyzed from the weekly summary report. In addition to these the form of anthrax, like cutaneous, inhalation and ingestion were not mentioned. This affects the completeness of the analysis.

6. Challenges and limitations

Anthrax is immediately reportable disease in Ethiopia according to the national PHEM Guideline. Therefore, any human anthrax case and death should be reported either case investigation form or with a line list. All of the cases and death were reported in weekly summary report format. This reporting format has no age, sex, urban and rural distribution. Moreover, reported anthrax cases are not classified as suspected, probable and confirmed as per the WHO recommended case definition. The cases were not reported as cutaneous, inhalation, and ingestion form of the disease. And there were clear constraints in the data collection and data quality to reach to strong conclusions and recommendations.

7. Conclusion:

This analysis indicated that anthrax remains to be a major public health problem in Ethiopia. Increasing number of cases and fatalities were reported especially from Amhara, Tigray, SNNPR, and Oromia. All regions are not reporting Human suspected anthrax cases with the recommended standard format and the surveillance strength status varies from region to region. There is no emphasis on the implementation of one Health in the country.

8. Recommendation:

Control of anthrax depends on the integration of veterinary and human health surveillance and control programmes. Animals should be vaccinated with anthrax vaccine before the season of anthrax. I recommend strong routine cross-notification between the veterinary and human health surveillance systems should be part of any zoonotic disease prevention and control programmes, and close collaboration between the two health sectors is particularly important during epidemiological investigations. All regions and Ministry of Health and Ministry of Agriculture should strength their surveillance system and early preparedness. The case and death should be reported with daily epidemic reporting format or a line list and with case-based immediately and also the case should be reported in specific form of the disease. Continuous data analysis and feedback to all stakeholders should to be conducted on regular bases so as to improve quality of both human and animal surveillance data.

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Chapter III – Evaluation of Surveillance System

Evaluation of the Surveillance System, Gondar Town, Amhara Region, Ethiopia, 2014

Abstract

Background: The evaluation of public health surveillance systems should involve an assessment of system attributes and the evaluation should emphasize on those attributes that are most important for the Objectives. Over all purpose of surveillance of all diseases is to monitor the trend against the stated tolerance limits, as early warning and response system, and pick any deviation from the limit at the earliest point in time for prompt response to assess diseases performance activities and attributes of surveillance system.

Methods and Materials: Cross- Sectional Descriptive Study Design was used to evaluate the Gondar Town Health surveillance system from July 15 to July 30, 2014. Gondar Town has 24 Kebeles, of which 13 (54.2%) and 11 (43.8%) are Urban and Rural kebeles respectively. A total of 17 Health facilities and Gonder Town Health Office were included in the study. We interviewed the surveillance focal persons and HEWs using questionnaire. The primary sampling units were selected with convenient sampling technique. Quantitative data were entered and analyzed using Microsoft office Excel 2007 and the qualitative information were summarized to support the findings.

Result: A total of 17 (32.1%) from 53 both government and private run Health Facilities and Town Health Office were evaluated. All Health Facilities do not analyze cases by time, place and person used for planning and epidemic monitoring. Eighty percent of health facilities have national PHEM guidelines and none of them posted and used the case definitions of all priority diseases, except Measles, AFP/Polio, and NNT. All reporting sites collect and report all immediately reportable diseases on weekly reporting format on weekly basis do not use daily reporting formats on daily basis. The Town reporting rate was 87.9% during 2013/14 (2006E.C). All respondents agreed that the case definitions are simple and easy to understand.

Conclusions and Recommendation: Some of the health facilities are not operating according to the set objective. Therefore; those health facilities should implement nationally set standards.

Key Words: Surveillance, Evaluation, Gonder Town

1. Background

The idea of observing, recording, and collecting facts; analyzing them; and considering reasonable courses of action stems from Hippocrates[1]. However, the first real public health action that can be related to surveillance probably occurred during the period of Bubonic Plague (early 1300), when public health authorities boarded ships in the port near the Republic of Venice to prevent illness with plague-like illness from disembarking[2].

The definition for public health surveillance most often used by the Centers for Disease Control and Prevention (CDC) is the ongoing systematic collection, analysis, and interpretation of health-related data essential to the planning, implementation, and evaluation of public health practice, closely integrated with the timely dissemination of these data to those who need to know[3]. The final link in the surveillance chain is the application of data to prevention and control.

A surveillance system includes the functional capacity for data collection, analysis, and timely dissemination of information derived from those data to persons in public health programs who can undertake effective prevention and control activities[4]. Although the core of any surveillance system includes the collection, analysis, and dissemination of data, the process can be understood only in the context of specific health events. A surveillance system should be established at the beginning of public health activities set up in response to an emergency. Public health surveillance classically comprises of six core activities (detection, registration, confirmation, reporting, analysis and feedback) that are made possible through four support activities (communication, training, supervision and resource provision) [4]. Data originated from public health surveillance system can be used for immediate public health action, program planning and evaluation, and formulating research hypotheses[5]. Those functions: 1.Guide immediate action for cases of public health importance 2. Measure the burden of a disease (or other health-related events), including changes in related factors 3. The identification of populations at high risk, and the identification of new or emerging health concerns 4. Monitor trends in the burden of a disease (or other health-related events), including the detection of epidemics (outbreaks) and pandemics 5. Guide the planning, implementation, and evaluation of programs to prevent and control disease, injury, or adverse exposure 6. Evaluate public policy 7. Detect changes in health practices and the effects of these changes 8. Prioritize the allocation of health resources 9. Describe the clinical course of disease 10. Provide a basis for epidemiologic

research[6].Surveillance system evolve in response to ever-changing needs of society in general and of the public health community in particular[4]. To understand and meet those needs, an organized approach to planning, developing, implementing, and maintaining surveillance system is imperative. Health staff conduct surveillance activities at all levels of the health system so that they can detect public health problems of concern to their community. Surveillance priorities may be communicable and non-communicable diseases, conditions or events that include national or local priorities such as acute outbreaks, maternal deaths or events associated with human health[7]. An essential function of a public health surveillance system is to be vigilant in its capacity to detect not only known public health threats with established case definitions and formal reporting channels, but also events or hazards that are not specifically included in the formal reporting system[8]. These may be events such as clusters of disease patterns or rumors of unexplained deaths. Each Public health surveillance is heavily dependent on clear case definitions that include criteria for person, place, and time and that are potentially categorized by the degree of certainty regarding as suspected or confirmed cases[9].

Efforts to establish disease surveillance system were initiated in Ethiopia in 1947 E.C when the Government issued quarantine rules[10]. Subsequently, several legal and administrative measures were taken to strengthen communicable disease surveillance. However, those efforts were not supported with appropriate resources, thus; surveillance was limited in scope and usefulness. In the health sector, various institutional arrangements were implemented to strengthen surveillance services. In 1948 E.C, an anti-epidemic service was established that later in 1951 E.C identified 35 priority diseases for surveillance; those diseases were classified into first class disease (immediately notifable) and weekly reportable, second-class diseases[10]. Those arrangements continued with several minor changes until the 1994 E.C health system reform. The health reform taking into account the resource constraints and the need for strengthening functional surveillance system selected nineteen priority diseases (including those under vertical programs) for surveillance[10].

The FMOH adapted a comprehensive strategy recommended by WHO for member states during the 48th assembly in 1998 for improving communicable diseases surveillance and response through Integrated Disease Surveillance and Response (IDSR) linking community, Health Facility, Woreda and National levels[11]. Accordingly, as a first step, a comprehensive

assessment of the existing surveillance, epidemic preparedness and response system of the country was conducted in October 1999[12]. The assessment revealed that most disease prevention programs have vertical surveillance systems, resources are scarce for surveillance at all levels, quality of surveillance is compromised by uncoordinated and multiple use of data collection tools, data are not processed timely and completely to guide health interventions, no data processing and utilization at the district level, there is hardly any feedback at all levels, and epidemic preparedness and management capability are weak[12].

The Ethiopian Ministry of Health has designed a new system 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[13]. The system is fully integrated, adaptable, all-hazards and all health approach national preparedness and response system. The system comprised of four major components which included: Public Health Emergency Preparedness, Early Warning, Response, and Recovery. The major component of the early warning is surveillance of diseases. As Surveillance is a cyclic process, it interacts and is linked with other major components and activities.

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[6]. 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 and the evaluation should emphasize those attributes that are most important for the objective.

Rationale of the study

Public health surveillance systems should be evaluated periodically to assure the effectiveness and efficiency of the systems. In Gondar Town surveillance system evaluation was not done recently and the status of public health surveillance system was not well known. Therefore, this study was conducted to determine the status of core activities of the surveillance system, describe the specific attributes of the system and identify areas for improvements.

2. Objectives of assessment

General Objectives:

To assesses the performance of core activities and attributes of surveillance system.

Specific Objective

- To assess the core activities such as case detection, reporting , analysis and response of surveillance system in the study area
- To assess the Surveillance system‟s key attributes
- To assess major challenges of quality of surveillance system
- To evaluate the attributes of surveillance system.

3. Methods and Materials

3.1 Study Areas and Sample Size

The Amhara Regional State is one of the regional states in the Federal Democratic Republic of Ethiopia**.** Administratively, the Region is divided into 10 Administrative Zones and three Administrative Towns. Gondar Town is one of administrative Towns, with 24 Kebeles, of which 13 (54.2%) and 11 (43.8%) are Urban and Rural kebeles respectively. The total population of Gonder Town was 267,957 with 47,931 (17.9%) Rural and 220,606 (82.1%) Urban residents, of which 126,649(47.3%) were male and 141,307(52.7) female. It is located at a distance of 728 K.M from Addis Ababa, the Capital City of Ethiopia. A total of 17 health facilities and Gondar Town Health Office were included in the study. We interviewed the surveillance focal persons and HEWs using semi-structure questionnaires. The primary sampling units were selected with convenient sampling technique. Quantitative data were entered and analyzed using Microsoft office Excel 2007 and the qualitative information were summarized to support the findings.

3.2 Study Time Frame:

The study was conducted from June 15 to June 30, 2006 E.C. in Gondar Town.

3.3 Study subject:

The study subjects were the Town Health Office and Health Facilities (hospitals, health centers and health posts) which were engaged in the surveillance system.

3.4 Study Design:

Cross- Sectional Descriptive Study Design was used to evaluate the surveillance system. The study was conducted as per the Updated Guidelines for Evaluating Public Health Surveillance Systems, published by the Center for Disease Control and Prevention (CDC) for the evaluation of the surveillance system.

3.5 Data Collection Tools and Procedures:

Data collections were conducted by the principal investigator. Semi-structured questionnaires were used to interview the Town Health Office and Facilities, PHEM focal person, HEWs and personal observations of documents were also conducted in the Town Health Office, and Health

Facilities. Data collected were transferred in to electronic version and descriptive analysis were performed using Spread sheet/excel.

3.6 Permission to generate data:

Permission to collect data was obtained from the Amhara Regional Health Bureau and was written to Gondar Town Health Office, Health Centers and Health Posts.

3.7 Document review:

The Principal Investigator reviewed, abstracted, and recorded data of outpatient (OPD) registers and laboratory (lab) registers especially, malaria lab result. The abstracted register data were then compared to the facility,,s aggregate weekly reports and also reviewed supervision checklists. The purpose of the document review was to understand and assess the data reporting process, and to compare data across different sources to identify any problems with data quality and completeness.

3.8 Meeting with Town Health Office Surveillance Focal Person

A brief meeting was carried out with the Town Health Office Surveillance Focal Person and the staff of the health facilities we visited. The interviews were conducted to identify factors that facilitate and/or hinder data collection and reporting and to assess the quality of supervision, training, system management, effective data dissemination and use, and the system,,s long-term sustainability. This meeting was also an important first step for our assessment.

3.9 Operational Definitions

Acceptability: Willingness of persons and organizations to participate in the evaluation of the surveillance system. It was measured quantitatively through reviewing completeness of report forms for the past three months and timeliness of data reporting

Accessibility; Ease statistical information was obtained from the agency. Those included the ease availability of information could be ascertained, as well as the suitability of the form or medium through which the information can be accessed. The cost of the information may also be an aspect of accessibility for some users.

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

Flexibility; A flexible public health surveillance system can adapt to changing information needs or operating conditions with little additional time, personnel, or allocated funds.

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

Sensitivity; Sensitivity refers to the proportion of cases of a disease (or other health-related event) detected by the surveillance system.

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

Representativeness; A public health surveillance system that is representative accurately describes the occurrence of a health-related event over time and its distribution in the population by place and person.

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

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

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

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

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

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

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

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

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

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

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

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

3.10 Data Source:

The data sources were Secondary Data or Surveillance Reports, Work Plan and Registration Books.

4. Results

4.1. Population under surveillance

According to the National PHEM Guideline, the total population living throughout the country is set to be under surveillance for all the twenty priority diseases. Thus, the Gondar Town Administration follows the same structure, with a total population of 267,975 people to be under surveillance (projected from the 2007 national census).

4.2. Availability of a National Manual and Forms

From the assessment, we found that all health centers and Hospitals, except Azezo HC and IBX General Hospital (80%) have national PHEM guidelines and none of Health Facilities except, Belajeg HC posted and used both community and standard case definitions of 15 priority diseases, whereas all Health Facilities and the Health Office had posted and used the case definitions for Measles, AFP/polio, and NNT. The Woreda Health Department had PHEM guideline, reporting formats (weekly reporting format, line list, case investigation form and daily epidemic reporting format). There was no case investigation form and daily epidemic reporting format in all Health Facilities. IBEX General Hospital did not have any PHEM reporting format during the assessment. All visited Health Facilities had outpatient and inpatient registers for recording of cases and the handling of those registers were good.

4.3. Data Reporting

The Woreda Health Office and the majority of visited Health Facilities reported that they did not run short of surveillance forms during the last three months. Weekly reports were sent to Woreda Health Office from Health Facilities using hard copies and cell phones. Currently, the Amhara Region identified 13 immediately reportable diseases and nine weekly reportable diseases; they include one additional disease known as lishmaniasis in weekly reportable diseases than nationally identified weekly reportable diseases.

Table 7 : List of Reportable Diseases/Conditions in Amhara Region, Ethiopia 2014

Immediately Reportable	Weekly Reportable
1. Acute Flaccid Paralysis(polio) 2. Anthrax 3. Avian Human Influenza 4. Cholera 5. Dracunculiasis / Guinea worm 6. Measles 7. Neonatal Tetanus 8. Pandemic Influenza A (H1N1) 9. Rabies 10. Smallpox 11. Severe Acute Respiratory Syndrome (SARS) 12. Viral Hemorrhagic Fever (VHF) 13. Yellow fever	All the above + 1. Dysentery 2. Malaria 3. Meningitis 4. Relapsing fever 5. Typhoid fever 6. Typhus 7. Malnutrition 8. Maternal Death 9. Lishmaniasis

Reporting of the identified disease should be either immediately or on weekly bases using their own reporting formats. During epidemics, the reporting procedures vary from the routine reporting. For the immediately reportable diseases, a single suspected case is considered as a suspected outbreak. Therefore, suspected outbreak of those diseases should be notified from level to level Within 30 minutes of identification, but in the area all reporting sites collect immediately reportable diseases through the weekly reporting format on weekly basis and report it to the next higher level and also the suspected outbreak is not notified within 30 minutes to the next higher public authority. Different reporting tools are developed nationally to facilitate the reporting of the identified diseases and conditions to be utilized at different levels of the health system. The study sites did not use appropriate reporting formats to report the diseases. They used weekly reporting format for daily reportable diseases and during outbreak they did not use case reporting formats and line list. All HPs/HCs report to the Woreda Health Office from Monday to Tuesday Morning using weekly reporting formats and by Phone, and Woreda Health

Office report to the Regional PHEM Office on Wednesday until mid-day using E-mail, this reporting schedule meet nationally seat standard.

Table 8: The Reporting Rates under Gonder Town Health Office by Epi-week, Ethiopia, 2014.

Epi week	Hospitals		Health Centers		Health Posts		Private Clinics		Totals	
	Expected	Reported	Expected	Reported	Expected	Reported	Expected	Reported	Expected	Reported
14	2	2	8	8	16	16	7	7	33	33
15	2	2	8	8	16	16	7	7	33	33
16	2	2	8	8	16	16	7	7	33	33
17	2	2	8	8	16	16	7	7	33	33
18	2	2	8	8	16	16	7	7	33	33
19	2	2	8	8	16	16	7	7	33	33
20	2	2	8	8	16	16	7	7	33	33
21	2	2	8	8	16	16	7	7	33	33
22	2	2	8	8	16	16	7	7	33	33
23	2	2	8	8	16	16	7	7	33	33
24	2	2	8	8	16	16	7	7	33	33
25	2	2	8	8	16	16	7	7	33	33
26	2	2	8	8	16	16	7	7	33	33

The Town Reporting Rates(%) in a week= [Number of Reports in 12 weeks in the Town/ Expected Numbers of Reports in 12 weeks]*100

The weekly reporting rate of the Woreda Health Office and all visited Health Facilities in the past 12 weeks prior to assessment were 100% (Table 8).The overall reporting rate during 2013/14 (2006E.C) was 87.9% for the Town Health Office.

4.4. Data Analysis and Dissemination

Staff of all visited health facilities have taken training of PHEM surveillance systems and those who were trained have given onsite orientation to Health Extension Workers and other Health Staffs at their respective sites. The Woreda Health Office and all Health Centers and Hospitals had computer, but none of them used them for data entry and analysis, except the Woreda Health Office and the Gondar Referral Hospital.

The Woreda Health Office and all visited Health Facilities had denominators for total population, Male, Female and under five years children which are very important to calculate attack rates and determine burden of disease. The Health Centers send their result of analysis to the Woreda Health Office. The analysis result was not described by time, person and place. It only includes total cases, deaths and activities performed. At the Woreda level, analysis of surveillance data was done quarterly, every six months and annually. This is because they were required to report for the administrative level not for real-time intervention of public health problems. During the assessment the Woreda Health Office has done the analysis of the Measles outbreak data by time, place and person for only reporting purpose not for the purpose of timely taking actions.

4.5. Epidemic Preparedness and Response

None of the health facilities had written emergency preparedness and response plan for any of the outbreak prone diseases relevant to the area, but the Health Office has it. All visited Health Centers have epidemic management committees with rapid response team, but the committee meets only during emergency and none of them produce minutes of the committees meeting. From the assessed Health Centers, none of them experienced shortage of drugs during recent measles epidemics even though there were no emergency stock of drugs and supplies, and no budget for emergency response. The Woreda Health Office has emergency stock of drugs and supplies. There were no vehicles assigned for Emergency response.

4.6. Outbreak Investigation and Confirmation

All Health Centers had no outbreak investigation checklist and there was one measles outbreak and also numbers of suspected outbreaks like rabies in the Town in the past six month. The Health Professionals working in all sites detect any suspected cases of diseases not based on both the standard and community case definitions stated on the National PHEM guide line. The laboratory confirmation for most of diseases under surveillance can be performed at regional levels. However, samples of a few diseases like Measles, Rabies and Polio are sent to National Laboratory to be examined at this level or to be sent to more advanced laboratories abroad. The Town Health Office and all Health Facilities had no capacity to transport specimens and had problem of skills to collect the samples of rabies cases, all reported cases were suspected rabies cases which had not been confirmed by Laboratory.

4.7. Supervision and Feedback

The Woreda Health Office had supervision plan and accomplished as per the plan. All visited Health Centers and Health Posts had no plan for supervisions. The Regional Health Department conducted supervision twice to the Town Health Office in the year 2013/2014 and the Town Health Office supervised all Health Centers, Health Posts and the two Hospitals two times during the same year. No written documents were available or used during the supervisory visits, except the Regional PHEM Office. Regional and the Town Health department provides feed back to their reporting units, but the Town as well as Health Centers had not practiced written feed back to the their respective reporting units in the last 12 months.

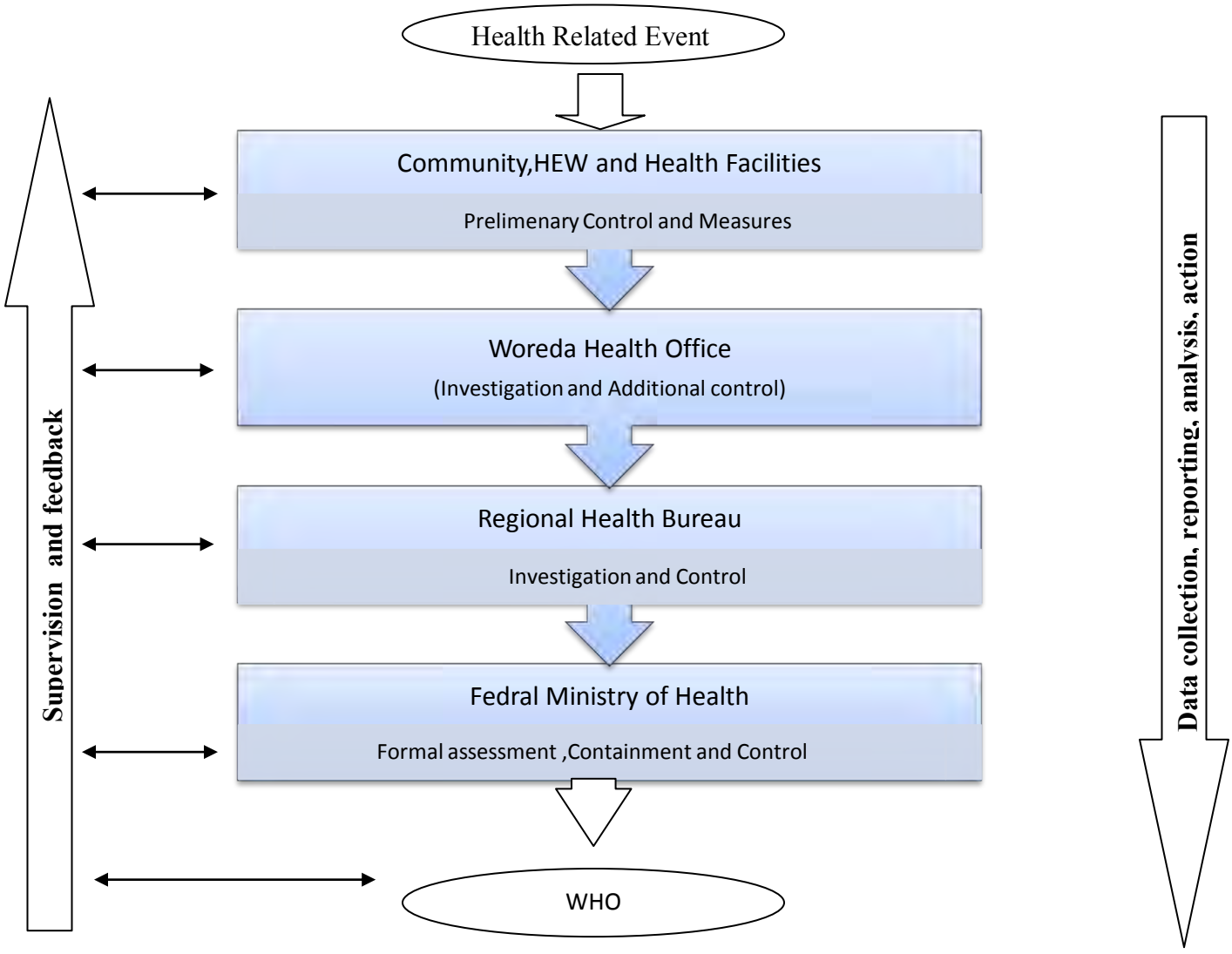

Figure 10: Flow Chart of Information in the Surveillance System in Gonder Town, Ethiopia, 2014

4.8. Resources and communications Facility

Surveillance focal persons were available in all Health Centers, but not assigned only for surveillance activities. Resources like computer with printer, motor cycles, stationeries, telephone for data management, and logistics are available in the Town Health Office. All visited Health Centers and Health Posts lacked internet access, Fax and Generators.

4.9. Surveillance system Attributes

4.9.1. Usefulness

The respondents confirmed that the surveillance system is helpful for early case detections and based on the information take actions to prevent epidemics. And claimed that the surveillance system is useful to determine the magnitude of morbidity and mortality due to diseases in the community, in addition to that, it is important to assess the effectiveness of prevention and control programmes for priority diseases.

4.9.2. Simplicity

Simplicity of the surveillance system was examined to see how case definitions of priority diseases are simple, easy and understandable and helpful for data organizing, entry and data analysis. All respondents agreed that the case definitions for all priority diseases are easy to understand and are applied by all Health Professionals. But, all Health Professionals did not use and apply both community and standard case definitions of the majority of the reportable diseases posted on their offices except, Measles, NNT, and Polio. The reporting formats of priority diseases are also very easy to understand and fill data by all Health Professionals. The Woreda Health Office needs less than five minutes to fill the form and from 10-15 minutes is required by Health Facility Professionals to fill the form.

4.9.3. Flexibility

All visited Health Office and Health Facilities declared that the reporting formats and procedures were flexible and could be used for other newly emerging health events (diseases) without much difficulty. This is due to the availability of a blank column for others. All respondents replied that the surveillance systems are easy to integrate with other systems. It is also easy to use technologies.

4.9.4. Data Quality

We observed complete reporting formats without blank or unknown response variables in the last one month in all visited Health Facilities and Woreda Health Office. The problem was that immediately reportable diseases were not reported using the proper formats. Data were also

reported using telephone on weekly basis. Collection and registration of data had some gaps like clinical registers and reporting formats are not uniform which compromised the quality of data. Quality of data was influenced by diagnostic test that the health professionals did not use standard case definitions of the majority of reportable diseases.

4.9.5. Completeness

Completeness of reporting sites refers to the proportion of reporting sites that submitted the surveillance report irrespective of the time when the report was submitted. Hence, the percentage of completeness of reporting sites in the Town was 87.8 %.in 2006 E.C. Low report was from July to September 2006 E.C.

4.9.6. Acceptability

All level of health personnel, especially those working at Governmental health facilities have high willingness to participate in the surveillance system, but some reluctance was noted in Private Health Facilities. Only33 (62.3%) out of the 53 of the Health Facilities were engaged actively in the surveillance system. The reason for the poor participation of the Private Health Facilities is due to lack of understanding of the relevance of data to be collected and also due to some communication barriers.

All Governmental reporting agents were eight (100%) Health Centers and 14 (100%) Health Posts respectively have accepted and have been engaged in the surveillance system, but majority of the reporting agents did not use appropriate reporting formats.

4.9.7. Sensitivity

Sensitivity in surveillance refers to the proportion of cases of a disease (or other health-related event) detected by the surveillance system.

The measurement of the sensitivity of a public health surveillance system of the area was varying for different diseases for different factors. For examples, in the case of rabies, the community traditionally had given loose case definition by themselves which caused the case definitions to be very sensitive, but it was difficult to know the true positive value due to the absences of laboratory confirmations. The other issue was the community medical care seeking behavior

especially for rabies was very high which made the system very sensitive. In the case of measles the standard and community cases definitions were available and posted at all health office and health facilities for detection of suspected cases using the case definition. But by Early detection of measles cases by professionals is still challenging though very well identified by the case definition. Tradition in the Town, like other Amhara region is that all children are expected to be infected with measles during their lifetime. Therefore, mothers did not typically seek medical care for their children with measles, unless the illness was followed by complications and for this reason the sensitivity of measles case detection was compromised.

4.9.8 Predictive value positive

The predictive value positive couldn't be calculated for all reportable diseases as the total number of persons actually with disease was not determined, especially rabies cases due to the absence of laboratory confirmations.

4.9.9. Representativeness

Representativeness shows how far the routine surveillance report is covered by the health service delivery system and how many facilities are reporting to the offices. According to the town health office, the health service coverage of the Town was 74.6% in the year 2006 E.C and all the visited Health Facilities and Office replied that both the rural and urban community benefited from the surveillance systems equally. The routine surveillance covers all Governmental Health Facilities and some Private Health Facilities. The weekly reporting formats lack some important variables like age, sex and other possible risk factors which are important epidemiologically that help to develop information to take appropriate actions.

4.9.10. Stability

All interviewed Health Facility and Health Office personnel responded that any new restructuring like BPR did not affect the procedures and activities of the surveillance. Conditions like lack of resources did not interrupt the surveillance systems in 2006 E.C.

4.9.11. Timeliness

The single most important measure of timeliness is whether data are submitted in time to begin investigations and implement control measures. Thus, timeliness of reporting was not measured according to the National PHEM Guidelines due to absence of date of receipt and date of report. According to the findings the surveillance report Timeliness of the Town was 100% in the last three months (from April-June/2006 E.C) as per the Town Health Office surveillance focal person because of accessibility and availability of transportations and telecommunications in the Woreda. Late reports are less important for Public health emergency management. Gondar Town which was at higher risk of immediately reportable diseases like, Rabies, timeliness of report is very important to find out abnormal increases in the number of cases and to take immediate actions.

5. Discussions

We found that a total population of 267,975 people were under surveillance in Gondar Town from projections of 2007 national census, but all reported cases and deaths were not only from those catchment populations, there were cases who came from neighboring areas seeking treatment in Gondar Referral Hospital.

The understanding of the Health Professionals and treatment seeking behavior of the community were found to be good for some diseases like rabies and weak for other diseases (measles) which influenced early detection and intervention of cases accordingly. In all Health Facilities, except Belajeg Health Center and Town Health Office were not available and posted the standard and community case definition of the majority reportable diseases.

The reporting date and use of reporting format for cases from Health Facilities to Town Health Office were not according to the National PHEM Guide line. Immediately reportable priority diseases should be reported daily with daily reporting formats, but in the area all health facilities reported on weekly bases with weekly reporting formats. The reporting rate of the Town Health Office within 12 weeks from Epi week 14, 2014 to 26, 2014 was 100% which was very good from expected 80%; this is due to good performance of all reporting agents due to accessibility of transportation and availability of telecommunication to provide and send the information to the respective higher reporting level. There were no registered documents to know and identify timeliness, but orally the Town Health Office surveillance focal person said that it was 100% in the last 12 weeks.

In Health Facilities and Town Health Office, surveillance focal persons were assigned, but in Health Facilities due to turn over and other work assignments to focal persons, it was difficult to accomplish the task as needed.

The surveillance data should be analyzed daily and on weekly bases to generate information for action. But the reported cases in all Health facilities were not done, except in the Town Health Office. The analysis was just for the week of reporting to the higher level helping nothing for immediate action. More over the computers in the health facilities were not used for data entry and analysis due to lack of training in data management and also the computers not assigned to surveillance data entry.

There is no strong feedback mechanism from Town Health Office to Health Facilities, but from the Region to Town Health Office it was good. Regional and the Town Health Department provides feed back to their reporting units, but the Town as well as Health Centers had not practiced written feed back to their reporting units in the last 12 months. The Woreda Health Office had supervision plan and accomplished as per the plan. All visited Health centers had no plan for supervisions. The Regional Health Department conducted supervision twice to the Town Health Office in the year 2013/2014 and the Town Health Office supervised all Health Centers, Health Posts and the concerned two Hospitals two times during that year.

6. Conclusions

Some of the health facilities are not operating according to the set objective of surveillance for public health action. Both community and standard case definitions were not posted and not used in some of the visited health facilities for some of the reportable diseases and also were not reported with appropriate reporting formats. The overall structural set up of the surveillance system in the Town was good, but in the creation of responsible unit /full time surveillance focal person are not assigned at each health facility level and majority of private health facilities are not engaged accordingly

7. Recommendations

- Surveillance focal persons should be assigned full time only for surveillance activities.
- All Health Professionals should post and use the case definitions of all identified priority diseases and report accordingly.
- The surveillance focal persons in Health Facilities should get refresher training on the PHEM guideline and data analysis and data should be analyised, interpreted and used for decision making.
- The Town Health Office should ensure the Timeliness of the report.
- Budget and resources should be available at the health center level for emergency purposes.
- All private health facilities should be engaged accordingly.

8. Limitation of the assessment

- Shortage of time to see and characterize all priority diseases.
- Sampling methods and sample size could be the limitations of this assessment.

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Chapter IV -Health Profile

Fentale Woreda, Oromia Regional State, Health Profile Assessment Report, 2014

Executive Summary

Health profile is presentation and discussion of health related data and important health related indicators to describe the health and related socio-demographic factors in the geographic area under discussion. The health profile will be a living document, with sections added to the health unit and allow for better response to changing demography and health of the residents of the area

Health problems are worse in pastoralist areas of Ethiopia, due to many factors like poor economic status, low health service coverage, lower education, poor infrastructure and frequent occurrence of drought. Therefore, it was necessary to assess and describe the health profile to identify the health constraint and service status of the Fentale Woreda.

Interview using structured questionnaire were the main tools for primary and secondary data collection. The Woreda Health, Agriculture, Finance and Economic, Education, Water, Energy, Transport and the Woreda Administration Bureau were visited and asked to fill the questionnaires that related to their respective sector. Finally data were compiled and analyzed manually and using Microsoft Excel and GIS was used for mapping. The general objective of this health profile description was to describe key aspects of the health status and demographics of Fentale Woreda.

Fentale is one of the woredas in the Oromia Region of Ethiopia. It is Part of the Misraq Shewa Zone located in the Great Rift Valley, 198 kms from Addis Ababa, the capital city of Ethiopia. It extends between 8^0 42‟-8^0 09‟N latitudes and$39^0$39‟-$40^0$04‟E longitudes. It has 18 kebeles and one big sugar factory camp with a total population of 71,722 of which 38,453 (53.6%) were male and 33,268 (46.4%) were female. Most of the residents were Oromo nationalities and more than 95% of them Muslim religion followers. The total household in the Woreda was 13,254 with an average family size of 4.8. Livestock rearing was the major agricultural practice in all 18 kebeles. The health sector takes 12.74 % (4,311,136 ETB) of the Woreda budget in the year 2006 E.C. The budget allocated for the health sector decreased by 2.2 % from the previous year.

In the year 2012/13 the numbers of students enrolled were 11,213 of which 5970 & 5243 were males and females students respectively. In all levels male outnumbered female students, except students enrolled in 11-12 grade level school.

Safe water supply and latrine coverage in the Woreda was 39% and 68% respectively. There was low coverage of transport, telecommunication, and power supply in the Woreda. However; there is sufficient health infrastructure in the Woreda, the immunization coverage of the Woreda was not satisfactory. The Woreda has a total of 119 health workers and 26 supportive employees. Acute Upper Respiratory Infections were the top leading causes of OPD visit for three consecutive years in the area. All kebeles of the Woreda are under risk of malaria infection throughout the year. The Woreda TB and HIV/AIDS prevalence was 5.2 per 10,000 population and 165 per 10,000 populations respectively.

Acute Upper Respiratory tract Infection, Diarrhea, and Malaria were the leading causes of Morbidity in the Woreda which was attribute to lack of clean drinking water, poor sanitation and low public awareness of environmental health and personal hygiene practices and low coverage and utilization of ITN and IRS. Malnutrition was also the main problem of the Woreda. Therefore, all stakeholders need to do a lot to overcome all the mentioned health problems of the area.

1. INTRODUCTION

Health profile is presentation and discussion of health related data and important health related indicators to describe the health and related socio-demographic factors in the geographic area under discussion. The health profile will be a living document, with sections added to the health unit and allow for better response to changing demography and health of the residents of the area. The data in a profile reflect the health of a given community from many different angles[1]. A community can refer to a county, a locality within a county, a tribe, or a multi-county region. The information may include data already collected and published about a community or information collected by the organizations or individuals creating the profile. As societies grow more complex and people are increasingly bombarded with health information and misinformation, health literacy becomes essential. People with strong health literacy skills enjoy better health and well-being, while those with weaker skills tend to engage in riskier behavior and have poorer health.

Health Profiles are designed to help local government and health services identify problems in their areas and decide how to tackle them[2]. They provide a snapshot of the overall health of the local population, and highlight potential problems through comparison with other areas and with the national average. In general, health profile is summarized auditing and discussing health related data and important health related indicators to describe the health and related social, economical, political and cultural factors in the geographic area under discussion. Subsequently, it is vital for prioritizing major health and health related problems of the community at any level. It is for planning and for appropriate intervention and is an entry point for operational research. Stake holders of health and health related issues will access evidence based information from well compiled health profile, but such valuable information is may not found in Fentale Woreda, Oromia Region.

Rationale

Health profile assessment is a way to gain a snapshot of a community‟s current assets and needs by examining and recording community strengths, challenges, and resources. Therefore, an assessment of current health profile of a Woreda is important to provide a way for a coalition to get a better understanding of the community‟s health and what the current needs may be. Fentale

Woreda is found in Oromia Regional State where most residents were pastoralists. Health problems are worse in pastoralist areas of Ethiopia due to many factors like poor economic status, low health service coverage, lower education, poor infrastructure and frequent occurrence of drought. Therefore, it was necessary to assess and describe the health profile to identify the health constraint and service status of Fentale Woreda.

2. Objectives

General Objective

- To develop Fentale Woreda health profile that could guide government health sector at all levels and different health partners to clearly identify communities health needs.

Specific Objectives

- To review existing health profile of Fentale Woreda
- To package and simplify complex health information in the Woreda
- To communicate the local burden of disease and other health related information in a practical, accessible format

3. Methods and Materials

From May 05-12/2014 health and health related data were collected in Fentale Woreda. Interview and Structured Questionnaire were the main tools for primary and secondary data collection. Health and health related data were collected from all stakeholders that have direct or indirect connection with health. The Woreda Health, Agriculture, Finance and Economic, Education, Water, Energy, Transport and the Woreda Administration Bureau were visited and asked to fill the questionnaires that are related to their respective sectors. An interview was conducted to the relevant health worker and officials. Different health related records were also checked. In addition to this, data that were missed during the field visit were obtained by phone from the concerned persons of the sectors. Support letter was written to the Oromia Regional Health Bureau from EPHI to cooperate during the data collection period. Spreads sheet/excel, and GIS were used to analize the data.

4. Results and Discussions

4.1 Background of the Woreda

The current Fentale Woreda prior to 1988 was administered under the Yerer and Kereyu Awraja along with other ten districts (Dulecha, Fentale, Boset, Lume, Ada‟a, Liben- Chukala, Gimbichu, Minjar, Shenkora and Berehet) of Shewa Administrative Region. During that period Awash Town (currently in Afar Region) was the capital of the District. In 1988, during the formation of Peoples‟ Democratic Republic of Ethiopia, two Districts “Fentale” and “Berehet” were integrated forming what was known as “Fentale-Berehet” Awraja with Metahara as a capital of Awraja. This structure continued during the transitional period (1991-1993), even after the downfall of the Derg Regime. With the formation of Regional States in 1993 Fentale, was restructured as an independent District of East Shewa Zone with Metahara Town as the district capital. After 1993, Berehet, Minjar, Shenkora and Dulecha districts were included under the Amhara Regional State. Currently, the Woreda undertakes its administrative duties and responsibilities in 18 kebeles, excluding Metehara Town.

4.2 Geography and climate

Fentale is one of the woredas in the Oromia Regional State of Ethiopia. It is Part of the Misraq Shewa Zone located in the Great Rift Valley, 198 km from Addis Ababa, the capital city of Ethiopia. It extends between 8^0 42‟-8^0 09‟N latitudes and$39^0$39‟-$40^0$04‟E longitudes. It is located in the northeastern part of East Shewa Zone. It is bordered by the Amhara Regional State in the west and northwest, with the Afar Regional State in the north and northeast; with West Hararghe and Arsi zones in east; and with Boset Woreda and Arsi zone (Merti Woreda) in south and southeast. It surrounds the administrative Town of Metehara in all directions and covers 1364.72 km^2. Most part of the Woreda has tropical agro-climate. Though the altitude of the Woreda is tropical; the temperature of the Woreda is influenced by the Rift Valley floor topography. As a result the mean annual temperature over the vast part of the Woreda (about 95% of the Woreda area) ranges from 23-25^0_c. The rainfall is weakly bi-modal with spring a small rainy season during the months of April and May while summer along rainy season during the months of July,

August and September. The vast area of the Woreda annual rainfall varies between 500 and 900 mm. Even there are areas with mean annual rainfall of less than 500mm.

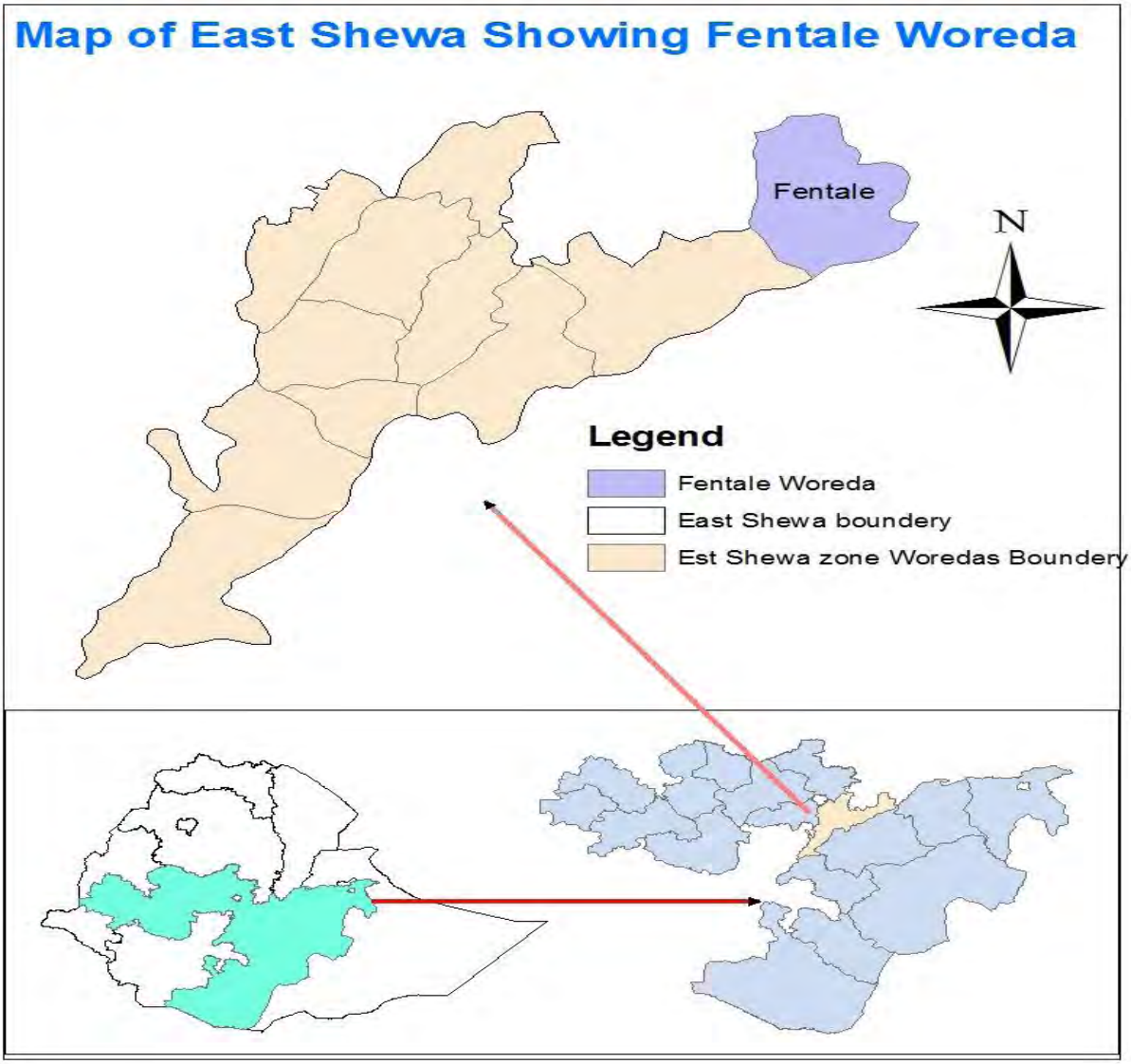

Figure 11: Fentale Woreda East Shewa Zone, Oromia Region, Ethiopia, 2014

In the Woreda there were a total of 18 kebeles and one big sugar factory camp and all 18 kebeles are rural. The Woreda has its own council and representative in the Federal Parliament. All governmental sector offices were found in the Town of Metehara.

4.4 Demography

According to the 2007 census and projections, in the year 2012/13 the size of Fentale Woreda population, including 18 kebeles and Metehara Sugar Factory was 71,722 of which 38,453 (53.6%) male and 33,268 (46.4%) female which make more male than female in the sex ratio (Table 9). The pyramidal age structure reflects that 31,557(44 %) were children under age 15 and predominant age group accounting for nearly half (46.8 %) of the total population found between 15 and 44 years, feature of this populations (between15 and 44 years) with high fertility levels, while only about 3694 (5.2%) of population were above 44years. Most of the residents were Oromo nationalities and more than 95% of them Muslim religion followers. The total household in the Woreda was 13,254 with an average family size of 4.8.

Table 9: Demographic data by Kebeles, Sex and Residency, Fentale Woreda, Ethiopia, 2014

S.N	Kebeles	Total Population	HHs	Sex		Residency	
				Male	Female	Urban	Rural
1	Alge	1471	692	794	677		1471
2	Dheka Hedu	1298	278	701	597		1298
3	Benti	2467	529	1332	1135		2467
4	Dhebit	1572	254	849	723		1572
5	Fate Lade	2541	485	1372	1169		2541
6	Galcha	2044	438	1104	940		2044
7	Gara D ima	1739	373	939	800		1739
8	Gidara	2352	515	1270	1082		2352
9	Godo Fafate	1620	347	875	745		1620
10	Gola	2038	477	1101	937		2038
11	Haro Karsa	1002	215	541	461		1002
12	Ilala	1633	350	822	751		1633
13	Kanifa	1837	394	992	845		1837
14	Sara Weba	2361	506	1275	1086		2361
15	Turo	2078	405	1122	956		2078
16	Tututi	5087	612	2747	2340		5087
17	Dire Saden	2510	538	1355	1151		2510
18	Qobo	3865	448	2087	1778		3865
19	MSF	22543	5398	12173	10370	camp	22543
	Total	**71,722**	**13,254**	**38,453**	**33,268**		**71,722**

4.5 Economic situation

Livestock rearing is the major agricultural practice in all 18 kebeles, which make a substantial contribution to the economy. Most rural farming, transport and source of income do directly or indirectly link with them. Livestock diseases continue to have major impacts on the economy, either through direct loss of livestock and source of a disease to human. The Woreda Finance and Economy Office identified 821(2.4%) Government Employees, 943 (2.8%) Private Employer, 1812 (5.4%) Daily Laborers 3709 (11%) were Jobless and the remaining are categorized under pastoralist in the Woreda.

4.6 Health budget allocation

Based on the information from the Woreda Finance & Economic Development Office, the annual budget allocated from the Region in the year 2013/14 for the Woreda was 33, 842, 149, ETB. Of that the amount budgeted to the Woreda Health Office was 4,311,136 (12.74%), ETB. The budget allocated for the health sector decreased by 2.2 % from the previous year. Additional budget has been allocated to the Woreda Health Office from donors and partners and it was difficult to find out the recorded and documented amount of the donors and partners part.

Table 10: Government Budget from 2003-2006 E.C, Fentale Woreda Oromia Region, Ethiopia, 2014

year	Woreda budget(ETB)	Woreda health budget(ETB)	Proportion of Health budget	Remark
2003 E.C	15,334,859	1,320,291	8.6	
2004 E.C	21,342,672	2,176,994	10.2	
2005 E.C	26,702,200	3,988,982	14.94	
2006 E.C	33,842,149	4,311,136	12.74	

4.7 Education

Education is a key determinant of individual opportunities, attitudes, and economic and social status. Studies have consistently shown that educational attainment has a strong effect on reproductive behavior, fertility, infant and child mortality and morbidity, and attitudes and awareness related to family health, use of family planning, and sanitation[3]. In the year 2012/13,

in the Woreda there were 7 (K.G) grade-level of school. Similarly there were 35 (1- 8) and 2 (9-10) grade-level of schools. It had one Preparatory school (11-12). The numbers of students enrolled were 11,213 of which 5970 & 5243 were males and females students respectively (Table 11).

Table 11: School Enrolment by Sex Fentale Woreda Oromia Region, Ethiopia, 2014

S.N	Grade	Sex		Total	GPI
		Male	Female		
1	K.G	450	421	871	.94
2	1-4	2741	2473	5214	.90
3	5-8	1956	1622	3578	.82
4	9-10	615	498	1113	.80
5	11-12	208	229	437	1
	Total	5970	5243	11,213	.88

Based on Gender Parity Index (GPI) shown table 11, in all levels males outnumbered females students, except students enrolled 11-12 grade level school which is contradicts with the national report in 2003E.C[4]. According to this report, primary school attendance was slightly higher than 1and secondary school attendance was lower than one. Therefore, a lot needs to be done to fill the gap of male to female proportion in the primary school and secondary school (1-10 grade level school).

4.8 Water Supply coverage

Fentale Woreda is found in the Rift Valley, which is characterized by high temperature, low and unreliable distribution of rainfall. Despite this fact, the Woreda has no enough surface and ground water (thought to be the effect of fluoride) resources. Awash River does act as the main source of water supply to the community. The total safe water supply coverage in the Woreda was 39% based on the Woreda Water and Energy Bureau information. In the Woreda, only Gelcha and Gola were getting safe water through pipe. Thus, the Woreda has high demand of water for all sorts of consumptions.

4.9 Transport, Telecommunication, Power supply

The total length of all weather roads in the Woreda was 250 K.Ms. regarding the road type, 42 K.Ms were asphalted and the remaining being dry weather roads. All kebeles have access to transportation and the recent cell mobile net work system covers the whole kebeles. In energy resource, 1992 households and 40 households were covered by hydroelectric power and solar energy respectively. Only one Health Center and one School had electricity power in the Woreda.

Woreda Health Office Structure

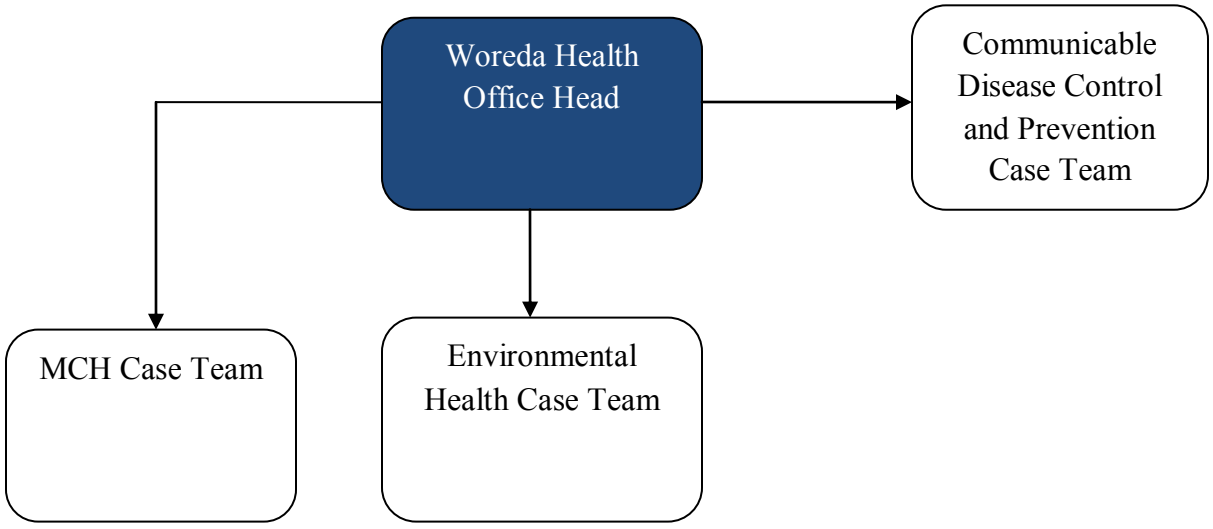

Figure 12: Woreda Health office Structure, Fentale Woreda Oromia Region, Ethiopia, 2014

The Woreda Health Office structure was organized under three case teams, MCH and Environmental Health Case Team lead by the case team leader and Communicable Disease Control and Prevention Case Team directly under the Woreda Health Office Head. The functions of those teams are:

- Undertaking all management responsibilities to ensure smooth implementation of health services in the Woreda

4.10 Health Infrastructure

The numbers of health institutions administered under the Bureau of Health that directly provide services to all people of the Woreda. In 2005 E.C there were four health centers and 18 health

posts. One Hospital and six Clinics mainly provide service to the Metehara Sugar Factory Workers found in the Woreda. And also two private Clinics were found in Algae kebeles.

Table 12: Health Service Coverage, Fentale Woreda, Oromia Regional State, Ethiopia, 2014

S.N	Type of Health Institution	Number	HF: population Ratio	Remark
1	Government Hospital	0		
2	Government Health Center	4	1:17931	
3	Government Health Post	18	1:3985	
4	Other Government Hospital	1	1:71722	
5	Other Government Clinics	6	1:11,954	
6	Private Clinics	2	1:35861	
	Totals	31		

Based on the health extension program one Health Post serves for 5,000 people, one Health Center Serves for 25,000 people and one District Hospital Serves 100,000 people. This makes the Woreda health service coverage about 100%.

4.11 Human resource; health workers and supportive staffs

The Woreda had a total of 119 health workers and 26 supportive employees. The health workers found in the Woreda were; two General Practitioners , one Health Officer ,34 Nurses , six Mid wives , three Laboratory Technicians , six Pharmacists , one Environmental Health worker, two Health Information Technologists , and 64 Health Extension Workers (Figure 13).

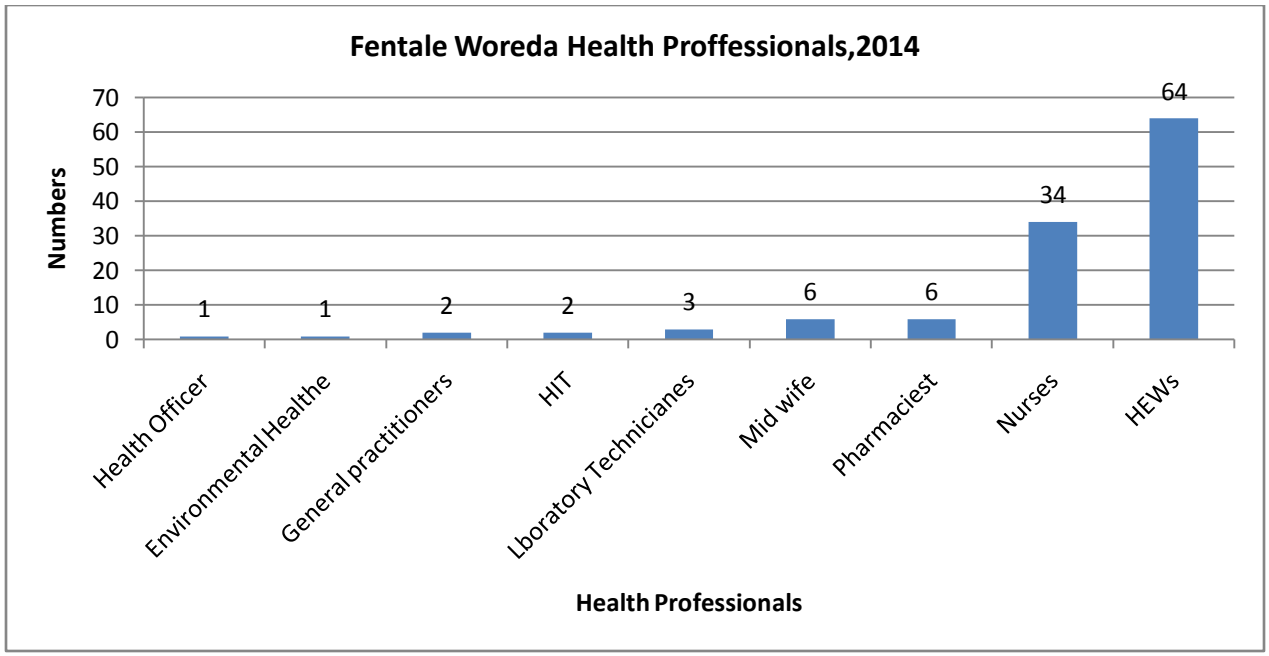

Figure 13: Health Professionals, Fentale Woreda, Oromia Region, Ethiopia, 2014

4.12 Vital statics

Regarding vital statistics, there were 385 per 10,000 populations and 1.4 per 10,000population crude birth rate and crude death rate respectively and there was no recorded maternal death in the year 2005 E.C in the Woreda. In the Woreda it was not possible to find out infant mortality and child mortality status.

4.13 Immunization Coverage

The history of immunization services in Ethiopia prior to 1980 has not been documented very well although the smallpox eradication activities have left some legendary memories[5]. The Expanded Program on Immunization (EPI) was launched in Ethiopia in 1980 based on the international, as well as national, experiences and resources gained during the smallpox eradication activities in the late 1970s[6]. The Fentale Woreda Health Office has been delivering vaccination for children for preventing and control of vaccine-preventable diseases. The immunization coverage in the Woreda in 2012/13 were 1676 (69%) for BCG, 1140 (63%) for Measles, 1445 (63.5%) for DPT3, 1470 (65%) for PCV3, 1168 (51%) for PAB and 1397 (61%) for fully immunization (Table 13).

Table 13: Immunization Coverage by antigen, Fentale Woreda, Oromia Regional State, Ethiopia, 2014

S.N	Antigen	Plan to Vaccinate	Coverage	Percent
1	BCG	2417	1676	69
2	Measles	2274	1140	63
3	Penta 1	2274	1803	79
4	Penta 3	2274	1445	63.5
5	PCV 1	2274	1829	80
6	PCV 3	2274	1470	65
7	PAB	2274	1168	51
8	Fully Immunization	2274	1397	61

The Woreda immunization coverage was not satisfactory compared to the Region and the National immunization coverage (Table 13). Therefore, the Woreda Health Bureau should do a lot to maximize the immunization coverage.

4.14 Maternal Health Service

Proper medical attention and hygienic conditions during delivery can reduce the risk of complications and infections that can cause the death or serious illness of the mother and/or the newborn baby. An important component of efforts to reduce health risks to mothers and children is increasing the proportion of babies that are delivered in health facilities. In Fentale Woreda, there were 2674 estimated pregnant women in 2012/13. Among those women 2164 (81%) got antenatal care service, 273 (21%) had their delivery attended by skilled birth personnel, 75 (10%) had their delivery by Health Extension Workers, 747 (>100%) their delivery by Traditional trained birth attendants and 1374 (56%) was the Post natal care coverage of those Target Eligible in the Woreda (Table 14).

Table 14: Maternal health service Fentale Woreda, Oromia Region, Ethiopia 2014

S.N	Service delivered	Target Eligible	Coverage	%
1	Family Planning	13197	8280	63
2	Ante natal Care (ANC)	2674	2164	81
3	Skilled Delivery	1317	273	21
4	Delivery by HEW	731	75	10
5	Delivery by TTAB	391	747	>100
6	Post natal Care (PNC)	2439	1374	56
7	TT2+ Non-Pregnant Women	13197	1905	14
8	TT2+Pregnant Women	2654	1016	38

One of the targets of the Ministry of Health, with respect to improving maternal and child health is to increase the contraceptive prevalence rate (CPR) to 66 percent by 2015[7].The Woreda contraceptive prevalence rate was promising to achieve the national program, A similar pattern was observed in other maternal and child health services. The Woreda post natal care coverage (56%) is higher than compared to the national report (42.1%) in 2003E.C.

4.15 Environmental Health and Sanitation

Environmental health programme is one of the main components of the current National Health Policy as it is evident that environmental factors are major determinants of public health outcomes. The main objective of the programme is to contribute to the attainment of a significant reduction in morbidity and mortality due to environmental health related conditions. Ensuring adequate sanitation facilities is another Millennium Development Goal that Ethiopia shares with other countries. Regarding Latrine coverage in Fentale Woreda, there were 9002 (68%) in the year 2012/13 (Table 15).There was no solid and liquid waste management facility in the Woreda. The Woreda health education has been focusing on raising awareness in the population on the relationship between their health and their surroundings.

4.16 Community Health Service

There was active involvement of the community in planning and implementing of all disease prevention and control activities in the Woreda. In this process, there were 64 EHWs, 15

traditional birth attendants (TBAs), 290 Community Health Workers (54 on malaria, 200 on nutrition, 36 on EPI) and religious leaders, agricultural development workers, teachers, women and youth association. There were also International and Local NGOs who support the Woreda community health service activities technically and financially.

Table 15: Latrine coverage by House Hold, Fentale Woreda, Oromia Region, Ethiopia, 2014

S.N	KEBELE	HOSE HOLD	LATRINE COVERAGE	%
1	Alge	692	412	60%
2	Benti	529	161	30%
3	Dheka Hedu	278	98	35%
4	Dhebit	254	29	11%
5	Fate Lade	485	395	81%
6	Galcha	438	174	40%
7	Gara D ima	373	211	57%
8	Gidara	515	180	35%
9	Godo Fafate	347	168	48%
10	Gola	477	212	44%
11	Haro Karsa	215	33	15%
12	Ilala	350	146	42%
13	Kanifa	394	122	31%
14	Sara Weba	506	141	28%
15	Turo	405	174	43%
16	Tututi	612	314	51%
17	Dire Saden	538	245	46%
18	Qobo	448	189	42%
19	MSF	5398	5398	100%
	Total	**13,254**	**9002**	**68%**

4.17 Top ten leading causes of OPD visit (morbidity)

According to the information obtained from the Woreda Health Office, the ten leading causes of outpatient visit in the Woreda during 2003, 2004&2005 E.C are listed below in their descending order (Table 16, Table 17 and Table 18).

Table 16: Top ten causes of OPD during 2003 E.C, Fentale Woreda, Oromia Region, Ethiopia, 2014

	DEASESE(2003)	No of cases	%
1	Acute upper respiratory infection	10851	30%
2	Diarrhea non-bloody	4293	12%
3	Trauma	4040	11%
4	Malaria clinically	3019	8%
5	Disease of musculoskeletal system and connective tissues	2628	7%
6	Acute febrile illnesses	2613	7%
7	Urinary tract infections	2453	7%
8	Dyspepsia	2160	6%
9	Pneumonia	2147	6%
10	Helminthes	2032	6%

Table 17: Top Ten Causes of OPD during 2004 E.C, Fentale Woreda, Oromia Region, Ethiopia, 2014

No	DEASESE(2004)	No of cases	%
1	Acute upper respiratory infection	13938	25%
2	Diarrhea non-blood	6908	13%
3	Acute febrile illness	6035	11%
4	Malaria clinically	4722	9%
5	Disease of musculoskeletal system and connective tissue	4685	9%
6	Urinary tract infection	4299	8%
7	Pneumonia	3860	7%
8	Dyspepsia	3550	6%
9	Malaria confirmed with PF	3415	6%
10	Helminthes	3311	6%

Table 18: Top Ten Causes of OPD during 2005 E.C, Fentale Woreda, Oromia Region, Ethiopia, 2014

No	DISEASE(2005)	No of cases	%
1	Acute upper respiratory infection	7266	25%
2	Malaria confirmed with FP	3243	11%
3	Helminthes	3143	11%
4	Diarrhea non-blood	2748	9%
5	Acute febrile illness	2704	9%

6	Urinary tract infection	2265	8%
7	Trauma	2180	7%
8	Pneumonia	2030	7%
9	Malaria Clinical	1892	6%
10	Disease of musculoskeletal system and connective tissue	1758	6%

As could be seen the above three tables, Acute Upper Respiratory Infections were the first from the top ten leading causes of OPD visit in the three consecutive years.

4.18 Top ten causes of admissions (Morbidity)

Table 19: Top Ten Morbidity admission in 2005 E.C, Fentale Woreda, Oromia Region, Ethiopia, 2014

No	DISEASE(2005)	No of cases	%
1	Pneumonia	110	23%
2	Malaria confirmed with PF	58	12%
2	Diarrhea non blood	58	12%
4	Acute upper respiratory infection	52	11%
5	Dyspepsia	46	10%
6	Urinary tract infection	40	8%
7	Trauma	36	8%
8	Asthma	31	6%
9	Malaria other than PF	26	5%
10	AIDS	23	5%

Table 19 above indicates that among the top ten leading causes of admissions (Morbidity) Pneumonia, Malaria confirmed with PF and Diarrhea non blood were the top 3 diseases in the year 2005 EFY.

4.19 Endemic diseases

Malaria

All kebeles of the Woreda are under risk of malaria infection throughout the year .Malaria was one of the leading causes of both admission and outpatient visit disease of the Woreda (Table 20).

Table 20: Malarious Kebeles and Malaria Species, Fentale Woreda, Oromia Region, Ethiopia, 2014

S.N	Malarious Kebeles	Population at risk	Malaria case (2005 E.C)			Prevalence per 10,000 population
			Total malaria	PF	Other Malaria	
1	Alge	1471	1151	388	763	7825
2	Dheka Hedu	1298	73	50	23	562
3	Benti	2467	10	5	5	41
4	Dhebit	1572	111	105	6	706
5	Fate Lade	2541	129	95	34	508
6	Galcha	2044	129	112	17	631
7	Gara D ima	1739	116	71	45	667
8	Gidara	2352	198	177	25	842
9	Godo Fafate	1620	212	154	58	1309
10	Gola	2038	111	90	21	545
11	Haro Karsa	1002	88	71	14	878
12	Ilala	1633	726	567	159	4446
13	Kanifa	1837	101	59	42	550
14	Sara Weba	2361	49	39	10	208
15	Turo	2078	222	197	25	1068
16	Tututi	5087	169	120	49	332
17	Dire Saden	2510	188	179	9	749
18	Qobo	3865	134	125	9	347
19	MSF	22543	2387	1711	676	1059
	Total	**71,722**	**6283**	**4253**	**2025**	**876**

Compared to the Woreda kebeles, Alge 1151 (18.3%) and Benti 10 (0.2%) had the highest and the lowest burden of malaria respectively and the total prevalence of malaria in the Woreda were 876 per 10,100 population (Table 20). Of the total malaria cases 4253 (67.6%) were PF.

ITN distribution as replacement was 11,400 in 2003, zero in 2004 and 29,600 in 2006 E.C. In the area 40.4% of children under five and 16.9% of pregnant women reported having slept under an ITN. And 17,886 (92.2%) targeted houses were protected by IRS. We were not able to see either increase or decrease in the number of Malaria cases due to unavailability of data in the previous year.

4.20 HIV/AIDS prevention and control

According to the 2012/13 Fentale Woreda Health Bureau Report, 1131 people got VCT service and from those 34 (3%) (61.8% males and 38.2% female) were positive for HIV.A total of 29 TB positive people were tested for HIV and from those 4 (13.8%) were positive for HIV. Of 656 the mothers following ANC services that were tested for HIV, one (0.2%) pregnant women was positive for HIV. There were 1188 people living with HIV/AIDS in the Woreda and of those, 815 (68.6%) were taking anti retroviral (ART) drugs. Number of condom distributed was 4527 in 2005 E.C. and STI cases managed were 306.

The priority intervention area in the Woreda in relation to HIV/AIDS to date were IEC/BCC, condom promotion and distribution, voluntary counseling and testing (VCT), management of sexually transmitted infections (STIs), prevention of mother to child transmission of HIV (PMTCT), management of opportunistic infections, blood safety, infection prevention/universal precaution, care and support to the infected and affected.

4.21 TB and Leprosy

The Woreda TB prevalence was 5.2 per 10,000 populations with the mortality rate due to TB was 8.1% and other TB indicators are listed bellow in table 21.

Table 21: TB Indicators, Fentale Woreda Oromia Region, Ethiopia 2006 E.C

S.N	TB indicators	Coverage by %
1	Tuberculosis detection rate	55
2	TB treatment completion rate	92
3	Tuberculosis cure rate	90.3
4	TB treatment success rate	87.5
5	Total TB patients screened for HIV	78.4

Source: Fentale Woreda Health Bureau

The target set nationally for TB control in EFY 2003 was to increase TB detection rate from 36% to 59%, TB treatment Success rate from 84% to 85%, and TB cure rate from 65% to 80% and increase the proportion of PLWHA screened for TB from 15% to 80%[4].In the Woreda in EFY 2005, TB detection rate and TB patients screened for HIV was slightly below the target set nationally for the year 2003 EFY, while TB treatment completion rate and TB treatment success rate was above the target set by the year. (Table 21)

There was zero leprosy case report in the Woreda in the year 2005 E.C., which is true since leprosy is more confined to the highland parts of the country.

4.22 Nutrition, Food Shortage and any Other Disasters

Milk is the main food source of the area and production of milk in the area is small because of low yielding breeds, lack of grazing and forge, which have considerable food shortage in the area, particularly on children is serious. A total of 1030 (9.7%) children less than 5 years were screened for acute malnutrition in the year 2005 E.C. In order to prevent malnutrition in children, family and community should be the first line of protection. Community-Based Nutrition (CBN) aims to build up the capacity and the ownership of communities and families to make informed decisions on child care practices. The major implementation approaches include, growth monitoring, promotion and community conversation to assess the nutritional status of their children, analyze the causes of malnutrition and take action.

Table 22: Community Based Nutrition Fentale Woreda, Oromia Region, Ethiopia, 2014

S.N	GMP	Girls	Boys	Total
1	Total No of child < 2years	1033	1069	2102
2	Number of child weighed	946	870	1816
3	Normal weight (NW)	598	589	1187
4	Under Weight (UW)	260	252	512
5	Participants	Male=520		
		Female=713		
6	Participation rate	7%		
7	Reporting rate	72%		

Source, Fentale Woreda Health, Office

A total of 946 children less than two years were weighed (with 72% report completeness).The Percentage of children underweight was 24.4% of those eligible(1816) Out of which 260 (50.8%) and 252 (49.2%) were female and male respectively.

Table 23: Screened Malnutrition Children from 6-59 month, Fentale Woreda, Ethiopia, 2014.

S.N	Kebele	Total population	Target population 6-59 month	No of children screened 6-59 month	Children 6-9 month			
					No of children with lateral oedema	No of children MUAC<11 cm(sever)	No of children MUAC b/n 11-12cm (moderate)	No of children MUAC> 12 cm(mild)
1	Algae	1452	216	83	0	0	1	82
2	Turo	2051	304	152	0	4	1	147
3	Gidera	2322	345	87	0	2	10	75
4	Dire saden	2477	368	35	0	0	0	35
5	Gara dima	1716	255	81	1	4	4	72
6	Godo fata	1600	237					
7	Sara weba	2330	346	0	0	0	0	0
8	Kenifa	1814	269					
9	Fate leady	2508	372	110	2	7	7	94
10	Gola	2011	298	70	0	0	2	68
11	Gelcha	2017	299	113	0	10	3	100
12	Benti	2434	361	19	0	0	0	0
13	Dheka edu	1281	190	62	0	0	0	62
14	Kobo	3815	566	27	0	0	0	27
15	Ilala	1611	239	57	0	3	23	31
16	Tututi	5020	745					
17	Haro kersa	989	147	67	0	4	11	52
18	Dhebiti	1552	230	67	0	3	9	55
19	MSF	32722	4857					
	TOTAL	71722	10,644	1030	3	37	71	900

Source; Fentale Woreda Health Office

Numbers of children with lateral oedema were 3(0.3%). OF those screened children (1030) found only from two kebeles, 37(3.6%), 71 (6.9%), and 900(87.4%) sever, moderate, and mild Malnutrition respectively. (Table23).

N.B. Data from TFP, a national program incorporating treatment and management of severe acute malnutrition in primary health care services delivered from health post level to hospital level. Acute malnutrition in children under five is defined as MUAC<11CM and or the presence of bipedal oedema. Uncomplicated cases of severe acute malnutrition (SAM) are treated in the outpatient therapeutic program run from health posts and health centers (OTP).

Table 24: PLW, Screened for Malnutrition, Fentale Woreda, Oromia Region, Ethiopia, 2014

S.N	kebeles	Total population	Pregnant and Lactating Women			
			Target population(PLW)	No of PLW screened	No of PLW with MUAC<23 cm	Remark
1	Algae	1452	51			
2	Turo	2051	72	13	8	
3	Gidera	2322	81	8	1	
4	Dire saden	2477	87			
5	Gara dima	1716	60	9	1	
6	Godo fata	1600	56	15	0	
7	Sara weba	2330	82	25	8	
8	Kenifa	1814	63	13	7	
9	Fate leady	2508	88			
10	Gola	2011	70			
11	Gelcha	2017	71			
12	Benti	2434	85	64	11	
13	Dheka edu	1281	45	18	9	
14	Kobo	3815	134	19	3	
15	Ilala	1611	56	29	5	
16	Tututi	5020	176	107	4	
17	Haro kersa	989	38	35	3	
18	Dhebiti	1552	54	37	11	
19	MSF	32722	1145			
	Total	71722	2511	395	71	

As could be seen from table 24, a total of 395 (17.8%) pregnant and lactating women were screened for malnutrition from 13 kebeles in the Woreda and the remaining six kebeles Pregnant and Lactating Women were not affected by malnutrition. Of 2511 total targeted population of pregnant and Lactating Women, 35(92%), 64(75%) and 37 (68.5%) were reported from Haro Kersa, Benti and Dhebiti Kebele respectively while the least number 8 (9.9%) was reported from Gidera. Therefore, the Targeted Supplementary Feeding Programme, in support of the Enhanced Outreach Strategy (EOS) programme, has been providing much needed assistance to vulnerable groups who require extra food supplement.

Table 25: OTP by Age Groups in Fentale Woreda, Oromia Region, Ethiopia, 2014

Name of Health Office	Age group	Total beginning of the month	Total admission	Total discharged	Total end of the month	Remark
Fentale	<6 month	13	3	2	14	
	6-59 month	501	421	247	675	
	5-10 years	113	82	71	124	
	11-17 years	90	45	31	104	
	>18 years	72	4	56	109	
	Total	789	643	407	1026	

In the Woreda, there were 23 OTP sites and the total number admitted people to OTP were 643 in the year 2005 E.C. From the total people admitted to OTP 421 (65.5%) consisted of children 6-59 months age group. Regarding disaster situation, Drought, flood, crop pest, livestock disease were the biggest problems that affect the Woreda frequently. According to the Woreda Information Office Flooding always affected livestock grazing land, crops, human health, and infrastructure, as result flooding is the common natural hazard in the Woreda.

4.23 Essential drugs shortage

According to the Woreda Health Office, budget for drugs and other medical supplies was not clearly known, however, the Woreda Health Office pharmacist reported that there was shortage of some essential drugs in the year 2005 E.C.

5. Challenges and Limitations

In the Woreda, Language, Religion and Occupational characteristics were not clearly documented, and some essential health and economic indicators like Infant mortality, Child mortality, maternal mortality, ITN utilization rate and Average income per capital, Fund from NGOs were also not documented. Moreover, there was also difficulty to find out detailed information about the Woreda Disaster situation. In addition to those the previous 2 to 5 years Immunization coverage was not available and that was a challenge to see Immunization coverage progress in the Woreda.

6. Conclusion

This Woreda Health profile includes both previously identified health issues, and the identification of new, emerging health issues. Compared to the last three years, Acute Upper Respiratory Infection, Diarrhea, and Malaria were the leading causes of Morbidity in the Woreda which may attribute to lack of clean drinking water, poor sanitation and low public awareness of environmental health and personal hygiene practices and low coverage of ITN. Malnutrition was also the main problem of the Woreda.

7. Recommendations

- The Woreda immunization coverage should be registered and documented
- Important health indicators like maternal mortality, infant mortality and child mortality should also be registered and documented.
- Health education to the population is needed regarding environmental health, personal hygiene and the importance of ITN and IRS
- To alleviate malnutrition in the Woreda people should shift from pastoralist to agro-pastoralist and should have access to modern technology to maximize the agricultural product.
- Clean water, Road, Transport, Telecommunication and power supply should be available and there is a needed to maximize their coverage in the Woreda.

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Chapter V-Scientific manuscript for peer reviewed Journal

Title: 5.1. Human and Animal Anthrax in Ethiopia: A retrospective record review 2009-2013

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Abstract

Background: Anthrax is a Zoonotic disease, caused by a gram-positive, none- motile and spore forming bacteria, Bacillus anthracis. Globally, 10-100 thousand human anthrax incidences occur annually with significant number of cases from Chad, Ethiopia, Zambia, Zimbabwe and India. Ethiopia as one of the countries with high burden of the disease has been experienced recurrent wave of hyper endemic/ epidemic for many years. Even though Anthrax is one of the reportable diseases in Ethiopia, available data have not been analyzed and interpreted so far. We conducted this analysis to determine the magnitude and trends of the disease in Ethiopia.

Methods: Five years, 2009-2013, human and animal anthrax surveillance data were officially requested and received from the Ethiopian Public Health Institute and the Ministry of Agriculture respectively. The data were analyzed by time and place using Epi.info.7.3.1 and Microsoft Office Excel 2007. Arc Geographic Information System (GIS) was used to determine the relationship between human and animal anthrax cases.

Results: A total of 5,197 human and 26,737 animal anthrax cases (human to animal ratio 1:5) were reported from 2009 to 2013 with 86 human anthrax deaths (CFR:1.7%). The National human prevalence was found to be 1.3 per 100,000 populations per five years, while it was 6.7, 2.3, 1.5 and 0.2 in Tigray, Amhara, SNNP and Oromia regions respectively. Zero human case was reported from pastoralist regions with 55-216 animal cases (Afar, Somali and Benshangul Gumuz). The human prevalence was high in May followed by February (0.20 and 0.15 per 100,000 populations per year respectively).

Conclusion: This data analysis revealed that, less number of Human anthrax cases are reported than Animal cases in Ethiopia. The pastoralist areas where humans and animals co-exist closely did not report a single human case for the last five years.

Recommendation: To determine the magnitude of anthrax in Ethiopia both human and animal surveillance system should be strengthened giving due attention to pastoralist areas. Prevention intervention should be in place in areas where the prevalence of the disease is high.

Key Word: Anthrax, *Bacillus*, Human, Animal, Ethiopia

1. Introduction

Anthrax is an acute spore forming warm blooded animal‟s disease including human beings caused by a gram-positive, non-motile bacillus anthracis [1]. The name of the bacterium is derived from “anthrakis”, the Greek word for coal, because anthrax in humans causes black, coal-like lesions on the skin at the site of inoculation.

Herbivorous and wild mammals are most commonly infected by Anthrax through ingestion or inhalation of spores while grazing. Ingestion is thought to be the most common route by which herbivores contract anthrax. Carnivores living in the same environment may become infected by consuming infected animals[2]. Human cases usually develop after exposure to infected animals and their tissues. In most countries, human anthrax occurs infrequently and sporadically, mainly as an occupational hazard among veterinarians, agricultural workers and workers who process hides, hair, wool and bone products. Human-to-human transmission has not been documented. In humans, cutaneous, gastrointestinal and inhalational are the three forms of anthrax. The incubation period in humans is usually 1 to 7 days, but varies with the form of the disease [3].

Anthrax is globally distributed disease, reported by all continents that are populated heavily with animals and humans. Animal Anthrax outbreaks have been recorded in nearly 200 countries by The World Anthrax Data Site, a World Health Organization Collaborating Center for Remote Sensing and Geographic Information Systems for Public Health [4]. The data types recorded by The World Anthrax Data Site are: country-of-origin, anthrax status, vaccination program, species affected, year of outbreak, number of outbreaks during the year, number of cases, number vaccinated and total livestock population. The anthrax status of a given country may be classified into one of the six categories: hyper endemic/epidemic, endemic, sporadic, probably free, free and unknown. The countries with hyper endemic/epidemic status are frequently in Africa, like Zimbabwe, from 1978-1980; where an epidemic infected nearly 10,000 humans and took 151 lives although the status of Egypt is “Probably free”. Examples of regions with unknown anthrax status are the polar extremes, the Arctic and the Antarctic [5, 6].

Animal anthrax is an endemic disease in Ethiopia which occurs in May and June every year (anthrax season) in several farming localities of the country, although suspected cases of

livestock anthrax are reported from several districts, few of those are officially confirmed [7]. The common use of traditional medicine for anthrax in Ethiopia [8-10] indicates that the disease is well recognized by rural communities but little is known about its prevalence, epidemiology and public health significance. In the Ethiopian fiscal year 2003, according to the Fedral Democratic Republic of Ethiopia Ministry of Health surveillance data, a total of 1,096 suspected human anthrax cases and 16 deaths (with a CFR of 1.5%) were reported from four regions (Tigray, Amhara, Oromia, and SNNPR) [11]. The highest number of cases were reported from Tigray (396), followed by SNNPR (340), Amhara (296), and Oromia (64), while the highest number of deaths (9) were reported in SNNPR (56% of the total deaths), with Oromia accounting for 5 deaths (31%) and Tigray for 2 (13%). In 1993 there were 305 cases reported and none in 1994[12-14], indicating that the surveillance system is developing recently but surveillance data of anthrax is not analyzed and communicated to concerned bodies regularly. So, the main propose of this analysis was to assess the five years anthrax trend in order to get valuable inputs and recommend evidence based interventions.

Zoonoses are diseases transmissible between animals (domestic and wildlife) and humans. It has been estimated that 60% of all human diseases and around 75% of emerging infectious diseases are zoonotic among which Anthrax is a serious zoonotic disease that can affect most mammals and several species of birds [15]. In Ethiopia, anthrax is endemic so it is an important public health issue and there is an apparent need for accurate information through a strong surveillance system to warrant evidence based action. Therefore, analyzing anthrax data from 2009 to 2013 can be used to assess the five year trend of anthrax in Ethiopia and determine the distribution of cases. This helps to identify areas of hyperendemnicity, and out the completeness of the reporting system to engage in corrective actions.

2. Methods and Materials

2.1 Study area, population and period

Ethiopia is found in Eastern Africa, between 3 and 15-degree North latitude and 33 and 48-degree East longitude. Djibouti, Eritrea, the Republic of the Sudan, and the Republic of the Southern Sudan, Kenya, and Somalia border the country with a total area of 1,104,300 sq km. Ethiopia is the second most populous country in sub-Saharan Africa after Nigeria, with estimated population of 90 million in July 2011. Five year anthrax data were analyised (January 27-February 21/2014)

2.2 Source of Data

Secondary data from EPHI/PHEM data base from 2009-2013 were used to review human anthrax and animal anthrax data were abstracted from the Ministry Of Agriculture.

2.3 Study Design

Descriptive method of study was carried out. The trend and distributions of anthrax cases by place and time was presented using graphs, tables and map.

2.4 Sample Size and Sampling Method

All anthrax data reported between 2009 and 2013 in EPHI/PHEM and from the Ministry of Agriculture were included in this analysis.

2.5 Statistical Analysis

Descriptive statistical analysis were made using Epi. Info 7.3.1 and Microsoft Excel

2.6 Case Definition

According to Public Health Emergency Management Guideline, a suspected case of anthrax was any person with acute onset of disease characterized by several clinical forms which include:

1) **localized form**:

Cutaneous: skin lesion evolving over 1 to 6 days from a popular through a vesicular stage, to a depressed black Escher invariably accompanied by edema that may be mild to extensive.

2) **Systemic forms: Gastro- intestinal**: Abdominal distress characterized by nausea, vomiting, anorexia and followed by fever

Pulmonary (inhalation): brief prodrome resembling acute viral respiratory illness, followed by rapid onset of hypoxia, dyspnea and high temperature, with x-ray evidence of mediastinal widening

Meningeal: acute onset of high fever possibly with convulsions, loss of consciousness, Meningeal signs and symptoms; commonly noted in all systemic infections and has an epidemiological link to confirmed or suspected animal cases or contaminated animal products.

3. Results

A total of 5197 and 26737 cases and 86 and 8523 deaths of human and animal anthrax respectively were documented the last five years (2009-2013) nationally. Cases and deaths were reported in weekly summary report, not accomplished with line list. The human anthrax cases annual prevalence was 1.31/100,000 population per year (average midyear population 79234530). All human cases were reported during the specified period on weekly summary format.

The human and animal anthrax cases load was 10(0.01 per 100,000 population) human and 5393 animals) in 2009, 1773(2.2 per 100,000 population) in 2010, but animal cases (8187) in 2011.In 2012, 1407(1.7 per 100,000 population and 5639) and in 2013, 1066(1.3 per 100,000 population) and 4038 both human and animals cases respectively. See fig 14

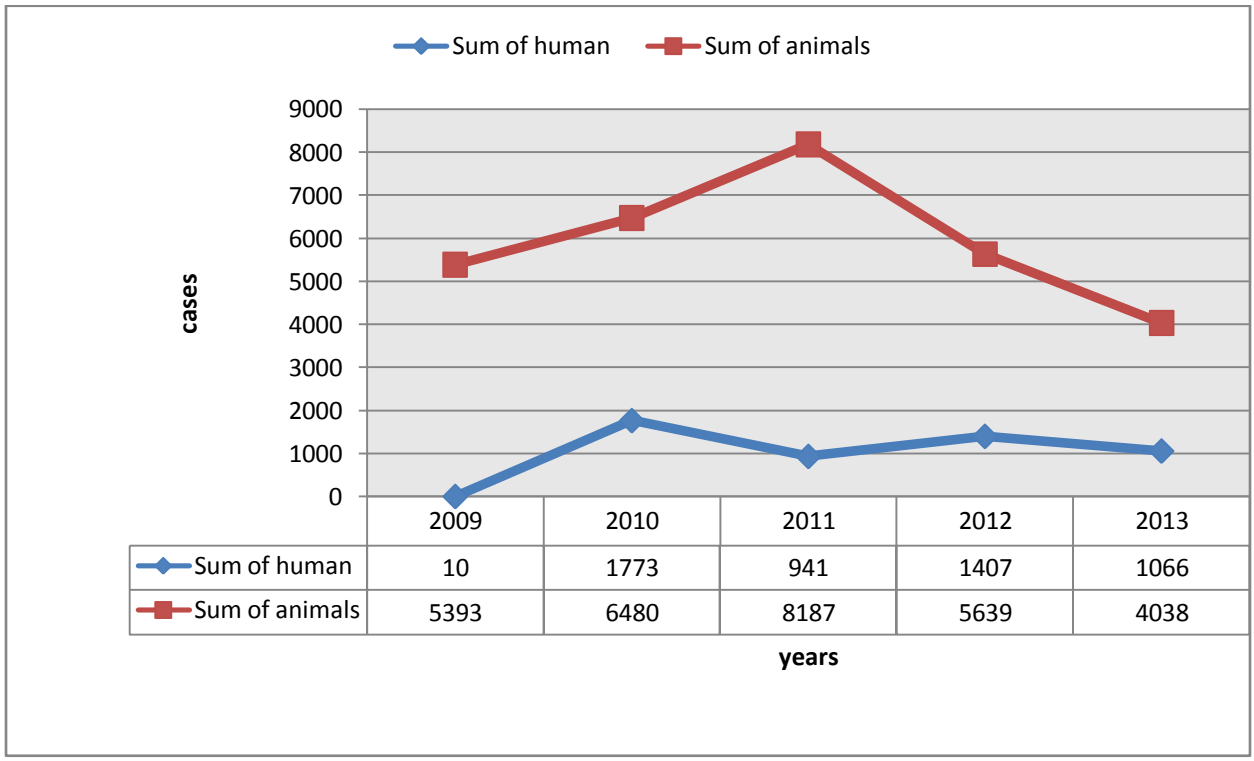

Figure 14: Human and Animal Anthrax Cases by year (2009-2013), Ethiopia 2014

As seen in fig.15, human cases in May were 796 and in animals, 3083 and 3205 in May and October respectively. Two thousand four hundred fifty four (47.2%) human cases were reported from February to May; 2149(41.4%) from June to November; 594(11.4%) from December to

January and regarding animals 10061(37.6%) cases were reported from March to June; 6111(22.9%) from September to October; and the load from November to February was 3271(12.2%).

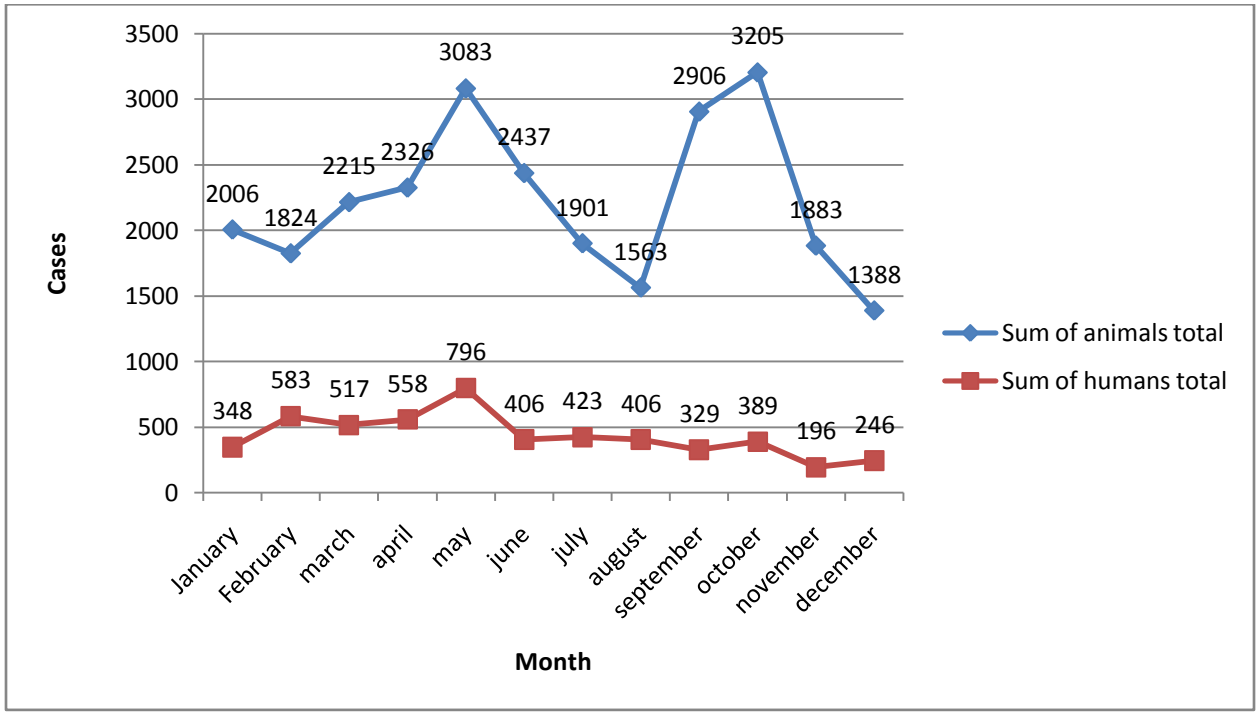

Figure 15: Human and Animal Anthrax Cases by Month from 2009-2013, Ethiopia 2014

Table 26: indicates that the number of human cases in different regions, range from Zero to 2107. The majority of the cases were reported from Amhara, Tigray, SNNPR, and Oromia. Of which Amhara reported 2107 cases (40.5%), Tigray1602 (30.8%), SNNPR 1224(23.7%) and Oromia 262(5%), while 1 was observed from Addis Ababa and Gambella and no cases were reported from Afar , Somali, B-Gumuz , Harari, and Diredawa regions. Prevalence of human cases by region was (Tigray: 6.7, Amhara: 2.3, SNNPR: 1.5, Oromia: 0.18, Gambella: 0.06, Addis Ababa: 0.007, and Afar, Somali, B-Gumuz, Harari, Diredawa: 0) per 100,000 population. During 2009-2013, human anthrax case fatality rate (CFR %) seen (6.1%) in Oromia, (3.3%), in SNNP, (0.9%), in Tigray, (0.7%), in Amhara.

The Human: Animal anthrax case ratio by region was (Tigray: 2:1, SNNPR: 1:1, Amhara: 1:6, Addis Ababa: 1:12, Oromia: 1:44, and 0:55, 0:216, 0:140 in Afar, B-Gumuz, and Somali regions respectively and no animal case was reported from Dire Dawa and Harari). The data

disaggregated in zonal level the ratio 73:1 Bench Maji, 6:1 Central Tigray from SNNPR and Amhara regions respectively.

Table 26: Human Anthrax Cases, Deaths, Incidence and CFR and Human/ Animal Anthrax Ratio

Administrative &Region	Human cases	Human death	Incidence/ 100,000 population/year	CFR (%)	Animal cases	Human/Animal case ratio
Amhara	2107	15	2.3	0.7%	12577	1:6
Tigray	1602	14	6.7	0.9%	665	2:1
SNNPR	1224	41	1.5	3.3%	1333	1:1
Oromia	262	16	0.2	6.1%	11639	1:44
Addis Ababa	1	0	0.01	0.0%	12	1:12
Gambella	1	0	0.1	0.0%	100	1:100
Afar	0	0	0.0	0.0%	55	0:55
B. Gumuz	0	0	0.0	0.0%	216	0:216
Dire Dawa	0	0	0.0	0.0%	-	-
Harari	0	0	0.0	0.0%	-	-
Somali	0	0	0.0	0.0%	140	0:140
Grand Total	5197	86	1.3	1.7%	26737	1:5

4. Discussion

This data analysis uncovered the prevalence of Human and Animal anthrax between 2009 and 2013in Ethiopia. The prevalence of human anthrax cases in Ethiopia was 1.3/100,000. In addition to that, the fatality of the cases was lower (CFR 1.7%) compared to Zambia [16]. This might be due to the under reporting of the cases in Ethiopia.

As the national FMoH and FMoA surveillance data from 2009-2013 indicates, more cases of human and animal anthrax were reported from four big regions which have comparatively good surveillance system and trained manpower. The four big regions Amhara, Oromia, SNNPR, and Tigray reported a total of 5195 (99.9%) human and 26214 (98%) animal anthrax cases. The highest human case prevalence was in Tigray followed by Amhara, SNNPR, Oromia, Gambella and Addis Ababa. Only animal cases without human cases were reported from Afar, Somali, and B-Gumuz. This is due to the difference in surveillance system strength. Regions with strong surveillance system reported highest number of both human and animal"s cases compared to regions with poor surveillance system. More over the strength of surveillance system of FMoH and FMoA at federal level has significant impact on the result.

Both suspected human and animal anthrax cases were reported in larger number in the month of May and also larger numbers of animal cases were reported in October. This is dry season, during this time the grass is short and animals are, forced to graze very close to the ground. This increases chances of animals picking up anthrax spores in areas whose soils and pastures are contaminated with the spores[7]. Therefore, case of anthrax in animals is very common during this time increasing risk of human anthrax exposure.

Out of the total human cases were reported between 2009 and 2013 only, 10(0.2%) of the cases and Zero case fatality were notified in 2009.

In 2010, the number of reported human cases increased by 33.9% and there was an increase of the CFR by 0.9%, compared with 2009. In 2011, the case fatality rate increased by 0.8%, while, the number of human reported cases failed by 16% compared with 2010.The occurrences of human anthrax cases reported in 2012 and 2013 increased by 9% and 3.4% respectively and in 2012 the case fatality rate increased by 0.9%, while, in 2013 the case fatality decreased by 0.1% compared with the previous year.

The human: Animal case ratio from the surveillance data was 1:5. This is opposite to Northern Europe, 1:10 and 10:1 in Africa and Asia [16]. This human to animal ratio reflect country‟s economic condition, quality of surveillance, social traditions and dietary behavior[16]. Therefore the result of the five years surveillance data Human and Animal anthrax case ratio (1:5) was might be the quality of surveillance system of the country.

Most of the suspected human cases and deaths were reported in weekly summary report, but not accomplished with line list. This reporting system lack detail information that help to analyzed the case by different variables. Therefore variables like age, sex, urban and rural case distributions were not analyzed from the weekly summary report. In addition to these the form of anthrax, like cutaneous, inhalation and ingestion were not mentioned. This affects the completeness of the analysis.

5. Challenges and limitations

Anthrax is immediately reportable disease in Ethiopia according to the national PHEM Guideline. Therefore, any human anthrax case and death should be reported either case investigation form or with a line list. All of the cases and death were reported in weekly summary report format. This reporting format has no age, sex, urban and rural distribution. Moreover, reported anthrax cases are not classified as suspected, probable and confirmed as per the WHO recommended case definition. The cases were not reported as cutaneous, inhalation, and ingestion form of the disease. And there were clear constraints in the data collection and data quality to reach to strong conclusions and recommendations.

6. Conclusion:

This analysis indicated that anthrax remains to be a major public health problem in Ethiopia. Increasing number of cases and fatalities were reported especially from Amhara, Tigray, SNNPR, and Oromia. All regions are not reporting Human suspected anthrax cases with the recommended standard format and the surveillance strength status varies from region to region. There is no emphasis on the implementation of one Health in the country.

7. Recommendations:

Control of anthrax depends on the integration of veterinary and human health surveillance and control programmes. Animals should be vaccinated with anthrax vaccine before the season of anthrax. I recommend strong routine cross-notification between the veterinary and human health surveillance systems should be part of any zoonotic disease prevention and control programmes, and close collaboration between the two health sectors is particularly important during epidemiological investigations. All regions and Ministry of Health and Ministry of Agriculture should strength their surveillance system and early preparedness. The case and death should be reported with daily epidemic reporting format or a line list and with case-based immediately and also the case should be reported in specific form of the disease. Continuous data analysis and feedback to all stakeholders should to be conducted on regular bases so as to improve quality of both human and animal surveillance data.

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Title 5.2 Measles Outbreak in Kbebe-Tsehay Orphanage, Gulele Sub City, Addis Ababa, Ethiopia-2014

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Abstract

Background: Measles is one of the most communicable infectious diseases with greater than 90% attack rate on susceptible persons. Although efforts have been made to improve vaccination coverage, there have been ongoing outbreaks throughout Ethiopia. On September 8, 2014 unknown cause of respiratory disease outbreak was reported from Kbebe-Tsehay Orphanage, Addis Ababa in the Capital City of Ethiopia. We investigated to confirm the outbreak, identify risk factors and implement control measures.

Methods: Both descriptive and unmatched case-control study, using two controls was `conducted in Kbebe-Tsehay Orphanage. Patient observation was made at Health-Care Facilities. Suspected Cases were defined as: Children with fever and cough and with or without diarrhea, vomiting, respiratory distress and Coryza. Controls defined as any children living in Kbebe-Tsehay orphanage without sign and symptom of the disease. A suspected case with laboratory confirmation (positive IgM antibody) or epidemiological link to confirmed cases in an epidemic. We reviewed Hospital records where patients were admitted (Girum, Betsega, St.Yarid, Yekatit12 Hospitals and Kbebe-Tsehay Orphanage Clinic) and line list was also prepared to gather information about new cases and was maintained until the end of the outbreak. We interviewed cases and controls using questionnaire through their Guardian and the camp nurses. Five blood samples were collected for laboratory confirmation. We used Epi Info version 7.3.1 and micro- soft excel for data entry and analysis.

Results: Three of five blood samples tested positive for measles IgM antibodies. A total of 22 measles cases with one death were reported starting August 25, 2014 to September 10, 2014. The overall attack rate (AR) and Case Fatality Rate (CFR) were 14.7/100 population and 4.5% respectively. From all cases (22), none developed clinical sign of rash. Among all, the total numbers of measles cases were higher in females 13 (59.1 %) than males 9 (40.9 %). The median age of cases was 7 months and controls 46 month. Only 9 (40.9%) of the cases were vaccinated

and 13 (59.1%) were not vaccinated, whereas 9 (20.5%) of the controls had recorded measles vaccination history and 35 (79.5%) had no vaccination cards. From the study groups 22 (100%) cases and 9 (20.5%) controls had contact history to a suspected case. Sharing a bed with two or more children (OR: 8.11; 95% CI: 2.5 – 26.6) and the new children admitted to the dorms (OR: 13.2; 95% CI: 3.8 – 45.6) were found to be significantly associated with the disease.

Conclusion: A measles outbreak without rash was confirmed with a (CFR) of 4.5%. Sharing a bed with more than one child and being a new child in the orphanage were noted to be significant risk factors for developing the disease. Therefore, using a separate bed and knowing the vaccination status of new children admitted into the orphanage are recommended as mechanisms to limit transmission of measles epidemic.

Key Words: Measles: Outbreak: Case Control: Kbebe-Tsehay Orphanage.

1. Introduction

Measles is one of the most contagious diseases known to mankind[1]. The name measles is derived from the latin, misellus, meaning miserable[2]. It is an RNA virus with only one serotype, classified as a member of the genus Morbillivirus of the family Paramyxoviridae. There are numerous distinct genotypes[3]. Humans are the only natural hosts of measles virus[4]. Transmission is person-to-person, airborne, by direct contact with nasal or throat secretions of an infected person, and less commonly, indirectly by articles freshly soiled with nose and throat secretions[4]. Measles is one of the most communicable infectious diseases with a greater than 90% attack rate on susceptible persons[5]. The incubation period is approximately 7– 18 days, usually 10 days from exposure to fever, and 14 days until the rash appears, rarely as long as 19 – 21 days[4].

All persons who have not had measles disease or have not been successfully immunized are susceptible[5].Measles infection appears to confer lifelong immunity[6]. Infants whose mothers have had measles are protected against the disease for approximately 6 – 9 months or more depending on the amount of residual maternal antibody at the time of pregnancy[5]. Children born to mothers with vaccine-induced immunity receive fewer antibodies and may be susceptible at an earlier age[5]. Immunization at 12 – 15 months induces immunity in 95% or more of vaccine recipients. The second dose increases immunity levels to almost 100 %[7].

Generally, persons born prior to 1970 can be assumed to have acquired natural immunity to measles[7]. Individuals born in or after 1970 are considered susceptible unless there is serological proof of immunity or documented history of 2 doses of measles-containing vaccine as recommended in the Alberta Immunization Policy (AIP)[7].

Disease in an immunocompromised individual can be severe and have a prolonged course. It may occur without the typical rash[8].Complications are more common among children under five years of age and individuals 20 years of age and older[5]. The most common causes of death are pneumonia in children and acute encephalitis in adults[5]. It often occurs in explosive epidemics characterized by high fever of 38oC or more; plus the appearance of maculopapular rash of about 3 days or more; with one or a combination of Coryza, cough, conjunctivitis and Koplik spots in the oral mucosa of measles‟ victims[9]. Measles produces significant illness,

death, and disability[10]. In 1980, before widespread vaccination, measles caused an estimated 2.6 million deaths each year. It remains one of the leading causes of death among young children globally, despite the availability of a safe and effective vaccine[5].

In spite of the progress achieved over the past few decades in eliminating and controlling the disease from many parts of the world through immunization, regions of high measles transmission still exist. Global migration and international travel to and from such regions pose a constant threat of re-introduction of virus transmission in regions that have eliminated measles[5].

Measles has continued to cause large outbreaks all over the world even in countries that have achieved high vaccination coverage with a single dose strategy[11]. Estimated global coverage with a first dose of vaccine increased from 72% in 2000 to 84% in 2011[12]. The number of countries providing the second dose through routine services increased from 97 in 2000 to 141 in 2011. An estimated 20 million children worldwide did not receive the first dose of vaccine in 2011[13]. More than half of those children lived 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). In 2011, large measles outbreaks were reported in all those countries and several others: in DRC (134,042 cases), Ethiopia (3,255 cases) India (29,339 cases), Nigeria (18,843 cases), Pakistan (4,386 cases) France (14,949 cases), Italy (5,189 cases), and Spain (3,802 cases). Most of these countries are in WHO regions which have committed to eliminate measles by 2015 or 2020[13].

Measles infection prevention and control intervention have been undertaking strongly in Ethiopia. The national measles vaccination coverage in 2006 E.C was 86.5 % as reported from the Federal Ministry of Health[14]. Improving routine vaccination coverage, providing a second opportunity for measles vaccination through supplementary immunization activities (SIAs), improving measles-case management, and establishing case-based measles surveillance are among the core activities implementing regarding prevention and control of measles in the country.

In 2012 and 2013, Addis Ababa Administrative City has been reporting sporadic measles cases from different sub-cities. As part of it Kbebe -Tsehay Orphanage found in Gulele Sub-City has

been reporting the cases starting August 25, 2014. The cases increased and spread in the camp. The camp Health Department put in place prevention and control measures by itself; but they cannot control the cases and they referred the cases to different Hospitals found in the city for better treatment. Based on the information and request, the Ethiopian Public Health Institute organized a team with the objective of identifying the cause and determining the magnitude of the outbreak and finally to recommend prevention and control measures.

2. Methods and Materials:

2.1 Case definition:

- **Suspected Case:** Children found in Kbebe -Tsehay Orphanage Camp from August 25, 2014 with fever and cough and with or without diarrhea, vomiting respiratory distress and Coryza.
- **Confirmed Case:** Any child found in Kbebe -Tsehay Orphanage Camp from August 25, 2014 presenting with above features with laboratory confirmation of presence of measles IgM or epidemiologically linked to confirmed cases in an outbreak.
- **Controls:** Any child found in Kbebe -Tsehay Orphanage without sign and symptom of the disease

2.2 Investigation Area:

Addis Ababa is the capital city of Ethiopia, geographically located at 9:03N degree 38.74E degrees and divided into ten sub cities. Kbebe -Tsehay Orphanage is found in one of the Sub-Cities known as Gulele. The Orphanage has a maximum capacity of holding 150 children, coming from different regions of the country.

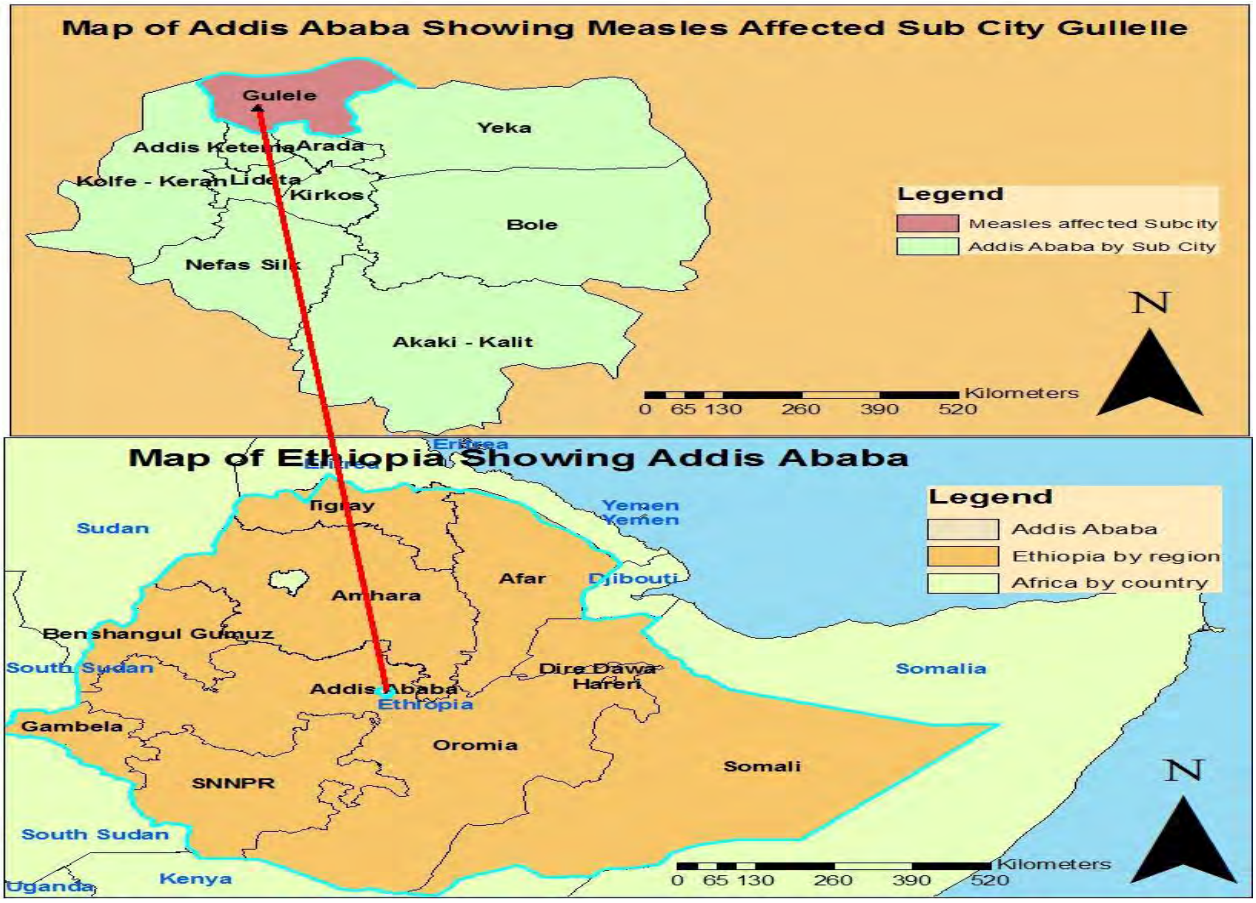

Figure 16: Map of Addis Ababa City Administration and Ethiopia, 2014

2.3 Data collection:

Surveillance reports were assessed and reviewed. Regular contact was maintained throughout the outbreak period in the Kbebe -Tsehay Orphanage, and additional cases were verified by daily communication with the head nurse in the camp using telephone.

For each case who fulfilled the case definition investigators interviewed, the cases through their care givers/nurses using a structured questionnaire developed for the investigation; We reviewed Hospital records where patients were admitted (Girum, Betsega, St.Yarid, Yekatit12 Hospitals and Kbebe-Tsehay Orphanage clinic) and line list was also prepared to gather information about new cases and was maintained until the end of the outbreak.

Individuals were considered to be vaccinated only if vaccination was documented in their log files. Children, who had no record of vaccination, on logbooks, were considered to be unvaccinated or unknown.

2.4 Study design:

Case-control study with together descriptive study were implemented to investigate the outbreak. Unmatched case-control study design in the ratio of 1:2 (22 cases and 44 controls) was carried out for the determination of the risk factors. Data from questionnaires were entered and analyzed into a computerized data base using Epi Info version 7.3.1 and micro- soft excel. During the analyses, P-value and /or 95% confidence interval (CI) for OR (odds ratio) were used in judging the significance of the associations. P-value less than 0.05 were taken as significant association.

2.5 Data quality assurance:

Two people (the investigator and one field Epidemiologist) collected the data. There were detailed discussions on the question and the collected data were checked on daily basis during the investigation. Data cleaning were done using Epi Info version 7.3.1, by the principal investigator.

2.6 Laboratory investigation:

During the outbreak investigation, five throat swab samples were collected and send to the National Influenza Laboratory to assess influenza and corona virus. Blood samples were collected and CBC was done and also five serum samples were sent to the National Measles and Polio Laboratory for confirmation of measles. In addition, chest X-Ray was taken at Hospital level for those admitted cases. Other cases were epidemiologically linked with laboratory confirmed cases.

2.7 Environmental Investigation:

Generally, the Orphanage environmental condition, including housing condition, sleeping rooms, housing ventilation, the availability of toilets and hygienic condition of the cases and controls were observed.

2.8 Ethical issue:

Verbal consent was obtained from all respondents before starting interview and all agreed to participate.

3. Result:

3.1 Descriptive results

A total of 22 cases with median age of 7 month were registered from August 25, 2014 to September 10, 2014 in Kbebe-Tsehay Orphanage, Gulele Sub City Addis-Ababa Ethiopia. Of which three of the cases were confirmed by laboratory and the rest 19 cases were epidemiological linked. The overall attack rate was 14.7/100 population with a case fatality rate of 4.5 %. Among the total number of measles cases, 13 (59.1 %)) and 9 (40.9 %) were females and males respectively. However, the percentage of the case by age group in, 0 to 5 months was 18.2, 6 to 9 months was 59.1 and it was 22.7 in age group 10 to 12 months. There were no measles cases above 12 months.

The distribution of the diseases in relative to cases dormitory were 77.3% (17 cases) in 0 –1year dormitory with and in reception room were 22.7% (5 cases).

Of the total investigated cases, 22 (100%) had fever and cough; 13 (59.1%) had vomiting; 8 (36.4%) had diarrhea, 9 (40.9%) had nasal discharge; 3(13.6%) cases had conjunctivitis; 15 (68.2%) had respiratory distress; 1(4.5%) case had sleep long time; 2(9.1%) cases had grunting; and 2(9.1%) cases had loss appetites. (See table 27 below).

Table 27: Measles Sign and Symptoms in Kbebe-tsehay Orphanage, Addis Ababa, Ethiopia, 2014

Sign and Symptoms	Number (N=22)
Fever	22(100%)
Cough	22(100%)
Vomiting	13(59.1%)
Diarrhea	8(36.4%)
Nasal Discharge	9(40.9%)
Conjunctivitis	3(13.6%)
Respiratory Distress	15(68.2%)
Grunting	2(9.1%)

Loss of Appetites	2(9.1%)
sleep long time	1(4.5%)

From patients who received antibiotics treatment, 1 (4.5%) did not respond, but others 21 (95.5 %) improved from their illnesses.

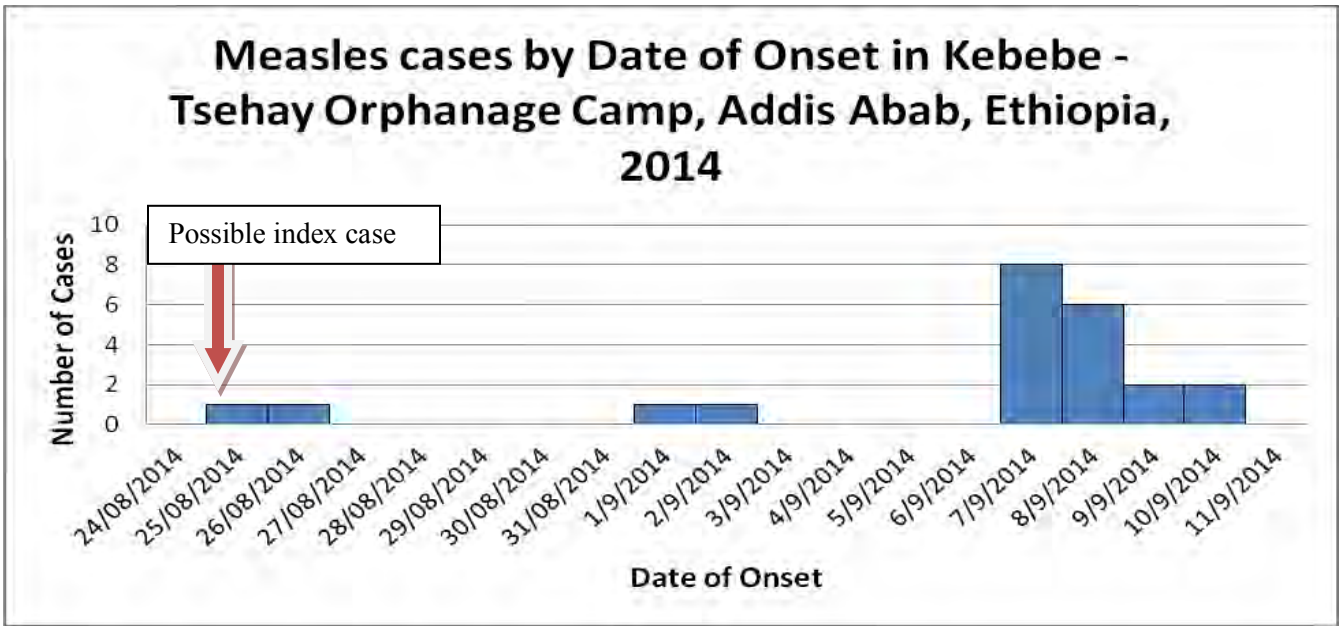

Figure 17: Measles cases by Date of Onset Kbebe -Tsehay, Addis Ababa, Ethiopia 2014.

The outbreak spanned over a period of 17 days (from August 25, 2014 – September 10, 2014). Majority of the cases 8(36.7%) occurred on September 7, 2014 and six cases were reported the next day. The last two cases were detected in the day of September 9, 2014 and September 10, 2014 respectively. The possible index case was found on September 25, 2014 from reception room and spread to the room where 0 – 1 year housed.

3.2 Case –Control Study Results:

We compared 1:2 ratios of 22 cases (median age of 7 month) and 44 controls (median age of 48 month). From the total variables considered as risk factors for developing measles cases, sharing one bed for two or more children (OR: 8.11; 95% CI:2.5 – 26.6; P-Value: 0.000024) and admission of the new child in the dorms (OR: 13.2; 95% CI: 3.8 – 45.6; P-Value: 0.0000009)

were associated with more likely development of the disease. However, the OR of vaccination status was 0.37 with 95% CI: 0.12 – 1.14 and P-Value 0.079 was not significantly associated with protection from contracting measles.

From the study groups (case-control) 22 (100%) cases and 9 (20.5%) controls had contact history to the suspected cases. Only 9 (40.9%) of the cases were vaccinated and 13 (59.1%) were not vaccinated, whereas 9 (20.5%) of the controls had recorded measles vaccination history and 35 (79.5%) had no vaccination cards.

3.3 Laboratory Investigations:

Five throat swabs were collected from those patients admitted at Kbebe-Tsehay clinic and tested at the National Virology Laboratory for all respiratory viral infection in the EPHI lab (Influenza A, Influenza B, Respiratory Syncytiaal virus, Parainfluenza 1, Parainfluenza 2, parainfluenza 3, human metapneumo and MERS-cov.) and all tested negative for those virus. And from all patients (22) blood samples were collected at different Health- Care Facilities where patients were admitted and tested negative for bacterial infections. Of five serum samples send and tested at national polio and measles laboratory, three were positive for measles IgM. We found that all cases which occurred in the Orphanage were epidemiologically linked with laboratory confirmed cases since they shared a lot of things.

3.4 Radiological finding:

The doctors handling inpatient thought that 15 patients may have pneumonia and imaging tests were ordered to evaluate for pneumonia. And 11 chest x-ray examinations were conducted and 9 (81.8%) of them had pneumonia and 2 (18.1%) had normal finding.

3.5 Response activities:

During the outbreak period, case management was given for all cases in their admitted health-care facilities. Finally, vaccination was given for all children age group $\geq$ 6 month to control and prevent transmissions.

4. Discussion

This investigation revealed a confirmed measles outbreak in Kbebe-Tsehay Orphanage in Gulele Sub-City, Addis Ababa, Ethiopia. The observed clinical picture of this outbreak did not full fill the typical clinical sign of measles. From the total of 22 cases, none of them developed rash, this result is supported by measles in an immunocompromised individual can be severe and have a prolonged course and it may occur without the typical rash[8]. Measles Complications are more common among children under five years of age [5].The most common causes of death due to measles complications are pneumonia in children[5]. In this study, there were 15 patients with pneumonia and one death due to this complication.

Majority of the cases (77.3%) occurred in the dormitory of 0-1 years relative to the other dormitory (reception room).This is the dorm where more children (up to 39 children) live together compared to other eight dormitories found in the Orphanage.

The use of measles vaccine in infant immunization programs globally has lead to significant reduction in measles cases and deaths. Despite the availability of an effective measles vaccine for almost 40 years, the disease still causes a considerable burden in many countries especially in the developing countries primarily due to under utilization of measles vaccine[15]. In this study, less number, 9 (40.9%) of the cases were vaccinated than in the control group, Females were more affected than males with the ratio of 1 male to 1.2 female. In this outbreak, the minimum age group of the case was 3 months which is unexpected age group affected by measles and the maximum age group was 12 months Infants whose mothers have had measles are protected against disease for approximately 6 – 9 months or more depending on the amount of residual maternal antibody at the time of pregnancy[5]. Children born to mothers with vaccine-induced immunity receive fewer antibodies and may be susceptible at an earlier age[5].

This investigation found that an important contributing factor in this outbreak was sharing one bed for two or more children (OR: 8.11; 95% CI: 2.5 – 26.6; P-Value: 0.000024).. In addition to this, the new entrants to the orphanage (OR: 13.2; 95% CI: 3.8 – 45.6; P-Value: 0.0000009) constituted a key contributing factor for this outbreak. There were new children admitted in the orphanage before the start and during the outbreak period.

Conclusion: A confirmed measles outbreak occurred without a typical clinical sign of rash with CFR of 4.5% and with a high complication rate in Kbebe-Tsehay Orphanage, in Addis Ababa, Ethiopia. The analytical result indicating that using one bed for more than one child and the admission of new children in to the orphanage were the risk factors to enhance the spread of the disease

Recommendation: use one bed for one child and know the vaccination statuses of new children admitted into the orphanage in addition to that, supplementary immunization activity should be encourage.

Acknowledgement

We, the investigators, would like to thank all the study participants, the Federal Public Health Emergency Management Center (PHEM), the Addis Ababa City Administration Health Office and Kbebe-Tsehay Orphanage Staff for the overall cooperation during the course of this assessment.

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Chapter VI-Abstracts for Scientific Presentation

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Title: |. Measles Outbreak without Rash - in Kbebe-Tsehay Orphanage, Gulele Sub City, Addis Ababa, Ethiopia-2014

Abstract Text:

Background: Even if efforts have to improve vaccination coverage there have been outbreaks here and there in Ethiopia. On September 8, 2014, a suspected measles outbreak was reported from Kbebe-Tsehay Orphanage, Addis Ababa, Ethiopia to Federal Public Emergency Center. Investigation was made to confirm the outbreak, identify risk factors, and implement control measures.

Methods: We conducted unmatched case-control study. Structured questionnaire was used to collect data from 22 cases and 44 controls. Suspected Cases were defined as: Children with fever and cough and with or without diarrhea, vomiting, respiratory distress and Coryza. Controls defined as any children without sign and symptom of the disease. A suspected case with laboratory confirmation (positive IgM antibody) or epidemiological link to confirmed cases in an epidemic. Patient observation was made at Health-Care Facilities. We reviewed Hospital records and prepared line list to gather information. Five blood samples were collected for laboratory confirmation. We used Epi Info 7.3.1 and Excel for data analysis.

Results: A total of 22 measles cases without rash were identified. Three of five blood samples tested positive for measles IgM antibodies. The AR and CFR were 14.7/100 and 4.5% respectively. The median age of cases was 7 months and controls 46 month. Sharing a bed with two or more children (OR: 8.11; 95% CI: 2.5 – 26.6) and the new children admitted to the dorms (OR: 13.2; 95% CI: 3.8 – 45.6) were found to be significantly associated with the disease.

Conclusion: A measles outbreak without rash was confirmed with a (CFR) of 4.5%. Sharing a bed with more than one child and being a new child in the orphanage were noted to be significant risk factors for developing the disease. Therefore, using a separate bed and knowing the vaccination status of new children admitted into the orphanage are recommended as mechanisms to limit transmission of measles epidemic.

Key Words: Measles: Outbreak: Case- Control: Kbebe-Tsehay Orphanage.

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Title: ll. Human and Animal Anthrax in Ethiopia: A Retrospective Record Review 2009-2013

Abstract Text:

Background: Globally, 10-100 thousand human anthrax incidences occur annually with significant number of cases from Chad, Ethiopia, Zambia, Zimbabwe and India. Even though anthrax is a reportable disease in Ethiopia, data have not been analyzed and interpreted for public health intervention.

Methods: Five years, 2009-2013, human and animal anthrax surveillance data were officially requested and received from the Ethiopian Public Health Institute and the Ministry of Agriculture respectively. The data were analyzed by time and place using Epi- info 7.3.1. Arc Geographic Information System (GIS) was used to determine the relationship between human and animal anthrax cases.

Result: A total of 5,197 human and 26,737 animal anthrax cases (human to animal ratio 1:5) were reported from 2009 to 2013 with 86 human anthrax deaths (CFR:1.7 %). The National human incidence was found to be 1.3 per 100,000 populations per five years, while it was 6.7, 2.3, 1.5 and 0.2 in Tigray, Amhara, SNNP and Oromia regions respectively. Zero human case was reported from pastoralist regions with 55-216 animal cases (Afar, Somali and Benshangul Gumuz). The human incidence was high in May followed by February (0.20 and 0.15 per 100,000 populations per year respectively).

Conclusion: This data analysis revealed that less number of Human anthrax cases is reported than Animal cases (ratio 1:5) in Ethiopia. The pastoralist areas where humans and animals co-exist closely did not report a single human case for the last five years.

Recommendation: To determine the magnitude of anthrax in Ethiopia both human and animal surveillance system should be strengthened giving due attention to pastoralist areas. Prevention intervention should be in place in areas where the prevalence of the disease is high.

Key Words: Anthrax, Surveillance, Human, Animal, Ethiopia

Chapter VII -Narrative Summary of Disaster Situation Visited

Meher Season Emergency needs assessment conducted in Gamu-Gofa and Wolaita Zones and Alaba Special District, SNNPR, Ethiopia, December 2014

Executives Summary

As in the past consecutive years, Ethiopia has been preparing emergency Health and Nutrition preparedness to overcome different health and nutrition emergencies caused by different Hazards, namely drought, epidemics, flooding Hearth slide etc. This year Meher season assessment was conducted from November 30 to December 22/2014 in selected Zones and Districts of SNNPR to identify areas where emergency assistance (health, nutrition) might be needed due to disaster situations and to address with acceptable estimates of the number of the population needing emergency assistance for the upcoming six months period.

The assessment was conducted in two zones and one special district from each zone Districts were selected based on emergency health and nutrition problems in consultations with the FMoH, RHB of SNNPR and ZHDs. The assessment was done by interviewing responsible persons from different units of health sector as well as reviewing secondary health and Nutrition data, using the questionnaire developed by FMOH/EPHI/PHEM.

Mult-sectoral Epidemic Prevention and Control Committees at the zonal and district levels were existed; however, there is no regular meeting. There are epidemic preparedness and response plan in each visited zones and Districts but not budget secured at district level. There is no any ongoing epidemic in all districts of Gamu-Gofa and Wolaita Zones and Alaba Special District SNNPR. An AWD and Malaria outbreak is anticipated in Wolaita Zone, However, Measles and Meningitis outbreak not expected in all visited Zones and Special District. In Wolaita Zone in different districts there will be 1,348,089 and 129,306 total estimated population expected affected by malaria and AWD respectively. Therefore to cope up from this health emergency, the Zone will need 1,404.450 birr for Malaria and 1,111,830 birr for AWD but Gamu-Gofa Zone and Alaba Special District not require or need financial support for the upcoming six month.

1. Introduction

The Ethiopian Ministry of Agriculture and the regional Disaster Risk Management and Food Security Sector in collaboration with other relevant Governmental sector and non-Government partners conducts a nationwide vulnerability assessment and risk mapping twice a year. These assessments are called Belg and Meher Assessments. The Meher assessment is always conducted following the main harvesting season to see the level of production and map the different hazards occurred and predict the potential economic, health and social threats. During the assessment possible human health and nutrition risks were expected to be identified and numbers of beneficiaries were estimated. Finally based on the results of the assessment humanitarian document prepare and distributed to all concerned partners to fill the gaps identified to stops and minimize public health consequences. To address this objective, standard checklists classified by Region/Zone and Districts level were used to collected health and nutrition data.

Southern Nations Nationalities, Peoples Regional State is one of the Regions in the Federal republic of Ethiopia with estimated total population of 18,951,895 residing in about 18,000 sq. km, living harmoniously with different languages diversity and has 56 ethnic groups. The assessment was conducted in 10 Zones and 1 Special District, from each Zone two or three districts were selected based on emergency health and nutrition problems in consultations with the FMOH, RHB and ZHDs. Accordingly, this health assessment as part of Meher needs assessment was conducted in two zones (Gamu-Gofa and Wolaita) and one special district (Alaba) and six hotspot districts from these two zones and one kebele from Alaba special district selected. The assessment was conducted from November 30 to 22 December 2014 in these hot spot districts particularly give emphasis on the emergency health and nutrition situation and needs. The purpose of this assessment is to identify areas where emergency health and nutrition assistance needed for the upcoming six months (Tire to Sene 2007 EC) and to determent the gap in the capacity of the health system in addressing anticipated risks so as to develop response plan.

2. Objective of the assessment

- To assess the extent, types, magnitude, severity and likelihood of different risks in the most "vulnerable" Districts of Gamu-Gofa and Wolaita Zones and Alaba Special District
- To assess the existing capacity of the health system of Gamu-Gofa and Wolaita Zones and Alaba Special District to address those Risks.
- To determine gaps in the capacity of two zones and one special district (Gamu-Gofa, Wolaita and Alaba) health system to address anticipated/impending risks and existing threats.
- Based on the findings, contribute to the regional response plan development.

3. Methods and Materials

The assessment was conducted in two zones and one special district (see Table 28). From each zone Districts were selected based on emergency health and nutrition problems in consultations with the FMOH, RHB of SNNP and ZHDs. The assessment was done by interviewing responsible persons from different units of health sector as well as reviewing secondary health and Nutrition data, using the questionnaire developed by FMOH/EPHI/PHEM.

Briefing by different sectors of the zones were made to the team members before departing to the selected Districts, and also debriefing by the assessment team was done at last and discussions were under gone about the findings of the assessment.

Table 28: District Visited in Gamu-Gofa, Wolaita, and Alaba SNNPR, Ethiopia 2014.

Zones	Districts and Kebele	Remark
Gamu-Gofa	Kamba	
	Uba Debre-Tsehay	
	Mirab-Abaya	
Wolaita	Humbo	
	Dugna Fango	
	Boloso Sore	
Alaba Special District	Sibita	

4. Assessment findings

4.1 Gamu-Gofa Zone

Coordination: Multi-sectoral Epidemic Prevention and Control Committee at the zone level existed. The committee consists of all expected governmental organizations and other relevant sectors and headed by zonal administrators having head of health department as secretary. The problems were the committees have no regular meeting; they meet and discuss only if the epidemic occurred.

Ongoing Outbreak: There is no any outbreak in the last three month and also currently there is no ongoing epidemic in all districts of Gamu-Gofa Zone according to the Zonal Health Department information. As of the discussion with Gamu-Gofa Health Department the weekly malaria report shows upward of cases in Some District. But the increasing case did not pass the threshold level as result it did not fulfill the criteria of outbreak.

Anticipated Epidemics: There is no anticipated epidemic that could occur in the zone, mentioned by the Zone Administrative Office during our discussions.

Public Health Emergency Management: The Gamu-Gofa Zone Health Office has public health emergency preparedness and response plan and secured the budget for public health preparedness and response. Moreover, if any epidemic happens the zonal health departments and zonal epidemic prevention and control committees mobilize any available resources. At zonal level there were two trained staffs on public health emergency management.

Stock: As observed the main store there was no stored drug and supplies. All drugs and supplies distributed to all districts timely based on their request and availability, told us the Zone Health Office.

Requirements/Needs:

Currently, there is no risk factor leading to outbreak/epidemic in the zone particularly with top diseases (AWD, Measles, Malaria and Meningitis).But in the zone there are 42830 people affected by different natural problems, among which 32940 (77%) people will scope the situation by Owen without external support but the rest 9890 (23%) people are needs emergency support

to scope the situation. It is anticipated that those people would be vulnerable to health and related emergencies therefore; close attention is needed to ensure those people can respond to any outbreak/epidemic and health related emergencies.

District level

Socio-Demographic Profile:

Kamba District, Uba Debre-Tsehay District, and Mirab-Abaya District were selected and visited from Gamu-Gofa Zone.

Kamba, Uba Debre-Tsehay, and Mirab-Abaya Districts of Gamu-Gofa zone have a total populations of 195,518, 87,132 and 94,713 respectively, of which 95,804 (49%), 44,046(50.5%) and46409 (49%) are male in respective Districts. Of the total populations 30,520(15.6%), 13,593 (15.6) and 14,784 (15.6%) were children under five in Kamba, Uba Debre-Tsehay, and Mirab-Abaya Districts respectively. In the three districts there were no special population such as pastoralist, refugees, internal displacement population and migrant workers.

Coordination:

For coordinated and integrated response to public health emergencies a multi-sectoral PHEM coordination forum has a big impact. In all visited districts have a PHEM coordination forum involving Governmental Organizations and other relevant stakeholders with distinguishable responsibilities and duties and none of them has regular meeting. All of the visited districts have public health emergency preparedness and response plans and majority of them securing fund for Public health emergency by the District Health Offices in addition to this the District council also allocates fund for epidemic responses when any epidemic occurred.

Morbidity:

The top five causes of morbidity of under five children and above five in the visited districts differ somewhat. The most common diseases for under five year‟s children in the visited three districts were Malaria, Pneumonia, Diarrhea, Acute Febrile Illness, and Helminthiasis. In adult the top five morbidity causes in the visited districts were Malaria, Pneumonia, Trauma, Acute febrile illness and Typhoid fever. (See table below)

Table 29: Top five cause morbidity under five Children and above, Gamu-Gofa Zone, Ethiopia, 2014.

Zone	Districts	Top 5 Morbidity Under 5	Top 5 Morbidity above 5
Gamu-Gofa	**Kamba**	1.Malaia	1.Malaria
		2.Pneumonia	2.Typhoid fever
		3.Diarrhea	3.Acute febrile illness
		4.Acute febrile illness	4.Trauma
		5.Heliminthiasis	5.Pneumonia
	Uba-D/Tsehay	1.Malaria	1.Malaria
		2.Pneumonia	2.Helmenthiasis
		3.Diarrhea	3.Trauma
		4.Skin infection	4.Respiratory infection
		5.Otitis	5.Pneumonia
	Mirab-Abaya	1.Malaria	1.Malaria
		2.Acute febrile illness	2.Acute febrile illness
		3.Diarrhea	3.Typhoid fever
		4.Respiratory infection	4.Trauma
		5.Pneumonia	5.Pneumonia

Diseases trend in the last five months:

In all visited districts in the last five month there were no cases and deaths of measles AWD, and meningitis, however, there were 4134 malaria cases with two deaths were reported from all visited area during June to October 2014, namely, Mirababaya (694 cases), Uba D/tsehay (1141cases) and Kamba (2380 cases), with two death from Mirababaya and Uba D/tsehay, (See table 30)

Table 30: Numbers of Cases and Deaths, June- Oct. in three Districts, SNNPR, Ethiopia, 2014.

Districts	Month	AWD		Malaria		Measles		Meningitis	
		Cases	**Deaths**	**Cases**	**Deaths**	**Cases**	**Deaths**	**Cases**	**Deaths**
Kamba	**June**	0	0	591	0	0	0	0	0
	July	0	0	563	0	0	0	0	0
	Aug	0	0	430	0	0	0	0	0
	Sept.	0	0	392	0	0	0	0	0
	Oct	0	0	404	0	0	0	0	0
Uba-D/Tsehay	**June**	0	0	252	0	0	0	0	0
	July	0	0	219	0	0	0	0	0
	Aug	0	0	219	1	0	0	0	0
	Sept.	0	0	243	0	0	0	0	0
	Oct	0	0	208	0	0	0	0	0
Mirab-Abaya	**June**	0	0	170	1	0	0	0	0
	July	0	0	162	0	0	0	0	0
	Aug	0	0	147	0	0	0	0	0
	Sept.	0	0	134	0	0	0	0	0
	Oct	0	0	80	0	0	0	0	0

1. **AWD**: Zero cases were reported from three assessed districts during the last five month.
2. **Malaria**: According to the assessed districts health department reports, malaria cases were somewhat decreased in all malaria endemic area from the last five months of 2014. From June to October 2014, a total of 4134 cases with two deaths were reported. Majority of the cases 2380 (57.6%) were from Kamba followed by 1141 (27.6%) cases were from Uba D/tsehay, and from Mirababaya 693(16.8%) cases. In the three assessed Districts there are about 55 malaria endemic kebeles with an estimated population of 244831.

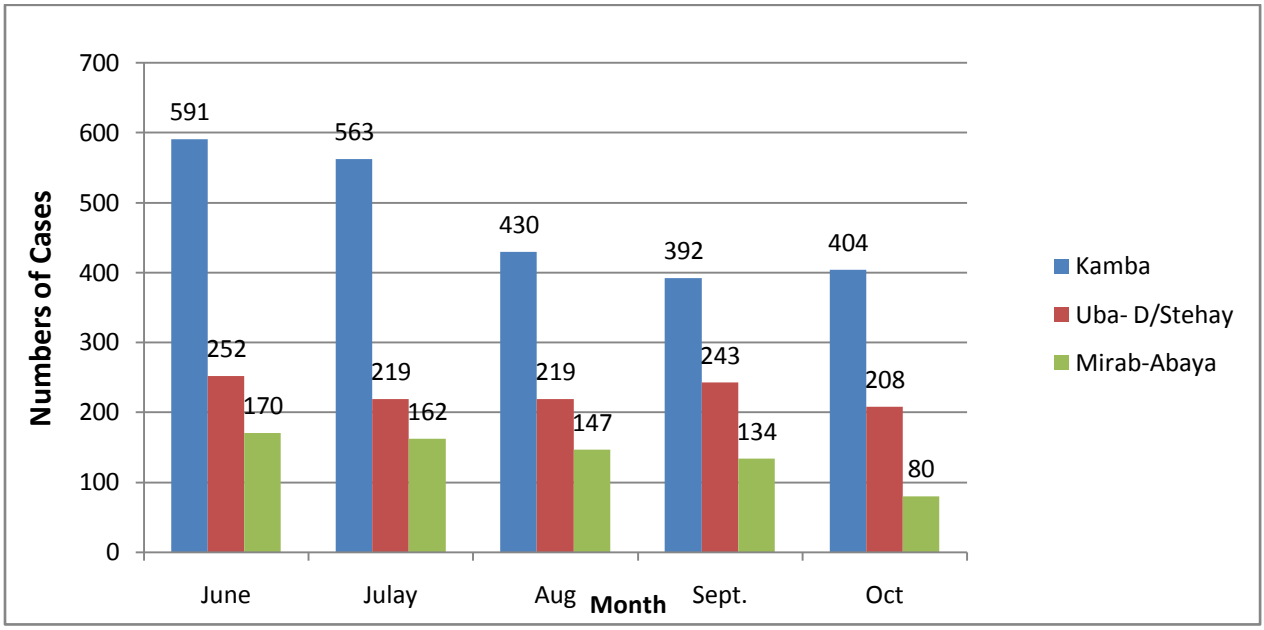

Figure 18: Malaria Cases in Gamu-Gofa Zones, Selected Districts, 2014

3. **Meningitis:** There was no any meningitis case reported from the three assessed districts as well as all districts of Gamu-Gofa zone according to zonal and districts health office information.
4. **Measles:** In the last five month there was no report of measles in all assessed districts in the zone.

Outbreak of diseases:

There was no any epidemic of diseases or significant health emergency in the last five month in the visited three districts, except upraising of Malaria but those increasing number of malaria did not fulfill the criteria to announce an outbreak. There is no ongoing outbreak during the period of assessment too.

Preparedness:

At the assessed district there were some emergency drugs and supplies used to be manage the cases in case of any outbreak occurred. All visited three districts have got adequate and

inadequate drugs and supplies have kept on their stores in the upcoming one month. (See table 31).

Table 31: Emergency Drugs & Medical Supplies at District Level, Gamu-Gofa Zone, Ethiopia, 2014.

Drugs and Medical Supplies	Kamba	Uba- D/Tsehay	Mirab-Abaya
	Yes/No	Yes/No	Yes/No
Ringer Lactate (to treat AWD cases)	Yes	No	Yes
ORS (to teat AWD)	Yes	Yes	Yes
Doxycycline (to treat AWD cases)	Yes	No	No
consumables: Syringe, Gloves (AWD Mgt)	Yes	No	No
Amoxil susp. (measles)	Yes	No	No
Tetracycline ointment (measles)	Yes	No	No
Vit. A (measles)	No	No	Yes
Coartem for malaria	Yes	Yes	Yes
Lab supply: RDT for Malaria	Yes	Yes	Yes
Lab supply: RDT(pastorex) for meningitis	No	No	No
LP set			
CTC kit available (AWD)	No	No	No

Based on table 31 we can concluded that, there were good preparedness for malaria outbreak in case it happens in the next one months, besides the activity implemented to prevent and control the malaria in the assessed districts.

Risk factors for epidemic to occur:

The risk factors for the outbreak/epidemic to occur in the visited three districts are summarized in table 32 below.

All Kamba, Uba Debre-Tsehay, and Mirab-Abaya Districts have malaria endemic area. There were risk factors in these assessed districts which highly contribute for malaria cases occurrence. In addition to the existence of malaria breeding sites such as stagnant water, interrupted or potentially interrupting rivers during the dry season, unprotected traditional irrigation were the major contributing risk factors in all the visited three districts. On the other hand ITN distribution and IRS coverage were more than 80% and 50% respectively in all visited districts.

No expectation of Meningitis outbreak in the coming one to two month and did not occurred the last three years in the visited three districts.

AWD outbreak is anticipated due to the inadequate safe water supply and occurrence in one of the visited district in the last five month. In another hand the there were above 75% and 70% latrine coverage and utilizations respectively in all assessed districts.

Currently there is no ongoing measles outbreak in all observed districts. No risk for Measles so far identified in all visited districts. The vaccination coverage against measles antigen was 84 %, 92% and 97% in Mirab-Abaya, Uba Debre-Tsehay, and Kamba Districts respectively.

Table 32: District with risk factors for epidemics by diseases, visited District, SNNPR, Ethiopia, 2014

Diseases	Risk factors for epidemic to occur	Kamba	Uba-D/Tsehay	Mirab-Abaya
Malaria	Malaria endemic area	yes	Yes	Yes
	presence of malaria breeding site	yes	Yes	Yes
	Interrupted or potentially interrupting river	yes	Yes	Yes
	Unprotected irrigation in the area	yes	Yes	Yes
	ILINs coverage < 80%	No	No	No
	Indicate the coverage of IRS	56	60	100
Meningitis	was epidemics in the last 3 years	No	No	No
	Has vaccination conducted in the last 3 years	Yes	Yes	Yes

AWD	was AWD epidemics in the last 3 years		No	No	No
	Latrine coverage		78	75	83
	Latrine utilization		70	70	76
	Safe water coverage		54	38.4	57.5
Measles	is there ongoing outbreak		No	No	No
	measles vaccination coverage	less than one year	97	92	84
	Has SIA		No	No	Yes

Nutrition Situation:

Food insecurity was also the most series challenge in the assessed districts in Gamu-Gofa zone that resulted increase in severity of malnutrition cases in the previous years. Currently, the situation of food security has been improving and thus significant decline in OTP/SC admissions has been reported in the last two to three years. Based on five month data from the TFP in three assessed districts, from June – October 2014 as shown in the below, new admissions to Therapeutic Feeding Program (TFP) in both Outpatient Therapeutic Program (OTP) and Stabilizing Centers (SC) has risen in two districts in the month of July to September 2014 and then it was decline in the month of September but in the case of Mirababaya district high number of new admission of OTP and SC were reported in June 2014 and from July to October 2014 the number of new admissions become decline in the district.

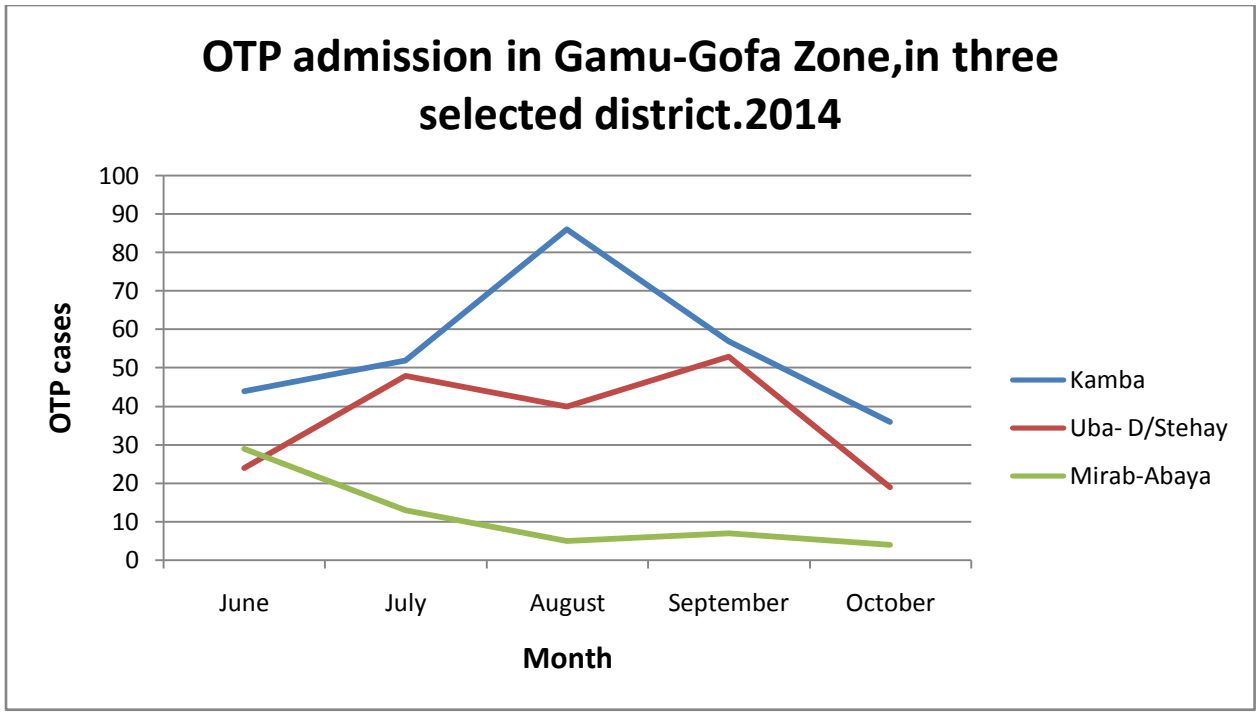

Figure 19: OTP admission cases trend in Gamu-Gofa Zone by District, SNNPR, Ethiopia, 2014.

In all visited districts all Health Posts providing OTP service and Health Center also providing SC service. From a total of 517 OTP admission cases 275(53.2%) were reported from Kamba district from June to October 2014.

4.1.1 Gaps/Challenge:

- Budget allocation for PHEM at District level
- Multi-sectoral Epidemic Prevention and Control Committee have no regular meeting.
- None of the District has CTC kits and meningitis laboratory supplies (RDT, LP).
- Poor data management
- Lack of Logistics/Transportation
- No available emergency drugs and supplies at zone store.

4.1.2 Recommendations:

- Multi sectoral PHEM coordination forum should be functional on regular bases irrespective of the epidemics occurrence.
- Fund allocation for emergency preparedness and response should be considered at district levels which are not secured.
- Emergency drug and medical supplies should be available at zonal level

- The coverage of safe water should be improved in all visited area.
- Meningitis drugs and laboratory supplies and CTC kits are required in all visited Districts.
- Trend in malaria cases has been decreasing in all assessed districts but needs further investigations and interventions.
- Nutrition intervention should be strengthening in all visited area.
- 9890 peoples those are vulnerable to food insecurity should get attention their health too.

4.2 Wolaita Zone

Coordination: At Wolayita zone multi-sectoral Epidemic Prevention and Control Committee are established. The committee consists of all expected governmental organizations and other relevant sectors and headed by zonal administrators having head of health department as secretary. The main treat was the committees have no regular meeting time and discuss the situation; they meet and discuss only if the outbreak/epidemic occurred.

Ongoing Outbreak: There is no any outbreak in the last three month and also currently there is no ongoing epidemic in all districts of Wolaita Zone according to the Zonal Health Department report. The discussion hold with Wolaita Zone Health Department the weekly malaria report shows upward of cases in most malarious District in the last five month. But the increasing case did not pass the threshold level as result it did not fulfill the criteria of outbreak.

Anticipated Epidemics: There is anticipated epidemic that will occur in the zone, mentioned by the Zone Administrative Office during our discussions.

In the last three years there was no AWD outbreak in Wolaita Zone. However due to shortage of safe water supply, 5883 internal displaced people and occurrence of flood in some area of the zone there is no guaranty of not occurring AWD cases in the coming months.

Malaria cases have been reported from different Districts of the Zone. According to the Zone Health Offices the cases of malaria have been decreased by 50% comparing to the previous years, however, in some malarious districts due to low IRS coverage, shortage of LLINs and utilization of LLINs there will be expected malaria epidemics in the Zone.

Due to high vaccination coverage of Measles and meningitis there will not be expected epidemics in the Zone in the upcoming six month.

Table 33: Risk by Districts and Population in Wolaita Zone SNNPT, Ethiopia, 2014

Region	Zone	District at risk	Type of risk	At risk population
SNNPR	Wolaita	Boloso sore	Malaria	215145
	Wolaita	Boloso Bombe	Malaria	110083
	Wolaita	Humbo	Malaria	154500
	Wolaita	Duguna Fango	Malaria	141333
	Wolaita	Damote Sore	AWD	126757
	Wolaita	Humbo	AWD	154500
	Wolaita	Duguna Fango	AWD	141333
	Wolaita	Kindo Koysha	AWD	131678

Public Health Emergency Management: The Wolaita Zone Health Office has public health emergency preparedness and response plan. Based on plan the Zone Health Office has budget for public health preparedness and response activity. In addition to this, if any epidemic will occurs, the zonal health office with zonal epidemic prevention and control committees mobilize any available resources. In Wolaita Zone there were a total of 96 trained staffs on public health emergency management.

Stock: During our assessment we were observed the main drug store of the Zone. There was emergencies drug and supplies in the store. Available drugs and medical supplies that can be used for emergencies are presented in the table below.

Table 34 : Emergency Drug and Supplies by Available and Gaps in Wolaita Zone, Ethiopia , 2014.

Drug &Medical Supplies		Total requirement	Available	Gap
1.Meningitis Vaccine		vaccinated this year		
2.Drug	Coartem	50,000 dose	50,000	0
	Oily CAF	101 vials	0	101
	Doxcycline	452 pk	30	422
	Ringer Lactate	206 bags	0	206
	ORS	446 box	0	446
	Amoxil Suspension	2060 bots	500	1160
	Cortimoxazole Susp.	268 bots	0	268
	TTC Ointment	3860 tubes	0	3860
	Vit. A	864 tin	864	0
3. Lab. Supplies	RDT(malaria)	60,000 tests	16,000	44,000
	Pastorex	20	0	20
	LP set	100	0	100
	TI bottle	30	0	30
	CTC kit (AWD)	1	0	1
4. Medical Supplies	Gloves	2000 pairs	200	1800
	Syringe/surgical	2500 pcs	400	2100
	PPE	15	0	15

Requirements/Needs: This information was essential for making decisions to guide control and prevention activities. Considering the existence of a number of risk factors, there will be expected occurrence of AWD and Malaria outbreaks. In Wolaita Zone in different districts there will be 1,348,089 and 129,306 total estimated population expected affected by malaria and AWD respectively. Therefore to cope up from this health emergency, the Zone will need 1,404.450 birr for Malaria and 1,111,830 birr for AWD.

District level

Socio-Demographic Profile:

From Wolayita Zone three districts (Humbo, Dugna Fango and Boloso Sore) were selected and assessed by the team.

Humbo (159,005), Dugna Fango, (120,040) and Boloso Sore, (209,625) have a total populations, of which 77,913 (49%), 58,820 (49%) and 104,288 (49.7%) are male in respective Districts of the Zone. Of the total populations Humbo 24,303(15.3%), Duguna Fango18, 720 (15.6) and Boloso Sore 32,722(15.6%) were children under five in respective districts. Among the visited three districts there were special populations such as internal displacement population 5883 and 3180 migrant workers found in Humbo district.

Coordination:

During public emergencies coordinated and integrated response is very crucial. To public health emergencies a multi-sectoral PHEM coordination forum has a big impact. In all visited districts have a PHEM coordination forum involving Governmental Organizations and other relevant stakeholders with distinguishable responsibilities and duties and none of them has regular meeting. All of the visited three districts have public health emergency preparedness and response plans and none of them securing fund for Public health emergency by the District Health Offices level, in addition to this, in all visited District, the district‟s administrative council also not allocates fund for epidemic responses when any epidemic occurred.

Morbidity:

Five top cause of morbidity for both under five children and above five are little different in their order and type in the visited three districts. The most common diseases for both under five year‟s children and above five in the assessed three districts were Malaria and Pneumonia (see table below).

Table 35: Top five cause of morbidity by District, Wolayita Zone, SNNP, Ethiopia, 2014.

Zone	Districts	Top 5 Morbidity Under 5	Top 5 Morbidity above 5

Wolayita	**Humbo**	1.Malaria	1.Malaria
		2.Pneumonia	2.Typhoid fever
		3.Diarrhea	3.Trauma
		4.Respiratory infection	4.Pneumonia
		5.measles	5.Acute febrile illness
	Duguna Fango	1.Malaria	1.Malaria
		2.Pneumonia	2.Pneumonia
		3.Acute febrile illness	3.Skin infection
		4.Skin infection	4.Acuterespiratory infection
		5.Diarrhea	5.Gastrites
	Boloso Sore	1.Malaria	1.Malaria
		2.Pneumonia	2.Uper respiratory infection
		3. Internal parasites	3.Pneumonia
		4.Diarrhea	4. Internal parasites
		5.Uper respiratory infection	5.Trauma

Diseases trend in the last five months:

In the last five month in all assessed districts there were no cases and deaths of measles, meningitis, and AWD report, however, there were 6402 malaria cases reported from June to October 2014, in each district, Humbo (2983 cases), Duguna Fango (2047 cases) and Boloso Sore (1372 cases) were reported.

Table 36: Numbers of Cases and Deaths, by Districts, SNNP, Ethiopia, 2014.

Districts	Month	AWD	Malaria	Measles	Meningitis

		Cases	Deaths	Cases	Deaths	Cases	Deaths	Cases	Deaths
Humbo	June	0	0	1044	0	0	0	0	0
	July	0	0	596	0	0	0	0	0
	Aug	0	0	440	0	0	0	0	0
	Sept.	0	0	429	0	0	0	0	0
	Oct	0	0	474	0	0	0	0	0
Duguna Fango	June	0	0	418	0	0	0	0	0
	July	0	0	497	0	0	0	0	0
	Aug	0	0	341	0	0	0	0	0
	Sept.	0	0	378	0	0	0	0	0
	Oct	0	0	413	0	0	0	0	0
Boloso Sore	June	0	0	253	0	0	0	0	0
	July	0	0	238	0	0	0	0	0
	Aug	0	0	228	0	0	0	0	0
	Sept.	0	0	207	0	0	0	0	0
	Oct	0	0	446	0	0	0	0	0

1. **AWD.** In Humbo, Dugna Fango and Boloso Sore district were not reported acute watery diarrhea in the last three years while Humbo district had had reported cases of AWD in 2002 E.C. Due to internal displacement, low safe water coverage and latrine coverage and utilization there is a risk of AWD occurrence in Humbo district.
2. **Malaria.** Currently, there is no investigated occurrence of malaria epidemics in all assessed districts. According to the districts health department report, number of malaria cases are increasing in the last five month but did not passed the threshold level to fulfill the outbreak/epidemic criteria especially Boloso Sore District.

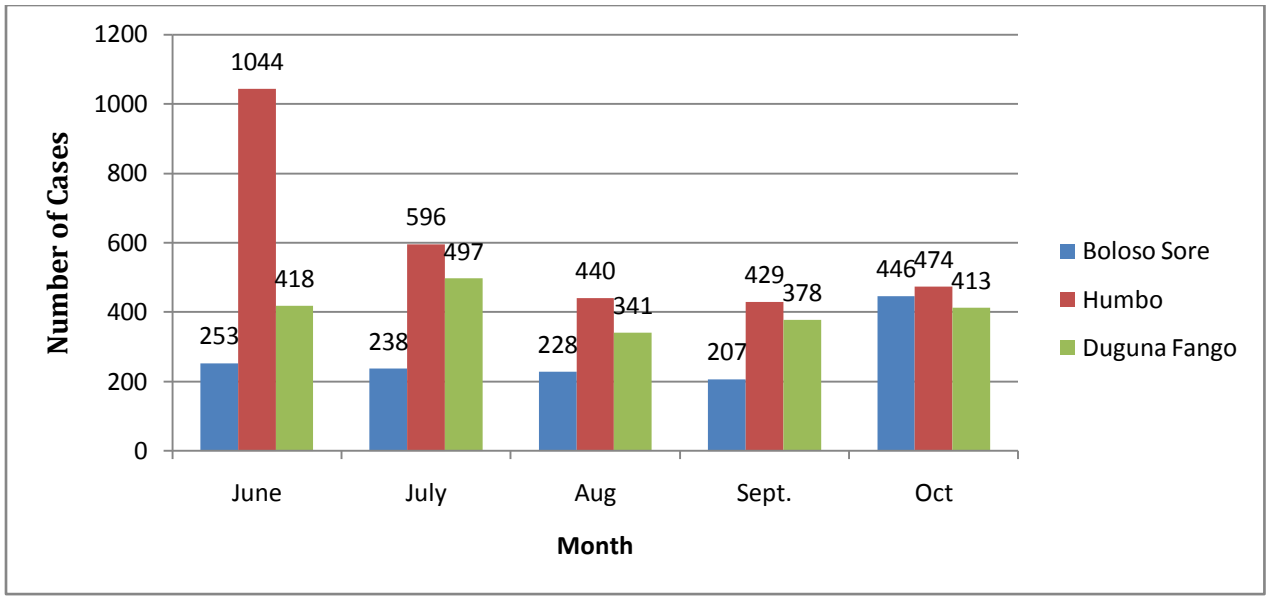

Figure 20: Malaria Cases by month in Wolayita Zones, Selected Districts, 2014.

As seen the above figure, in Humbo district there were high number of malaria cases reported in the month of June compare to the other month and district while all the assessed districts were relatively equal number of cases reported during the month of October.

3. Measles. Measles is one of the vaccine preventable diseases causing higher morbidities in children under five. In three selected districts there was no outbreak reported in the last five months.

4. Meningitis. Regarding meningitis in the last three years in the assessed three districts, there was no occurrence of outbreak/epidemics.

Outbreak of diseases: In the past five months no any disease outbreak was reported in the visited districts. During the assessment period there were no ongoing outbreak/epidemics in the selected districts too.

Preparedness: Beside to Zonal Health Office, the assessed districts Health department have enough and easily accessible emergency drugs or supplies enough for the next one month"s except the absence of some drugs and supplies and is summarized in the table below.

Table 37: Emergency Drugs & Medical Supplies at District Level, Wolaita Zone, Ethiopia, 2014.

Diseases	Drugs and Medical Supplies	Humbo	Boloso Sore	Duguna Fango
		Yes/No	Yes/No	Yes/No
AWD	Ringer Lactate	Yes	No	No
	ORS	Yes	Yes	Yes
	Doxycycline	Yes	No	Yes
	CTC kit	Yes	No	No
	consumables: Syringe, Gloves	Yes	Yes	Yes
Measles	Amoxil suspension	Yes	Yes	Yes
	Tetracycline ointment	Yes	Yes	Yes
	Vit. A	Yes	Yes	Yes
Malaria	Coartem for malaria	Yes	Yes	Yes
	Lab supply: RDT for Malaria	Yes	Yes	Yes
Meningitis	Lab supply: RDT(pastorex)	Yes	No	No
	LP set	Yes	No	No

As seen the table above there is good preparedness for malaria and Measles outbreak in case it happens in the next one month.

Risk factors for epidemic to occur:

The risk factors for the outbreak/epidemic to occur in the visited three districts are summarized in table 38 below.

All the selected districts (Humbo, Dugna Fango, and Boloso Sore) have malaria endemic kebeles. There were risk factors in these assessed districts which highly contribute for malaria cases occurrence. In addition to the existence of malaria breeding sites such as stagnant water, interrupted or potentially interrupting rivers during the dry season, unprotected traditional irrigation were the major contributing risk factors in all the visited three districts. In addition to this in Boloso Sore District ITN distribution and IRS coverage were less than 80% and 26.5% respectively and in Dugna Fango District the coverage of IRS was 44.5 which were also highly contributing to the malaria cases occurrence.

No expectation of Meningitis outbreak in the coming one to two month and did not occurred the last three years in the visited three districts and in general Wolaita Zone too.

AWD outbreak is anticipated in four districts according to Zonal Health Office information due to the inadequate safe water supply, the occurrence of flood, low utilization of latrine and the existence of people displacement. This detail information presented above in Zonal information.

During our assessment there is no ongoing measles outbreak in all selected districts. No risk for Measles observed in all visited districts. In Humbo, Dugna Fango, and Boloso Sore Districts the vaccination coverage against measles antigen was 98.2%, 98.5% and 99.7% respectively.

Table 38: District by risk factors to epidemics, Wolaita Zone, SNNPR, Ethiopia, 2014

Diseases	Risk factors for epidemic to occur	Humbo	Boloso Sore	Duguna Fango
Malaria	Malaria endemic	yes	Yes	Yes

	area			
	presence of malaria breeding site	yes	Yes	Yes
	Interrupted or potentially interrupting river	yes	No	Yes
	Unprotected irrigation in the area	yes	Yes	Yes
	ILINs coverage < 80%	No	No	No
	Coverage of IRS	98%	26.5	44.50%
Meningitis	was epidemics in the last 3 years	No	No	No
	Has vaccination conducted in the last 3 years	Yes	Yes	Yes
AWD	was AWD epidemics in the last 3 years	No	No	No
	Latrine coverage	95%	95%	98.30%
	Latrine utilization	85%	75%	86%
	Safe water coverage	60%	67%	23%
Measles	is there ongoing outbreak	No	No	No
	measles vaccination coverage less than one year	98.2	99.70%	98.50%
	Has SIA	No	No	Yes

Nutrition Situation:

Acute malnutrition in children under five is defined as MUAC<11CM and or the presence of bipedal oedema. Uncomplicated cases of severe acute malnutrition (SAM) are treated in the

outpatient therapeutic program run from health posts and SAM Cases presenting complications are treated as inpatients in stabilization centers (SCs).

In Wolaita Zone monthly reported new cases of outpatient therapeutic programme (OTP) and inpatient therapeutic programme (SC) admissions in the last four years trends presented in figures 21 and 22 respectively.

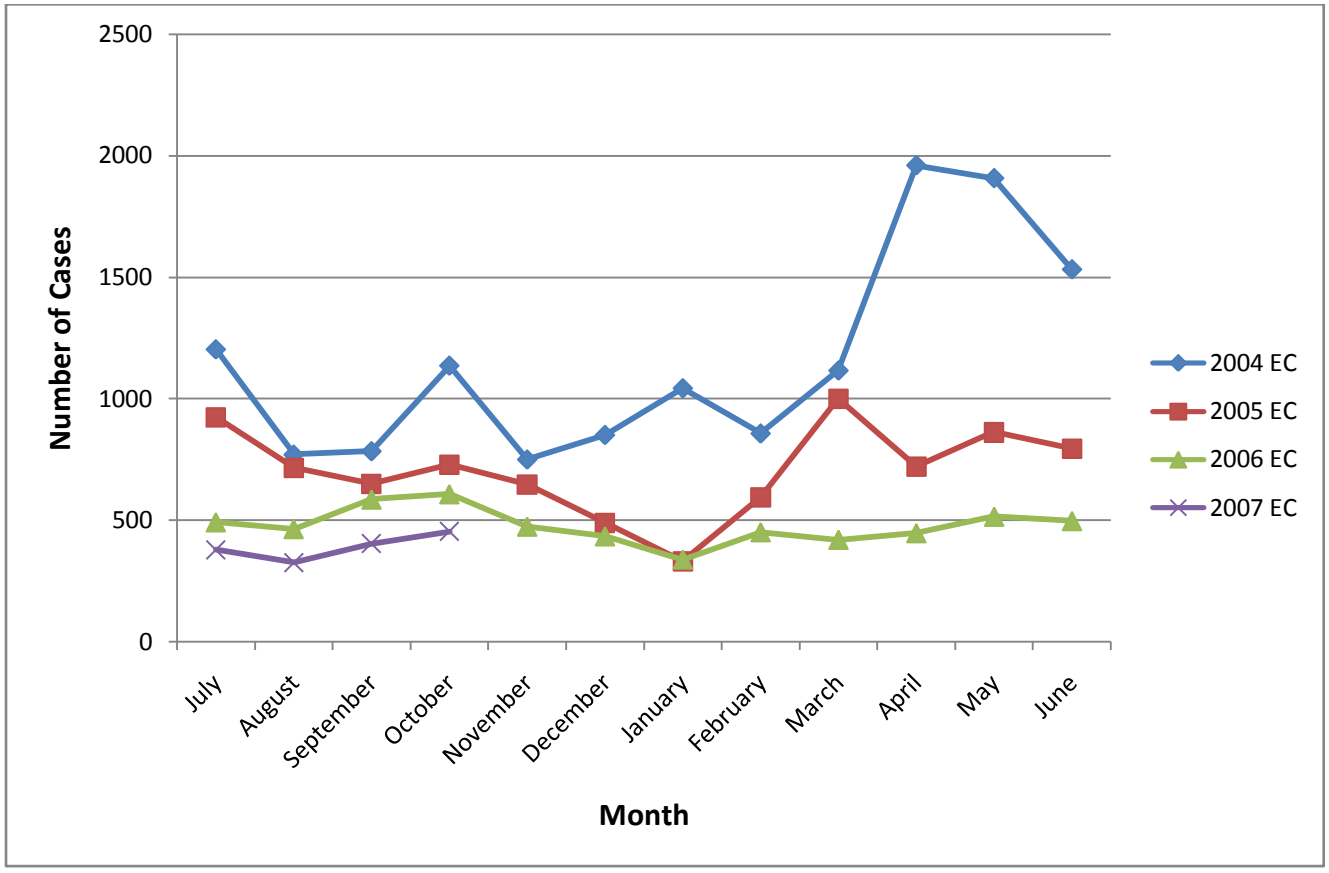

Figure 21: Number of New OTP Admissions by Month Wolaita Zone, SNNPR, Ethiopia, 2014

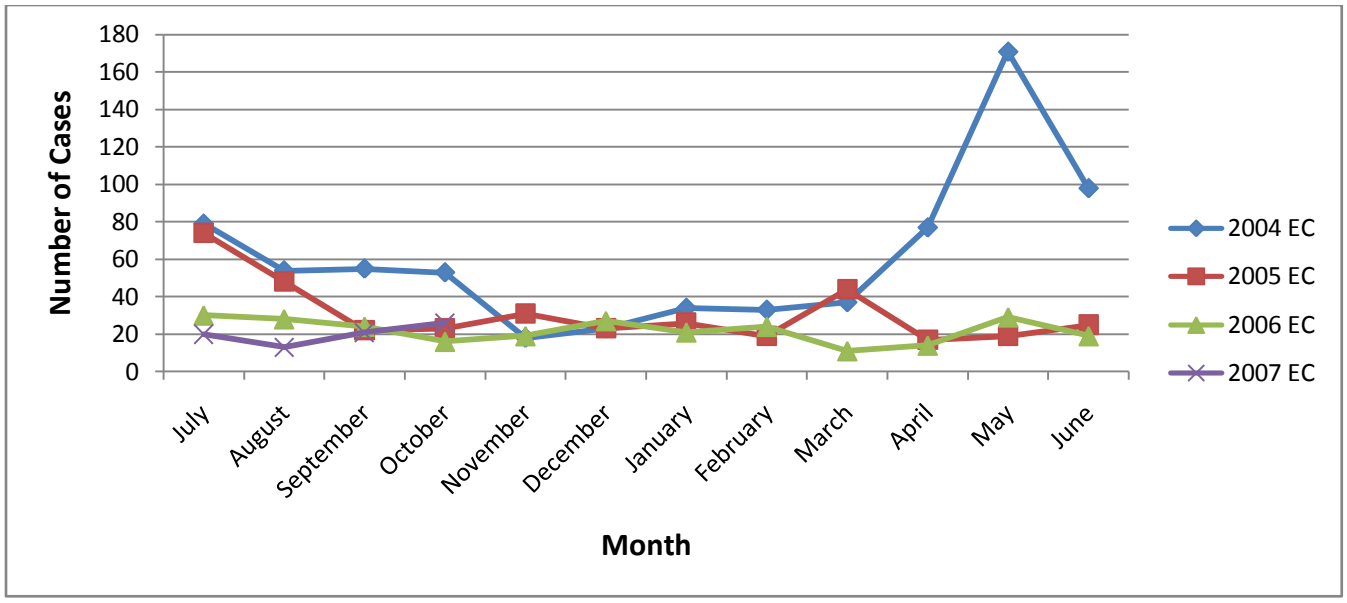

Figure 22: Number of New SC Admissions by Month, Wolaita Zone, SNNPR, Ethiopia, 2014.

According to the data provided by the Zone Health Offices new admissions to TFP Program in both Outpatient Therapeutic Program (OTP) and Stabilizing Centers (SC) have decreased in Wolaita zone.

During the discussion with Zone Health officials to understand the real cause of decreasing malnutrition problem in the area, the following possible reasons were mentioned.

- Improving the awareness of the community on child care and feeding through one to five networking of health development army.
- Improving the intersectoral collaboration with agricultural and other sectors.
- Improving the skill and knowledge of service providers through trainings and supportive supervisions so that it minimized the admissions of children who are not eligible.
- Improve the OTP and SC supplies.
- The quarterly CHD programme improved the nutritional status of children and mothers.
- The linkage between health post and health center.
- Appropriate OTP management which reduced the number of readmitted cases.
- Improving the recording and reporting problems at health post, health centers and districts level.

4.2.1 Gaps/Challenge:

- Budget allocation for PHEM at District level
- Multi-sectoral Epidemic Prevention and Control Committee have no regular meeting.
- None of the District has CTC kits and meningitis laboratory supplies (RDT, LP).
- Poor data management
- Lack of Logistics/Transportation
- Low coverage of IRS.

4.2.2 Recommendations:

- Multi sectoral PHEM coordination forum should be functional on regular bases irrespective of the epidemics occurrence.
- Fund allocation for emergency preparedness and response should be considered in all visited area.
- The RHB and FMoH should find the way to fill the gaps identified on shortage of drugs and supplies especially PPE, CTC kit, LP set, Pastorex, ORS, Ringer Lactate.
- The coverage of safe water and utilization of latrine should be improved in all visited area to protect the anticipated outbreak of AWD.
- Trend in malaria cases has been decreasing in all assessed districts but needs further investigations and interventions.
- Nutrition intervention should be strengthening in all visited area.
- The requirement of 1,404,450 birr for malaria and 1,111,830 birr for WAD should be secured through RHB and FMoH.

4.3 Alaba Special District

Socio-Demographic Profile:

Alaba Special District found in SNNPR, administratively classified in to 79 Kebeles with the total population 314,416. Of the total population 154,063 (49%) were male and 49,080 (15.6%) were children under five. In the special district there were no special population such as pastoralist, refugees, internal displacement population and migrant workers.

Coordination:

Multisectorial public health emergencies coordination forum for health at Alaba Special District is functional according to District Health Office information. The meeting of the forum is not frequent as well as not regular. It is taking place only during epidemics. The Districts Health Office has public health emergency preparedness and response plans and securing fund based on their plan. In addition to this, the district‟s administrative council also allocates fund for epidemic responses when any epidemic occurred in the Woreda.

Morbidity:

The top five causes of morbidity of children under five year and above five year in the visited district were summarized in table below. As seen in the table the most common type of diseases for under five year‟s children were Malaria, Pneumonia, Diarrhea (non-bloody), Acute Febrile Illness, and All type of Respiratory Diseases. In adult the top five morbidity causes were Malaria, Acute Febrile Illness, Trauma, Pneumonia and All type of Respiratory Diseases.

Table 39: Top Five Morbidity by Age Groups Alaba Special District SNNPR, Ethiopia 2014

Zone	Districts	Top 5 Morbidity Under 5	Top 5 Morbidity above 5
	Alaba Special District	1.Malaria	1.Malaria
		2.Pneumonia	2.Acute febrile illness
		3.Diarrhea	3.Trauma
		4.Acute febrile illness	4.Pneumonia
		5.Respiratory infection	5.Respiratory infection

Diseases trend in the last five months:

In the last five month (June – Oct. 2014) in Alaba Districts there were 20 cases and Zero deaths of measles, 12 cases and Zero death of meningitis, Zero case and death of AWD and 3234 cases and Zero death of malaria reported, see summarized data in table 40 below.

Table 40: Numbers of Cases and Deaths, by Diseases, Alaba District, SNNP, Ethiopia, 2014.

Districts	Month	AWD		Malaria		Measles		Meningitis	
		Cases	Deaths	Cases	Deaths	Cases	Deaths	Cases	Deaths
Alaba	June	0	0	721	0	12	0	3	0
	July	0	0	707	0	3	0	5	0
	Aug	0	0	604	0	0	0	3	0
	Sept.	0	0	600	0	4	0	2	0
	Oct	0	0	602	0	1	0	0	0

1. **AWD:** AS seen summarized table above from June to Oct. 2014 there was no AWD case reported from the District.
2. **Measles:** In the last five month (June – Oct. 2014) a total of 20 measles cases reported but these numbers of measles cases are low in number compared to last years. According to the District Health Office information large number of those measles cases not part of the district rather they were came from their adjacent Zone for seeking treatment.
3. **Meningitis:** A total of 13 suspected meningitis cases were reported in the special district in the last five consecutive months (June – Oct. 2014). Due to high coverage of meningitis vaccination in this year they will not expect outbreak/epidemic.
4. **Malaria:** According to the districts health department surveillance report, number of malaria cases are increasing in the last five month but did not passed the threshold level to fulfill the outbreak/epidemic criteria and these number highly decrease comparing to the last year data.

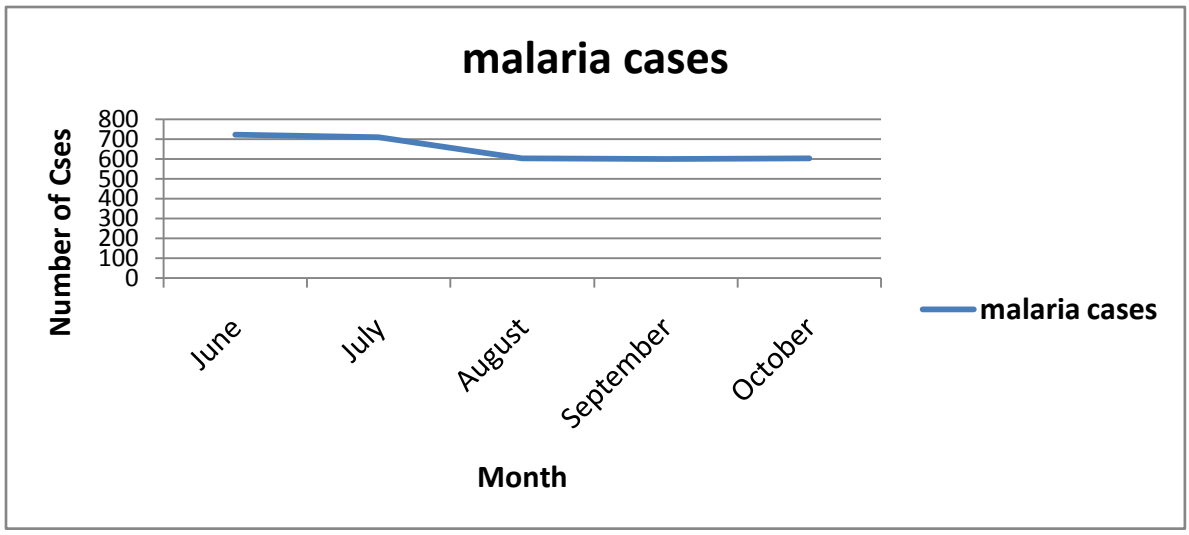

Figure 23: Malaria cases by Month, Alaba District, SNNPR, Ethiopia, 2014.

As seen the above figure, high numbers of malaria cases were reported from June – July 2014 and from June – August the case had decline but from August – Oct. more or less constant number of cases reported.

Preparedness: The Alaba Special District has got enough stock of the following items, for the upcoming one month, in case outbreak/epidemics occur:

- Ringer Lactate (to treat AWD cases)
- ORS (to teat AWD)
- Doxycycline (to treat AWD cases)
- consumables: Syringe, Gloves (AWD Mgt)
- Amoxil Susp. (measles)
- Tetracycline ointment (measles)
- Vit. A (measles)
- Coartem for malaria
- Lab supply: RDT for Malaria
- Lab supply: RDT(pastorex) for meningitis
- LP set

Risk factors for epidemic to occur:

Currently, there is no risk factor causing to outbreak/epidemic particularly with Meningitis. But in the Special District there are risk factors for malaria outbreak; all kebeles were malaria endemic areas, there were breeding sites in the areas. As per Distinct water department in Alaba Special District, therefore, majority of people are now in shortage of drinking water and have

been serving from unsafe drinking water from the distant river sources or neighboring water supply system in other kebeles as result AWD will be expected in the district even if their latrine coverage and utilization is high. Similarly measles outbreak anticipated the district due to the difficulty of address measles vaccination for children those live in another zone which is adjacent to their kebele and the child those are come from neighboring kebele suspected to measles had been got the treatment in the health center which is found in Alaba Special Woreda.

Nutrition Situation:

Currently, the situation of OTP and SC admission has been declining in this special district compare to the last five months (June – Oct. 2014) and the last year the same period of time. The number of OTP and SC cases seems high as seen the below but the reason why it look like high in numbers are due to expansion of OTP and SC and improving the reporting systems in the district, mentioned the district Health Department Officials during our discussions.

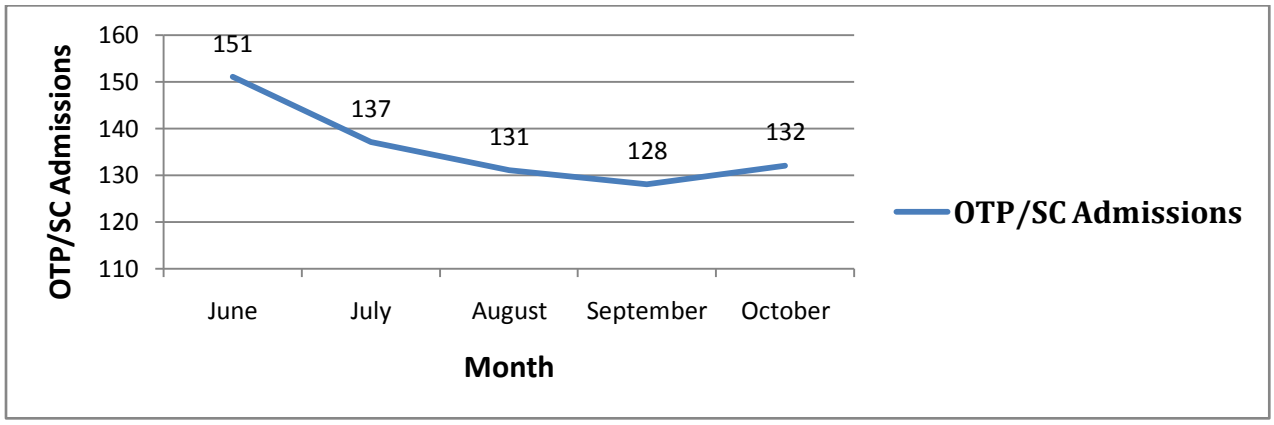

Figure 24: OTP/SC Admissions by Month, Alaba Special District, SNNPR, Ethiopia, 2014.

4.3.1 Gaps/Challenge:

- Budget allocation for PHEM at Kebele level
- Multi-sectoral Epidemic Prevention and Control Committee have no regular meeting.
- The existence of measles and meningitis cases in the last five month
- Poor data management
- Lack of Logistics/Transportation

4.3.2 Recommendations:

- Multi sectoral PHEM coordination forum should be functional on regular bases irrespective of the epidemics occurrence.
- Fund allocation for emergency preparedness and response should be considered in the district.
- The RHB and FMoH should find the way to fill the gaps identified on shortage of drugs and supplies especially PPE, CTC kit, LP set, Pastorex, ORS, Ringer Lactate.
- The Region and Federal Government should be involved to alleviate serious problem of safe water coverage in the district.
- Trend in malaria cases has been decreasing in all assessed districts but needs further investigations and interventions.
- Nutrition intervention should be strengthening in all visited area.
- In the last five month there are about 20 measles cases and 13 meningitis cases. In this regard the Region, federal government and partners should support the district managing the cases.

Chapter VIII – Protocol/Proposal for Epidemiologic Research Project

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February 2015

Title: Assessment of Bed Net Utilization among Children Under Five Years of Age and Pregnant Women of Pastoralist Area, Fentale Woreda, Oromia Regional State, Ethiopia 2015

Executive summary

Background: In Ethiopia 75% of the total land mass is malarious and 68% of its population is estimated to be at risk of malaria infection. East Shoa Zone is one of the 14 Zones in Oromia Regional States accounting more than half of malaria burden annually. Among 12 Woreda in the Zone, Fentale Woreda is highly malarious; almost 100% of the land is malarious. There were no studies that have examined the factors associated with Bed Net utilization among Children Under Five Years of Age and Pregnant Women of Pastoralist Area, Fentale Woreda, Oromia Regional State, Ethiopia

Objective: The study is aimed to assess the proportion of Bed Nets ownership by households, utilization among under 5 children and pregnant women and factors affecting ownership and utilization of Fentale Woreda.

Method: Community based cross- sectional survey will be conducted. Primarily, the malarious villages will be stratified as rural and factory camps. The existing households will be identified using registration list available at Woreda Health Office. Study units will be identified by multistage random sampling technique. A total sample of 768 households will be proportionally selected. Both self-reported information and direct observations will be used to collect data. Data will enter to the computer using Epi info Version 7.3.1 and analyzed.

Expected outcome: The investigator hopes that the result of this study will demonstrate itself as a powerful tool for scaling up Bed Net utilization among children aged <5 and pregnant women for remarkable success in reduction in all causes under 5 years of age children mortality in the area. Enhance regularly utilization of Bed Nets for pregnant women and contribute significantly to minimize anemia in pregnant women, adverse birth out comes such as spontaneous abortion, still birth, premature delivery and low birth weight. Once factors affecting Bed Net utilization are addressed a significant number of children age < 5 and pregnant women will be actively

involved, and the current nationally and locally low utilization coverage will be scaled up to the desired level of coverage.

Finally, the outcome of this study will also helpfully to improve the Bed Net utilization among children age < 5 and pregnant women in other area.

1. Introduction

1.1. Background

Malaria prevention and control interventions have recently undergone major increase in Africa, and malaria disease burden is reported to be declining in several African countries[1], including Ethiopia and other East African countries[2-5]. However, there is complexity within countries, including large geographical variation in incidence and differing upward or downward trends between indicators, hospitals or areas [2, 6, 7]. Repeated representative nationwide malaria prevalence surveys are now becoming the norm, and there is a good attention on improving estimates of the impact of control measures on malaria mortality[8]. However, Malaria remains a public health problem in sub-Saharan Africa and it is more serious in vulnerable groups such as children under five year old and pregnant women[9].

In Ethiopia 75% of the total land is malarious and 68% of its population is estimated to be at risk of malaria infection[10].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[11].

Since1950ʿs, significant efforts have been done to control malaria in Ethiopia. However, the disease continues to be one of the major causes of illness, death and impediment to socioeconomic development in the country[12]. The National Malaria Control Program (MCP) of Ethiopia developed a strategic plan to reduce the burden of the disease by 25% in the year 2005 and by 50% in the year 2010. To meet the above mentioned goal, early diagnosis and effective treatment, selective vector control and epidemic prevention and control has been the main focus[12].On the contrary, both the chemotherapy and vector control arms of malaria prevention mainly through indoor residual insecticide spray (IRS) are being challenged by the appearance of drug resistance Plasmodium parasites and insecticide resistant Anopheles

mosquito vectors, respectively in sub-Saharan Africa including Ethiopia[13-17]. This together with unstable nature of malaria transmission in Ethiopia[18], necessitates high distribution of ITNs to malaria prone areas as one of the major vector control strategies.

Insecticide treated nets are reported to be highly effective in reducing childhood mortality and Morbidity from malaria[19].In Ethiopia insecticidal net coverage has increased to 53.3% (FMoH, 2008). Nationwide distribution of Bed Nets especially long lasting insecticide treated nets (LLITNs) along with artemisinin-based combination therapy (ACT) has resulted in 73% reduction in in-patient malaria cases as well as 62% reduction in deaths in children under 5 years of age in Ethiopia[20].Like other malarious areas of Ethiopia, Bed Nets are among the major malaria vector control strategies in malaria prone areas of Oromia region.
All kebeles of the Fentale Woreda are under risk of malaria infection throughout the year Malaria is one of the leading causes of both admission and outpatient visit disease of the Woreda.

1.2 Statement of the problems

Ethiopia, realizing the effectiveness of Bed Nets for prevention of malaria transmission, scaling up distribution and utilization of Bed Nets to cover 60% of children fewer than 5 years of age and pregnant women living at high risk area of malaria transmission is undergoing[21]. In order to support this part of malaria prevention aspect there was much effort and resources allocated from donors. On the other hand the proper utilization coverage of Bed Nets among priority and high risk groups were found to be very low, where as the 1st phase of the commitment has ended by 2005[22].

Since three-fourth of the land mass in Ethiopia is malarious and Oromia is the 1st largest Region, it shares majority of the health and economic burden of malaria in this country and region. Similarly high proportion of resources to prevent and control malaria is expended in the region, especially in Woreda with intensive transmission[21]. Among these, Fentale Woreda (100% of the land malarious and 100% of population at risk) stands among the top. Therefore, in addition to the governmental effort, Non-Governmental Organizations and others (sugar factory) in the Woreda were distributing bed nets in their respective catchments[23]. The share of social marketing is also not negligible[24]. Despite different preventive measures taken, the magnitude

of the disease has remained the leading cause of morbidity and mortality, always raising the question why?

Data about Bed Nets utilization rate among under 5 children and pregnant women, factors affecting utilization will remained un assessed in the study area.

In the light of this background, the present study will examine the situations and tries to fill the gaps. The data generated will be assist the local authority and Regional Health Bureau to prepare implementation plan and evaluation of their activities. Additionally, it will help to national information

2. Objectives

General Objective:

To assess Utilization of Bed Nets among under five Children and Pregnant women and describe factors affecting its use in the area

Specific Objectives

- To identify the proportion of households with Bed Nets
- To identify the proportion of under five Children and Pregnant women utilizing Bed Nets
- To identify knowledge of respondents and other factors affecting utilization of Bed Nets.

3. Methods and Materials

3.1 Study Design

Community based cross-sectional study will be conducted in pastoralist area of Fentale Woreda

3.2 Study Area and population

Fentale Woreda is one of the woredas in the Oromia_Regional State of Ethiopia. It is Part of the Misraq_Shewa_Zone located in the Great_Rift_Valley, 198 km from Addis Ababa, the capital city of Ethiopia. It extends between 8^0 42ʻ-8^0 09ʻN latitudes and $39^0$39ʻ-$40^0$04ʻE longitudes. It is located in the North-Eastern part of East Shewa Zone. It is bordered by the Amhara Regional State in the West and Northwest, with the Afar Regional State in the North and Northeast; with West Hararghe and Arsi zones in East; and with Boset Woreda and Arsi Zone (Merti Woreda) in South and Southeast. It surrounds the administrative Town of Metehara in all directions and covers 1364.72 km^2. Most part of the Woreda has tropical agro-climate.

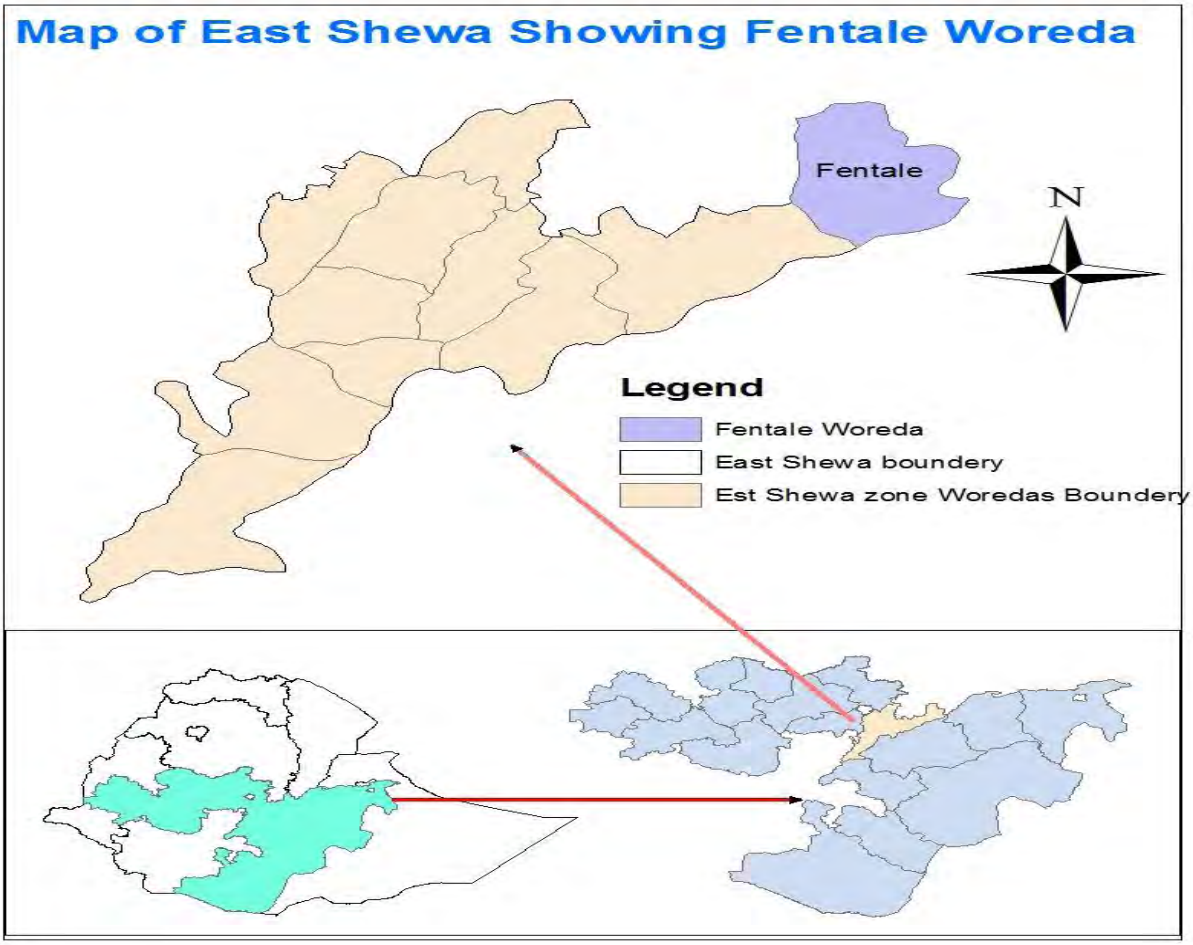

Figure 25: Fentale Woreda East Shewa Zone, Oromia Region, Ethiopia, 2014

In the Woreda there are a total of 18 kebeles and one big Sugar Factory Camp and all 18 kebeles are rural. According to the 2007 census and projections, in the year 2014/15 the size of Fentale Woreda population, including 18 kebeles and Metehara Sugar Factory are 73,801. More than two-thirds (68.6%) were of the population inhabiting in the rural villages, where as the rest in Metahara Sugar Factory Camps. Concerning the health care services, there are one Factory Hospital, four Governmental Health Centers, eight non –Governmental Health Centers, 18 Health Posts and five Private Health Facilities.

3.3 Source Population

The source population will be all households which are found in rural villages and Factory Camps with high risk malaria transmission in Fentale Woreda.

3.4 Study subjects

The study subjects will be households and under five years of age children and pregnant women of Fentale Woreda who will be chosen randomly from villages and factory camps that are at risk of malaria transmission. It is assumed that one under five child and pregnant women sleep under the mosquito net, but if more than one existed in the household, one under five child and pregnant women in the household will be selected from each by lottery method.

Inclusion criteria for study participants: All children aged < 5 and all pregnant women living in the Woreda under investigation will be eligible for interview.

Exclusion criteria for study participants: All children aged > 5 and no pregnant women, and also who are in-patients and who are unable to hear, unconscious or mentally disabled.

3.5 Sample Size Determination

The study sample size will be determined by statistical calculation. The estimation of population proportion, p, where p is the proportion of households that uses Bed Nets for children under 5 years of age and pregnant women, assuming that one child or pregnant women sleep under a net. Because of the approximation of households properly utilizing Bed Nets in the area is unknown, p = 0.5 will be used, as this value gives sample size sufficiently large to guarantee an accurate prediction, at 95% confidence interval and 5% error of estimate.

The following formula will be used.

$$n = \frac{(z\_/2)^2 * p\,(1-p)}{d^2}$$

Where:-

n= sample size

p= 0.5 (proportion of HH using Bed Nets)

Z x/2=1.96 (Z=score corresponds to 95% confidence interval).

d= 0.05 (Margin of error)

$$n = \frac{(0.5)\,(0.5\,(1.96)^2}{(0.05)^2} = 384 \text{ HH}$$

The study group will be stratified twice (multistage) and the design effect is taken to be 2; the total sample will be 2x384= 768

10% contingency will be considered =77 households, which will gives a total of 845 households.

3.6 Sampling procedures

The study units will be identified by stratified multistage random sampling technique. Primarily, the source population will be stratified in to Rural (18 kebeles) and factory camp (7 camps), with a population proportion of 68.4% and 31.6% respectively. This is believed to increase representatives of the subjects as there might be differences by type of residence, information, economic status and efforts from external bodies which causes variations. The number of households which will be selected from each randomly selected kebeles will be determined by the households (population) proportion of respective kebeles. Furthermore, the study units (households) will be selected by simple random sampling using the recent registration list.

3.7 Data Collection Method

The data will be collected by interviewer using structured questionnaire which will be pre- tested by principal investigator and two EFETP residents who will be assigned as supervisor, for appropriateness before the actual data collections. The questionnaire will be translated to Oromo language. Six data collectors, twelve assistants (community health agents from respective villages, kebele and camp) and two supervisors will recruit on the basis of educational, ability to speak the regional working language (oromifa) and Amharic. The team will divided into six groups with 1 supervisor for three teams.

3.8 Variables of the study

Dependent variables:

- Availability of Bed Nets in the household (possession)
- Practice on Bed Nets utilization: children under 5 years of age sleep under the net and pregnant Women sleep under the net.
- Knowledge of respondent:-

Independent variables:

- **Socio-economic characteristics**: Sex, Age Educational status, Religion, Source of Income

- **Health information**
- **Environmental:** Type of living room, Place of residence, Season of the year

3.9 Data Quality Assurance

All data collectors will be given intensive training to collect accurate data, to avoid bias and to record carefully and emphasize as the investigator will check the accuracy of their work, and the investigator will conduct regular supervision during data collection process.

Questionnaire will be pre-tested on small number of respondents who are comparable to the sample of the respondents, but are not parts of it and it will be translated in to the local language and then back to English to ensure that the meanings are maintained.

To assure the quality of the data, properly designed data collection instrument will be used. Every day; all of the collected data will be reviewed and checked for completeness and relevance by the supervisors and principal investigator. Data cleaning will be done by running frequency of variables using Epi/info by the principal investigator.

3.10 Data Analysis

All the quantitative data collected, once checked, will be coded, recorded on a computer and analyzed using the epi-info software package (Centers for Disease Control and Prevention). Also; data will be cleaned and checked for outliers, inconsistencies and missing values. Binary logistic analysis will be used to compare socio-demographic characteristics.

Multiple logistic regression models will be used to identify factors associated malaria with children aged < 5 and pregnant women.

For the qualitative part, data collected by in-depth-interview. The transcribed text from each informant will be translated from Afan Oromo to English. The data will be transcribed and analyzed manually, in line with the objectives of the study.

3.11 Operational definition

- **Bed Net-** is a material made of nylon, polyester, polyethylene and synthetic with cotton mixture with different shape, size and used to protect people against insect bites.

- **Insecticide Treated Mosquito Nets**- nets treated with insecticide to kill or irritate mosquitoes and used as physical barriers.
- **Target group**-groups which are nationally identified as high risk and given priority for Bed Nets utilization, these include pregnant women and children under 5 years of age, community affected by emergency and all others living in malarious area.
- **Bed Nets Utilization-** The use of standardized properly hanged (mounted) over the bed or the sleeping area and less than 5 years of age child and pregnant women sleeping under the mosquito net during the early morning of observation day.

3.12 Ethical Considerations

Ethical clearance will be obtained from review board of Addis Ababa University, Faculty of Medicine and Public Health. Permission will be sought from East Shewa Zone, Oromia Region Health Department. An informed verbal consent will be obtained from every eligible individual before inclusion into the study by explaining the objective of the research. Privacy and confidentiality will be ensured. The name of respondents will not be written on the consent form, thus the information you provide will not be known to others. There is no risk involved in participating in the study and the participation of individuals will be purely voluntary, and they can withdraw any time after they get involved in the study without compromising the services.

3.13 Dissemination plan

The results of the study will be presented to Addis Ababa University for approval; then after which it will disseminated to National Program managers within the Ministry of Health. The Ministry of Health then will share with t Region, Zone, District, its stake holders and partners working on the disease. Then after Abstract will be prepared and be presented in different Scientific Communities such as Ethiopian Public Health Association Annual Conference, AFENET and TEPHNET regional and global conferences after witch finally get published. The documentation of this study result through publishing of it will be of immense value to the elimination of malaria disease as major disease of public health in the African Continent.

4. Budget and Implementations Time

A total of 5000.5 USD will be needed to conduct the study. The project will take about six months including preparation of final report, detail is found in the table below. Study will be started within two weeks after grant released.

4.1 Project Budget Break Down

Description	Item	Unit	Quantity	Unit cost in US$	Multiplying factor	Total cost in US dollar
Personnel	Principal Investigator	DSA	one	20	20*10 days	200
	Supervisors	DSA	two person	20	40$*10 days	400
	Data collectors	DSA	six person	15	90$*10 days	900
	Local assistants	DSA	12 person	10	120$*10 days	1200
	Driver	DSA	One person	20	20$*10 days	200
	Training	DSA	22 person	10	10$*22 person	220
Sub-total cost						3,120$
Travel	fuel	litter	1000	1	1000L*1$	1000
	lubricants	jurican	1	5	1*5$	5
	Car rent	number	1	80	80$*10 days	800
Sub-total cost						1805$
Supplies	Pencils	Each	30	0.05	0.05$*30	1.5
	Note books	Each	30	0.5	0.5$*30	1.5
	CD-RW	Each	30	0.25	0.25$*30	7.5
	Flip chart paper	Each	10	0.75	0.75$*10	7.5
	Marker	Each	10	0.75	0.75$*10	7.5
	Photocopy cost	Each	800	0.05	0.05$*800	40
	Printing and binding	Each	4	2.5	2.5$*4	10
Sub-total cost				75.5$		
Total cost						5000.5$

4.2 Project implementation time

S.No	Description/ Activity/	2015					
		Jun	Jul	Aug	Sep	Oct	Nov
1	Preparation						
2	Obtain Support letter From AAU-SPH						
3	Development of questionnaires						
4	Pre-testing questionnaires						
5	Arranging and preparations of stationary and logistics						
6	Recruitment and training data collectors						
7	Data collection						
8	Data entry and cleaning						
9	Progress report submission						
10	Analyze Data						
11	Report Writing						
12	Report Submission						
13	Presentation of Findings						

5. Informed Consent Sheet

Objective: To assess Utilization of Insecticide Treated Nets among households and describe factors affecting its use in pastoralist area of Fentale Woreda

Procedure: This project will take about 30 minutes of your time. There are two parts. First, we will clearly explain you the purpose, benefits and risks of the study. We will give you a chance to ask questions and gate answers about the study. Second, we will ask you about Utilization of Insecticide Treated Nets among households and describe factors affecting its use in pastoralist area of Fentale Woreda. All information collected during this study will be kept private and will only be known by the investigators.

Benefits: This project will help the government and the community scale up the effort of malaria prevention and control.

Risks: There is no risk to you from answering the questions or being participated in this study. I will give you a copy of this consent.

Privacy: We will keep information about you private. We will not collect your name. Only the investigators will have access to the data and only for study purpose. We will not use any information that might identify you when we present or publish the study‟s results.

Payment: There is no cost to you for being part of the project. The approximate time that this study will take is 30 minutes. There will be no involvement past today.

Participant Agreement: The project has been explained for me. I have been given a chance to ask questions. I feel that all my questions have been answered. Being in this study is my choice. I may change my mind and leave the study any time during the interview.

Participant Signature_____ Date_____

Name of persons obtaining consent_____

Signature of persons obtaining consent _____ Date _____

6. Reference

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Chapter IX- Other Additional Output Reports

Training

Report on Public Health Emergency Management Basic Level Cascaded Training For Afar Region, Woreda Level PHEM Focal Persons from September 21 - 26/2014, Amhara Region Kombolcha, Ethiopia, 2014

Executive Summary

In order to address the human resource needs of PHEM, the Federal Ministry of Health in collaboration with partners established the Ethiopia Field Epidemiology Training Program (FETP) in 2009. Based on the lessons learned from other successful programs over the globe, the pyramidal model has been adopted and tailored to the needs of the country. Hence, the advanced training is designed and given at the top of the pyramid for addressing human resource needs at higher level. However, it is realized that the advanced training could not address the high demand for human resource at all levels of the PHEM system of Ethiopia. Therefore, PHEM has designed the basic level training to strengthen the capacity of the PHEM system at Woreda and zone level where there is a huge gap in implementing its activities.

The training was conducted in Kombolcha Town from 21-26 September 2014 in collaboration with the regional health bureau and WHO surveillance focal person with CDC financial support through EPHA. The total trainees in attendance were 64 (98.4%) and most of them were PHEM and EPI focal persons of the respective Woreda health office and health facilities.

1. Introduction

In Ethiopia, the ability to detect problems and respond to health emergencies through proper surveillance system has been largely limited. As a result, prevention and control of epidemics was weak and this was partly due to lack of skilled personnel. The Federal Ministry of Health identified Public Health Emergency Management as one of the core processes for intervention during its Business Process Reengineering exercise

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 in Ethiopia. It is the process of anticipating, preventing, preparing for, detecting, responding to, controlling and recovering from consequences of public health threats in order that health and economic impacts are minimized. In view of this, PHEM guideline was developed as a working document.

In order to address the human resource needs of PHEM, the Federal Ministry of Health in collaboration with partners established the Ethiopia Field Epidemiology Training Program (FETP) in 2009. Based on the lessons learned from other successful programs over the globe, the pyramidal model has been adopted and tailored to the needs of the country. Hence, the advanced training is designed and given at the top of the pyramid for addressing human resource needs at higher level. However, it is realized that the advanced training could not address the high demand for human resource at all levels of the PHEM system of Ethiopia. Therefore, PHEM has designed the basic level training to strengthen the capacity of the PHEM system at Woreda and zone level where there is a huge gap in implementing its activities.

This cascaded intensive training have be 64 trainees comprised of PHEM focal persons and Woreda and Health Facility surveillance focal persons who were represented from Afar Region, 32 woredas and two city councils. The main objective of the training was to strengthen capacity in recognizing and responding to public health emergencies, strengthen the early warning & surveillance system and conduct effective surveillance activities, provide guidance on how to implement the designed Public Health Emergency Management using the skills and knowledge of the basics of field epidemiology training at Woreda level which is the lowest functional unit and help the trainees to use the data collected from the system, to detect and respond to priority

diseases, risks, conditions and events and thereby contributing to reduction of the burden of illness, death and disability in the communities.

2. Objectives of the PHEM Basic Level Training

General Objective

- To give knowledge for the participants for field epidemiology at basic level to strength the PHEM system at Woreda level.

Specific Objectives:

- Strengthen capacity in recognizing and responding to public health emergencies during the pre-emergency phase
- Strengthen the early warning & surveillance system and conduct effective surveillance activities
- Introduce modern multi hazard approach and PHEM system specific to protection, prevention and response.
- Improve the use of information for detecting, investigating and responding to public health threats and recovery
- Improve the flow and use of surveillance information throughout the health system
- Manage coordination and collaboration with partners and stakeholders to avoid crisis and catastrophes through mobilizing resources and capacity building
- Develop skills in applied epidemiology including: 1) how to plan for, conduct, interpret the results of the investigation, and communicate the results to those with a need to know; 2) the application of descriptive epidemiology (time, place, person, agent, transmission, host, and environment) to investigating disease in communities; 3) the application of analytic epidemiology as appropriate to developing data in the field, including how to collect the data, analyze the data, and interpretation of the data; 4) the application of the descriptive epidemiology and analytic epidemiological data to developing control and prevention measures at Woreda level.

3. Methods and Materials

Date of the training, number of trainees and duration of training were decided by Afar Regional Health bureaus, EPHA and EPHI. Invitation letters were developed and sent to Afar Regional Health Bureaus two weeks ago before the date of training. Training schedule was drafted by PHEM and enriched by input from Regional Health Bureaus and EPHA. Given that, the number of the trainee was 64, the training was arranged in two rooms. The learning approaches were follows that of an adult learning indicating that it was learner centered. The duration of the training has two parts. Part I, the intensive phase is six-day training that requires classroom-based teaching -learning and dedicated time for undergoing through the five modules of the training. Part II is an on-job training which is part and parcel of the PHEM activities in the respective woredas. This phase of the training was assisted by mentors who are experts in the field epidemiology including the respective PHEM staff. Two different outputs will be expected from the on-job training (E.g. surveillance data analysis and outbreak investigation or Woreda health profile or any other combination suggested by mentors). The outputs will be presented and delivered to zonal or regional PHEM with approval of the respective mentors. A description of the mentorship is provided as part of the participant modules.

The training was conducted in collaboration with RHB PHEM staff, EPHI and financial contribution of CDC through EPHA; the total money expended for this training was Birr 413,159 birr with 81 cents.

Training methodology

- Lecture with discussion by facilitators
- Exercises (Individual and group)
- Case studies
- Reading assignments (Individual and group reading)
- Mentorship during on-job-training

Materials used

- Training Modules
- PHEM guideline
- Specific reference materials/guidelines

- Other reading materials
- Case studies
- PHEM data
- PowerPoint slides
- Pictures
- Computer
- Flipchart
- Markers
- Laptop
- LCDs, notepad, pen, CD per trainee etc.

Target group for the course

The training was intended to build the skills and knowledge of the Public Health Emergency Management teams at Woreda level with special emphasis on Woreda PHEM staff, surveillance officers/focal points and Health Facilities. Therefore the modules will help to improve their knowledge and practice at them working environment in PHEM. Public Health Officers, Environmental Health Technologists, Laboratory Technologists, Nurses and others who were assigned as focal points at the Woreda health system including personnel at Health Facilities were target groups for the training.

4. Major activities accomplished

After self introduction had been made by participants, a well-coming address and opening remarks took place by Mr. Ibrhaim A. Afar Region, Health Bureau PHEM Officer.

Expectations and ground rules have been laid down. The training was represented by all zones that came from the Region.

Pre test was given before the main topics started, and then followed by presentation which was participatory and focused on basic level PHEM module.

There were recap every morning before starting the session which were presented by one participant who was nominated from respective Zone.

Group exercise were given for trainees by dividing them in to four groups each section for each topic, after they attempt the exercise, the group representative presenting the answer on flipchart and also provided the assignment a general discussion taken by the group member, all the document (question and answer) has given to the participant used as a reference.

The group also gains knowledge of PHEM at basic level which were early warning and Surveillance, Public Health Emergency Response, Public Health Emergency Preparedness and recovery from Public Health Emergency during the six days training.

Figure 26: Picture Shows the Trainee at Group Exercise and Discussion, Kombolcha Ethiopia, 2014

Prior to the closure of the program at the last day of the training there was post test. It was hoped that this training would enhance the PHEM surveillance capability of the Afar Region as the participants are instructed and expected to cascade down to the Kebele and Community level integrative manner with other programmes and activities.

5. Achievement

- Out of 65 invited trainees 64(98.4%) of them attended the training
- Of the 64 trainees 7(11%) were female
- Only 4.6% of the trainee scored above 50% during pre-test, while 61% of the trainees scored above 50% in the post-test.

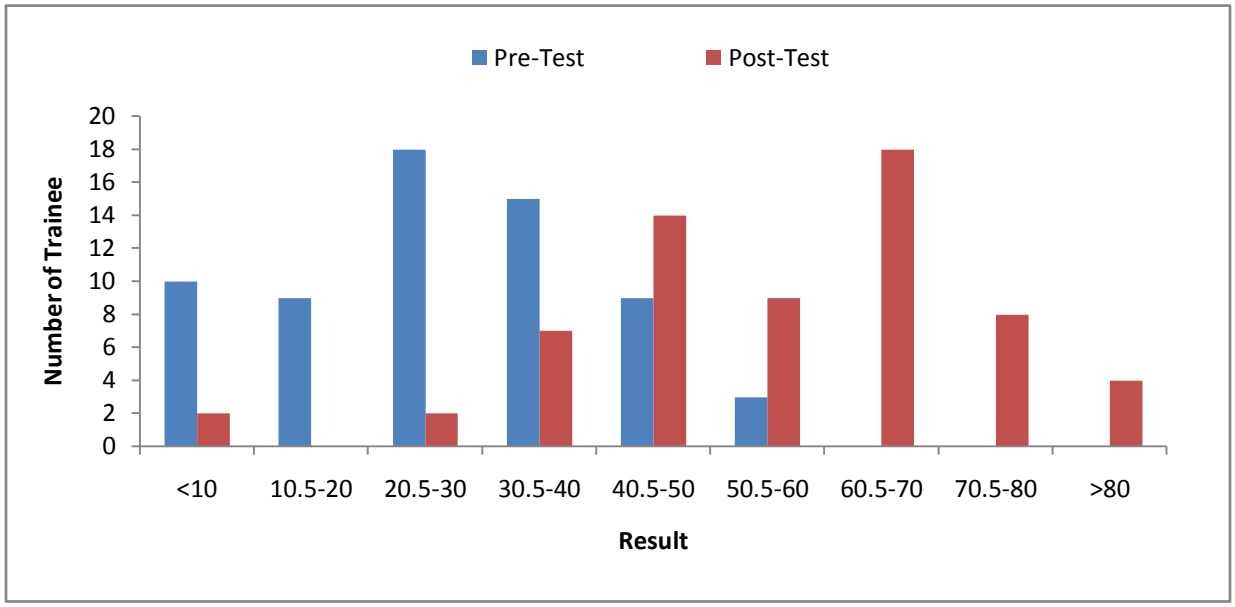

Figure 27: Afar PHEM basic level cascading training pre and post test result

6. Conclusion and Recommendation

In conclusion there was more than expected participants in this training 64 (98.4%) of them attended the training, 60% of trainees scored above 50% during post test which indicates that this basic level training will give a better knowledge for the improvement of public health emergency in the region, help to improve the surveillance system for the Woreda and also helps to improve the preparedness and response capacity at zonal and Woreda level. This kind of training should be continued in the future to others Region of Ethiopia.

EVD ACTIVITIES

EVD Activities Report of Gambella, Agnuwa Zone, and Gog Woreda land port EVD screening site, October 2014

Team members:-

Dr. Getahun Bahiru & Gebeyehu Dumessa

INTRODUCTION

There is currently an Ebola Viral Disease (EVD) outbreak that has affected several West African Countries including Nigeria, Liberia, Sierra Leon, Guinea, Senegal and Democratic Congo. The Ethiopian Ministry of Health is closely monitoring the outbreak and has put in place measures to prevent introduction of the virus in the country. Currently the Government of Ethiopia with its partners have been deployed supportive technical staffs and EFETP residents to Addis Ababa International airport and at different land port of the country to perform EVD screening the passengers and In-migrant those coming from Ebola infected west Africa countries and also give training, Awareness creation and sensitization for the community, Health professions and others those are consider venerable to EVD.

Gambella Region is one of the major land port entry sites of the country, therefore the Ministry of Health Ethiopia have been deployed the first supportive technical staffs for EVD screening since august 26/2014 for one month to two land port entry site called Pagag and Gog Woreda and after one month we the second team have take over the activities from the first team for one month also to strengthen the activates which were started by the first team and full fill the gap which were not covered by the previous team .

Week one activates performed

On Sep.29/2014 we have left Addis and arrived at Gambella, Gog Woreda EVD screening site on Oct. 1/2014 before lunch time. On this day the first team introduced us with the Woreda Ebola task force, screening staffs, technical working group and partners.

Figure 28: Picture taken when the first team introduces the second team with Gog Woreda screening site staffs and Gambella Region PHEM focal person.

On Oct. 2/2014 we returned back to Gambella town and on Oct. 3/2014 all the Gambella team (first & second team) has conducted meeting at Gambella health office and the first team has introduced the new team with Gambella regional PHEM focal person. On this day we attended debriefing presented by the first team and takeover Ebola preparedness and screening activities from previous team in the presence of the region PHEM focal person Mr. Nena.

Figure 29: Picture taken when the first team presents their EVD one month activities debriefing for Gambella region PHEM focal person

Figure 30: Picture taken after group one‟s debriefing and handover of EVD activities for group two in the presence of Gambella region PHEM focal person. (standing, from left to right; Gebeyehu, Tesema, Nena, Gemechu, Omed, Dereje, Dr. Getahun, Tasew and sitting,, from left to right; Dr. Desta & Habtamu)

On this week we have also prepared temporary action plan to be accomplished within one month during our stay at the screening site.

Summary report of screening activities

In this week (1/10/2014 – 4/10/2014) a total of 139 in-migrants were screened for EVD while crossing the Ethio – South Sudan border at Gog District land port entry point. Among the total screened in-migrants, 94 (67.6 %) of them were male and 109 (78.4%) of them have information about EVD. All of the in – immigrants screened during this week, have no travel history to Ebola affected countries, fever (sickness) and EVD sign/symptoms.

Table 41: Number of immigrants screened in pudenda land port, Gambella, Ethiopia, 2014

Sr. #	Date screened	# immigrants screened			# of immigrants screened with fever	# of immigrants screened that has travel hx to EVD affected countries	# immigrants suspected of EVD
		Male	Female	Total			
1	1/10/2014	20	0	20	0	0	0
2	2/10/2014	28	12	40	0	0	0
3	3/10/2014	30	13	43	0	0	0
4	4/10/2014	16	20	36	0	0	0
5	Total	94	45	139	0	0	0

Challenges

On our first week activity we were not faced a big problem except the network access for timely communication.

Week two activities report

Orientation on non- contact IR thermometer operation

On the first day of this week we have oriented all screening staffs of Gog land port entry screening site how to operate, use and adjust non-contact IR thermometer for measuring body temperature of in- migrants. In this week the screening activity has strengthen by using the thermometer for the first time.

Figure 31: Pictures showing non-contact IR thermometer orientating and measuring body temperature of immigrants at Gog land port screening site, Gambella, Ethiopia, 2014

Awareness creation activities

In this week we have conducted awareness creation and discussion on EVD meeting with eight Pugnido Town hotel owners in collaboration with Gog Woreda health office. Topics of discussion were:-

- Sign and symptoms of EVD
- Mode of transmission of EVD
- How to communicate carefully to guests who came from Ebola affected countries (Ex. not to shake hands)
- To avoid exposure and direct contact to any body fluids of suspected guest.

- To follow health status of those guests and immigrants who come from Ebola affected countries
- To use gloves and disinfectants during housekeeping and cleaning
- Proper and frequent hand washing in case of contact with any body fluid.

Moreover we have told for the hotel owners to notify for the Woreda health office if they saw any sign of bleeding, vomiting, and diarrhea in the rooms and if the guests showed any sign of sickness.

Figure 32: EVD orientations for Pugnido Town hotel owners at Gog screening site, Gambella, Ethiopia, 2014

Training activates to EVD

In addition to the above mentioned activity we were giving EVD training for the neighboring Woreda called Jor, which is 38 K.M far from the screening site Gog Woreda. The training was given integrated with Guinea worm eradication program.

A total of 50 trainee were attended the training and among those participants 15 (30%) were HEWs, 9(18%) were Health Professionals, 4(8%) were Woreda Health Office Workers, 15

(18%) were Woreda Kebele leaders and 7 (14%) were from others Governmental sectors like Agricultures, Waters, Education, Women Affairs and Woreda Administration.

EVD topics we have addressed during the one day training were; what is Ebola, sign and symptoms, mode of transmissions, how Ebola patient get treatment and support, what we will do to get Ebola suspected or confirmed cases, who are vulnerable to EVD and prevention and control of Ebola.

Figure 33: Training on EVD for different stakeholders at Jor Woreda, Gambella, Ethiopia, 2014

Summary report of screening activities

In this week (6/10/2014 – 12/10/2014) a total of 148 in-migrants were screened for EVD while crossing the Ethio – South Sudan border at Gog District, Gambella Region land port entry point. Among the total screened in-migrants, 99 (66.9 %) of them were male and 78 (52.7%) of them have information about EVD. All of the in – immigrants screened during this week, have no travel history to Ebola affected countries. The immigrants those were crossing the land port have no body temperature above 38 ^{o}c (fever) and also none of them show the sign/symptoms of EVD.

Table 42: Number of immigrants screened in pudenda land port, Gambella, Ethiopia, 2014

Sr. #	Date screened	# immigrants screened			# of immigrants screened with fever	# of immigrants screened that has travel hx to EVD affected countries	# immigrants suspected of EVD	# of immigrants who have information about EVD
		Male	Female	Total				
1	6/10/2014	18	12	30	0	0	0	28
2	7/10/2014	26	4	30	0	0	0	30
3	8/10/2014	6	5	11	0	0	0	1
4	9/10/2014	6	7	13	0	0	0	5
5	10/10/2014	22	0	22	0	0	0	1
6	11/10/2014	7	10	17	0	0	0	13
7	12/10/2014	5	4	9	0	0	0	0
	Total	99	49	148	0	0	0	78

Figure 34: Immigrants arriving at the land port and taking orientation about EVD at Gog screening site, Gambella, Ethiopia, 2014

Challenges

Network problem to timely communication and update EVD

The delays of the isolation center construction

From Week three to week six activities report

This is the 3rd in a series of regular reports on the EVD preparedness activity have been accomplished in the last four weeks at Gog district, Gambella Region fugnido-puchala land port. The report contains four different activity categories which are; 1) awareness creation and social mobilization, 2) EVD screening activity, 3) Temporary Isolation Center establishment and 4) meeting with the region president and cabinet members.

Summary report of screening activities

A total of 292 in-migrants were screened with zero suspected cases of EVD while crossing the Ethio-Sudan border at fugnido-puchala entry and exit land port of Gog district, Gambella Region up to the end of 31 November. From 292 in-migrants 206(70.5%) and 86 (24.5%) were male and female respectively and 217(74.3%) of them have information about EVD. All of the in – immigrants screened during these four week, have no travel history to Ebola affected countries. (See table)

Table 43: Number of immigrants screened in pudenda land port, Gambella, Ethiopia, Ethiopia, 2014

Sr. #	Date screened	# immigrants screened			# of immigrants screened with fever	# of immigrants screened that has travel hx to EVD affected countries	# immigrants suspected of EVD	# of immigrants who have information about EVD
		Male	Female	Total				
1	13/10/2014	13	7	20	0	0	0	20
2	14/10/2014	23	13	36	0	0	0	34
3	15/10/2014	11	9	20	0	0	0	20
4	16/10/2014	10	1	11	0	0	0	11
5	17/10/2014	13	1	14	0	0	0	6
6	18/10/2014	18	4	22	0	0	0	22
7	19/10/2014	0	0	0	0	0	0	0
8	20/10/2014	5	4	9	0	0	0	9
9	21/10/2014	10	3	13	0	0	0	4
10	22/10/2014	7	0	7	0	0	0	4

11	23/10/2014	10	6	16	0	0	0	6
12	24/10/2014	9	8	17	0	0	0	16
13	25/10/2014	6	2	8	0	0	0	0
14	26/10/2014	9	5	14	0	0	0	13
15	27/10/2014	9	2	11	0	0	0	5
16	28/10/2014	10	5	15	0	0	0	13
17	29/10/2014	11	2	13	0	0	0	2
18	30/10/2014	15	5	20	0	0	0	19
19	31/10/2014	17	9	26	0	0	0	13
Total		206	86	292	0	0	0	217

From 13/10/2014 to 31/10/2014, 292 In-migrants were screened for EVD with mean of 15 In-migrants and range of 0-36. Of the total 292 In-migrants 0 In-migrant was reported in the day of 19/10/2014 and maximum 36(12%) in-migrants screened in 14/10/2014 day of the week.(see figure bellow).

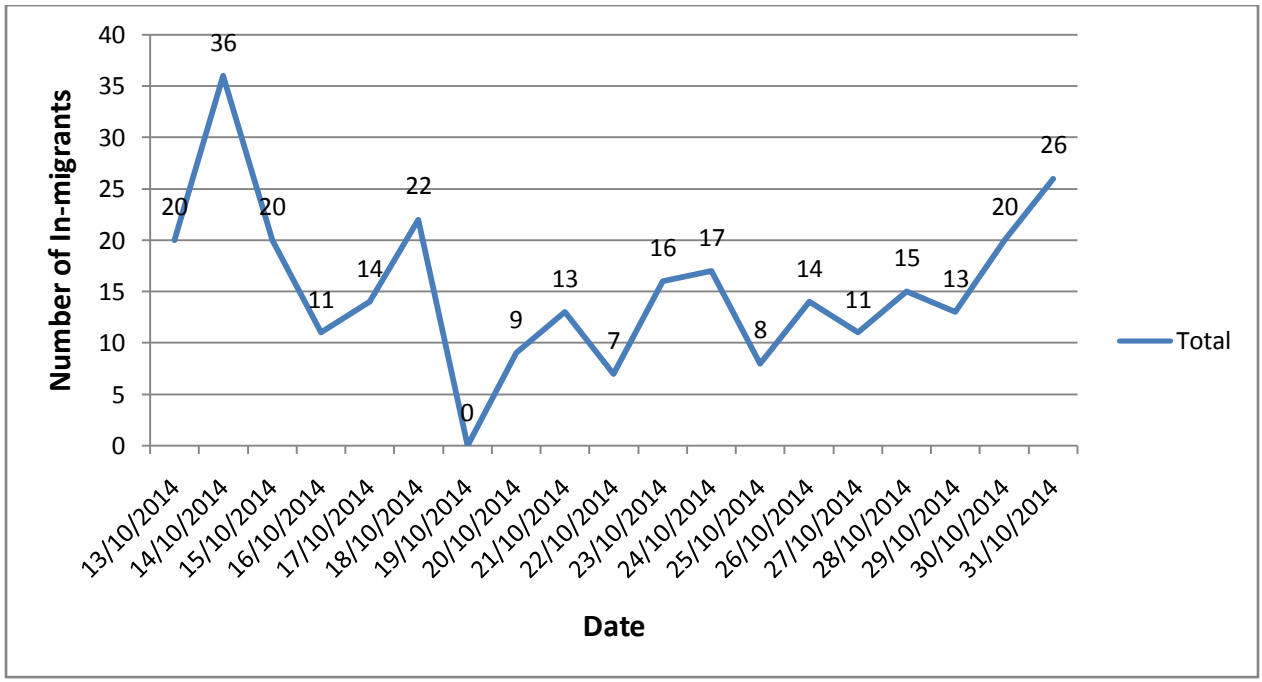

Figure 35: Number of In-migrants screened for EVD at Gog District, Gambella Region Fugnido-puchala land port from 13 November to 31 November 2014.

The Four Week (September 29 to October 29/10/2014) Tentative plan of action Gambella Region, Gog Woreda EVD Screening Site, Ethiopia, 2014.

Objectives	Strategies	List of planned activities	Time				Responsible body
			Week 1	Week 2	Week 3	Week 4	
To scale up and strengthen EVD preparedness, screening and prevention activities at Gambella Region Gog district, land port screening site	1. By creating awareness on EVD to Gog district health extension workers 2. By capacitating the Screening site with necessary logistics and technical skill 3. By awareness creation on EVD to Gog district Kebele leaders, Hotel owners and for the community 4. By strengthening the activities of Gog District	Travel to Gambella, Gog land port Ebola screening site	X				Dr. Getahun and Gebeyehu (second team)
		Introduce with Woreda Ebola task force, Technical working group and screening staffs	X				Tasew E and Dereje
		Introduce with Gambella Region PHEM focal person and attend debriefing presented by fist Gambella team	X				All Gambella team (first team & second team)
		Develop the four week plan of actions					Dr. Getahun, Gebeyehu and Woreda Health Office
		Takeover Ebola preparedness and screening activities from previous team	X				Second team
		Strengthening Ebola screening activities at the land port	X	X	X	X	Dr. Getahun, Gebeyehu & screeners
		Provide orientation on non- contact IR thermometer utilization for screeners	X				Second team
		Inform the hotline # 8335	X	X	X	X	Second team

	Ebola task force.	Awareness creation about Ebola for urban and rural HEWs		X			Second team & partners
		Awareness creation about Ebola for community leaders of 16 kebeles of Gog district		X			Second team, Woreda health office & partners
		Conduct needs assessment for construction of isolation center		X			Second team
		Awareness creation about Ebola for Hotel owners of Pugnido town			X		Second team & Woreda health office
		Awareness creation about Ebola for Pugnido Bus station workers			X		Second team & Woreda health office
		Awareness creation about Ebola for schools found in Gog Woreda			X		Second team & Woreda health office
		Build isolation center at pugndo town			X		Second team, Woreda health office & partners
		Report preparation and Communication with Concerned Bodies	X	X	X	X	Second team
		Debriefing of activities preformed for Woreda and regional Ebola task force				X	Second team

This tentative action plan prepared by Gebeyehu Dumessa and Getahun Bahiru EFETP 5th cohort Residents, Gog Woreda Land port entry EVD screening site, Gambella, Ethiopia, 2014.

Annexes

Annex 1: Measles Outbreak Investigation Tool in Gulele sub-city, Addis Ababa, Ethiopia, 2014:

1. Case **2. Control**

Name_____

Date of Data collection_____

Address_____

Dormitory number_____

Birth place: _____

4- **Socio-demographic Characteristics**

S/N	Question	Alternatives
1.1	Sex	1.Male 2.Female
1.2	Age	Years____ Month_____
1.3	Respondent relation to case or controls?	1. Mother 2. Father 3. Guardian
1.4	Occupation	1. Farmer 2.House wife 3.Student 4.Unemployed 5. Daily laborer 6.Merchant 7. Government 8.Others(specify)
1.5	Educational level of parents	1. Illiterate 2.Read & write 3. Elementary 4.Secondary 5. College and above
1.6	Religion	1. Orthodox 2. Muslim 3. Catholic 4. .Protestant 5. Other_____

Clinical presentations

2.1	What were the sign and symptoms	1.Fever 2.Rash 3.Cough 4.Coryza(runny nose) 5. Red eyes 6.Diarrhea 7. Small white spots inside the cheeks 8. Malaise 9. Sore throat 10.Nasal Discharge 11.weakness 12. Sweating 13. Loss of appetite 14.Others ----------
2.2	Date of onset	----------/----------/----------
2.3	Admission status	1-inpatient 2-outpatient
2.4	Date of admission	----------/----------/----------
2.5	Outcome of the patient	1. Live 2. Death

Treatment Information

3.1	Did you go to health facility for treatment?	1. Yes 2. No
3.2	If yes date seen at health facility?	----------/-------/----------
3.3	Did you receive any drugs?	1. Yes 2. No
3.4	If Yes, treatment taken	1.ORS 2.Antibiotics 3.Vitamin A 4.TTC ointment 5. Anti pyretic 6. Others----------
3.5	Laboratory findings	1. Negative 2. Positive 3. Others

Exposure Information

4.1	Do you have history of travel outside of your camp before onset of the disease?	1. Yes 2. No
4.2	If Yes to where_____ (might be local or abroad) and when?	----------/-------/----------
4.3	Are there any family members with the same sign and symptoms?	1. Yes 2. No
4.4	Have you a contact history with the same sing and symptoms before onset of the disease?	1. Yes 2. No
4.5	Were the new child joined the dorm before two weeks the onset of the disease?	1. Yes 2. No
4.6	If yes when?	----------/---------/----------
4.7	How many children sleeping together in dorm?	----------/---------/----------
4.8	A bed for two or more child?	1. Yes 2. No
4.9	Were they playing together?	1. Yes 2. No
4.10	Have the camp population contact with outside/village community?	1. Yes 2. No
4.11	What it looks like the house condition?	1- ventilated 2- Not ventilated 3- Have separate kitchen 4- Have separate toilet
4.12	Do you use of biomass fuel for cooking	1. Yes 2. No
4.13	Did you eat any raw food prior to onset?	1. Yes 2. No
4.14	Are you eating always cooked food?	1. Yes 2. No (No what items----)

4.15	Do you have any contact history with breaks in the skin animal tissue, blood, urine, vaginal discharges, and abort fetus?	1. Yes 2. N (if yes, explain_____)
4.16	Was there any animals aborted?	1. Yes 2. No
4.17	Did you use raw milk and dairy products?	1. Yes 2. No

Vaccination Status

5.1	Have you vaccinated for measles?	1. Yes 2. No 3.Unknown
5.2	If yes source of information?	1. History 2. Vaccination card 3. Log book
5.3	Dosage	1. One 2. Two &above 3.Dont know

General Information

1. Did you observe any strange things in your living area? □Y □N If yes please explain for me

   _____

   _____

   _____

   _____

What could you say about the cause of illness?

_____

_____

Annex 2: Polio Outbreak Investigation Tool

Investigation form for VDPV outbreak

EPID Number: ETH-SOM-NOG-2014-1011

Polio Type: Check one WPV1_____ WPV3_____ VDPV2_____

Polio confirmation from case_____ contact_____

DATE Lab COMNFIRMATION REPORT RECEIVED dd/mm/yy: _____

DATE INVESTIGATION STARTED dd/mm/yy _____COMPLETED: _____

If more than 48 hours passed between receiving of lab confirmation and completing the polio outbreak case investigation, explain reason for delay: _____

LIST Names OF investigators and ORGANIZATION:

INSTRUCTIONS FOR COMPLETION OF INVESTIGATION FORM

1. The form should be filled completely, with clear writing
2. Use dd/mm/yy format in those that require dates
3. Report should be submitted on the 7th date of notification of outbreak to all concerned(investigator should submit earlier than this)
4. After fully completing the form it should be sent to

WHO/EPI- POLIO ERADICATION PROGRAM Investigation Form for WPVs and VDPVs

Background

1. Reason why this case is investigated :(check the one which is appropriate)
2. Confirmed WPV1:_ _Confirmed WPV3_____Confirmed VDPV_____
3. Name of Informant: _____
4. (Informants should preferably be persons responsible for the child/case within two weeks before and after onset of paralysis)

5. Relationship of informant to AFP case being investigated: a) Father b) Mother c) relative d)other mention_____

Identifying information/ Basic demographic information for the case

1. EPID Number: _____
2. Name optional
3. Date Onset of Paralysis: (dd/mm/yy) : _____
4. Sex (check one): Male: ____ Female_____
5. Date of Birth (dd/mm/yy):_-_
6. (If Date of birth not available then) Age in Months or years at time of Onset of Paralysis:
7. Date of notification,_____
8. Date of investigation initial investigation,_____
9. Date of 1st stool collection,_____ Date of 2nd stool collection, _____
10. Date stools sent to the lab: _____
11. Date stools arrived in the lab,:_____
12. Stool condition on arrival at lab: Adequate :__Inadequate _____
13. Reason if stool is inadequate…….....

Demographic information parents

1. Fathers full Name_____ _____ Age of Father: ____
2. Father"s Occupation: **----------,settlement type** rural or town)_____
3. Mother"s full Name:_____ age of mother: _____
4. Religion: _____
5. Location/village: _____
6. Clan _____ _____ sub clan: _____
7. kebele: _____ woreda/district:: _____
8. Zone: _____ Region: _____
9. How many children do you have? Male _____ Female_____
10. How long has the child been living at this location? (Specify days, months or years) _____
11. Is the family of the case nomads? Yes _____No_____

12. Was the child living in a different location in the month prior to the onset of paralysis? (Yes or no): ___
13. If yes please give location: Village, _____kebele----------Woreda/District:----------
14. zone _____Region ----------

Parents Educational Status (Check box for the highest level of education of each parent)

1. Highest Educational Level	Father	Mother
2. Illiterate		
3. Read & write		
4. Primary School		
5. Secondary School		
6. Post-Secondary School or Higher		
7. occupation		

Socioeconomic Status of Case household (give you best personal assessment)

1. High
2. Middle 3) poor

Description of Area (check one)

1. Rural		a.
2. Urban		
3. Nomadic		

Give any other information that you feel is significant in describing the area in which the

1. Does the family live in a permanent structure? Yes_ No: _
2. Distance (estimated in KM) from the case household to the nearest health facility ___
3. Name of nearest health facility._____
4. Does that health facility offer routine immunization services? Yes_____ No: ___
5. Are there any Nomadic/refugee camps within 5 km of the case household? Yes___No: __
6. If yes name and location(describe the situation)_____
7. Is the family aware of any other AFP Cases in the surrounding area? Yes _ No__

8. If yes give the name and location of cases and whether they have been previously investigated or not: (put this information below)

_____

Health seeking behaviour

1. Exposure of any family members to high risk families/communities/population Yes/No if yes describe
2. What actions taken after onset of paralysis at home or other sites explain
3. Parents health status (circle one and describe)
    a. Any current illness 2) Any previous history of illness

Health status of siblings/children past and present

Description	Child1	Child2	Child3	Child4
Any previous history of illness Yes/NO, (if yes write detail				
Any current history of illness Yes/NO, (if yes write what detail)				
Total OPV doses during campaign				
Total RI doses				

Clinical Information (this information should be reconfirmed from the family and not copied from the original case investigation form)

1. Date on an initial examination; _____
2. Was there fever at the onset of paralysis? Yes __ No if yes duration----------
3. How long, in days, between the onset of paralysis and full paralysis ___

Body parts involved in paralysis/weakness: (check all that apply)

	Upper Arm	Lower Arm	Upper Leg	Lower Leg
Right				
Left				

For additional clinical part use the detail case investigation for late cases

4. Was the paralysis/weakness asymmetric? Yes __ No____
5. Describe the muscle tone of the paralyzed/weak limbs (check one):
   A) Normal_____ b) Decreased/Floppy __
6. Muscle power_ LA___LL____RA____RL____
7. Were the specimens adequate? Yes ___ No____
   If no, explain_____
8. Was there any history of trauma in the days or weeks prior to the onset of paralysis? Yes __No:-------
   If yes please explain_____
   _____
9. Was there any history of chronic disease in the days or weeks prior to the onset of paralysis? Yes _____No: __
   If yes please explain:_____
   _____
10. Did the child take any medication currently and before_____
    _____
    _____

Travel History

1. Did the AFP case travel in the 30 days prior to the onset of paralysis/weakness? Yes _No __
   If yes where? (Explain briefly and give dates as best as possible)
   Date: _____Kebele:____ Woreda_____
   Region_____
   _____
   _____
2. Did any close family members travel outside of the local area in the 30 days before onset of paralysis? Yes_____No: ___

If yes where? (Explain briefly and give dates as best as possible) date: _____Kebele:____ Woreda----------

Region_____

3. Were there any recent visitors to the home from outside of the local area in the 30 days prior to the onset of paralysis? Yes ___ No_____

   If yes where? (Explain briefly and give dates as best as possible) date: _____Kebele:----------Woreda_____

   Region_____

4. Has the AFP case travelled since the onset of paralysis/weakness? Yes_____No: ____

   If yes where? (Explain briefly and give dates as best as possible) date: _____Kebele:_____

   Woreda----------

   Region_____

   a. Any Recent travel of the parent or child in the last 2 months (Yes/No)

   If yes

Date	village	district	zone	Region

   b. Any visitors to the family within two months before onset(Yes/No

Date	village	district	zone	Region

Vaccination History

IMMUNIZATION HISTORY:

1. Does the family have a vaccination card for the child? Yes__ No___

2. If yes DATE OF IMMUNIZATION

	YES	NO	UNKNOWN	DD/MM/YY
OPV 0	____	_____	_____	_____/_____/_____
OPV 1	_____	_____	_____	_____/_____/_____
OPV 2	_____	_____	_____	_____/_____/_____
OPV 3	_____	_____	_____	_____/_____/_____

3. Any supplemental immunization

Round	_____	_____	_____	_____/_____/_____
Round	_____	_____	_____	_____/_____/_____
Round	_____	_____	_____	_____/_____/_____
Round	_____	_____	_____	_____/_____/_____
Round	_____	_____	_____	_____/_____/_____
Round	___	_____	_____	_____/_____/_____
4. Others mention	___	_____	_____	_____/_____/_____

5. Number of doses of OPV the child received from routine vaccination (do not include doses received after the onset of paralysis, and do not include doses received from mass vaccination campaigns) __

6. If the child is not fully vaccinated (three doses of OPV by routine vaccination by 12 months of age, not including birth dose) explain why: _____

1. Lack of parental awareness
2. Vaccinator did not come
3. Far distance
4. Parental refusal
5. Card lost
6. Mothers too busy/not at home
7. Others, Specify _____

7. Total number of doses received during NID _____

1. If NIDs missed, why? Choose answer from above: _____

2. If other or refused then give an explanation of the reason why were missed_____

_____

_____

3. What else you needed to know about immunization to make you vaccinate your child?-

_____

4. Who in your immediate community do you trust to convince you to fully immunize your child?

_____

5. What source of information about immunization/OPV would have been more credible?

_____

6. What other health interventions given along with immunization would have made you to fully immunize your child? _____
7. Would you support immunization of children <5 years in your community? Yes/No
8. If yes, how? _____
9. If No, why? _____
10. In the affected settlement, is there evidence that Traditional Leaders are fully engaged/supportive in campaign (e.g. clan /community heads following the vaccination teams? Are the vaccination teams selected from the area) Yes ___ No____
11. If no, explain_____
12. Is the Woreda task force functional? Yes …. No; ___ .Is there a HEW in the village? Yes: ___ No___
13. If no explain……

_____

_____

14. Is there any evidence of gaps in micro-planning for SIAs? Yes _____ No____
15. If Yes, explain_____

_____

16. Is there any evidence of gaps in vaccination team performance Yes ____ No _____
17. If Yes, explain_____

Assessment of the immunization status of the Woreda

Questions	**Yes/NO**
Immunization	
1. Is the Woreda provide routine immunization	
2. If no why(use separate sheet if necessary)	
3. Is there EPI trained health personnel assigned at Woreda level	
4. If yes, did he train on RI/cold chain management?	
5. Do you have cold chain at Woreda level?	
6. If yes how many times in a day do you record the fridge temperature?	
7. How many permanent fixed vaccination sites do you have in the Woreda?	
8. How many outreach sites do you have?	
9. How many health facilities in the Woreda? Write number	
10. Of those HFs how many of them are providing RI? Write number	
11. If not all providing RI why is it?	
12. cold chain equipment"s write all of them by type	
Which of the following problems have you encountered	
1. Poor community awareness	
2. Community resistance	
3. Lack of vehicles for outreach programs	
4. Lack of per-diem for outreach programs	

5. Shortage of vaccines	
6. Lack of cold chain equipment	
7. Shortage of manpower for outreach programs	
8. Security	
9. Hard to reach areas	
10. Others, please specify	
OBSERVE if there is a cold chain system	
1. Are there expired vaccines?	
2. Do they record refrigerator temperature?	
3. Are vaccines arranged properly	
4. Are there items other than vaccine in the refrigerator?	
5. Are there stock management book?	
6. Is the vaccine management book updated for each antigen	
7. Do they have knowledge of VVM?	
8. Do they monitor coverage using monitoring chart?	
9. Do they report RI monthly?	

k. AFP surveillance

a.

Items	Yes/NO	Major surveillance problems
1. Is there a zonal/Woreda focal person?		
2. Is he/ she trained?		

3. Is there a focal person at each health unit?		
4. Does the zonal/Woreda focal person go for active search		
5. If yes, how often? 1. Regularly 2. Not regular		
6. In which health units was active search carried out during the last one year		
7. Has the focal person reported AFP cases in the last one year		
8. Does the focal person have access to vehicle/motorcycle for surveillance activities		
9. Does the focal person use management tool		
10. Is the woreda reports weekly IDSR report		
11. Woreda NP-AFP rate		
12. Woreda stool adequacy rate		
13. Investigation form available		
14. Specimen collection kit/cup available		
15. Surveillance guideline available(AFP, measles & NNT)		
16. Is there weekly IDSR reporting form?		
17. Do they report weekly?		
18. If they report weekly , timely report_____% completeness of reporting_____%		
19. Is rumour log book available?		
20. Knowledge of focal person on surveillance adequate?		

21. Any surveillance supervision for the last six months from higher level?		
22. How many visits made by the surveillance officer to the woreda office for supportive supervision?		
23. Surveillance performanc eof the woreda NPAFP rate : _____ % Stool adequacy: _____%		
24. Who Reported this case? Health facility focal person : – vaccinators__ communitygroup....Informant___Other__ If other, explain		
25. Any evidence that active surveillance was conducted in the nearest health facility according to the guidelines? (signature on HF register, report on visitors book etc		
26. Any unreported cases found in the woreda visited HFs		
List major gaps in AFP Surveillance		

Community attitudes towards vaccination and paralysis (FGD guide)

1. What do you think about the health service in the area?
2. What do you think about the vaccination service in your area? Try to get advantage of vaccination and other beliefs
3. Have you seen any child with paralysis in your community?
4. Where do people take a child with paralysis?
5. Do you get health education regarding EPI, surveillance*?*

Instructions for Vaccination Coverage Survey

Select 30 houses with at least one child less than 5 years of age in the area surrounding the case household. Record the following information on all children less than 5 years of age **(if more than one under 5 children available in the HH, interview the youngest child only)** in those 30 households. Age of child in months, Number of doses of OPV received through routine immunization, whether the child received OPV during the last immunization campaign and whether the child received OPV in the previous immunization campaign. If zero dose in SIAs, indicate the reason.

Tally the information using Appendix II and then complete the information on Appendix I.

APPENDIX I Vaccination Coverage Survey

Calculate and report the following using the data in Appendix II:

1. Percentage of children 6 – 35 months of age who had received 3 routine OPV doses. _
2. Reasons for zero dose in RI (analyze codes below and give percentage) _____
3. Percentage of children 0-5 years who received OPV in the last immunization round. ___
4. Reasons for non-vaccination in last immunization campaign _____
5. Percentage of children less than 0-5 years who received OPV in the prior immunization round. _____
6. Reasons for non-vaccination in the prior immunization round _____
7. Reason for zero dose in SIAs (analyze codes below and give percentage) _____

8. Give the reported EPI coverage (for last year and cumulative for the most current this year) for OPV for the Woreda in which the case lives (as reported by the EPI program) _____%

Appendix II

woreda_____

kebele:_____

Settlement: _____

Travel history &

AFP case

House Number	Name of the Child	Village (Kebele) name	Sex (M/F)	Age (months)	RI Card seen (Y/N)	OPV Status								Recent travel of the parent or child in the last 2 months (Yes/No)	To Which Place - District
						Number of OPV doses received through RI	*Reason if Zero dose for RI (use codes below)	Number of OPV doses received through SIA	*Reason if Zero dose for SIA (Use codes below)	Immunized in Last round of SIA? (Y/N)	*Reason if not immunized last round (use codes below)	Immunized in round prior to Last round? Y/N)	*Reason if not immunized in round prior to last round (Use codes below		
1															
2															
3															
4															
5															
6															
7															
8															
9															
10															
11															
12															
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16															
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19															
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21															
22															
23															
24															
25															
26															
27															
28															
29															
30															

Codes for Reasons for not receiving Vaccines: 1=OPV Safety; 2. Child Sick; 3=Religious Belief; 4=No Felt Need; 5=Political Differences; 6=No Caregivers Consent; 7=U
immunization; 10=Service not provided; 11=SIA teams not visited the house; 12=To far from the health facility; 13: Child absent; 14=new born; 15=AEFI; 16= Others,

Annex 3: Health Profile Assessment Questionnaire Fentale Woreda, Oromia Regional State 2014

1. Historical aspects of the Woreda

- Woreda Name
- How & why the name given
- How and when the Woreda was formed_____
- Any other historical aspect about the Woreda_____

2. Geography and Climate

Woreda map_____

- Location(distance) ----------Direction ----------
- Altitude
- Surface Area ----------
- Town __rural (land)

Geographical coordinate

- Latitude
- Longitude
- Annual rain fall(average)
- Annual temp(average)
- Climatic zones

3. Woreda boundaries

	Kebeles	Total Population	Sex		Residency	
S.N			Male	Female	Urban	Rural

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

Main income sources

- Agriculture
  - Cultivated area_____
  - Grazing area_____
  - Cropping seasons_____
  - Land density_____
- Livestock
- Tourism
- Trade
- Other business

House hold income source

- Agriculture_____ (#)
- Government Employer_____(#)
- Private Employer_____(#)
- Daily Laborer (#)
- Different business_____ (#)
- Jobless (#)
- Average Income per year_____

Characteristics	Frequency	Percentage
Educational institution		
K.G		
Primarily School (1-8)		
Secondary (9-10)		
Preparatory(11-12)		
College/ University		
TVET		
School health activities: Number of schools with Water supply		
Schools with functional latrines Male Female		
Schools with HIV/other Health clubs		

6. Educational Status

School Enrolment	Sex				Total
	Male		Female		
	Frequency	Percentage	Frequency	Percentage	Frequency
Illiterate					
KG					
1_8					
9_12					
TVT					
Collage/University					
School Age Children (target)					
Coverage					
School dropout in 6 months or year 2005					

7. Water coverage

Characteristics	Frequency	Percentage
Total safe water coverage		
Safe water supply coverage by kebeles		
Main source of water supply		
Kebeles getting safe water		
Population getting safe water		
Daily water consumption per day per person		

Other Facilities

Characteristics	Frequency	Percentage
Transport		
Accessibility (main roads)		
Type of road		
How many kebeles have access to transportation		
Flow of transportation per day		
Telecommunication		
How many people have access to fixed telephone		
How many people have access to mobile phone (coverage)		
Post Office		
Bank		
Power supply		
How many house hold get power supply		

8. 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_____

9. District health system

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

-Is there health management team (HMT) at Woreda levels? Yes/no

-If yes, describe the HMT in detail (composition, functions, etc)

- Do you have non-governmental organizations working on health and heath related issues? yes/no
- List the NGOs (and what they are doing) working on health and health related issues in your Woreda

10. Vital Statics and Health Indicators

- Infant Mortality Rate (IMR) _____(total <1 yr deaths this 2005yr)
- Child Mortality Rate_____(this year"s total <15 yr deaths)
- Crude Birth Rate_____
- Crude Death Rate_____ (total deaths 2005yr _)
- Maternal Mortality Rate_____(2005 total maternal deaths_____)
- Contraceptive prevalence rate
- Contraceptive acceptance rate _____
- ANC rate (how many of the total expected pregnancies attended ANC)
- Percentage of deliveries attended by skilled birth attendants
- Percentage of deliveries attended by HEWs
- Percentage of deliveries attended by TBA
- PNC rate(how many of the total expected Mothers attended PNC)
- Average family size

11. Immunization Coverage

S.N	Type of Vaccine	Vaccination Status			
		PLAN TO VACCINATE	ACHIEVEMENT	PERCENTAGE	RANK
1	BCG				
2	Penta 1				
3	Penta 3				
4	Measles				
5	PCV 1				
6	PCV 3				
7	Fully immunized				
8	TT2+NPW				
9	PAB				

12. Health Service

Type and Number of Health Institution

Type		Number	Total No. of beds	HF: Population Ratio
Gov. Hospital				
Gov. Health center	Type A			
	Type B			
Private H.Fs (clinics/diag. lab/drug stores)	Clinics (all type)			
	Diag. Lab.			
	Drug store			
Gov. Health posts				
NGOs	H.Ps			
	H.Cs			
	Hospitals			
	Clinics			
OGOs	Hospitals			
	Clinics			
Health service coverage				

Type and Number of health professionals

Type	Frequency	Percentage	Health Professional: Population Ratio
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			
Total			

13. Top causes of morbidity

Top ten leading causes of OPD visit (morbidity)

DEASESE(2003)		No of cases	%
1	Acute upper respiratory infection		
2	Diarrhea non-blood		
3	Trauma		
4	Malaria clinically		
5	Disease of musculoskeletal system and connective tissue		
6	Acute febrile illness		
7	Urinary tract infection		
8	Dyspepsia		
9	Pneumonia		
10	Helminthes		

No	DEASESE(2004)	No of cases	%
1	Acute upper respiratory infection		
2	Diarrhea non-blood		
3	Acute febrile illness		
4	Malaria clinically		
5	Disease of musculoskeletal system and connective tissue		
6	Urinary tract infection		
7	Pneumonia		
8	Dyspepsia		
9	Malaria confirmed with PF		
10	Helminthes		

No	DISEASE(2005)	No of cases	%
1	Acute upper respiratory infection		
2	Malaria confirmed with FP		
3	Helminthes		
4	Diarrhea non-blood		
5	Acute febrile illness		
6	Urinary tract infection		
7	Trauma		
8	Pneumonia		
9	Malaria Clinical		
10	Disease of musculoskeletal system and connective tissue		

Top ten causes of admissions (Morbidity)

No	DISEASE(2005)	No of cases	%
1	Pneumonia		
2	Malaria confirmed with PF		
2	Diarrhea non blood		
4	Acute upper respiratory infection		
5	Dyspepsia		
6	Urinary tract infection		
7	Trauma		
8	Asthma		
9	Malaria other than PF		
10	AIDS		

14. Health budget allocation

Government

- Total budget allocated for the Woreda _____(consecutive 5 years)
- Total budget allocated for health _____ (____ %)

years	Woreda budget	Health budget	%
2003			
2004			
2005			
2006			

Funds from NGO

- Total ____unknown_____ (purpose/programs)_____

15. 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;

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

- MCH (Delivery, ANC, PNC)

_____

Family Planning Methods

Methods	Frequency	Percentage
Oral Contraceptive		
IUCD		
Implant		
Injection		
Condom		

Is their EPI (outreach service?)

- Yes
- No

Conduct cold chain or vaccine management supportive supervision

- Yes
- No

If yes, do you have checklist?

- Yes
- No

Environmental Health and Sanitation

- Latrine coverage & utilization rate

Type of Latrine

Type of Latrine	**Frequency**	Percentage
Open field		
Pit Latrine		
Ventilated Pit Latrine		
Others		

Solid waste management

Is their solid waste container?

- Yes
- No

Is their solid waste container loader?

- Yes
- No

If yes, frequency of solid waste collection_____

- Liquid waste management only in Metehara sugar factory camp
- others_____
- Health Education (what, when, where, how and who conducted health education)_____

17. Endemic diseases

Malaria:

- Total malarious kebeles & Pop at risk
- ITNs coverage (including current dist) Total requirement
- Is there IRS this year(No of kebeles)
- Total cases/yr deaths/yr 0,<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 PIHTC PMTCT
- HIV prevalence_____
- HIV Incidence (new cases/yr)_____
- Total PLWHA
- On ART on Pre-ART
- Other HIV prevention activities_____

Nutrition

- 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_____

18. Essential drugs (shortage) ----------

Annex 4: Rapid-Meher Assessment Questionnaires SNNPR Ethiopia 2014

Interviewer name_____			Institution:_____
Interview Date: (dd) ____/(mm)_____/2014			Region:_____
			Zone:_____
Main contact at this location:	Name:_____	Position:_____	Tel:_____

1. COORDINATION					
A. Is there a functional multisectorial coordination forum for the health sector? Yes□ No□					
B. Are all relevant government, NGOs and UN agencies represented? Yes□ No□					
C. Frequency of regular meeting? (Weekly, Every 2 weeks, monthly…..)					
2. Outbreak? Yes□ No□					
Was there any outbreak in the last 3 months? YES_____ NO_____					
If yes, specify the type of disease Type of outbreak _____Number of cases _____Deaths _____(specify the time period)_____					
If yes, specify the type of disease_____, _____, _____					
Type of outbreak _____Number of cases _____Deaths _____(specify the time period)_____					
Type of outbreak _____Number of cases _____Deaths _____(specify the time period)_____					
Type of outbreak _____Number of cases _____Deaths _____(specify the time period)_____					
3. **Mention anticipated epidemics**_____, If yes please indicate Zone/Woreda at risk and risk population per anticipated risk: *(Use the back side)*					
4. Public Health emergency Management					
A. Is there a Public Health Emergency Preparedness and Response plan? Yes□ No□					
If yes, is the plan budgeted/ funded? Yes□ No□					
B. Is there a trained staff on PHEM (Regional/Zonal/Woreda/HFs) Yes□ No□					
If yes specify number of trained personnel_____					
C. Is there a Regional trained Rapid Response team (RRT)? Yes□ No□					
D. Is there stock of: *(Use the Stock estimation matrix to estimate the amount of stock for each drug/supply for 6 months)*	Drugs and medical supplies		Total requirement	Available	Gap
	i. Meningitis vaccine				
	ii. Drugs:	Coartem			
		Oily CAF			
		Doxcycline			
		Ringer lactate			
		ORS			
		Amoxil suspension			
		Cortimoxazole suspension			
		Tetracycline Ointment			
		Vit A.			

	iii. Lab supplies	RDT (Malaria)			
		Pastorex (Meningitis)			
		LP set			
		TI bottle			
	CTC Kit (AWD)				
	Medical Supplies	Gloves,			
		Syringe			
		PPE			
	Others(specify)				

Summary: Requirements/Needs/2014

Region/Zone	Type of Health emergency	Total estimated Beneficiaries	Required finance

Region	Zone	Woreda at Risk	Type of Risk	At risk Population

Comments:_____
_____
_____

Annex 5: Rapid Meher Assessment - Health Sector: Woreda level Questionnaire 2014 GC.

Serial No

Interviewer name _____ Institution:_____

Interview Date: (dd) ____/(mm)_____/2014_____ Region:_____

Zone:_____ Woreda_____

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

SECTION I: SOCIO- DEMOGRAPHIC PROFILE				
1.1. Woreda total population:	M:_____F:_____		Under 5_____	Total:____
1.2. Special Population *(if any):*	Pastorals____	Refugees____	IDPs____	Migrant Workers___

SECTION II: HEALTH PROFILE	
2.1. Coordination	
Is there a 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□

2.2. Morbidity (List top 5 causes of Morbidity) in the year 2006 EC (2013-2014 GC)

a. Morbidity below 5	b. Morbidity above 5
1.	1.
2.	2.
3.	3.
4.	4.
5.	5.

2.3. List number of cases/deaths from Sene 2006 EC to Tikimt 2007 EC (June–Oct 2014)

Month	AWD		Malaria		Measles		Meningitis		Other (specify)
	Cases	Deaths	Cases	Deaths	Cases	Deaths	Cases	Death	
June 2014									
July 2014									
Aug 2014									
Sept 2014									
Oct 2014									

2.4. Outbreak?

Was there any outbreak in the last 3 months? YES_____
NO_____

If yes, specify the type of disease
Type of outbreak _____Number of cases _____Deaths _____(specify the time period)_____

Is there any ongoing outbreak of any disease? YES_____ NO_____

Type of outbreak _____Number of cases _____Deaths _____(specify the time period)_____	
Type of outbreak _____Number of cases _____Deaths _____(specify the time period)_____	
Type of outbreak _____Number of cases _____Deaths _____(specify the time period)_____	
2.5. Preparedness: Is there emergency drugs and supplies enough for 1 month? Or easily accessible on need?	
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□	
Lab supply: RDT for Malaria Yes□ No□	
Lab supply: RDT (pastorex) for Meningitis Yes□ No□ LP set Yes□ No□	
Number of CTC kit available: (for A WD) Yes□ No□	
Main shortage (if any): Specify	
Is budget allocated for emergency Rapid response by the Woreda?	

SECTION III: RISK FACTORS			
Diseases	**Risk factors for epidemics to occur**	**Yes**	**No**
Malaria	Malaria endemic area		
	Presence of malaria breeding site		
	Interrupted or potentially interrupting rivers		
	Unprotected irrigation in the area		
	LLINs coverage <80%		
	Indicate the coverage of IRS 2006		
	Depleted prevention and control activities		
	Number of malarious kebeles and total population in these Kebeles	Keb _____ pop _____	
Meningitis	Was there Meningitis epidemic in the last 3 years (If yes specify date)		
	Has vaccination been conducted in the past 3 years		
	If yes : Indicate the date and number of people vaccinated	date	No
AWD	Was there AWD epidemic in the last three years (If yes specify date)		
	Latrine coverage		
	Latrine utilization		
	Safe water coverage		
Measles	Is there ongoing measles outbreak		
	What is the measles vaccination coverage of 2006 EC, less than one year		

	Has SIA been conducted in 2006 EFY		
	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 May to October 2014

Month	Total SAM Cases	Total Number of TFP (OTP/SC) in the Woreda	Number of SC.	Number of OTP.	Total Number of OTP/SC reported.	Therapeutic Supplies enough Y/N (for the next -- mo)			Children Discharged from TFP referred to SFP Y/N
						RUTF	F100	F75	
June									
July									
Aug									
Sept									
Oct									

Any comment

_____

_____

_____

_____

Annex 6: Afar Region PHEM Basic Level Cascaded Training Schedule, Ethiopia, 2014

Date	Time	Topic	Presenter	Remark
Day 1, Sunday **(September 21,2014)**	8:30-9:00	Registration of Participant	Facilitator	
	9:00-9:15	Opening Remark	Yasin Habib	
	9:15-9:45	Pretest	Facilitator	
	Module 1: Introduction of Module			
	9:45-10:45	Introduction	Abdi A.	
	10:45-11:00	**Tea break**		
	Module 2: Early warning and surveillance			
	11:00-1:00	2.1 Introduction of early warning and surveillance	Ibrhaim A./ Woisa A.	
	1:00-2:00	Lunch break	Individual	
	2:00-4:00	2.2 Basic Epidemiology for public health	Abrham L.	
	4:00-04:15	**Tea break**	Facilitator	
	04:15-05:30	2.3 Early warning	Amanu S.	
Day 2, Monday **(September 22, 2014)**	8:30-10:30	2.4 Public health surveillance • Objective • Definition • Core function of Surveillance	Ibrhaim A./ Woisa A.	
	10:30-10:45	**Tea break**	Facilitator	
	10:45-1:00	Exercise 2.1		
	1:00-2:00	**Lunch break**	Individual	
	2:00-4:00	Continue 2.4 • Impact of Late/early detection of outbreak on Surveillance • Reporting periodicity surveillance data in Ethiopia • Reporting data tools of Surveillance	Abrham L./Amanu S.	
	4:00-4:15	**Tea break**		

	4:15-5:00	Exercise 2.2		
Day 3, Tuesday **(September 23, 2014)**	8:30-10:30	2.5 Surveillance data analysis, interpretation and communicating finding	Dr. Getahun B.	
	10:30-10:45	**Tea break**	Facilitator	
	10:45-1:00	Exercise 2.3		
	1:00-2:00	**Lunch break**	Individual	
Date	**Time**	**Topic**	**Presenter**	**Remark**
	Module 3: Public Health Emergency Response			
	2:00-4:00	3.1 Introduction • Objective and purpose of outbreak investigation	Ibrahim A./Woisa A.	
	4:00-4:15	**Tea break**		
	4:15-5:30	3.2 Step of outbreak Investigation	Abrham L.	
Day 4, Wednesday **(September 24,2014)**	8:30-10:30	Continued Step of outbreak Investigation	Abrham L.	
	10:30-10:45	**Tea break**		
	10:45-12:00	Exercise 3.1		
	12:00-1:30	**Lunch break**		
	1:30-3:30	Exercise 3.2		
	3:30-3:45	**Tea break**		
	3:45-5:30	Group presentation		
Day 5, Thursday **(September 25, 2014)**	**Module 4: Public Health Emergency preparedness**			
	8:30-9:15	4.1Introduction	Abdi A.	
	9:15-10:00	Exercise 4.1		
	10:00-10:15	**Tea break**		

	10:15:10:45	4.2 Vulnerability assessment and risk mapping	Ahamed A.	
	10:45-11:30	4.3 Preparing an epidemic preparedness and response plan	Ahamed A. /Ibrahim A.	
	11:30-1:30	**Lunch break**		
	1:30-3:30	Exercise 4.2		
	3:30-3:50	4.4 Capacity building	Ahamed A.	
	3:50-4:05	**Tea break**		
	4:05-5:00	Exercise 4.3		
	5:00-5:30	4.5 Monitoring and Evaluation		
	5:30-5:45	General Discussion		
Day 6, Friday	**Module 5: Recovery from Public Health Emergency**			
(September 26, 2014)	8:30-9:40	5.1 Introduction	Abdi A.	
	9:40-9:45	**Tea break**		
	9:45-11:30	5.2 Post epidemic assessment and its intervention 5.3 Monitoring and Evaluation of Recovery and Rehabilitation	Ahamed /A.Abrham L.	
	11:30-2:00	**Lunch Break**		***Juma***
	02:00-3:00	Practical exercise		
	3:00-3:30	Post test		
	3:30-3:45	Evaluation of the training		
	3:45-4:00	Orientation on the two output and the mentorship process	Alemayehu B.	
Closing Speech			**RHB Representative**	

Annex 7: Pre and Post Test

A. Choose the best answer (each choose question has 2 points)

1. Which of the following activities is NOT part of preparedness?

A. Capacity Building

B. Detecting the pattern of the epidemic

C. Coordination and collaboration

D. Planning for risk mapping

E. Planning for identified risks

Answer: B

2. A vulnerability assessment provides:

A. A means to inform decision makers about the needs of preparedness at different levels

B. A tool to initiate public health emergency preparedness plan

C. The basis for monitoring trends of risks

D. All

E. None

Answer: D

Use the following steps of an outbreak investigation for Question 3:

1. Analyze data by time, place, and person

2. Conduct a case-control study

3. Generate hypotheses

4. Conduct active surveillance for additional cases

5. Verify the diagnosis

6. Confirm that the number of cases exceeds the expected number

7. Talk with laboratorial about specimen collection

3. for an investigation of an outbreak, what is the logical conceptual order of the steps listed above?

a. 1-2-3-4-5-6-7

b. 5-6-4-1-2-3-7

c. 6-5-3-1-2-7-4

d. 6-5-7-4-1-3-2

Answer: D. Early steps include confirming that the number of cases exceeds the expected number, verifying the diagnosis, and preparing for field work (which includes talking with laboratorial about specimen collection). Next steps include conducting surveillance to identify additional cases; analyzing the data by time, place, and person; generating hypotheses; and evaluating those hypotheses (for example, by conducting a case-control study).

4. Which ways that a local health department uncovers outbreaks?

a. Performing descriptive analysis of surveillance data each week

b. Receiving calls from affected residents

c. Receiving calls from healthcare providers

d. Reviewing all case reports received each week to detect common features

Answer: B, C. Most outbreaks come to the attention of health authorities because an alert clinician or a concerned case-patient (or parent of a case-patient) calls. The other methods listed occasionally detect outbreaks, but less frequently

5. A case definition during an outbreak investigation should specify:

a. Clinical features

b. Time

c. Place

d. Person

e. Hypothesized exposure

Answer: A, B, C, D. A case definition for an outbreak should specify clinical criteria as well as appropriate time, place, and person characteristics. The case definition should NOT include the hypothesized exposure of interest. First, the hypothesized exposure may not turn out to be the true exposure, so inclusion of the hypothesized exposure as part of the case definition during the case-finding step may result in missed cases. Second, during the analytic step, disease status and exposure must be determined independently to avoid bias. Including exposure as part of the case definition means that all cases will, by definition, be exposed, while only some of the controls will likely be exposed. As a result, the exposure will appear to be associated with disease, not necessarily because it is the true exposure, but because of the case definition.

6. The key feature of an analytic (epidemiologic) study is: (Select only one answer)

a. Analysis by time, place, and person

b. Calculation of a risk ratio or odds ratio

c. Use of Epi Info to analyze the data

d. Presence of a comparison group

Answer: D. The key feature that characterizes an analytic (epidemiologic) study is presence of a comparison group. Single case reports and case series do not have comparison groups and are not analytic studies. Cohort studies (compares disease experience among exposed and not exposed)

7. Disease control measures can be directed at the:

a. Agent

b. Source

c. Mode of transmission

d. Portal of entry

e. Host susceptibility

Answer: A, B, C, D, E. Disease control measures can be directed at the eliminating the agent (e.g. by sterilizing surgical equipment), interrupting transmission (e.g., reducing mosquito population, covering one‟s mouth when coughing), preventing entry into a host (e.g., wearing a mask, using insect repellant), or improving host defenses (e.g., by immunization).

Use the information in the following paragraph and data in the table for Questions 8–10.

An outbreak of gastrointestinal disease occurred 24-36 hours after people had attended a wedding. Of the 203 attendees (including the bride and groom), 200 completed questionnaires and 50 reported illness compatible with the case definition. Tabulated food consumption histories are presented in the table below.

Food Item	Ate Specified Food			Did Not Eat Specified Food		
	ill	well	Total	ill	Well	Total
Cake	46	138	184	4	12	16
Kitfo	45	155	100	5	95	100
Tibs	10	1	11	40	149	189

8. Which study design is most appropriate for this investigation?

a. Descriptive study

b. Case Control

c. Cohort

Answer: C

9. the most appropriate measure of association for these data is the:

a. Odds ratio

b. Risk ratio

Answer: B

10. Which food is the most likely culprit?

a. Cake

b. Kitfo

c. Tibs

d. Can‟t determine from the data presented.

e. Must be more than one food

Answer: B. the Kitfo (risk ratio = 45% / 5% = 9.0) is the most likely culprit. It has a high attack rate among the exposed group, a low attack rate among the unexposed group, and can account for 45 out of the 50 cases.

11. Public health surveillance includes which activities (multiple answer is possible)?

a. Data collection

b. Data analysis

c. Data interpretation

d. Data dissemination

e. Disease control

Answer: A, B, C, D. The term public health surveillance includes data collection, analysis, interpretation, and dissemination to help guide health officials and programs in directing and conducting disease control and prevention activities. However, surveillance does not include control or prevention activities themselves.

12. Routine analysis of notifable disease surveillance data at the Woreda health office might include looking at the number of cases of a disease reported this week . . .(multiple answers is possible)

a. And during the previous 2–4 weeks

b. And the number reported during the comparable weeks of the previous 2–5 years

C. By age, sex, kebele and or village of the patient

Answer: A, B, C. Analysis by time often includes comparison with previous weeks and previous years. Analysis by place can include analysis of both numbers and rates.

13. One week, a Woreda health office received substantially more case reports of a disease in one Kebele than had been reported during the previous 2 weeks. No increase was reported in neighboring Kebeles. Possible explanations for this increase include which of the following (multiple answer is possible)?

a. An outbreak in the county

b. Batch reports

c. Duplicate reports

d. Increase in the county‟s population

e. Laboratory error

Answer: A, B, C, D, E. An increase in case reports during a single week might represent a true increase in disease (i.e., an outbreak). However, the increase can also represent an increase in the population (e.g., from an influx of tourists, migrant workers, refugees, or students); reporting of cases in a batch, particularly after a holiday season; duplicate reports of the same case; laboratory or computer error; a new clinic or health-care provider that is more likely to make a particular diagnosis or is more conscientious about reporting; or other sudden changes in the method of conducting surveillance

14. The primary reason for preparing and distributing periodic surveillance a feedback is which of the following (multiple answers is possible)?

a. Document recent epidemiologic investigations

b. Provide timely information on disease patterns and trends to those who need to know it

c. Acknowledge/motivate the contributions of those who submitted case report

Answer: B. The primary purpose of preparing and distributing surveillance summaries is to provide timely information about disease occurrence to those in the community who need to know. The report also serves to motivate those who report by demonstrating that their efforts are valued and to inform health-care providers and others in the community about health department activities and general public health concerns.

15. One of the following is not a major indicator of early warning system

a. An increase in the number of cases beyond expected/occurrence of outbreaks

b. Unexplained morbidity and mortality

c. Malnutrition

D. Evidence of increase in zoonotic disease and/or related vectors

E. none of the above

Answer: E

B. <u>work out questions</u>

16. What is public health surveillance?(3 points)

Answer: Surveillance is the process of gathering, analyzing, and dissemination of information for the purpose of proper planning, implementation, and evaluation of health services / interventions

17. Write at list three objectives of public health surveillance? (3 points)

Answer: Objectives of surveillance:

- To detect epidemics/outbreaks so that they can be controlled in a timely manner,
- To predict epidemics so that health services can plan to respond, prevent where possible, treat and control priority diseases,
- To monitor trends of priority diseases in order that changing trends inform policy decision,
- To evaluate an intervention so that effective and efficient actions/policies are identified and supported

18. List at least 5 immediately reportable diseases under Ethiopian surveillance (5 points)

a. Acute Flaccid Paralysis (AFP) / Polio

b. Anthrax

c. Avian Human Influenza

d. Cholera

e. Dracunculiasis / Guinea worm

f. Measles

g. NNT

h. Pandemic Influenza A

i. Rabies

j. Smallpox

k. SARS

l. VHF

m. Yellow fever

19. Mention at least three key monitoring indicators for public health emergency response (3 points)

- Proportion of rumors verified within 3 hours of initial notification
- Percentage of out breaks that have been investigated within 48 hours
- Percentage of outbreaks that have CFR within the accepted norm
- Proportion of suspected outbreaks of epidemic prone diseases in which lab confirmation are completed according to the guideline

20. Woreda „X" has a population of 100,000. The proportion of children aged 6-59 months in the Woreda is 15%. The Woreda has low measles vaccination coverage is 50% in the last couple of years. The measles attack rate is 2% in children 6 -59 months of age. Fifty percent of the cases among the children were with severe measles.

A. Calculate the expected number of measles cases and severe measles cases in children for the Woreda. (3 points)

B. Calculate the amount of Vitamin A capsule 100,000 IU and TTC eye ointment (2 tubes per child) and paracetamol syrup 125mg/5ml needed for uncomplicated measles. Please consider 15% wastage factor.(3 points)

Answer:

A. Expected measles cases=300 Expected severe measles cases=150

B. TTC eye ointment =690 tubes

Vitamin A=1,035 Capsules

Paracetamol 345 Bottles

Annex 8: Assignment of mentors for the Afar Basic Level PHEM trainees

S.No	Mentors List	Mentees and their Address by Zone		Remarks
1	Elsabetee Megrssa	Zone 1	1. Goitom Kahsay 2. Huzeyfa Kassaw 3. Kedir Abate 4. Abreha Hailay 5. Hussien Mohammed 6. Jemal Mohammed	
2	Woisa Ahmed		1. Solomon Abreha 2. Elias Berhane 3. Abubakir Endris 4. Nuru Mohammed 5. Binyam Wolde 6. Abdu Mohammed	
3	Amenu Shiferaw		1. Berhanu Mulu 2. Addisu Kassa 3. Simelis Amare 4. Abubakir Wolde 5. Habib Ali	
4	Abdi Ahmed	Zone 2	1. Kedir Darassa 2. Mohammed Mussa 3. Temesgen Legesse 4. Tesfaye Kibret 5. Lion Mebrahitu 6. Aschalew Wondu	
5	Getahun Bahiru		1. Amlesh Ashebir 2. Mignot Moges 3. Ahmed Adem 4. Awol Tahir 5. Siraj Abdikadir 6. Ahmed Ismail	
6	Tefera Taddele	Zone 3	1. Mohammed Ayub 2. Woldehana Yazew 3. Shemsedin Kemal 4. Selam Mekonnen 5. Abduljebar Ahmed 6. Hussien Endris (Zone 2)	
7	Ibrahim Adem		1. Fikru Yigezu 2. Hussein Mohammed 3. Abebaw Mulu 4. Daniel T/Mariam 5. Abreha Meressa (Zone 2)	
8	Abrham Lilay	Zone 4	1. Nigus Desalegn 2. Aberash Abebaw 3. Kedir Biru 4. Asefa Kenaw 5. Mohammed Endris	

			6. Hussien Seid	
9	Ahmed Ali		1. Tewodros Negussie 2. Seid Ibrahim 3. Mekonnen Seid 4. Tsehaynesh Tadesse(Zone-3) 5. Yilma Haile 6. Berihun Markos	
10.	Nuraine Awol	Zone 5	1. Jemal Mohammed 2. Salahdin Seid 3. Alebachew Abdu 4. Mohammed Ahmed 5. Seid Adem 6. Mohammed Fentaw	
11.	Achenif Kidane		1. Mohammed Ahmed 2. Endris Junadin 3. Mohammed Ferufari 4. Hanna Negussu 5. Hiwot Tadesse 6. Abdulsemed Mohammed	

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: Getahun Bahiru

Signature: _____

Place: _____

Date of Submission: _____

The thesis has been submitted for examination with my approval as a university advisor.

Name of advisor: Professor Ahmed Ali

Signature: _____

Date: _____