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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

Misganaw Ayalew (BSc)

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

June 2015

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Approval by Examining Board

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List of abbreviations

AAU-SPH	Addis Ababa University School of Public Health
AFB	Acid Fast Bacilli
AFI	Acute Febrile Illness
AFP	Acute Flaccid Paralysis
AHI	Avian Human Influenza
AIDS	Acquired immune-Deficiency Syndrome
ANC	Antenatal care
ANDM	Amhara National Democratic Movement
ANGT	Adult Naso Gastric Tube
AOR	Adjusted Odds Ratio
AR	Attack Rate
ART	Antiretroviral Therapy
ASA	Acetyl Salsilic Acid
ASAR	Age Specific Attack Rate
AURTI	Acute Upper Respiratory Tract Infection
AWD	Acute Watery Diarrhoea
BCG	Bacilli Calmate Gurine
BF	Blood Film
BMI	Body Mass Index
BPR	Business Process Reengineering
CAF	Chloramphenicol
CBN	Community Based Nutrition
CBR	Crude Birth Rate
CI	Confidence Interval
CMR	Child Mortality Rate
COR	Crude Odds Ratio
CRS	Congenital Rubella Syndrome
CSF	Cerbro Spinal Fluid

CTC	Cholera Treatment Centre
CXR	Chest X-Ray
DRMFSS	Disaster Risk Management And Food Security
EDHS	Ethiopian Demographic Health Survey
EFETP	Ethiopian Field Epidemiology Training Program
ENHS	Environmental Health Science
ENSO	EL NINO Southern Oscillation
EPDRF	Ethiopian People's Democratic Revolutionary Front
EPHA	Ethiopian Public Health Association
EPHI	Ethiopian Public Health Institute
EPI	Expanded Program On Immunization
EPRP	Epidemic Preparedness And Response
ETB	Ethiopian Birr
GC	Gregorian Calendar
GIS	Geographic Information System
GR	Growth Rate
HDA	Health Development Army
H1N1	Homophiles Influenza Type 1
HAB	Household Asset Building
HEW	Health Extension Worker
HI T	Health Information Technician
HIV	Human Immune-Deficiency Virus
IDSR	Integrated Disease Surveillance And Response
IgM	Immuno Globulin M
IHR	International Health Regulation
IMR	Infant Mortality Rate
IPLS	Integrated Pharmaceuticals Logistic Supply
IRS	Indoor Residual Spay
IRT	Integrated Refreshment Training
ITN	Insecticide Treated Net

IV	Intravenous
LLIN	Long Lasting Insecticide Treated Nets
LN	Lymph Node
LP	Lumbar Puncture
LPA	Line Probe Assay
LUTF	Lost To Follow Up
MAM	Moderate Acute Malnutrition
MCV	Measles Containing Vaccine
MDA	Mass Drug Administration
MDSR	Maternal Death Surveillance And Response
MMR	Maternal Mortality Ratio
MoH	Ministry Of Health
MUAC	Mid Upper Arm Circumference
NGO	Nongovernmental Organization
NMR	Neonatal Mortality Rate
NNT	Neonatal Tetanus
NTD	Neglected Tropical Diseases
NTM	Non Tuberculosis Mycobacterium
NTP	National TB Program
OPD	Outpatient Department
ODF	Open Defecation Free
OPV	Oral Polio Vaccine
OR	Odds Ratio
ORS	Oral Rehydration Salt
OTP	Outpatient Therapeutic Program
PADET	Professional Alliance For Development In Ethiopia
PF	Plasmodium Falciparum
PFSA	Pharmaceuticals Fund Supply Agency
PHEM	Public Health Emergency Management
PITC	Provider Initiated Testing And Counselling

PLWHA	Peoples Living With HIV/AIDS
PMTCT	Prevention Mother To Child Transmission
PNC	Postnatal Care
PNGT	Paediatric Naso Gastric Tube
PO	Per Oral
PPE	Personal Protective Equipment
PSNP	Productive Safety Net Program
PV	Plasmodium Vivax
PVP	Positive Predictive Value
RDT	Rapid Diagnostic Test
ReSoMal	Rehydration Solution For Malnutrition
RHB	Regional Health Bureau
RIF	Rifampicin
RL	Ringer Lactate
RRT	Rapid Response Team
RUTF	Ready To Use Therapeutic Feeding
S. No	Serial Number
SAM	Sever Acute Malnutrition
SARS	Sever Acute Respiratory Syndrome
SC	Stabilization Centre
SIA	Supplementary Immunization Activities
SST	Sea Surface Temperature
TB	Tuberculosis
TFU	Therapeutic Feeding Unit
TI	Trans Isolation
TSF	Therapeutic Supplementary Feeding
TT	Tetanus Toxoid
UNICEF	United Nation Children Empowering Fund
URTI	Upper Respiratory Tract Infection
VCT	Voluntary Counselling And Testing

VHF	Viral Hemorrhagic Fever
VPD	Vaccine Preventable Diseases
WASH	Water Hygiene And Sanitation
WHO	World Health Organization
XDR	Extremely Drug Resistant

Executive Summary

The Ethiopia Field Epidemiology Training Program (EFETP) is a two years competency based masters program adapted from the United States Centers for Disease Control and Prevention (CDC) Epidemic Intelligence Service (EIS) Program. Addis Ababa University, the Federal Ministry of Health of Ethiopia/Ethiopian Public Health Institute (EPHI), the Ethiopian Public Health Association (EPHA), and Centers for Disease Control and Prevention Ethiopia and Regional Health Bureaus run the program jointly. It comprises of 25% class learning and 75% field activities, working in public health emergency and other health related priority issues. It is designed to assist the 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. Ethiopia adopted the field epidemiology training program to help improve leadership in the public health emergency management system.

This compiled body of works composed of nine chapters accomplished during the two years residency period. It comprises outbreak investigations, surveillance data analysis report, surveillance system evaluation, health profile description report, scientific manuscript for peer reviewed journals, abstracts for scientific presentation, narrative summary of disaster situation visited, protocol or proposal for epidemiologic research project and other additional outputs.

All the outputs during the residency period were compiled as single document. The first chapter consists of outbreak investigations. Two outbreaks were investigated, Measles outbreak in Mota town in May, 2015 and Scabies outbreak in Tach Gaynt district in October, 2015. The second chapter is five years (2010-2014) MDR TB data analysis report in Amhara National Regional State. Surveillance system Evaluation was conducted in South Gondar Zone, September 2015, Health profile description report was conducted in Libokemkem district. Two manuscripts were prepared for peer reviewed journals. And two abstracts were prepared both were presented at the 27th annual conference of the Ethiopian Public Health Association. Summary narrative report of rapid belg assessment done in North Wollo, North Shewa and South Wollo zones in July, 2015 conducted together with other relevant sectors and partners, is included in the seventh chapter. Proposal for epidemiologic research project is also prepared on Prevalence of MDR TB and associated risk factors among HIV Patients attending Felegehiwot Referral Hospital. Finally other additional works like trainings, supportive supervisions are included in this body of work. Skills on data management and conducting research acquired during the residency period

Chapter I – Outbreak/Epidemic Investigations

1.1 Assessment of Risk Factors for Measles Outbreak in Mota , East Gojjam, Amhara, Ethiopia, May 2015

Abstract

Background: Measles is the leading causes of death among young children. Though a safe and cost-effective vaccine is available measles occur as outbreak. In 2013, there were 145,700 measles deaths globally. In Africa, about 13 million cases and 650,000 deaths occur annually, with sub-Saharan Africa having the highest morbidity and mortality. Due to an increase in vaccination coverage in developing countries there has been a significant change in the epidemiology of measles such as higher incidence in older children and young adults. The aim of investigation was to assess risk factors and institute doable intervention measures.

Methods: We applied the case definition, a maculopapular rash and fever with coryza, conjunctivitis or cough, to select cases of measles. We conducted 1:2 unmatched case-control study from May 2-10 /2015. Data was collected using structured questionnaire. Analysis was done using Epi Info 7 and SPSS software. Then, Odds Ratio with 95% CI and P-value were used to measure the significance of association in bivariate and multivariate analysis.

Results: Of 143 reported cases, half of them were females. The median age of cases was10 (Q1=4, Q3=19) years while that of controls was 9 (Q1=5, Q3=15) years. The overall attack rate (AR) was 218/100,000. It was higher among 15-44 years (471/100,000). No death reported throughout the outbreak. Being vaccinated against measles was 85% less likely contracting measles [AOR: 0.15, (95% CI: 0.06, 0.38, P< 0.0001)], contact history with cases [AOR: 7.1, (95% CI: 2.4, 12.6, P < 0.0001)].

Conclusion: Adults and children greater 15 years old were more affected. Absence of vaccination and contact with cases were found to be risk factors. We searched cases house to house and provided case management to stop the epidemic. Strengthening the routine surveillance activity and EPI program were recommended to the district health office.

Key words: Measles, Mota, Case control, outbreak

Introduction

Measles is an acute and highly infectious disease caused by measles virus, a member of genus Morbillivirus of Paramyxovirus family(1). It is one of the communicable diseases still causing preventable mortality and morbidity. Infection is characterized by cough, Coryza, fever and the onset of a generalized maculopapular rash several days after initial symptom onset. Although most individuals recover from infection, complications can occur including otitis media, pneumonia, croup, diarrhea, encephalitis and, very rarely, sub acute sclerosing pan encephalitis(1). An infected person spreads measles from slightly before the onset of symptoms to four days after the onset of rash. Communicability is minimal after the second day (2).

Measles is one of the leading causes of death among young children even though a safe and cost-effective vaccine is available. In 2013, there were 145,700 measles deaths globally about 400 deaths every day or 16 deaths every hour(3).

In Africa, about 13 million cases and 650,000 deaths occur annually, with sub-Saharan Africa having the highest morbidity and mortality. Due to an increase in vaccination coverage in developing countries, there has been a significant change in the epidemiology of measles such as higher incidence in older children and young adults. Under nourished people are more susceptible to measles complications, slow recovery and higher fatalities.

Literature Review

Being vaccinated against measles gives protection against measles up to 99% and the World Health Organization recommends that all children who receive the first dose of vaccine should also have a second opportunity for vaccination(4).

Vaccination coverage is the key indicator to measure the progress of measles control. Ministries of Health (MoH) report annual administrative coverage (i.e. number of doses delivered divided by estimated number of children in the targeted age group) based on population estimates. In many contexts however, population estimates are often not up-to-date (i.e. population censuses might not be frequently performed and vital event registration may be absent or partial), resulting in biased or inaccurate estimates. Consequently, population-based surveys are often the best available means to estimate vaccination coverage at both local and national levels(5).

The national Expanded Programme on Immunization (EPI) was established in 1980 in Ethiopia. The Measles Initiative developed a joint strategic plan to reduce measles-related deaths by strengthening routine immunization, supplementary immunization activities (SIAs) in the form of mass vaccination campaigns, reinforced surveillance, and adequate case management. Measles vaccines have dramatically reduced cases and deaths during recent decades and includes provision of the first dose of measles-containing vaccine (MCV1) provided at or shortly after the ninth month of age (6).

The measles case-based surveillance system has helped greatly in terms of documenting the epidemiology of measles in Ethiopia. However, little is known of the magnitude and distribution of other febrile rash illnesses. In African countries, including Ethiopia, CRS is widely under-recognized as a public health problem, and information on(7).

The introduction of measles vaccination throughout the region led to longer inter epidemic periods and a shift in the age distribution of remaining cases toward older children; however, measles continued to be primarily a childhood disease(8).

A study done in Cameroon shows the main reason for non vaccination of children in the routine activities was refusal (25%). The second most frequent was lack of information (9). Age-specific attack rate of infants <1 year of age (10, 11).Children between 1-4 years of age had significantly higher than those aged 5 years and above. The overall attack rate was 41 per 100,000 people with no sex predilection of cases (10). The major factors which determine the occurrence of the measles outbreak are accumulation of the susceptible population, illiteracy, poor hygiene, low income, overcrowding and a refusal for vaccines (12).

The majority of measles cases in these outbreaks sought treatment from traditional healers. The interval between the occurrence of the first case and the notification of outbreak was long, with investigation and response beginning after a median interval of two weeks (13).

In Ethiopia according to the 2014 WHO report, 16028 suspected and 2370 laboratory confirmed measles cases were reported with annual incidence of 14.61/100,000(15). In Amhara region 2014/2015 from (July to March) 65 districts report measles outbreak with total cases 4833and 40 deaths were reported due to measles(16).

Objectives

General objective

- To identify the etiologic agent and risk factors for the occurrence of the outbreak and institute appropriate control measures.

Specific objectives

- To identify the etiologic agent
- To characterize the outbreak by place, person and time
- To identify risk factors and determine extent and magnitude of the outbreak
- To institute prevention and control measures to stop further spread of the disease.

Methods and materials

Study area

Mota town is one of the town administration found in East Gojjam Zone, Amhara Region. The town is located at a distance of 371 kms from Addis Ababa and 120 kms from regional town Bahir Dar. It is bounded by Hulet Eju Ense district. The town is situated at an altitude of 2487 meter above sea level. According to the 2015 population projection the woreda has total population of 38,200 about half (18,748) were males. It has four urban kebeles, with one district hospital, one health center and four health posts. The health service coverage of the district is 100 %(16).

Figure 1 : Map of Mota town, East Gojjam, Amhara, Ethiopia 2015

Study period: The study was conducted from May 2-10, 2015

Study design: We conducted unmatched Case-control study with ratio of two controls per one case to determine the possible risk factors of the outbreak

Target population: All populations in Motta town where cases and controls found.

Study population: Cases and controls selected to be included under the study

Sample size: Cases were selected randomly from the line list and recruited into the study. Controls were neighbors of cases who did not develop measles during the period of the study.

Sample size was calculated using Epiinfo 7 stat calc for unmatched case-control study by taking

Two sided confidence level (1-α) = 95%

Power (% chance of detecting) = 80%

Ratio of controls to cases = 2

Proportion of controls with exposure =13%

Proportion of cases with exposure = 33%

When the sample size is calculated Using Epiinfo statcalc a total of 180 samples 60 cases, and 120 controls were selected using a control to case ratio of 1:2.

Inclusion &Exclusion criteria

Inclusion criteria

Cases: Any resident of Mota town who tested positive for IgM or had symptoms of measles
Controls: A control was any resident of Mota town during the study that was a neighbor to a case and who did not develop signs and symptoms of measles.

Exclusion criteria

Controls that had previous measles attack were excluded

Data collection: Structured questionnaire was used to collect data for case-control study and additional data were also collected by line listing which used for the descriptive analysis and cases were identified using WHO standard case definitions. Data was collected by principal investigator and co-investigator including HEWs by translating the questionnaire into Amharic.

Data quality control: The data was primarily collected by principal investigator and co-investigator. Prior to entering the data in to the computer the missing variables and consistency of filling of questionnaires and completeness of data was checked every day during data collection.

Data entry and Analysis: Data was entered and analyzed using Epiinfo 7 and Arc GIS. After data cleaning and recoding both descriptive and advanced statical analysis were under taken. Results were presented using graphs, tables, charts and attack rate was calculated. Odds ratio with 95% CI, and p-value were constructed to measure association and significance.

Variables

Dependent variable

- Measles infection

Independent variables

- Age
- Sex
- Vaccination status
- Contact history
- Travel history
- Educational status of family
- Having television and radio

Case definition

We used the WHO case definition

Suspected measles case: Any person with fever and maculopapular (non-vesicular) generalized rash and cough, Coryza or conjunctivitis (red eyes) OR any person in whom a clinician suspects measles (17, 18).

Confirmed measles case: A suspected case with laboratory confirmation (positive IgM antibody) or epidemiologically linked to confirmed cases in an outbreak(17, 18).

Epidemiologically linked case: A suspected measles case that has not had a specimen taken for serologic confirmation and had contact (in place, person and time) to a laboratory confirmed case; i.e., living in the same or in an adjacent district with a laboratory confirmed case where there is a likelihood of transmission; onset of rash of the two cases being within 30 days of each other or contact with epidemiologically linked case (17, 18).

Measles death: A measles death is defined as any death from an illness that occurs in a confirmed case or epidemiologically linked case of measles within one month of the onset of rash (10).

Suspected measles outbreak: is defined as occurrence of five or more reported suspected cases in one month in a defined geographic area, like, kebele, woreda or health facility catchment area
Confirmed measles outbreak: is defined as occurrence of three or more laboratory confirmed cases in one month in a defined geographic area, like, kebele, woreda or health facility catchment area.

Laboratory investigation: Prior to the investigation period five blood serum samples were collected and sent to national measles laboratory (EPHI) and the result was positive for measles IgM.

Result

Descriptive Epidemiology

The outbreak lasts for more than three months with 143 cases of measles and no death. The index patient was a seven years old female child with unknown vaccination status. She had travelled to Ayehu Birhan Kebele of the adjacent Woreda (Huleteju enese) to visit her relatives on 1/24/2015. She got cured from the illness without receiving any medical intervention.

When the outbreak reported on 06/03/2015 the woreda team verified the existence of the outbreak on the same day. On 12/03/2015 sample from four cases was collected and sent to the national measles laboratory. Three samples were found to be positive for measles IgM. Two field epidemiology residents went to the district on May 2, 2015 to investigate the outbreak.

Case Control study was conducted to determine the contributing factors for the occurrence of the outbreak. A total of 143 cases, 71(49.6%) male and 72(50.4%) female were line listed. From the total, 60 cases and 120 community controls were recruited.

The median age of cases was 10 (Q1=4, Q3=19) years while that of controls was 8 (Q=5, Q3=15) years. Majority of the cases 155 (85.6%) belong to the Orthodox Christian followers the rest 25 (13.4%) were Muslim.

Fever (100%), Maculopapular rash 58(97%), Conjunctivitis 54(90%) and Cough 45(75%) were the most frequently reported symptoms.

Only 15(25%) of the cases and 67(56%) of the controls are vaccinated against measles. Vaccination status was less than 50% in all age groups of cases. Better vaccination status was seen in children less than five years controls.

Table 1: Vaccination status of study participants by age in Mota town, Amhara, 2015

Age group	vaccination status						Total
	cases			controls			
	yes	no	total	yes	no	total	
<5	4	12	16	20	5	25	41
5-14	8	12	20	33	20	53	73
>= 15	3	21	24	14	28	42	66
total	15	45	60	67	53	120	180

According to the district annual administration report measles vaccination coverage for the Woreda for 2010, 2011, 2013, 2014 and 2015 was 76.3%, 85.5%, 87.6%, and 71.9 % respectively. From the 143 suspected cases, 91 (64%) of the cases in the district were not vaccinated against measles only 30% of the cases had taken one or more dose of measles vaccine where10 (7%) had unknown vaccination status.

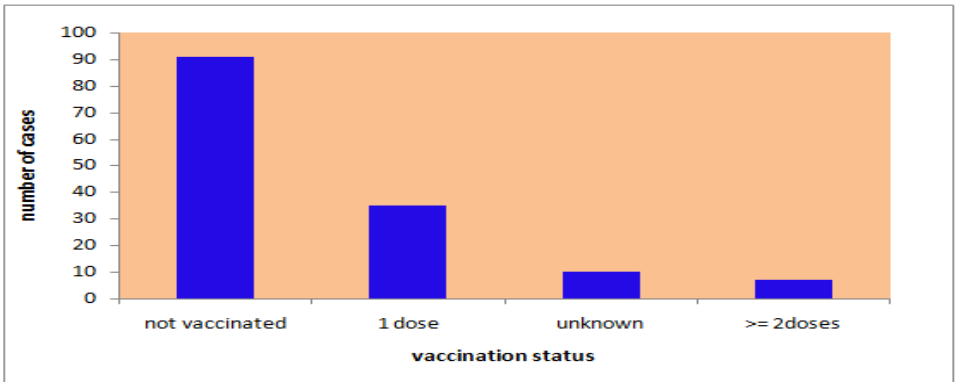

Figure 2: Vaccination status of study participants in Mota town, Amhara, 2015

The commonest reason raised by interviewed residents 46(25%) of Mota town for not vaccinating children against measles was not knowing the time (schedule) when measles vaccine is given. Some 13 (25.6%) parents or care givers still believe that the vaccine would hurt their child.

Table 2: Summary of reasons not to vaccinate against measles, Mota town, Amhara, 2015

Reason not to vaccinate	Number	Percent
Do not know time of vaccination	46	25.6
Hurt my child	13	7.2
Far	9	5
Do not prevent measles	5	2.8
Child not 9 months	4	2.2

The over all attack rate was 218 /100,000. Both age spesfic attack rate and number of cases was higher in adolecents and adult age groups from 15-44 years (471/100,000) and ther are no measles cases in people aged more than 45 years .

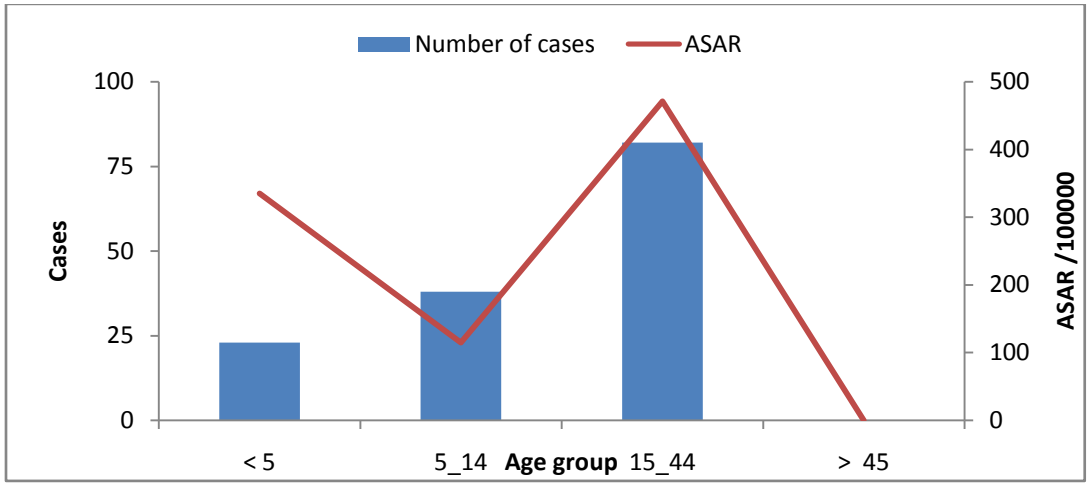

Figure 3: Numbers of measles cases and ASAR in Mota town, Amhara, 2015

Forty nine (81.7%) got treatment in health facilities while 11(18%) were treated for measles at home and seven (11.7%) three (5%) patients were taken to local healer. The median duration for seeking treatment after onset of illness was three days (Q1=2; Q3=7).

Table 3: Action taken by care givers for measles patients Mota town, Amhara2015

Actions taken for measles patient	Cases	
	Number	Percent
Take to facility	49	81.7
Keep home	11	18.3
Prepare ceremony	7	11.7
Take to local healer	3	5

Delay in reporting and response which may lead to person to person transmission of the disease. The index case had onset of symptoms 26 of January 2015.Rumor was reported from the community to the district. After two month the outbreak was reported to the region. Outbreak last for about four months affecting about 143 cases.

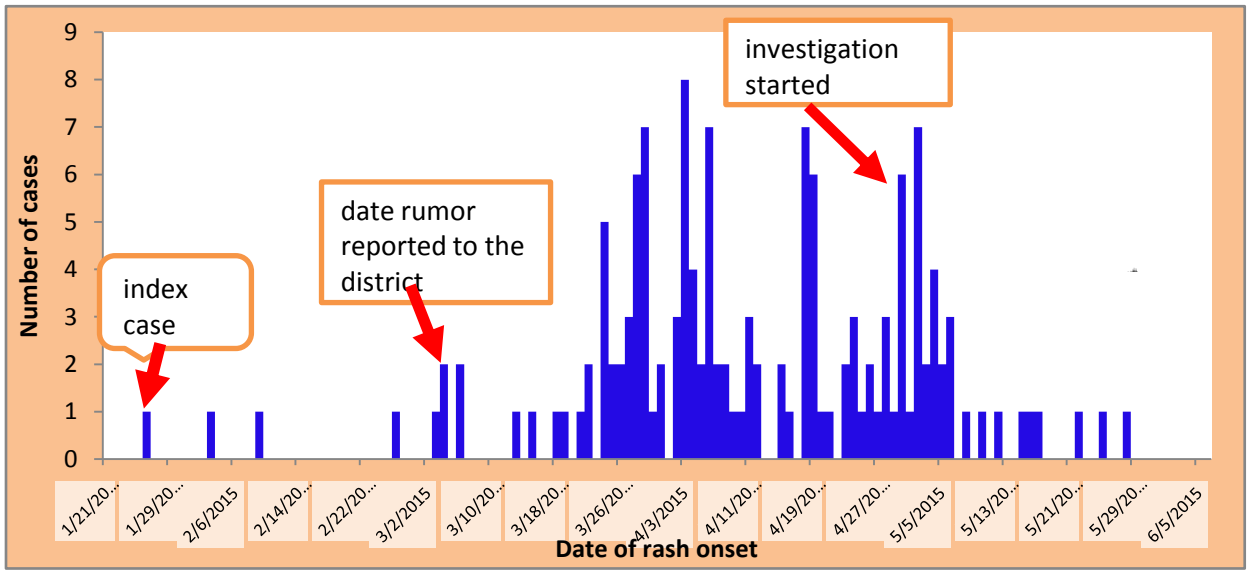

Figure 4: Number of measles cases by date of onset of rash Mota town, Amhara, 2015

Most measles cases were from Kebele 2 of Mota town which accounts about 78 (55%) of the cases this is because most residents of the Kebele came from the rural kebele of the adjacent Woreda and the least is Kebele 4 which has only 19 (13%) cases

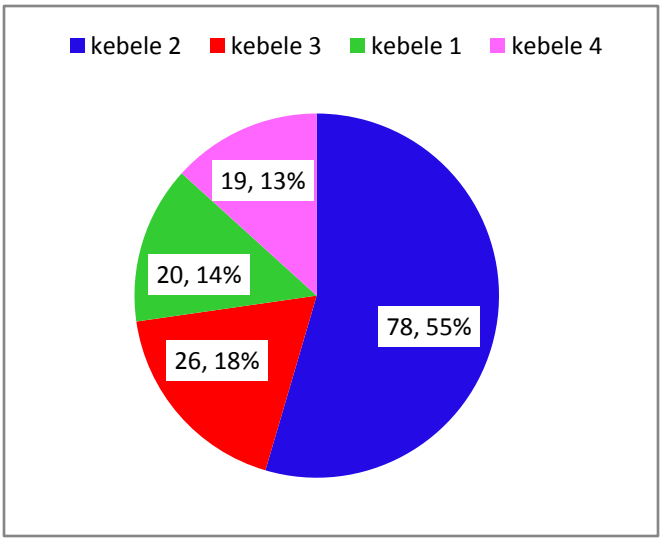

Figure 5: Measles cases by Kebele Mota town, Amhara, 2015

Analytic Epidemiology

We compared the 60 cases with 120 community controls the statistically significant variables were being vaccinated against measles was 85% less likely contracting measles (AOR= 0.15, 95% CI, 0.06, 0.38) history of travel 7-21 days prior to the onset of rash COR 6.19 (95 % CI 3.1, 12.3) where as family size, having radio or television and educational level of care givers has no statically significant association on multivariate analysis the odds of contracting measles was 7.1 times higher among those who has contact history with measles cases (AOR=7.1 ,95% CI 2.4,20.6).

Table 4: Bivariate and multivariate analysis results of measles outbreak, Mota town, 2015

S.No	variables		COR,95%CI,P-value			AOR, 95%CI,P-value		
1	Sex	M/F	1.19	(0.63,2.24)	0.57	0.57	(0.23,1.36)	0.20
2	Age	5-14/<5	0.69	(0.26,1.34)	0.21	0.54	(0.18,1.6)	0.27
		15-44/<5	1.03	(0.45,2.36)	0.93	0.57	(0.2,1.7)	0.33
		>45/<5	0.7	(0.15,3.08)	0.63	0.32	(0.04,2.3)	0.26
3	Contact history Yes/No		9.6	(4.49,20.6)	0.0001*	7.1	(2.4,12.6)	0.0003*
4	Owning TV Radio Yes/No		1.9	(1,3.7)	0.047*	2.6	(1.1,6.2)	0.02*
5	Vaccination Yes/No		0.19	(0.1,0.4)	0.0001*	0.15	(.0.06,0.38)	0.0001*
6	Travel history Yes/No		6.19	(3.1,12.3)	0.0001*	2.2	(0.8,6)	0.12
7	Overcrowding Yes/No		1.1	(0.6,2)	0.832	1.3	(0.56,3.2)	0.49

*Statically significant

Interventions Undertaken

Technical assistance was provided for health workers on case management, recording and reporting situation. Active home to home case search, routine surveillance and vaccination was strengthened. The situation was closely followed at each level on a daily basis until the epidemics became over.

Discussion

Both the number of cases and ASAR was higher in the age group from 15-44 years this shows different finding from the study done in Simada, South Gondar where the ASAR was higher in under five children (10). Similar investigation in China Wenzhou City shows highest attack rate in children less than one year(171/100,000)(11). The attack and case fatality rates were 218 /100000 inhabitants and zero respectively this attack rate is higher compared to similar study done in Cameroon (34/100000)(14).

Only 42 (29%) of 143 cases were vaccinated against measles these result shows higher proportion of measles among vaccinated as compared to similar study done where 153 cases, only 34(22.2%) had a card-confirmed measles vaccination status this discrepancy might be due to the impaired potency of the vaccines due to mishandling and cold chain maintenance . The shift to older children and adults has implications for disease burden estimates and may disproportionately lower the measles mortality burden relative to the morbidity burden, because case fatality ratios are lower in older cases(8). The outbreak started from the 4^{th} to the 24^{th} epidemiological week of 2015 with a peak on the 10^{th} week after onset

Males and females were equally affected by the diseases .The Epi curve had multiple peaks this might be due to the late detection of the outbreak leads to person to person transmission. The average coverage of the first dose of measles vaccine in the districts was 80.3 % (range: 71.9 – 87.6). Districts repeatedly failed to meet the target of 90% this might also contribute to the occurrence of the outbreak.

This study tried to identify several risk factors associated with contracting measles in Mota town having contact with measles patient found to be risk factor for contracting measles it is associated with 7.1 fold increase in the odds of contracting measles(95%CI ,4.49-20.62) this result shows comparative finding with the study done in china Wenzhou City(13). Being vaccinated against measles also prevents contracting measles. This has similar finding with the study done in Zimbabwe (6).

In addition, history of travel to an area where there is measles case is associated with developing illness. Educational level of the mother or care giver and size of the family in the house hold has no statistically significant association with contracting measles. This study reveals different finding from other studies that both the number of cases and ASAR is higher in people aged

>15years and the risk increase with increase in age. This might be due to the high vaccination coverage in children and infants who might lead the disease to shift to older ages who were not vaccinate against measles during their childhood.

Limitation

Some parents /care takers fail to remember their vaccination status and date of contact with cases /recall bias

Conclusion

People aged 15-44 years were more affected by the outbreak, being unvaccinated against measles, and history of travel 7- 21 days prior to rash onset and contact to measles cases contributes to the occurrence of the outbreak. Delay in case notification and management prolongs the time of the outbreak. .

Recommendation

- HEWs have to promote the awareness of the community on the modes of transmission of measles to avoid or minimize contact with cases and schedules of vaccination.
- Health extension workers have to assess cases home to home actively.
- The district health office has to strengthen cases management and conduct supplementary immunization campaign.
- The ministry of health should conduct measles vaccination campaign for adults because the case is higher in people aged more than 15 years.

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Annex I. Questionnaire for Measles outbreak investigation

Hello. My name is ----------.I work for the Amhara regional health bureau and I am doing an investigation of measles outbreak _the purpose of this question to get an information for public health action the information you provide will remain confidential would you be willing to participate? Thank you

Date_____

ID NO_____

Respondent: □ Patient □ Family member (Mother, Father: Brother or sister or other relatives close to patient.)

Investigators: _____, _____

Respondent's status □ Case □ Control

A. socio demography:

1. Age _____sex_____
2. Residence: Wereda _____, Kebele_____, Got_____
3. Occupation: _____
4. Religion A. Orthodox □ B. Muslim □
   C. Protestant □ D. Others □
5. Level of education

A. N/A □ B KG □ C. Primary □ D. Secondary □ E. Tertiary □ F. Unable to read and write□

6. Educational level of the mother/care giver
   A. Not able to read and write □
   B. Primary □
   C. Secondary □
   D. Tertiary □

7. Educational level of the father/care giver

A. Not able to read and write □ B. Primary □

C. Secondary □ D. Tertiary □

E. Do not know □

B. Clinical manifestations (√)

1. Do you have any of the following clinical features?

A. Rash □ B. Fever □ C. Cough □ D. Conjunctivitis / red eyes □ E. Coryza /running nose □

Others Symptoms_____ _____ _____

2. Date of rash on set: ____/_____/____DD/MM/YY

3. Date seen at health facility------/-----/------ DD/MM/YY

C. About Laboratory

1. Was sample taken? A. Yes □ C. No □

2. Date of collection of blood sample: _____

3. Date of specimen received by referral lab_____

4. Did result reported? A. Yes □ B. No □

5. If yes, is it A. Positive □

B. Negative □

C. Intermediate□

D. Immunization History

1. Did he/she/you vaccinated against measles? A. No □ B. Yes □

2. If yes; could you tell me the date of last measles vaccination; _____

3. Number of dose received: _____

4. If your answer is no for question 1 what is the main reason that you/your child not vaccinated

A. The health facility is far □

B. I do not know the time of vaccination □

C. The vaccine will hurt me /my child □

D. The child is not yet 9 months □

E. The vaccine does not prevent measles □

F. Other specify ----------

5. We‘re/ was he/she/you ever been sick with such diseases A. Yes □ B. No□

6. If yes when -------/----------/--------- DD/MM/YY

E. Exposure

1. Have moved any where during 7-21 days prior to rash onset? A. Yes □ B. No□

2. If yes, Where_____

3. Did the patient exposed with other similar case? A. Yes □ B. No□

4. If yes; where? _____ When? _____who was the patient _____

F. Transmission to others

1. Have you moved Some where four days prior to rash onset or four days after rash onset?

A. Yes □ B. No□

2. If yes where _____

3. Is there other case in the neighborhood? A. Yes □ B. No□

4. If Yes, Who is He /She _____?

5. Are there other cases within the household? A. Yes □ B. No□

6. If Yes, Who are He/ She? _____

7. Where does the patient work/study? _____.

8. Are there other cases in the workplace/school A.? Yes □ B. No□

9. Where does the patient socialize (market, church, club, school, other _____?

G. complications

1. DO you have any of the following complications?

A. Diarrhea A. Yes □ B. No □

B. Ear infection A. Yes □ B. No □

C.Blindness /change in vision A. Yes □ B. No □

C. Convulsion A. Yes □ B. No □

D. Pneumonia (cough, chest pain, SOB) A. Yes □ B. No □

E. Mouth ulcers A. Yes □ B. No □

2. Nutritional status

A. MUAC---------

B. Bilateral edema A. Yes □ B. No □

1.2. Scabies Outbreak Investigation in Tach Gaynt District, South Gondar Zone, Amhara Region, October, 2015

Abstract

Introduction: Human scabies is a parasitic infestation caused by Sarcoptes scabiei var hominis. Scabies affects people from every country. Children are especially susceptible to scabies as well as to secondary complications. The predominant route of transmission is direct skin-to-skin contact. Risk factors including: age, gender, ethnicity, overcrowding, hygiene, and season proposed to contribute for the occurrence of scabies. The aim of the study was to identify the risk factors and to take appropriate measures.

Methods: We conducted unmatched case control study from October 8-15/2015 in Tach Gaynt district South Gondar zone. We included 61 cases and 122 controls. We define cases as those any resident Tach Gaynt district that has papular pruiritic rash. We collected the data using interviewer administered questionnaire. Data was entered into Epi Info 7 and analyzed using SPSS version 21, Epi Info 7 and Arc GIS.

Results: A total of 2,969 scabies patients were reported. Of which, 1436 (48.3%) of them were females. The median age of cases was 12 (1 to 70) years and that of controls were 15 (1 to 60) years. The overall attack rate was 9.4%. It was higher for people older than 60 years (17.7%). On bivariate analysis educational level [COR=2.8, (95%CI,1.3,7.6)], infrequent changing of clothes [COR=2.4, (95% CI ,1.1,6.5)], infrequent bathing [COR=3,(95% CI,1.5,5.7)], infrequent washing of clothes [COR=2.6 (95% CI,1.2,5.2)], family size >=6 [COR=2, (95% CI,1.1,4.4)], contact with scabies patients [COR=8 ,(95% CI 3.7,17.5)], sharing of bed clothes [COR=10.8 (95% CI,5.2,22.4)] and sleeping together with scabies patient [COR=9.5,95% CI,4.6,19)] were associated with scabies diseases. On multivariate logistic regression analysis the Odds of contracting measles was 10.2(95%CI, 4.9.21.4) times higher among those who share bed clothes

Conclusion: People aged greater than 60 years and those who aged from 5-9 years had the highest attack rate and poor personal hygiene practices contributed for the outbreak. Intensifying surveillance activities, case management and including scabies under the public health emergency management reporting system were recommended.

Key words: Scabies, Tach Gaynt, case control

Introduction

Human scabies is a parasitic infestation caused by Sarcoptes scabiei var hominis(1,2). Scabies was defined on the basis of typical clinical findings that is, inflammatory papules with a typical distribution that were pruiritic, without the use of microscopy or dermatoscopy. Scabies lesions were classified according to presence of bacterial super infection (i.e. _scabies‘ or _infected scabies‘(3). It distributes worldwide and affects 300 million individuals annually, encompassing all age groups and social classes(4).

Some immunocompromised, elderly, disabled, or debilitated persons are at risk for a severe form of scabies called crusted, or Norwegian, scabies. Persons with crusted scabies have thick crusts of skin that contain large numbers of scabies mites and eggs (1).

Rates of scabies occurrence vary in the recent literature from 0.3% to 46%(1).Scabies affects people from every country. However, it is the most vulnerable, young children and the elderly in resource-poor communities who are especially susceptible to scabies as well as to the secondary complications of infestation. The highest rates occur in countries with hot, tropical climates, where infestation is endemic, especially in communities where overcrowding and poverty coexist(1).

Predominant route of transmission is direct skin-to-skin contact. Transmission by means of shared clothing or other indirect method is rare with classic scabies but may occur with crusted scabies (e.g., in immunocompromised hosts). Transmission among family members and in institutional settings is common(5). Procedures that involve hands-on contact can provide an opportunity for mite transmission(6).

The adult female scabies mites burrow into the upper layer of the skin (epidermis) where they live and deposit their eggs(2). The more parasites on a person, the greater the likelihood of transmission, either direct (i.e., skin-to-skin contact) or indirect (e.g., through infested bedding, clothing, or other fomites)(7).

In a previously unexposed healthy individual, the interval between exposure and the onset of itching is usually 4-6 weeks. In persons who have previously had scabies, re-exposure may produce symptoms in 48 hours or less (owing to prior sensitization to the mite and its saliva and feces) (6).

Literature review

Scabies causes highest morbidity because of unbearable itch, secondary infection, post infective complications such as glomerulonephritis and the highest risk of spreading the infestation to close contacts (8).

Scabies treatment usually is recommended for members of the same household, particularly for those who have had prolonged skin-to-skin contact. An infected person can spread scabies even if he/she does not have symptoms, and can continue to transmit scabies to others until treatment is successful and all mites and eggs are destroyed on a person, scabies mites can live for as long as one to two months(7). All household members and other potentially exposed persons should be treated at the same time as the infested person to prevent possible reexposure and reinfestation.

Exhaustive and complete data are not available from many countries, but such data as can be utilized suggest that scabies is endemic in tropical regions, with an average prevalence of 5–10% in children. A number of epidemiological factors have been proposed as influencing the distribution of scabies infestation in populations, including: age, gender, ethnicity, overcrowding, hygiene, and season. scabies is not influenced by hygienic practices or the availability of water, since the prevalence of scabies is very high in the Kuna Indians in Panama and among children in the Solomon Islands, where individuals take frequent baths and where careful daily personal hygiene is traditional(9). Having scabies increased the risk of skin sores by 4.4 times in children aged 1–4years(10).

Scabies prevalence was previously thought to be cyclical, but studies of long-term incidence suggest that epidemics and other observed fluctuations are multifactorial being related to social and environmental changes such as wartime, overcrowding, and climatic change(11).

Control strategies will require innovation, leadership, collaboration, and a considerable increase in available resources. Successful long-term control must involve addressing the underlying social determinants of poverty and overcrowding, and this should be reflected in policy and advocacy. There is clear overlap with other NTDs across a range of domains, including mapping, surveillance, and effective systemic treatments, and therefore the ideal control strategy for scabies would be integrated within the global and regional strategy for other NTDs (12). Previous experience suggests community-based mass-treatment approaches are likely to be the

most effective for control of scabies and skin sores in remote Aboriginal(13).

Objectives

General objective

- To describe the risk factors for the occurrence of scabies outbreak and institute appropriate control measures

Specific objectives

- To describe the magnitude of the disease in the district
- To investigate the risk factors for the occurrence of the outbreak
- To institute appropriate control and prevention measures

Methods

Study area: This study was conducted in Tach Gaynt district which is located in the North Western Ethiopia 100 km from Debretabor, 200 Km from Bahir Dar and 766 km from Addis Ababa. The district covers a total area of the 99,640.3 hectares. According to the 2015 population projection the total population of the district was 117,130. The safe water coverage of the district is 63%. It has 15 Health posts six Health centers with primary health service coverage of the district is 94 % in health posts and 100% in health centers.

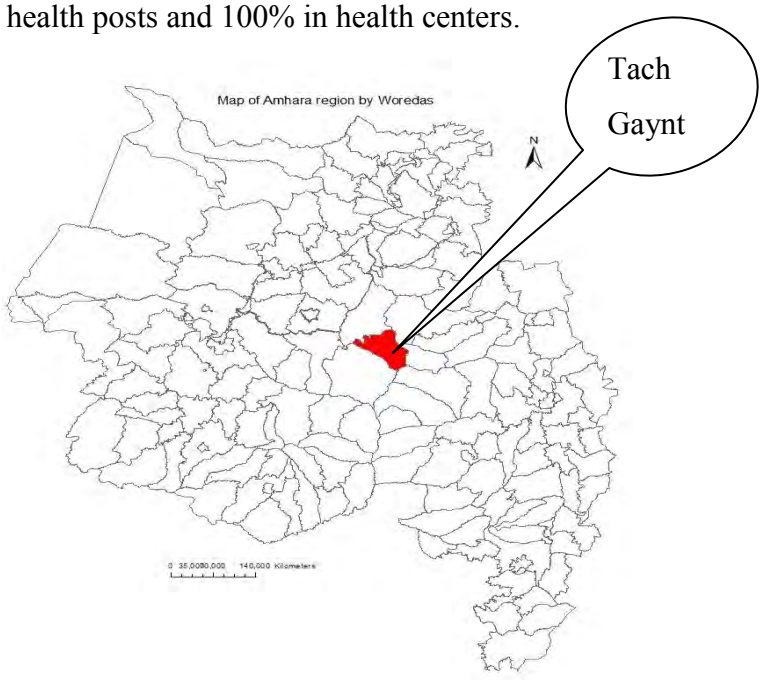

Figure 6: Map of Amhara national regional state, Ethiopia, 2015

Study period: We conducted the study from October 8-15/2015

Study design: We conducted unmatched cases control study. Controls were communities of Tach Gaynt who had no signs and symptoms of scabies during the time of data collection.

Target population: All the populations in Tach Gaynt district

Sampling and sample size determination: We calculated the sample size using statcalc Epi Info 7 for unmatched case control study using exposure among controls 10%, power 80%, and ratio of two controls to cases and confidence level of 95%. The total calculated sample was 61 case and 122 controls. We used non probability sampling techniques. Study subjects were included on convenient basis.

Data collection: We prepared questionnaire including sociodemographic variables, possible risk factors intermes of personal hygiene living habits and condition, family size and previous history of scabies infestation. We provided orientation for data collectors. We interviewed respondents by translating the questionnaire into Amharic language. We had also used line list of patients for descriptive analysis. Questionnaires were revised for completeness and consistency before leaving the place. Besides, prior to entering the data into the computer the missing variables and consistency of filling of questionnaires and completeness of data was checked every day during data collection.

Data analysis: Data was entered into Epi Info version 7 then analyzed using SPSS 21 and Arc Gis10.2. Descriptive analysis was performed for sociodemographic characteristics and other risk factors. We explained results as frequencies, proportions, rates, mean /median and standard deviations. Risk factors were identified statically by computing OR with 95% CI, P- values, and bivariate and multivariate analysis. Finally we presented the data using tables, graphs and charts and maps

Inclusion &Exclusion criteria

Cases: Any resident of Tach Gaynt who had popular pruiritic/ itchy rash.

Controls: A control was any resident of Tach Gaynt district during the study that did not develop signs and symptoms of scabies.

Variables

Dependent variables

- Scabies disease

Independent variables

- Age
- Sex
- Contact history
- Frequency of bathing
- Educational level of the family
- Frequency of changing clothes
- Sleeping with scabies patient
- Sharing bed clothes
- Amount of water fetched

Case definitions: We defined suspected case of scabies was any resident of Tach Gaynt district who has popular (vesicular) pruiritic (itchy) rash

Operational definitions

Infrequent bathing: Those who take shower after one week or more

Infrequent changing of clothes: Those who wear same cloth for more than one week without washing and changing

Educated: those who attend formal education more than grade four.

Hypothesis: The null hypothesis was stated as there is no association between socio demographic variables, access to water, frequency of bathing, washing and changing clothes with counteracting scabies.

Result

Descriptive Epidemiology

The outbreak started since October 2014 however it was reported late ie after 11 months. When the outbreak was reported to the region a team composed of different disciplines including dermatologist went to the district and confirmed the existence of scabies outbreak in the area.

We had conducted a case control study. A total of 2969 scabies case were reported from the district. Of those cases 1436 (48.3%) were female. We recruited 60 cases and 122 controls into the study. The median age of patients was 12 (1 to 70) years where as that of the controls was 15 years ranging from (1 to 60) years. The overall attack rate for all categories of age was 9.4 %. The age specific attack rate was higher for people older than 60 years and relatively lower for children under five years of age.

Table 5: Age distribution of scabies patients in Tach Gaynt, South Gondar, 2015

Age group	Population at risk	Number of cases	Percent	Age specific attack rate
< 5	3474	235	7.9	6.8
5-9	4416	544	18.3	12.3
10-19	9026	794	26.7	8.8
20-29	4891	331	11.2	6.8
30-39	3588	329	11.1	9.2
40-49	2586	254	8.6	9.8
50-59	1730	122	4.1	7.1
>= 60	2030	360	12.1	17.7
Total	31741	2969	100	9.4

The earliest case was started since October 2014. The outbreak was reported in August 2015 and intervention was started on October 2015

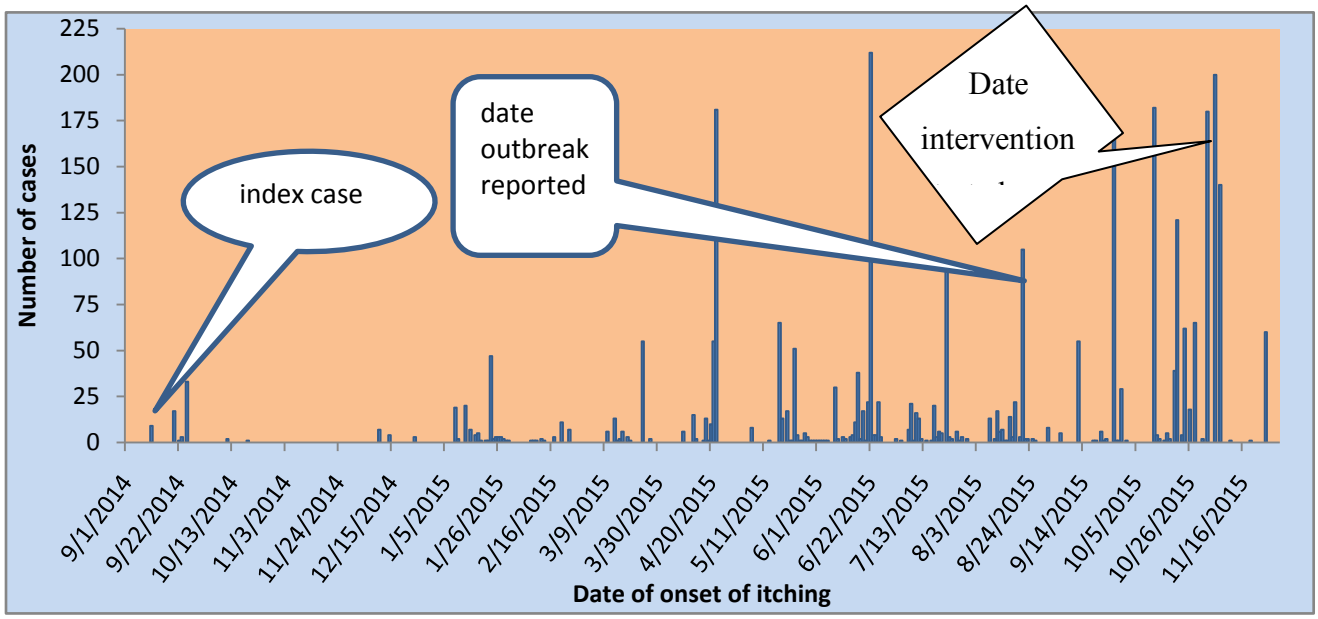

Figure 7: Epi curve of scabies outbreak in Tach Gaynt district, South Gondar zone, Amhara, Ethiopia, 2014 to 2015

Out of total 15 kebeles in the district five (33.3%) kebeles were affected by outbreak. The attack rate varies by kebeles which ranges from 0.4% to 18.1% the highest prevalence was in Benat kebele which ie, 18.1%.

Table 6: Distribution of scabies cases by kebeles of Tach Gaynt, Amhara, 2015

kebele	Total Population	No of scabies cases	Attack rate
Benat(0 9)	6064	1098	18.1
Endwa (10)	5359	840	15.6
Magessa (11)	5237	880	16.8
Anseta(5)	6467	103	1.6
Aketo (7)	7714	48	0.4
Total	30841	2969	9.6

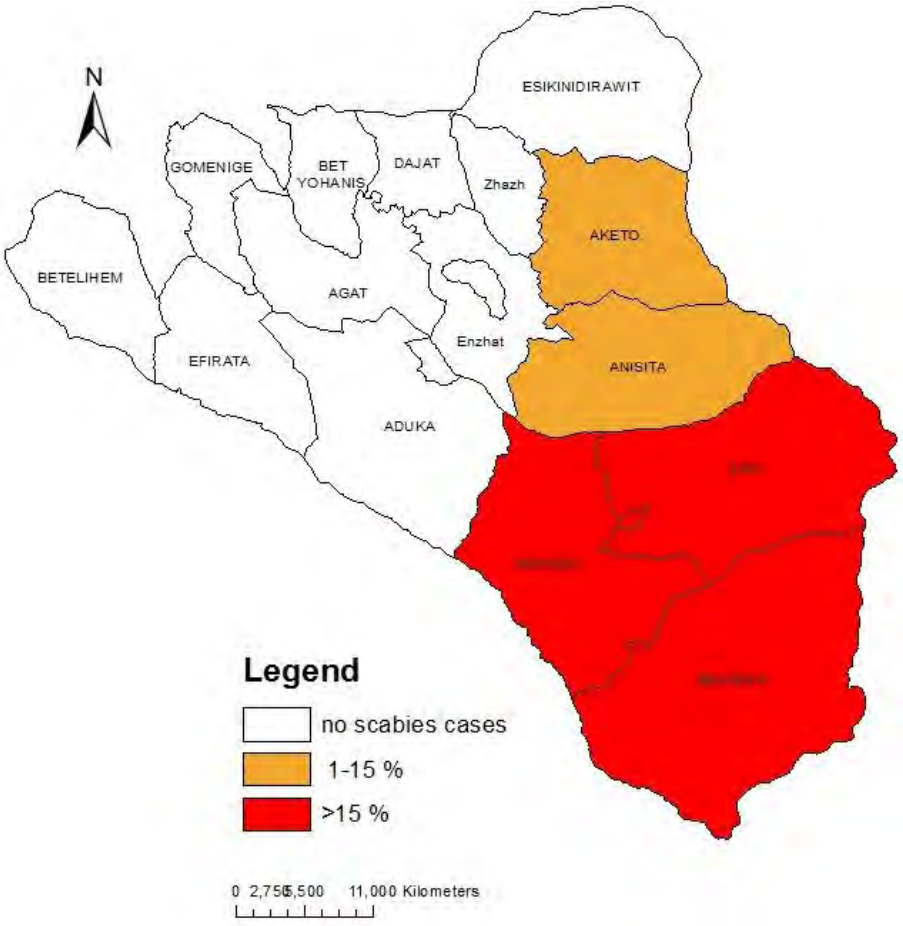

Figure 8: Prevalence of scabies among kebeles of Tach Gaynt district, 2015

From the total study subjects 77(42.3%) were male. Ninety nine percent of the respondents were Orthodox Christianity followers. The average amount of water fetched per house hold was two Jericans or 40 liters per household for an average family of five in the household.

Ninety eight percent of the respondents replied that they had itching which was intense during night.

The most frequent site of the wound was hands about 53 (86.8%). Patients reported that they had itching on the hand followed by elbow 36 (59%). Thirteen patients (21%) reported that they had super infection.

Table 7: Body parts affected by scabies patients in Tach Gaynt, South Gondar, 2015

Hands	53	86.8
Elbow	36	59
Groin	29	47.5
Armpits	21	34
Waist	16	26
Breast	12	19
Other body parts	2	3.2

Figure 9 : Picture of scabies patients in Tach Gaynt district, South Gondar zone, Amhara

2015

Analytic Epidemiology

On bivariate analysis sleeping together with scabies patient, low level of education, in frequent changing of clothes, contact with scabies patient ,infrequent bathing , sharing bedclothes ,family size >=six were associated with contracting scabies. On the other hand only sharing bed clothes (AOR = 10.2) had association with counteracting scabies multivariate analysis. (See table 9)

Table 8: Bivariate and multivariate analysis of risk factors for counteracting scabies in Tach Gaynt, 2015

S. No.	Variables	Category	Patients N=61	Controls N=122	COR, 95% CI ,P - value	COR, 95% CI ,P - value
1	Sex	Male	38 (61.7)	68 (55.7)	1.3 (0.67,2.4)	-
		Female	33(38.3)	54(44.3)		
2	Educational level	illiterate	49(81.6)	75(62)	2.8(1.3,75.9)	-
		literate	11(18.4)	47 (38)		
3	Infrequent changing of clothes	yes	47(77)	76 (62.3)	2.4 (1.16,5)	-
		No	14(22)	46 (37.7)		
4	Infrequent bathing	Yes	40 (65.6)	51 (41.8)	3 (1.5,5.7)	-
		No	21(34.4)	71 (5825)		
5	Infrequent Washing clothes	Yes	47 (77)	68 (55.7)	2.6(1.2,5.2)	-
		No	14(23)	54(44.3)		
6	Family size >=6	Yes	46(75.4)	73 (59.8)	2 (1.1,4.4)	-
		No	15(24.6)	49(40.1)		
7	Water less than <15 Lt per individual/day	No	6 (9.8)	10 (8.26)	0.8 (0.28,2.38)	-
		Yes	50 (83)	46 (37)		
8	Contact with scabies patient in the last six weeks	yes	49(80.3)	46(37.7)	8 (3.7,17.5)	-
		No	12(19.7)	76(62.3)		
9	Share bed clothes	Yes	43 (70.4)	22(18)	10.8(5.2 ,22.4)	10.2

		No	18(29.6)	100(82.5)		(4.9, 21.4))
10	Sleep together with scabies patient	Yes	41(67.2)	22(19.1)	9.5(4.6,19)	2.2 (1 , 4.9)
		No	20 (32.8)	100 (81.9)		

- Not significant

Interventions undertaken

Mass drug administration (MDA) was undertaken in three kebeles that had prevalence greater than 15% with ivermectin and sulfur in two rounds two weeks apart. Similarly in kebeles whose prevalence was less than 15 percent cases and contacts were treated with ivermectin and sulfur ointment. Beside we conducted health education on the mode of transmission and prevention of the diseases. In addition we actively search additional cases.

Discussions

This study tried to identify the possible risk factors for contracting scabies pertaining to socio demographic characteristics personal hygiene, living conditions, contact history and level of education, and access to water.

This study shows1533(51.6%) of the cases were males this finding shows that different finding from the study done in Pakistan where 46%(8) were male this deviation might be that females may be good at keeping their personal hygiene and might attribute to socio cultural differences of females between the two countries.

Delay in notification and response activities gave an opportunity for the diseases to affect large number of people. It remained without reporting for more than 11 months and intervention was started after one year. It might be due to the fact that scabies was not included by the surveillance system and the health care providers considered it as it was not reportable. Besides scabies has no disease specific reporting format and it was reported with similar classification of illness with other skin disorders under the health management information system.

The age specific attack rate was higher for people aged greater than 60 years 17.7% followed by children 5-9 years which is(8) 12.3% this might be due to the fact that those group of people are not able to keep their personal hygiene and usually wear the same cloth for longer period.

The outbreak was reported 11 months after the onset of the illness and treatment was started after two months of detection the delay in reporting and response might be due to the fact that health care providers were not informed that scabies should be reported as public health important problem

Low level of education was associated with contracting scabies this study shows similar finding with the study done in Pakistan .this might be because less educated people are less conscious of the importance of personal hygiene and the role of good personal hygiene practice in preventing diseases (14).

On bivariate analysis this study shows family size greater than six is associated with scabies diseases this might be due to that the natural mode of transmission of the diseases follows close contact like overcrowding of sleeping space which might lead to sleeping together this result shows different finding from the study done among soldiers in Pakistan the possible discrepancy might be due to the difference in the study setting is which differs in the degree of close contact

On multivariate logistic regression analysis sharing bedclothes was found to be risk factor for counteracting scabies diseases.

Limitation

- Due to long duration of the illness may result in recall bias on the date of onset of illness
- It might not be representative because we used convenient sampling technique.

Conclusion

Due to delayed detection and response, the disease transmitted among many people. It remained without reporting for about 11 months. People aged >60 years and 5-9 years had the highest attack rate during the outbreak, sharing bed clothes scabies with scabies patients was found to be risk factor for counteracting scabies. We had provided mass treatment campaign in all the affected kebeles in two rounds of treatment.

Recommendation

- District health office and health extension workers have to increase the surveillance activity.
- Increase awareness of the community on the modes of transmission of scabies to avoid or minimize contact with cases.
- Health extension workers have to assess cases home to home actively.

- The regional health bureau should establish a mechanism to include scabies under the public health emergency management reporting system.

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Annex II. Questionnaire for scabies outbreak investigation

Respondent: □ Patient □ Family member (Mother, Father: Brother or sister or other relatives close to patient.)

Respondent's status Case Control □

A. socio demography:

1. Age _____sex_____
2. Residence: Wereda _____, Kebele_____, Got_____
3. Occupation: _____
4. Religion A. Orthodox □ B. Muslim □
   C. Protestant □ D. Others □
5. Level of education

   A. N/A □ B. KG □ C. Primary □ D. Secondary □ F. Tertiary □ G. Unable to read and write □

6. Educational level of the mother/care giver

   A. Not able to read and write □ B. Primary □ C. Secondary □

7. Educational level of the father /care giver

   A. Not able to read and write □ B. Primary □ C. Secondary □

Risk factor Investigation

8. Have you made any physical contact with the person who has the disease in the last 6 weeks?

8.1. If yes what type of contact ……

8.2. Did you sleep together with someone who has scabies A.? Yes □ B. No □

9. With whom do you sleep? ----------

10. What is your relation with the person whom you sleep with? Husband /Wife brother / sister mother/ father /cousin other specify……
11. Have you slept in the same bedclothes of someone who has been infested? A. Yes □ B. No □
12. How often do you take shower? A. Weekly □ B. Every other week □ monthly □ D. Quarterly □ E. Once a year□ F. other specify……
13. For how long do you wear a cloth? For week? A. (7days) □ B. For 15 days□ C. For 30 days □ D. two months□ E. three months □ F. other specify □
14. How often do you wash your clothes? A. weekly □ B. every two week□ C. monthly □ D. every two month □ E. Three month □ F. not at all □

15. Have you put on clothes (T –shirt or shirt, Shorts, pant) of someone who was diseased in the previous 6 weeks? A. Yes □ B. No □
16. If yes, what type of undergarment /clothes: T-shirt Shorts shirt other/specify …….

Characterization of the disease

17. Body parts affected A. hands □ B. wrist □ C. elbows □ D. breasts □ E. Armpits □ F. Waistline □ G. groin □ H. others……..
18. When is itching is intense? A. at night □ B. day time □
19. Symptom /period □-----/------/------ (DD/MM/YY)
20. Have you been infested before? A. Yes □ B. No □
21. Date of onset/onset of itching ……/……/…….(DD/MM/YY)
22. Date seen at facility ……/……/……..(DD/MM/YY)

Chapter II – Surveillance Data Analysis Report

2.1. The magnitude of multi drug resistance tuberculosis and related co morbidities in Amhara Region, Ethiopia, 2010-2014

Abstract

Introduction: Organisms that are resistant to the most effective anti-TB drugs (isoniazid and rifampicin) cause Multidrug-resistant TB (MDR-TB). Globally in 2013, 45.3% of the estimated MDR-TB patients have been detected, diagnosed and notified; About 97,000 patients were enrolled on MDR-TB treatment. Treatment was started in Amhara region in August 2010.The objective of the study was to describe the trend and magnitude of the disease

Methods: We conducted retrospective descriptive using record review from patients from 2010 to 2014. All MDR TB patients were included. We collected data from three multi drug resistant tuberculosis treatment centers in Amhara region and review patient register and charts.

Result: Of 342 MDR TB patients, males constituted 192 (56.1%). Case fatality rate was 41 (12%). The age specific attack rate was higher (4/100,000) in 25-44 years, while that of mortality was higher in >65 years old (1/100000). Urban areas had higher number of cases. HIV testing was done for 331 (96.8%) of the patients and 81(24.5%) were found HIV positive. Of these, 50% were on ART. Only 22(6.4%) were primary MDR TB cases. From 222 (64.9 %) screened for malnutrition, about half had moderate to severe malnutrition. The performance for MDR TB case detection for the years 2013 & 2014 was 48.7% & 66.4 % respectively. Treatment success rate was 84.6%, 80% and 77.9% for the cohorts of 2010, 2011and 2012 respectively.

Conclusion: The burden of MDR TB increases from year to year which might be due to the expansion in diagnostic and treatment centers with higher prevalence in males and urban areas. The performance of case search was lower than the global target but the treatment success rate found to be higher than the global average. Therefore, we recommend intensified case finding, strengthening strict follow up and observation of cases in first line anti TB treatment and nutritional screening.

Key words: MDR TB, co-morbidities, Amhara region, Ethiopia

Introduction

Multidrug-resistant TB (MDR-TB) is caused by organisms that are resistant to the most effective anti-TB drugs (isoniazid and rifampicin). It results from either infection with organisms which are already drug-resistant or may develop in the course of a patient's treatment(1). Primary MDR arises in settings where anti- tuberculosis chemotherapy has been applied inappropriately for several years(3).

In 2013, 136 000 of the estimated 300 000 MDR TB patients who could have been detected were diagnosed and notified. This represents a tripling in MDR-TB detection compared with 2009 (4). Nutritional assessment and regular monitoring of the nutritional state by a dietician are essential for the successful management of MDR-TB patients and should be an essential part of tuberculosis control programmes(5).

With the exception of two Ethiopian studies all other studies showed no association of any anti-TB drug resistance to either HIV positives or HIV negatives (6).

The adverse events from lifelong treatment of HIV with antiretroviral therapy (ART) coupled with side effects from MDR-TB drugs make the management and outcomes of MDR-TB in co-infected patients very challenging (7). Outcomes of MDR-TB did not differ significantly between patients who started ART before or after initiation of MDR TB except mortality was higher among patients who commenced ART before initiating MDR TB treatment, being severely underweight and underweight, cavitary lesions on baseline chest x-ray, the presence of other opportunistic infections and other co-morbidities(7).

Information on the extent of MDR-TB from Africa region is very limited, probably due to poor laboratory facilities, poor surveillance mechanisms and reporting procedures, outdated databases and sub-optimal coverage of the infrequent surveys.

Sub-Saharan Africa stands the burden of both very high TB incidence and the highest HIV prevalence rates in the world, and represents 14 % of the global burden of new MDR-TB cases(8). Ethiopia stands 15th out of the 27 high MDR TB countries in the world and 3rd in Africa next to South Africa and Nigeria (8). In Ethiopia 1.6% of new TB patients and 12% of previously treated patients had MDRTB (9).In 2014, 558 MDR TB cases and 413 were enrolled and outcome was recorded for 116 cases in Ethiopia (9).

The first patients were admitted for MDR-TB treatment in Ethiopia in 2009 in St. Peter‘s Hospital in Addis Ababa. In the same year, 45 /MDR-TB patients were enrolled initially in the second phase at St. Peter‘s Hospital. However, there has been a rapid scale-up of drug-resistant TB care in the last five years; in 2014, at the national and regional state level, there were 19 care sites for drug-resistant cases and therapy was initiated on 811 patients in 2012. This is because the expanding access to care for MDR-TB cases is limited to the main and regional large cities.

As a result of this, MDR-TB patients in rural and remote areas may not have access to health care services, may prefer consultation with traditional healers that are more readily available and come late to health care centers.

Delayed case detection and treatment of MDR-TB cases might also contribute to the spread of the disease in the community. Thus, there is a need to train health extension workers and volunteers how to screen and care for MDR-TB cases at the community level. Continuous public health awareness about MDR-TB at the community level is also very important to reduce the spread of this deadly disease.

The purpose of effective treatment of drug susceptible TB is curing the patient, interrupting transmission of TB to other persons, and preventing the development of drug resistant strains .

Literature Review

These goals are not being achieved in many regions of the country though anti-tuberculosis drugs are available. This might be due to either patient non-adherence to treatment or clinicians‘ non-adherence to the national treatment guidelines or both(10). In Amhara region MDR TB treatment was started in august 2010 at Gondar university hospital (11).

Case patients with positive HIV status and those who had received TB treatment under the Directly Observed Therapy program (DOT) were less likely to have MDR-TB. MDR-TB could be transmitted to otherwise healthy individuals. The protective association with HIV positive sero status may reflect selective survival of HIV negative MDR-TB and thus need to be investigated(12).

A study done in South West Ethiopia around Jimma area showed high prevalence among male is 60% and those aged from 15-44 years (84.4%)(13). The epidemiological impact of HIV on the epidemic of drug-resistant TB is not known and may depend on several factors. HIV-positive TB

cases are more likely to be smearing negative. In addition, delayed diagnosis of drug resistance and unavailability of treatment (particularly in previous years) have led to high death rates in people living with HIV. Both of these factors (smear negativity and short duration of disease due to mortality) may suggest a lower rate of general transmission. However, HIV-positive cases progress more rapidly to disease and in settings where MDR-TB is prevalent (either in the general population or in the local population such as a hospital or a district), this may lead to rapid development of a pool of drug-resistant TB patients or an outbreak(14). Anti-TB drug resistance was more frequent among retreatment patients than newly diagnosed cases (50.0 %.The HIV prevalence among the study population for who drug resistance testing result available is 19.1 %. The occurrence of drug resistance was not related to HIV infection status (15). Patients who received ART prior to commencing MDR-TB treatment were 1.7 times more likely to die compared with those who commenced ART after initiation of MDR-TB treatment(16).The association between malnutrition and disease is well recognized, but the explanation for the association is complex. In the context of TB and HIV/AIDS, attention should be focused on specific symptoms, such as weight loss, diarrhea, and loss of appetite, nausea, and specific disorders such as micronutrient deficiencies, known to occur commonly among TB and HIV-infected individuals and to impact adversely in the short- or the longer-term outcomes. Factors that affect food intake, such as food availability, appetite, eating patterns, medication side effects, traditional food taboos, lifestyles (smoking, alcohol, physical activity, caffeine intake, use of social drugs), psychological factors (stress and depression), stigma, and economic factors are also very important to consider(17). Place of residence, duration of illness and frequency of prior TB therapy (were significant factors to any drug resistance. Patients with history of treatment failure or defaulters were more likely to have isolates with rifampicin resistance(1) In our study, we observed that 66% subjects of study group were having BMI <18.5, 36% of subjects of study group were having serum total protein <5.5 gm/dl, 74% subjects of study group were having serum albumin <3.5 gm/dl. 42 % subjects were having anemia(Hgb ≤10)(18).

Rationale

Analysis of MDR TB data was not conducted in the region previously hence the data will help to clearly explain the trend of drug resistant tuberculosis and the regional profile of the disease. This is important to figure out the magnitude of the disease in different parts of the region. It also enables to evaluate the effectiveness of the efforts mitigated to halt the burden of MDR tuberculosis. Besides, the data will help public health officials and program managers to set priorities for future prevention and control of the disease.

Objectives

General objective

- To describe the magnitude of MDR TB and related co morbidities that provides guidance for intervention.

Specific objectives

- To describe the burden of MDR tuberculosis by person, place and time
- To estimate treatment success rate of MDR TB
- To describe the prevalence of HIV/AIDS among MDR TB patients
- To describe the nutritional status of MDR TB patients

Methods

Study area: We conducted the study in Amhara national regional state. It is found in the northwestern part of the country with a total area of 170, 000 square kilometers. Situated between 9 ^{0}20‘ to14 ^{0}20‘ latitude and 36 ^{0}20_to 40 ^{0}20‘east longitude. The region shares boundaries with Tigray in the north, Oromia in the south, Afar in the east, Benishangul Gumuz in the southwest and shares an international border with the Republic Sudan in the North West. The region is divided into nine administrative zones and three city administrations. The 2014 population estimate shows that 20,002,911 which contributes about 1/4th of the country‘s total population.

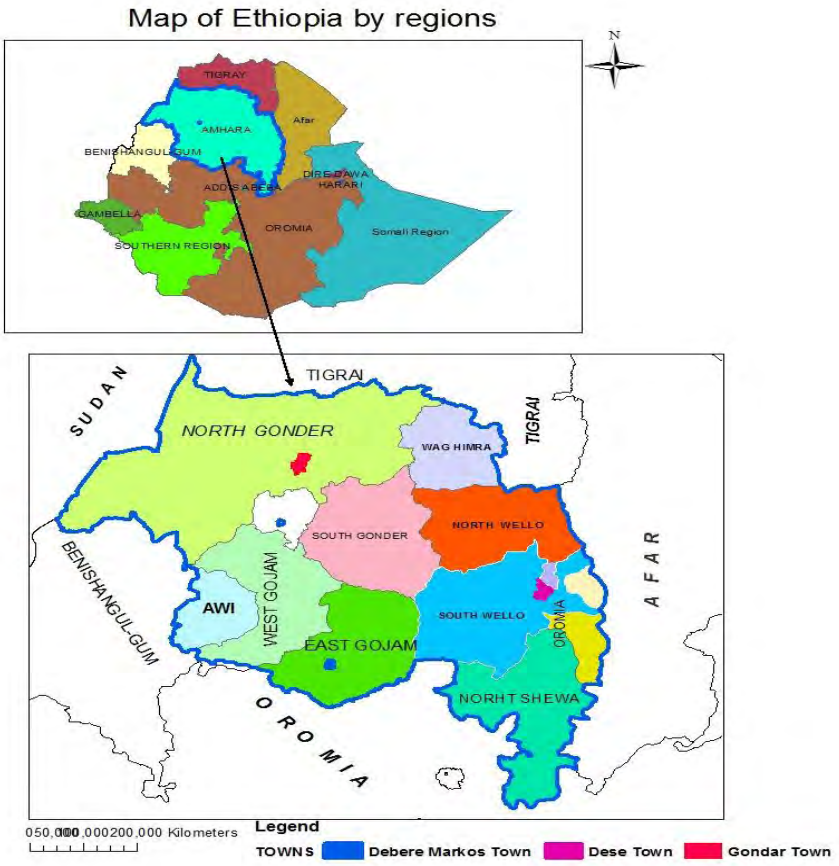

Figure 10: Map of Amhara region, 2015

Study design: We conducted retrospective descriptive crossectional study with record review

Study period: The study was conducted from August 2010 to December 2014

Source population: All MDR TB patients in Amhara region

Study population: All MDR TB patients in Amhara region who were on MDR TB treatment in the three treatment initiating centers.

Data source: We revised patient registry and patient charts in three MDR TB treatment-initiating hospitals (Gondar University Hospital, Boru meda Hospital and Debre Markos referral Hospital)

Data collection and analysis: Data was collected manually from three MDR TB treatments initiating centers and analyzed using Microsoft excel, Epi Info version 7 and Arc GIS. We calculated proportions, rates and present using tables, graphs maps and charts.

Ethical consideration

The Amhara national regional state health bureau public health emergency management core process provided official letter to collect data from three MDR TB treatment-initiating hospitals. Patient names and identifiers were not used for the study.

Definitions

According to the Ethiopian national MDR TB guide line

Bacteriologically confirmed MDR: Cases that have documented DST or laboratory result multi drug resistant or rifampicin only

Clinically diagnosed MDR-TB: Refers to those cases with no documented DST results but the clinical panel team decided to treat the patient with full course of second line (SLD) based on clinical criteria alone. It includes cases diagnosed based on X-ray abnormalities or suggestive histology and extra-pulmonary cases without laboratory confirmation. Cases of DR-TB in children may frequently fall into this category. When culture and DST results are available, these cases will be registered as bacteriologically confirmed.

Pulmonary TB: MDR Tuberculosis involving the lung parenchyma.

Extra pulmonary TB: MDR Tuberculosis involving organs other than the lungs.

New: A patient who has received no or less than one month of anti-tuberculosis treatment.

Previously treated with First line drugs: A patient who has received first line anti-tuberculosis treatment for four weeks or more

Previously treated with Second line drugs: A patient who has received second-line anti tuberculosis treatment for four weeks or more

Relapse: A patient who was previously treated for TB and whose most recent treatment outcome was ~~–c~~ured" or ~~–t~~reatment completed", and who is subsequently diagnosed with Bacteriologically positive TB by sputum smear microscopy, Xpert MTB/RIF, or culture.

Treatment after being lost to follow-up*:* A patient after taking treatment for more than one month who returns to treatment, Bacteriologically positive by sputum smear microscopy, Xpert MTB/RIF, or culture, following interruption of treatment for two or more consecutive months.

Treatment after failure of New TB regimen: A patient who has received new regimen for TB and in whom treatment has failed. Failure is defined as sputum smear positive at five months or later during treatment.

Treatment after failure of Retreatment regimen: A patient who has received retreatment regimen for TB and in whom treatment has failed. Failure is defined as sputum smear positive at five months or later during treatment.

Cured: Treatment completed without evidence of failure and three or more consecutive culture taken at least 30 days apart are negative after the intensive phase.

Completed: Treatment completed without evidence of failure but no record that three or more consecutive culture taken at least 30 days apart are negative after the intensive phase

Failure: Treatment terminated or needed for permanent regimen change of at least two anti TB drugs for different reasons.

Died: A patient who dies for any reason during the course of the treatment

Not evaluated: For whom no treatment outcome assigned either due to transferred out to other facilities or still on treatment

Result

A total of 342 MDR TB patients were treated in the previous five years from (2010 to 2014) in the three treatment initiating centers of Amhara region. The annual average number of cases was 69. Both morbidity and mortality was higher in males. Of these 192 (56.1%) were males. From recorded 41 deaths males accounted 23 (56.9%). None of the patients had history of treatment with second line anti TB drugs.

The median age was 28 years old the age ranges between 1 and 75 years and the majority [169 (49%)] of cases belong to the age group of 25-44 years old). Only three (0.9%) and seven (2%) of the cases were under five children and above 59 years respectively.

The morbidity due to MDR TB was higher in the age categories 25-44 years old 169 (4/100,000) followed by the age groups 15-24 (3/100,000) and lower in children aged 5-14years (3/100,000). The age specific mortality rate increases with age. It is highest in people aged more than 65 years (1/100,000) and no death was recorded is among children under five years old.

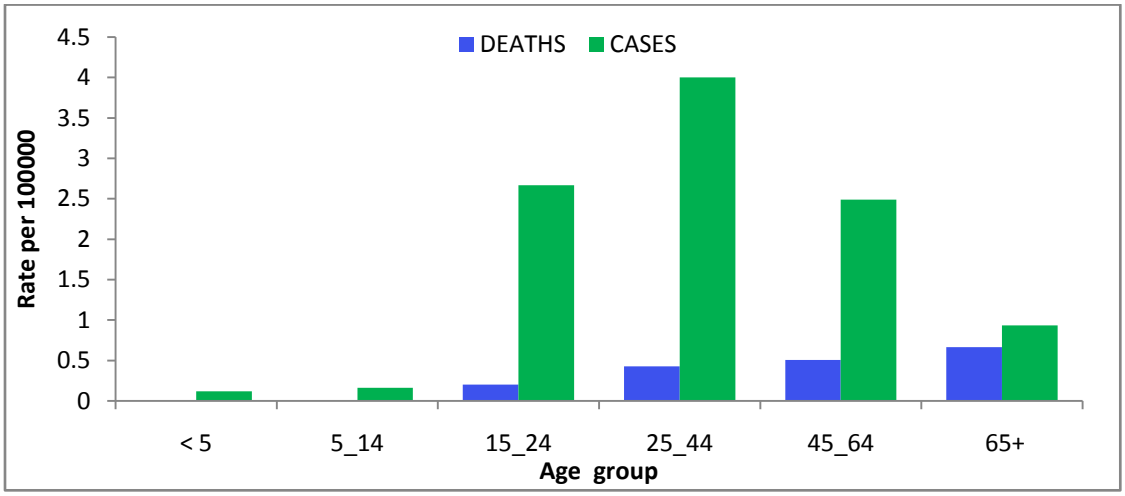

Figure 11: MDR TB age specific mortality and morbidity Amhara, Ethiopia, 2010 to 2014

The treatment of MDR TB has been given in three treatment initiating hospitals. From 342 MDR TB patients, the majority (67.5%) were from Gondar university hospital

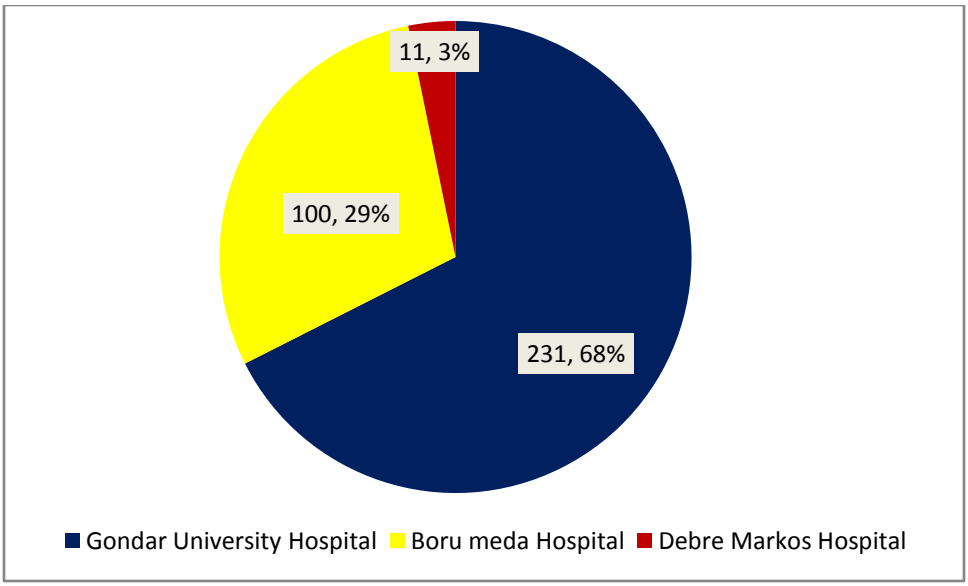

Figure 12: Distribution of MDR TB patients by treatment facilities, Amhara, 2010 to 2014

The highest prevalence of MDR TB was seen in Gondar city 40 (3/100, 0000) followed by Bahir Dar city 19 (1.4/ 100000) and Dessie city 8 (1/100000). From zones the highest prevalence was seen in Awi 0.84/100000 followed by North Gondar 83 (0.55/100,000) and the lowest was in Waghimra 2 (0.47/100, 0000)

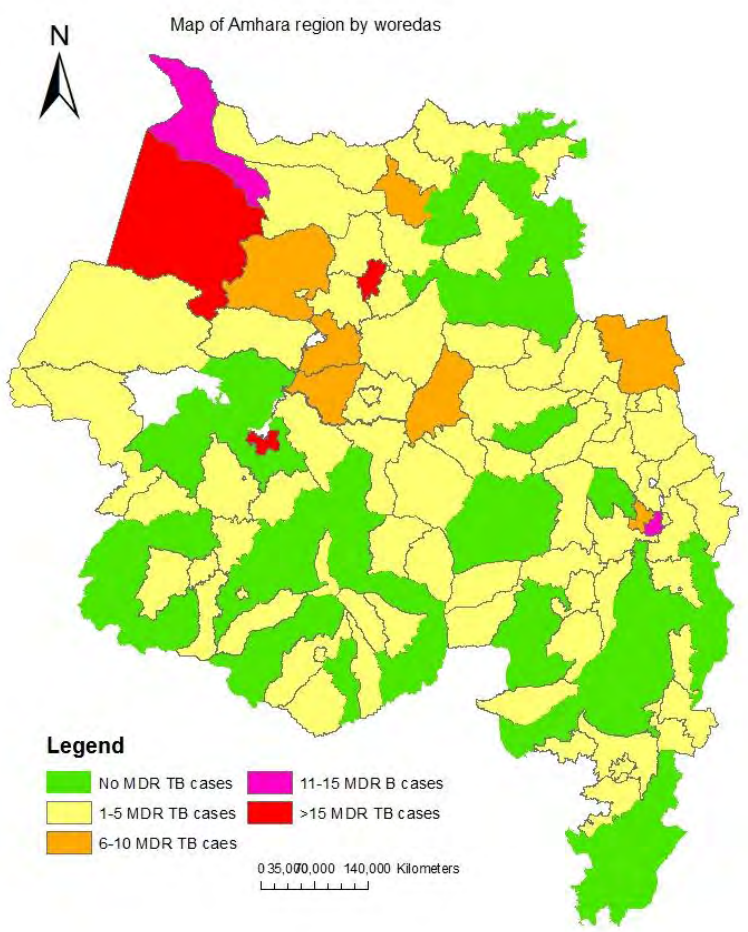

Figure 13: Distribution of MDR TB by woredas of Amhara Region, 2010-2014

The annual regional case notification performance for MDR TB for 2013 & 2014 was 48.7% & 66.4 % respectively. Regarding the anatomical site, 95% (325) were pulmonary where the rest 5% (17) were extra pulmonary.

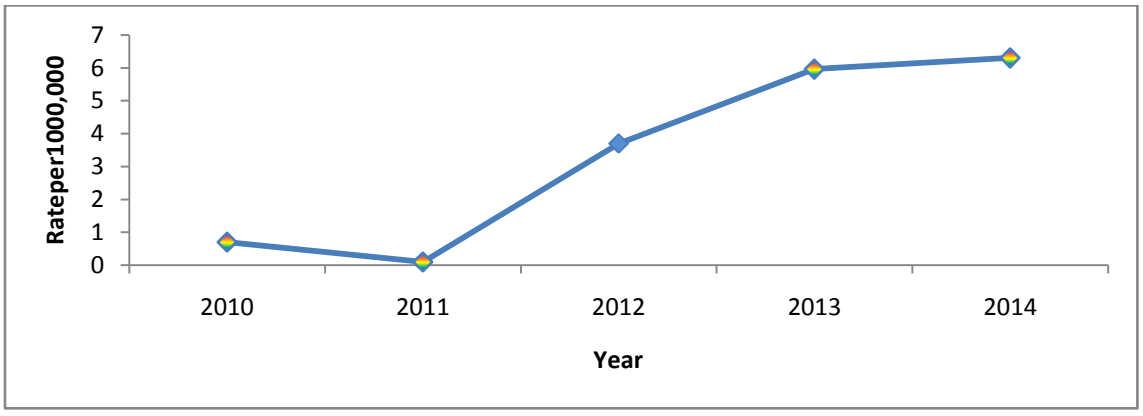

Figure 14: Trend of MDR TB cases in Amhara region, Ethiopia, 2010 to 2014

Laboratory diagnosis

The majority [195 (57%)] of patient samples were done using Line probe assay (LPA), 75(22%) using gene xpert and 68(20%) were using culture and drug sensitivity tests (DST) which were the most commonly practiced methods of diagnosis. Ninety seven percent (330) of the patients' diagnosis was confirmed by either one or more of the above diagnostic modalities while the rest three percent (12) were clinical cases of multi drug resistance tuberculosis. Besides out of the 342 patients 289 were MDR cases, 43 of them mono resistance (mostly rifampicin).

MDR TB and HIV co infection

Regarding HIV co infection from the total 342 patients, 331(96.8%) were tested for HIV, 81 (24 %) of them were HIV positive.

Table 9: Proportion of HIV test result of MDR TB patients, Amhara, 2010-2014

HIV test result	Frequency	Percent
Non- reactive	250	73
Reactive	81	24
Unknown	11	3
Total	342	100

From 81 HIV co-infected patients, 43(53.1%) were female, of this 40 (49.4%) patients started antiretroviral therapy (ART) and 35 (43.2%) patients started Cotrimoxazole preventive therapy. The outcomes of 47 patients were recorded, two (4.2%) completed their treatment, 27 (57.4%) cured, 12 (25.5%) died and five (10.6%) were lost to follow up. The proportion of MDR TB HIV confection was higher in Oromia zone (24%) followed by Gondar town and lowest in Waghimra where there was no MDRTB and HIV co infection.

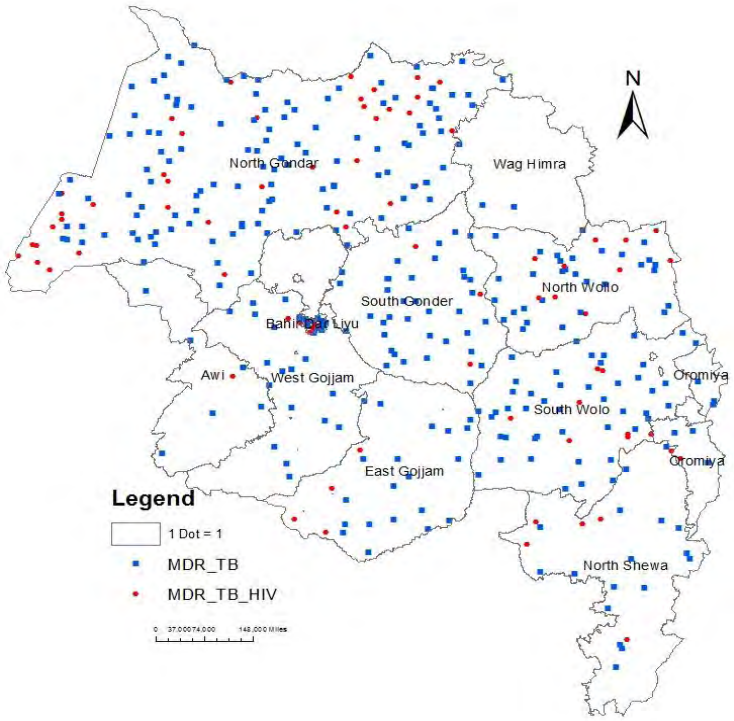

Figure 15: Distribution of MDR TB and MDR TB HIV co infection in Amhara region, 2015

Regarding the previous history of anti TB treatment from the total 342 MDR TB cases in the region only 22 were primary MDR TB cases the rest were on first line anti TB treatment .The majority of cases 226 (66%) were after failure of first line anti TB retreatment regimen, and 11.7%(40), were failure of new regimen, 10% (34) were relapse cases.

From 342 patients, 222 (64.9%) were screened for malnutrition and of these 77 (34.7%) were found to be severly malnurtioned (BMI less than 16) ,32(14.4%) were moderatly malnuritined BMI (16-16.99), 31 (13.9%) have had mild malnutrition BMI (17-18.49) ,while 78 (35.14% %) were normal.The rest one and three patients were obese and over weight respectively.

Four patients were XDR suspected of which one of them was lost to follow up and three were treatment failures. All these XDR suspects were from Gondar University Hospital. The MDR TB treatment success rate decreases from year to year for cohorts of 2010 was 84.6%, 80 % cohorts of 2011 and 77.9 % for cohorts of 2012

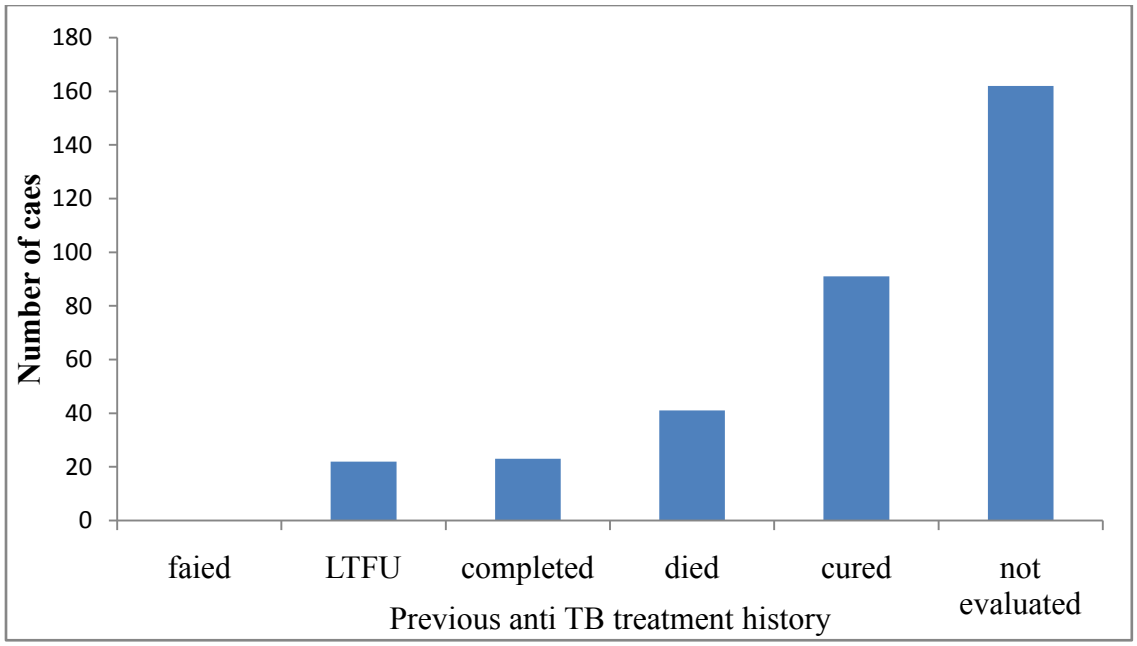

Figure 16: Treatment outcomes of MDR TB cases in Amhara, 2010-2014

Discussion

The trend of the diseases increases from year to year which might be due to the expansion of diagnostic and treatment centers. Morbidity and mortality was higher in males. The Age specific morbidity was higher for people aged from 15-44 years where mortality increases with age. Urban areas reported higher number of cases and about half of the patients screened for malnutrition had moderate to severe malnutrition.

Both morbidity and mortality due to MDR TB was found to be higher in males (56%). This result reveals consistent finding with the study conducted in St. Peter TB specialized hospital 59% MDR were male) and it is also similar with the study done in Kenya; that 62 % of the cases were male (12). Morbidity from multi drug resistance tuberculosis was higher among people aged from 25-44 years but the mortality increases with age which is consistent with the 2014 WHO global TB report people who are 65 years and older.

The prevalence was higher in more urbanized areas like Gondar, Bahir Dar and Dessie city administrations. This might be due to wrong recording of more cases as residents of the cities; it might also be due to the accessibility of diagnosis, treatment service in urban areas and the better health seeking behavior of the community.

The trend of MDR TB increases from year to year with sharp increase from 2011 to 2013. This result also goes in line with the result reported in St. Peter specialized hospital(6) & it might be due to the implementation of intensified case finding strategies and improvement and expansion in diagnostic and treatment facilities and improvement in the national TB program .

About 96.8% of the patients were tested for HIV with positivity of 24.5% death, LTFU was higher in HIV co infected 25% and 10.5 % respectively, and this might be that the burden of both drugs may have negative impact on patient's adherence and overlapping toxicity. This result shows higher percentage of co infection compared to the study done in South West Ethiopia (9.6%) (13) and India where only 14.2% have co infection. But lower than the finding from Uganda (19).

Only 6.4 % of the cases were primary MDR TB cases the rest were on first line anti TB treatment and of these 66% were after failure of first line retreatment regimen. This result also shows similar finding with the study done in Kenya 7.4 %(12)

About 222 (64.9%) of the patients were screened for malnutrition and 63 % of them found to have malnutrition. Of which 49.1% had moderate to severe malnutrition. This finding shows similar finding with the study done in Philippines (20). Additionally 34.7% have severe malnutrition comparable with the same study where 33.3% have severe malnutrition. This finding shows lower prevalence of malnutrition compared to the study done in India where 68.6% of the patients have body mass index less than 18.5% (21).

The overall treatment success rate in this study (our study) is found above 77%, which fulfilled the WHO target of a treatment success rate of above 70 %(18).

Limitations

Data was not available on the degree of resistance for each first line anti TB drug.
It might not represent all the regional prevalence since the data is collected from facilities

Conclusion

The risk of MDR TB was higher in retreatment TB cases (67.5%) and HIV co infected (24).The prevalence of under nutrition among MDR TB cases was also high (49%). MDR TB detection rate was found low but treatment success rate much higher than the global average.

Recommendation

- The Amhara National Regional State Health Bureau has to implement intensified case finding to increase the case detection rate
- Nutritional intervention should be an integral part of MDR TB case management
- Treatment facilities should screen patients for malnutrition.
- Further research should be conducted on the effect of HIV infection on MDR TB treatment outcome and why the disease is more common in the urban areas

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Chapter III – Evaluation of Surveillance System

3.1. Surveillance System Evaluation of Malaria, Measles and Sever Acute Malnutrition, South Gondar Zone, 2015

Abstract

Introduction: Public health Surveillance is the ongoing systematic collection, analysis, and interpretation of health data essential for planning, implementation, and evaluation of public health practice, closely integrated with the timely dissemination of these data to those who need to know. The objective of program evaluation is to determine as systematically and objectively as possible the relevance, effectiveness, and impact of programs with respect to their objectives. Public health surveillance was implemented by different strategies. Previously it was started by vertically for each disease.

Methods: Descriptive crossectional study design was employed from 28/09/2015 to 14/10/2015 in South Gondar administrative zone. One zonal health department two woreda health offices, four health centers and four health posts were included in the study. We interviewed PHEM officers, PHEM focal persons and health extension workers using structured questionnaire and review of reports and records were used.

Result: Malaria, measles and sever acute malnutrition were the major diseases and conditions of public health importance in the zone. In 2014/2015, 2017 measles, 2451 sever acute malnutrition, and 99,332 malaria cases were reported in the zone. Supervisions were made as integrated supportive supervision in each quarter but there was no program specific supportive supervision for public health emergency management. The overall reporting rate of all types of health facilities was good with 96%. None of the assessed health offices and health facilities investigated outbreak using standard outbreak investigation checklist. The major reasons were lack of knowledge on how to investigate an outbreak. Data analysis was not routinely practiced in both visited districts and was not used for decision making. The surveillance system was simple, flexible, acceptable and representative.

Conclusion:

The overall surveillance activities of the zone were not satisfactory. Data should be analyzed at district and facility level. There is also a need of program specific supervision activity other than

integrated supportive supervision, which is conducted in each quarter. Regarding laboratory activities malaria RDT were available at health post level.

Introduction

Public health Surveillance is the ongoing systematic collection, analysis, and interpretation of health data essential for planning, implementation, and evaluation of public health practice, closely integrated with the timely dissemination of these data to those who need to know(1). The International Health Regulations (IHR) 2005 underscore the commitment to the goal of global security and request all Member States to establish and implement effective surveillance and response systems to detect and contain public health threats of national and international importance(2).

Surveillance systems are often considered information loops or cycles involving health care providers, public health agencies and the public. The cycle begins when cases of disease occur and are reported by health care providers to the public health agencies .The cycle is not completed until information about these cases is relayed to those responsible for disease prevention and control and others –who need to know". Because health care providers, health agencies, and the public all have some responsibility for disease prevention and control, they all should be included among those who receive feedback of surveillance information (3).

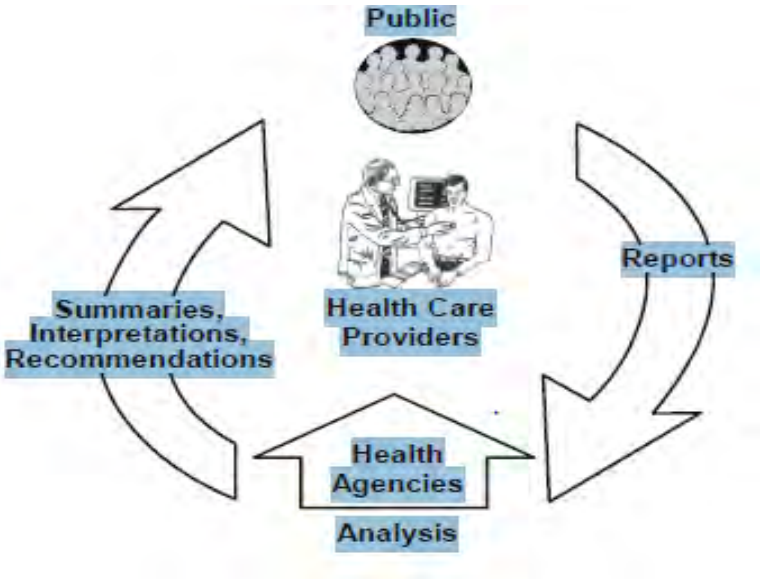

Figure 17: Information loop involving health care providers, public health agencies, and the public

The objective of program evaluation is to determine as systematically and objectively as possible the relevance, effectiveness and impact of programs with respect to their objectives. The basic principle of program evaluation involves information, expectation and attribution. Systematic guides for program evaluation are available. Data disseminated by a public health surveillance system can be used for immediate public health action, program planning and evaluation and formulating research hypothesis (4).

A systematic evaluation should address the following six aspects: 1/ importance , 2/ objectives and components (5), 3/ usefulness , 4/ cost , 5/ data quality (accuracy, representativeness and completeness) and 6/quality of surveillance system (simplicity , flexibility, portability , stability , acceptability) (6), sensitivity , predictive value positive (7), representativeness , and timeliness. Data and system architecture of a surveillance system should follow four design principles: automated, real-time, routinely useful, and locally useful (8).

In Ethiopia, public health surveillance was implementing by different strategies. Previously it was started by vertically for each disease, which was not economical for monitoring the diseases independently. After this integrated disease surveillance and response (IDSR), strategy was introduced and implemented throughout the country.

Generally, 23 selected diseases were expected to be reported federal ministry of health. Currently the system broadens to include any emergency beside to diseases outbreak and selected 21 diseases to surveillance in the country.

Regions were expected to report those diseases and any health and health related emergencies. The task of surveillance has been authorized by health sectors and health workers at all levels. In addition to government, health sectors and Non-governmental organization were engaged as stakeholder. World Health Organization was the main actor of surveillance as stakeholders in Ethiopia. According to new system established weekly report of 20 diseases were reported(9, 10).

Rationale of the study: Malaria, Measles and malnutrition are major public health concerns and epidemic prone in Ethiopia as well as in South Gondar of Amhara Region in which most parts of its population are at risk of outbreak of measles, malaria and malnutrition. The zone also has food insecure areas which lead to sever acute malnutrition. This evaluation of the surveillance

system addressed one immediately reportable (measles) and two weekly reportable diseases (malaria and sever acute malnutrition).

Use of the collected data at the local level as evidence for public health decision making is not well known, Surveillance system evaluation is not done in the area; and little is known about the effectiveness and efficiency of the system. The data generated from surveillance evaluation will be important to understand gaps, suggest possible intervention and help to improve public health decision making. Therefore evaluating public health surveillance systems helps to ensure that problems of public health importance are being monitored efficiently and effectively.

Objectives

General Objective

- To describe the existing surveillance system of malaria, measles and sever acute malnutrition and to provide appropriate recommendation**.**

Specific objectives

- To assess the core activities such as case detection, reporting, analysis and response surveillance system in South Gondar zone
- To assess the epidemic preparedness status of South Gondar zone
- To assess different attributes of surveillance system.

Methods and materials

Study Area: This surveillance system evaluation was undertaken in South Gondar zone of Amhara regional state. South Gondar is bordered on the south by East Gojjam, on the southwest by West Gojjam and Bahir Dar, on the west by Lake Tana, on the north by North Gondar, on the northeast by Wag Hemra and North Wollo, and on the southeast by South Wollo. The Abbay River separates South Gondar from the two Gojjam Zones. The zone is selected for its high burden of malaria, measles and it is one of the zones affected by the drought. South Gondar zone has a total population of 2,395,981 with health coverage of 82 for health centers and 78 for health posts percent in 2014/2015. The whole population is targeted under the surveillance system for 22 priority diseases. The zone has four hospitals, 93 health centers, four treatment centers, 11 medium clinics and 377 health posts.

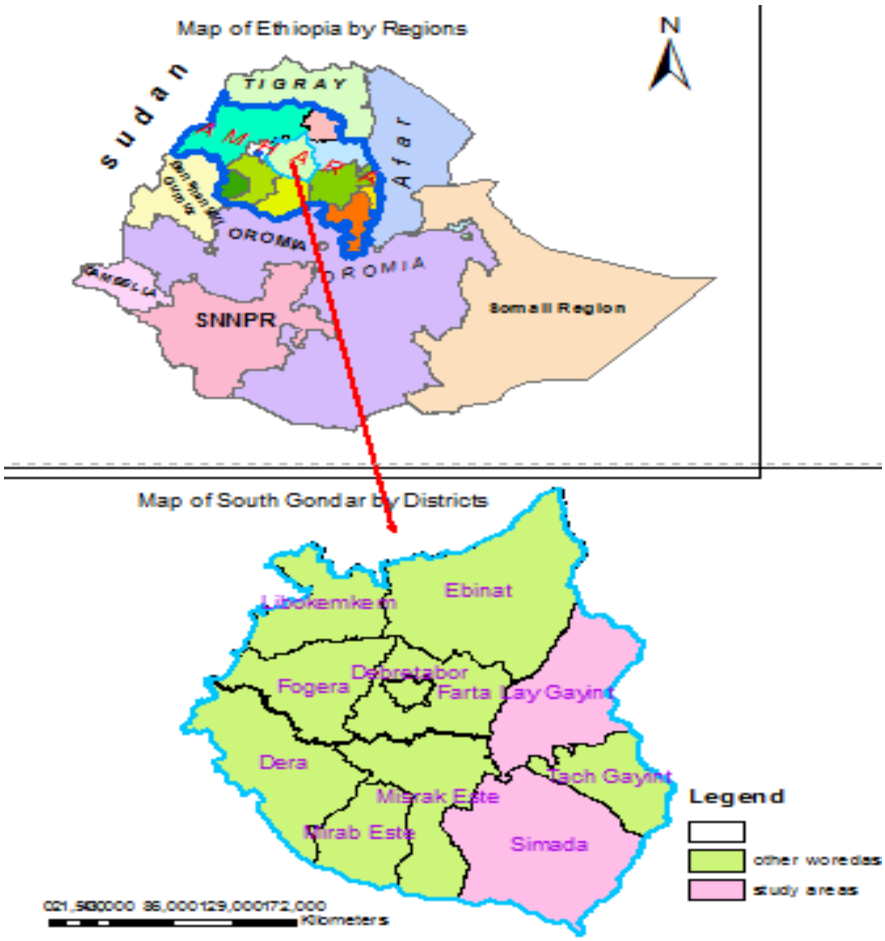

Figure 18: Map of Ethiopia by regions and Map of South Gondar by districts, 2015

Study design and period: Descriptive cross sectional study design was employed from 28/09/2015 to 14/10/2015

Sample Size and Sampling technique

Selection of zone

Amhara Regional State is one of the Regional States under the Federal Democratic Republic of Ethiopia. It is divided into 10 administrative zones and three administrative cities. South Gondar zone was selected purposively because of the presence of outbreak measles and malaria, SAM and the absence of system evaluation done before.

Selection of districts

South Gondar zone is divided into 10 districts and two administrative towns. Two districts (lay Gaynt and Simada)were selected purposively by discussing with the zonal PHEM officers depending on their performance in 2014/2015.Simada district had better performance in 2014/2015 in PHEM activities where Lay Gaynt had least performance .

Selection of health facilities

Health facilities were selected by discussing with district PHEM officers two health centers and two health post from each woreda were included in the evaluation similarly health centers were included based on the 2014/2015 PHEM performance by taking health centers that had better performance and least performance. Health posts were selected by convenience.

Data collection:

WHO surveillance evaluation checklist was used for Face to face interviewing of zonal and district PHEM officers, Health center focal persons and health extension workers. Review of reports and records was also used as part of the data collection system.

Data Analysis:

Data was entered and analyzed with MS Excel and results were presented using rates, frequencies, charts and graphs.

Case definitions

According to the Ethiopian public health emergency management guideline case definitions are classified into two i.e. standard and community case definitions (see below for all the three diseases) (10).

A case definition is a standard set of criteria for deciding whether an individual should be classified as having the health condition of interest.

Standard case definition: is a case definition that is agreed upon to be used by everyone within the country.

Community case definitions: is a case definition of disease an condition adapted to suit to health extension workers (HEWs) and community members including community health workers, traditional healers, birth attendants, kebele administration, agricultural workers, teachers, drug outlets, etc.

Standard case definition

Measles

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

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

Malaria

Suspected: Any person with fever or fever with headache, rigor, back pain, chills, sweats, malign, nausea, and vomiting diagnosed clinically as malaria

Confirmed A suspected case confirmed by microscopy or RDT for plasmodium parasites.

Sever acute malnutrition: Children age from 6 months to 5 years with MUAC less than 11cm and/or children with bilateral edema regardless of their MUAC.

Community case definitions

Rash: any person with fever and vesicular, maculopapular or postural rashes on any part of the body

Malaria: any person with fever or headache, back pain, chills, rigors, sweating ,muscle pain, nausea and vomiting or suspected case confirmed by RDT

Sever acute malnutrition: children age six month to five years with MUAC less than 11cm and bilateral leg edema or children six month to five years with bilateral leg edema

Result

The flow of information and data from the community to the ministry of health for all the 22 priority disease and conditions, when a suspected case presents to a health facility based on the case definition reports were sent to the next level. In case of rumors and immediately reportable diseases like measles all respondents replied that reports sent to the next level within 30 minutes. On the other hand, for weekly reportable diseases (malnutrition and malaria) reports were compiled and sent from facility to district health office on Monday, from district to zone on Tuesday, from zone to region on Wednesday. Similarly, feedbacks were sent down wards from the federal ministry of health at each step to the community (see figure below)

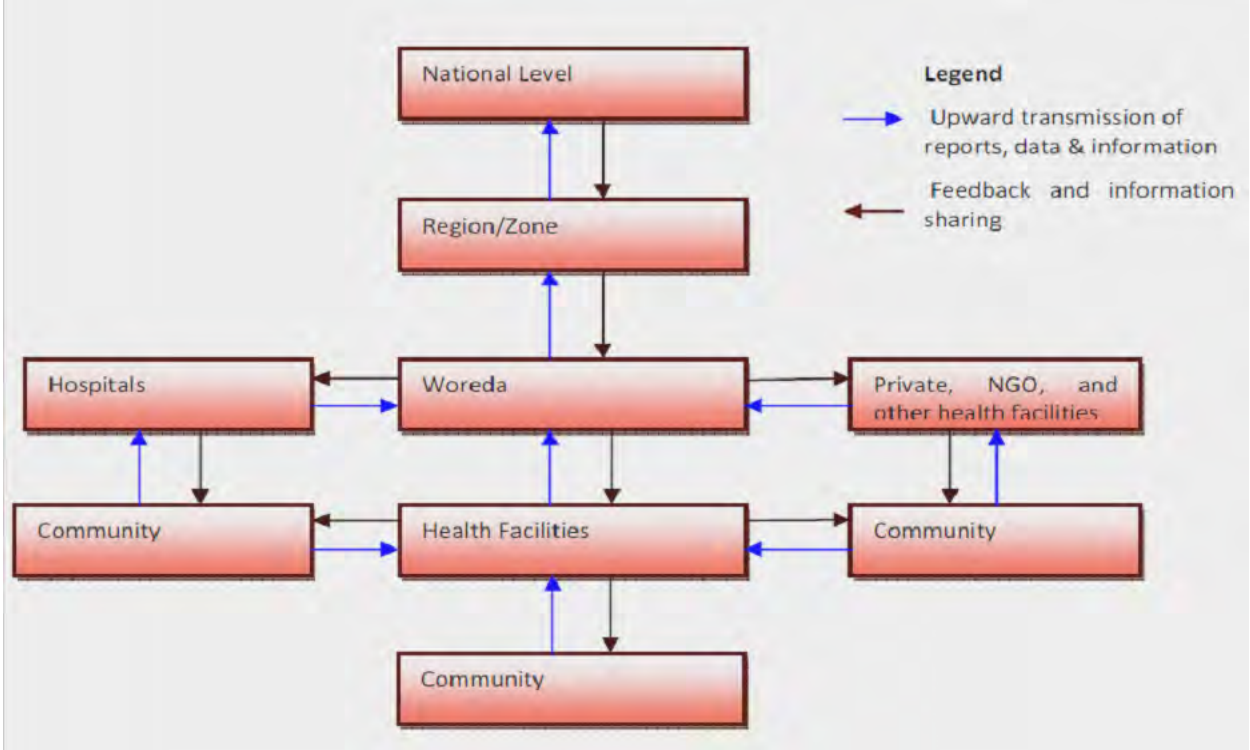

Figure 19: Diagram illustrating the formal and informal flow of surveillance data and information throughout a health system (source Public Health Emergency Management Guidelines for Ethiopia 2012).

Description of public health importance

Irrespective of the high measles vaccination coverage (90%), all (100%) of the districts had experienced measles outbreak in 2014/2015.Measles accounts 0.2% of the total patients. In

South Gondar zone from July to June 2014/2015 there were 2017 suspected measles cases from these cases 1045 (51.8%) were from Fogera district with two (0.1%) deaths.

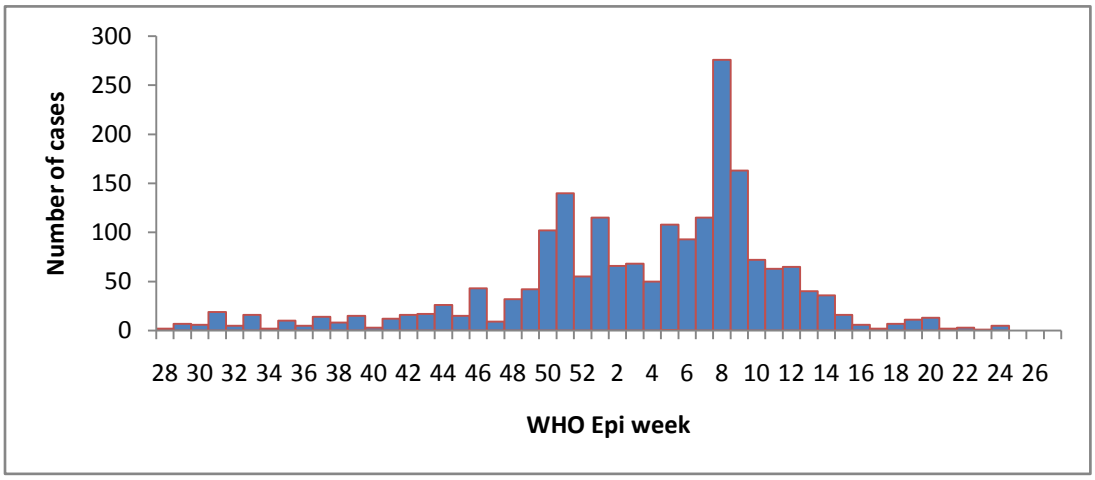

Figure 20: Trend of measles cases in South Gondar zone Amhara region 2015

Malaria

In 2014/2015, 614,101 confirmed malaria cases were reported from all zones of the region of this 16.2% were from South Gondar. The zone is known of its high malaria endemicity. Ten (83.3%) of the woredas or 278 kebeles are malarious. 2,108,463 populations are at risk of malaria that lives in these areas.

In 2014/2015, 99,332 confirmed malaria cases were reported in South Gondar zone. Of this 64,920 (65.4%) and 34,412 (34.4%) were plasmodium falciparum and plasmodium vivax respectively. Malaria accounts 10.6% of the total outpatient cases and 0.9% of the inpatient cases. Of the total malaria cases 3784 (3.8%) were under five children, 8% were people aged from 5-14 and the rest 88.2 %(87547) were above 15 years old. However, there were no deaths due to malaria.

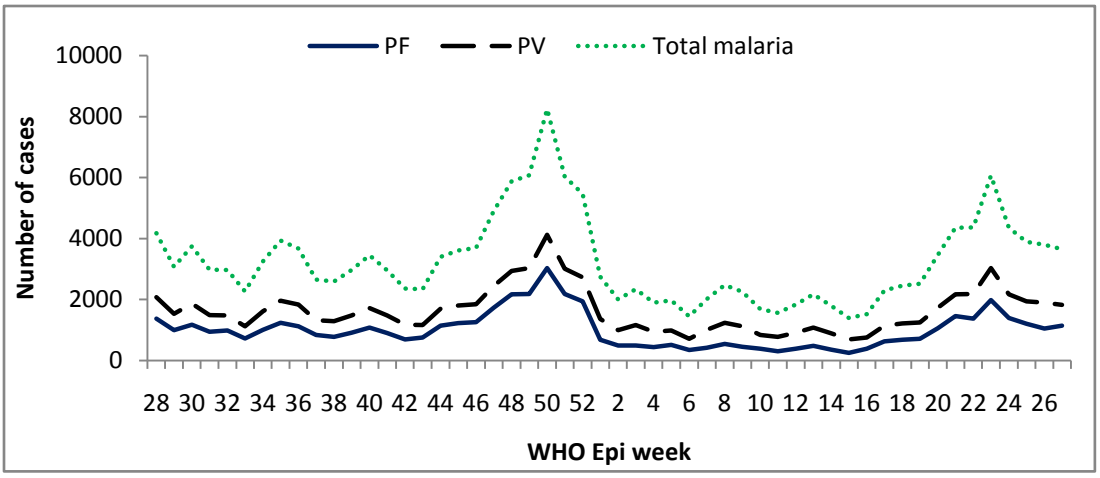

Figure 21: Trend of malaria cases by different species in South Gondar, Amhara, 2015

Malnutrition

Sever acute malnutrition is one of the twenty two diseases and conditions under the public health emergency management system which was reported on weekly bases. In 2014/2015, 17,586 sever acute malnutrition cases and 10 deaths (case fatality rate 0.06%) were reported regionally. South Gondar zone reports 14% (2,461) of the regional sever acute malnutrition (2,403 OTP) and (58 SC) cases. No deaths due to sever acute malnutrition were reported.

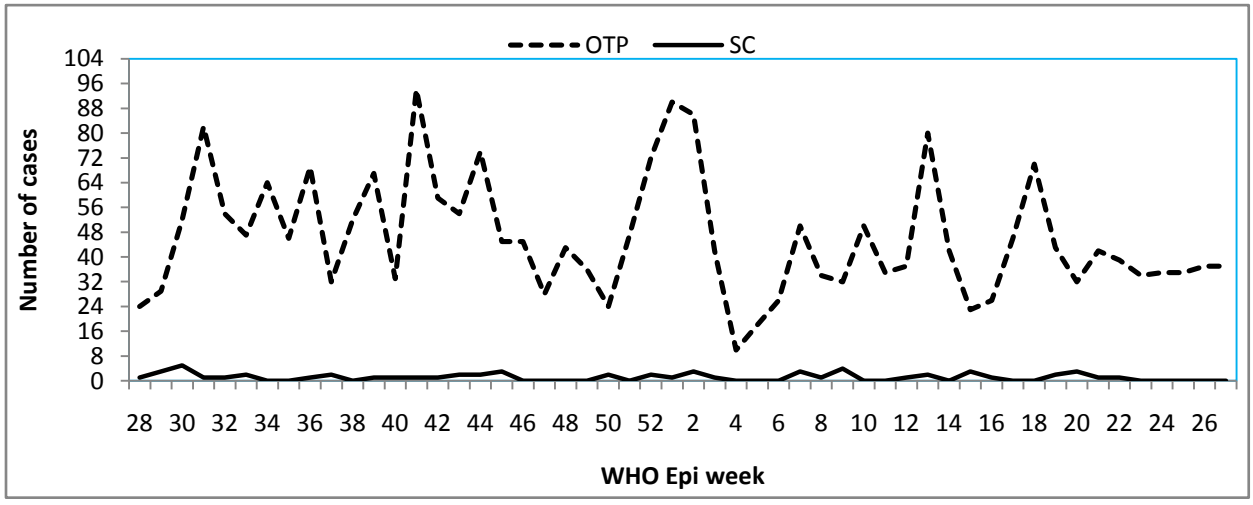

Figure 22: Trend of sever acute malnutrition cases in South Gondar zone, Amhara, 2015

Targeted diseases under surveillance

The Federal ministry of health public health emergency management gives prioritization to 21 diseases that are interest of national and international levels. Currently maternal death

surveillance is one of the weekly reportable diseases under the public health emergency management system. In addition, the Amhara national regional state includes Leishmaniasis in the weekly surveillance system hence the number of reportable diseases increases to 22. Of these, nine diseases (malaria, meningitis, dysentery, typhoid fever, epidemic typhus, relapsing fever and SAM, MDSR ,Leishmaniasis) were reported on weekly base and the rest 13 diseases (Guinea warm, Viral hemorrhagic fever, Rabies, Small pox, Yellow fever, Polio, NNT, Measles, Cholera, Anthrax, Avian human influenza, Sever acute respiratory syndrome and Pandemic influenza) have been reported as immediately. Of these targeted diseases under surveillance: malaria, measles and SAM were covered in this study.

Table 10: Lists of weekly and immediately reportable diseases/ conditions in Ethiopia

Immediately reportable		Weekly reportable	
1	Acute Flaccid Paralysis (AFP) /Polio	1	Malaria
2	Measles	2	Meningococcal Meningitis
3	Avian Human influenza	3	Typhoid fever
4	Anthrax	4	Dysentery
5	Guinea warm/ Dranculculiasis	5	Sever Acute Malnutrition
6	Viral hemorrhagic fever	6	Relapsing fever
7	Yellow Fever	7	Epidemic typhus
8	Cholera	8	Lehimaniasis –Amhara region
9	NNT	9	MDSR
10	Pandemic influenza		
11	Rabies		
12	Sever acute respiratory syndrome (SARS)		
13	Small pox		

Performance of the existing surveillance system

Population under surveillance

Public health emergency management targets all the population to be under surveillance for all the 21 disease nationally and 22 disease (includes Lehimaniasis) in Amhara region.

Table 11: Population under surveillance in South Gondar zone, Amhara region, 2014/2015

Administrative level	Total population	Rural	urban
Amhara region	20,002,911	2,836,275	17,166,636
South Gondar	2,395,981	12,101,793	294,188
Lay Gaynt	209,799	205,314	4,485
Simada	260,176	245,757	14,419

Amhara region is the second populated region in the country. Most of the people (85.8%) live in the rural part of the region. Concerning health facilities, the region has 31 hospitals, 832 health centers and 3349 Health posts.

Table 12: Number of health facilities South Gondar, Amhara, /2015 (11)

	Number of health facilities							
	Health posts	Health centers	hospitals	NGOs	others	Total	Health service coverage	
							HP	HC
Amhara Region	3349	832	31	7	362	4851	78	82
South Gondar	377	93	4	0	11	485	89	100
Lay Gaynt	43	9	1	0	0	53	92	100

Simada	43	10	0	0	0	53	72	100

Availability of case definition, clinical register, guidelines, reporting and communication

Regarding the presence of case definitions of the country's priority diseases, all visited districts and health centers have standard case definitions of all the countries priority diseases. They also had good understanding about surveillance and its objectives. Community case definitions were found in three (75 %) of the visited health posts of both districts. Although the regional health bureau prepared and distributed PHEM reporting pad there was scarcity of reporting formats at woreda level. All health facilities in the two districts had weekly PHEM reporting pads. On the contrary, all health facilities faced shortage of line lists and cases based reporting formats but it is available at woreda and zonal level.

Regarding the reporting facilities only public facilities report to the districts. At zonal level, private facilities were also included in the reporting. There were no military and NGO facilities that are expected to report weekly.

In the last one-year measles, NNT, AFP, rabies and anthrax were reported to the zone. The reports were received in the first 24 hours.

Communication utilities only one (8%) district and zonal health department had email access. Reports from the rest of the district including Simada and Lay Gaynt were received through telephone or paper. In case of emergency, PHEM focal person and officers communicate on daily bases or more frequently but if there was no emergency, they usually communicate on weekly basis either by telephone or weekly reports. Health posts in Simada district send report to health center on Saturday while those from Lay Gaynt send their report on Monday. All the four-health posts report using telephone. Health centers send their report to district on Monday and reports sent from district to zonal health department on Tuesday, finally the zone aggregates and sent to the region on Wednesday. Only the zonal health department and Tach Gaynt had an access to email. The reporting proportion was generally good for all types of health facilities with average annual report completeness of 96%. It is higher for health centers and lowest for nongovernmental health facilities there are no NGO facilities in the zone expected to report in the public health emergency management system.

Table 13: Weekly Reporting rates of health facilities in south Gondar, Amhara, /2015

Epi Week	Health posts		Health center		Hospital		Other		Total	
	expected	reported	expected	reported	expected	reported	expected	reported	expected	reported
40	377	336	97	97	1	1	8	7	483	441
41	377	362	97	97	1	1	8	8	483	468
42	377	365	97	97	1	1	8	7	483	470
43	377	368	97	97	1	1	8	7	483	473
44	377	367	97	97	1	1	8	7	483	472
45	377	373	97	97	1	1	8	7	483	478
46	377	367	97	97	1	1	8	7	483	472
47	377	362	97	96	1	1	8	7	483	466
48	377	369	97	97	1	1	8	7	483	474
49	377	357	97	96	1	1	8	7	483	461
50	377	352	97	97	1	1	8	7	483	457
51	377	356	97	97	1	1	8	7	483	461
52	377	357	97	97	1	1	8	7	483	462
Average no. of reported facilities	377	361	97	97	1	1	8	7	483	466
Proportion of reported	96%		100%		100%		88.5%		96%	

Data analysis

Only 50% of the woredas had permanently assigned surveillance officer the rest were by delegation. In all assessed health facilities and health offices, there were assigned trained responsible officers or focal person for report compilation and data analysis and other surveillance activities. In all of visited sites, they had appropriate denominator for data analysis. Although it is not routine, data analysis was done at zonal level and reports were disseminated to administration and department heads. In Lay Gaynt, district computer is not available for PHEM activities and officers lack computer skill. Only (33%) Simada district PHEM officer and Yekuasa health center PHEM focal person have basic computer skill like MS-excel, MS-word etc... On the other hand Simada district health office have computer for PHEM and analyze the collected surveillance data irregularly by place, person and time. However, none of visited health facilities and Lay Gaynt were analyzing surveillance data by converting into rate for comparison and analysis purpose this is because of lack of skill and shortage of computer and less attention given for data analysis. In all visited health facilities and woreda health offices, they prepared action threshold only for malaria i.e. all of them use malaria-monitoring chart.

Outbreak investigation

There was outbreak of measles in all districts a total with of 2250 cases and six deaths (case fatality rate 0.2 %) in the zone but none of these investigated by district or zonal level following the standard procedure of outbreak investigation. Skill gaps, scarcity of vehicle and budget were the main reasons not to investigate the outbreak. They did not have outbreak investigation checklist. The commonest problems were late reporting from the community. But if reports were sent to districts response were started within 24 hours. Response is provided based on the clinical findings and laboratory samples were sent to the EPHI.

Epidemic preparedness and response

Although it is not budgeted all districts and the zonal health department prepared epidemic preparedness and response plan. There was shortage of emergency supplies like IV fluid & vitamin A in Lay Gaynt district to respond dysentery and measles outbreak. All woredas have RRT but none of them conduct regular meeting and it becomes active when there is an outbreak. Wogeda health center has case management protocol for measles, malaria and malnutrition while

the rest of the health facilities had only the national PHEM guideline but did not have disease specific treatment protocol. The commonest challenges during an epidemic response were shortage of supplies, shortage of vehicle, late reporting by the community and health extension workers. Emergency preparedness and response task force is established at zonal and district level and conducts regular meeting monthly at zonal level but meeting is occasional at district level

Table 14: Epidemic preparedness and response status of south Gondar, Amhara, 2015

	Woreda(n=2)	Zonal health department(n==1)	Health center (n=4)
Prepare epidemic preparedness and response plan	2	1	0
Presence of emergency drugs and supplies	0	1	1
Experienced shortage of supplies	1	0	0
Existence of RRT	2	1	1
Presence of regular meeting by RRT	0	0	0
Allocate budget for epidemic response	0	0	1
Existence of case management protocol for Epidemic prone diseases(measles ,malaria ,malnutrition)	2	1	2
Car assigned for PHEM	0	0	N/A

Supervision and feedback

Supervisions and feedback are major activities that helps to improve the health system .Feedbacks and supervisions were given by region to zones regularly .But at zonal and district level supervisions were conducted as integrated supportive supervision in each quarter. Regarding feedback the region gave feedback weekly to zones in similar manner South Gondar zone provides feedback for districts weekly. From the assessed woredas, Simada provides feed back to cluster health centers. Three health posts (75%) except Wolela Bahir (never received supportive supervision in 2007) health post replied that they had received supportive supervision from cluster health center and woreda health office at least every 15 days. In general

the feedback and supervision mechanism was better at zonal and regional level and gets weaker down wards to woreda health offices and health facilities

Table 15: Supervision and feedback in South Gondar zone, Amhara region, 2015

Activities	Zonal health department(n=1)	Woreda(n=2)	Health center (n=4)	Health post
Have supervision plan	1	2	2	N/A
Provide supervision according to the plan	1	0	3	N/A
Receive specific supervision to PHEM	1	0	0	0
Receive integrated supervision	1	2	4	4
Have supervision checklist	1	2	0	N/A
Receive feedback weekly	1	2	2	0
Provide feedback	1	1	0	N/A
Conduct active case search	1	1		4

*N/A – not applicable

Training

All respondents from health centers and woreda health offices got five days training organized by regional health bureau. The health extension workers were trained on surveillance together with the integrated refreshment training but they had not received training specifically for public health emergency management.

Resources

All visited health facilities and districts compile weekly surveillance report manually. Data was aggregated by computer only at zonal level. Although there is computer for PHEM in Simada district and 75% of the visited health centers lack of skill on data management and computer application that was why they aggregate it manually. All health facilities and districts have motor

cycles but there is no staff member who has driving license. Hence the motor cycles were not using for surveillance activities

Table 16: Resources available in South Gondar, Amhara Region, 2015

Resources	zonal health department(n=1)	Woreda health office (n=2)	Health center (n=4)	Health post (n=4)
Electricity	1	1	3	1
Bicycles	0	0	2	4
Motor cycles	0	2	4	Na
Vehicles	1	1	0	Na
Computer	1	1	3	0
Telephone	1	1	1	0
Fax	1	0	1	0
Radio call	0	0	0	0
Generator	1	0	1	0
Megaphone	1	0	1	0
Projector	1	1	0	0
Internet access	1	0	0	0
Mobile phone(network access)	1	2	4	4

Laboratory diagnosis

The national reference laboratory at the Ethiopian public health institute performs tests for most of the immediately reportable diseases and sends feedback to facilities.For other priority diseases, which cannot be tested by the national laboratory capacity samples will be sent to international laboratories. The most series problem that faced was feedback from the national laboratory is delayed and not used for intervention most of the time it takes at least two months.

The Amhara national regional state has two regional research laboratories at Desse and Bahir Dar, which performs confirmatory tests for most of the weekly reportable diseases. Currently the Bahir Dar regional laboratory starts confirmatory test for measles. All the assessed health facilities have RDT for the diagnosis of malaria. Blood film is done in all visited health centers

Description of Each System Attribute

Usefulness

A surveillance system is useful if it contributes to the prevention and control of adverse health events, including an improved understanding of the public health implications of such events. A surveillance system can also be useful if it helps to determine that an adverse health event previously thought to be unimportant is actually important(12). All respondents from woreda health offices, zonal health department and health facilities understood that the surveillance system is important to permit accurate diagnosis early on a timely manner and it also helps to estimate the magnitude of morbidity and mortality related to those disease and allows evaluating the effectiveness of prevention and control program.

Simplicity

The simplicity of a public health surveillance system refers to both its structure and ease of implementation. Surveillance systems should be as simple as possible while still meeting their objectives. The simplicity of surveillance system is explained by the case definition because it is important to detect early the disease or condition under surveillance. Hence, cases definition should be easily understandable by all levels of professionals. All respondents of the study replied that the case definitions of malaria, measles and sever acute malnutrition were easily understandable.

Regarding the contents of the reporting format 100% of the district and zonal respondents and 25% of the health center respondents replied that the format lacks the most important variables like sex, age for measles and sever acute malnutrition but has age categories for malaria. Concerning the time it takes to fill the reporting format two out of seven respondents replied that it only takes five minutes while the rest said that it takes more than 15 minutes to fill the reporting format.

The other measure of simplicity is the time it takes to diagnose by laboratory respondents replied that, it takes more than one month to receive the feedback from the central laboratory for measles or the feedback may not come at all. Regarding malaria, it takes 30 minute if it is diagnosed using microscopy and 30 minutes if the diagnosis is with RDT.

Flexibility

A flexible public health surveillance system can adapt to changing information needs or operating conditions with little additional time, personnel, or allocated funds. Flexible systems can accommodate, for example, new health-related events, changes in case definitions or technology, and variations in funding or reporting sources. In addition, systems that use standard data formats (e.g., in electronic data interchange) can be easily integrated with other systems and thus might be considered flexible (13).

All the respondents at health offices and facilities replied that the current reporting format is used for other newly occurring health event without much difficulty. Any change in the existing procedure of case detection and reporting will not be difficult for implementation. A good example was MDSR integrated into the PHEM system without much difficulty in the repotting structure and respondents also replied that they can use the option (other) if any new event took place. However, all respondents replied that capacity-building activities should be made first before integrating program into the public health emergency management

Report timelines and completeness

Generally the report timelines and completeness of all types of facilities is above the WHO minimum requirement (80%)

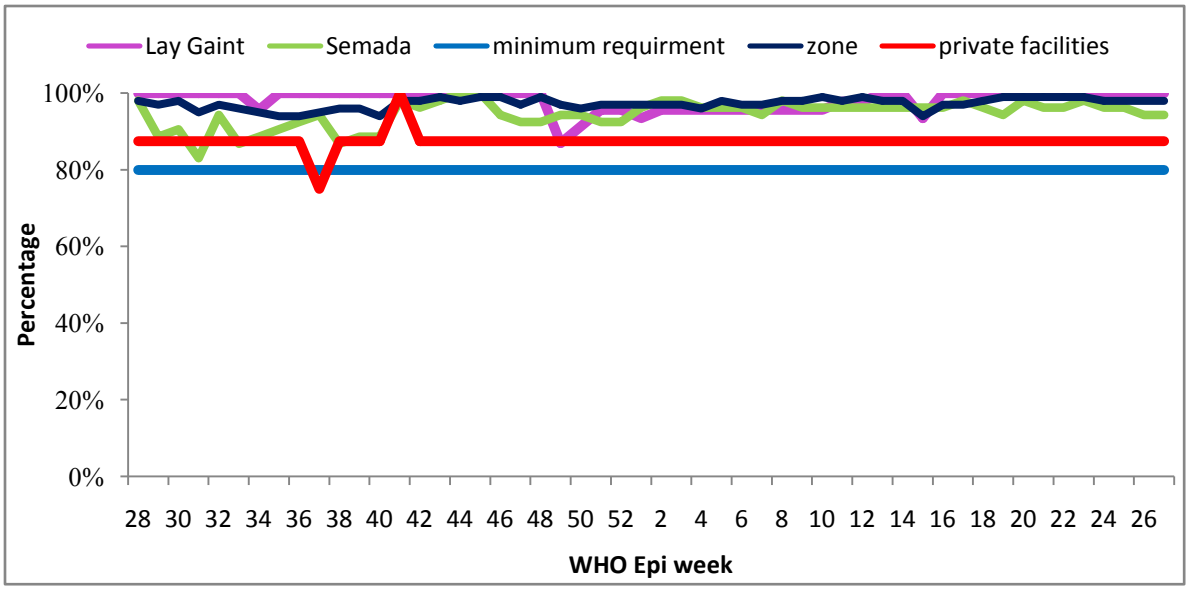

Figure 23: Weekly report completeness of South Gondar, Amhara, 2015

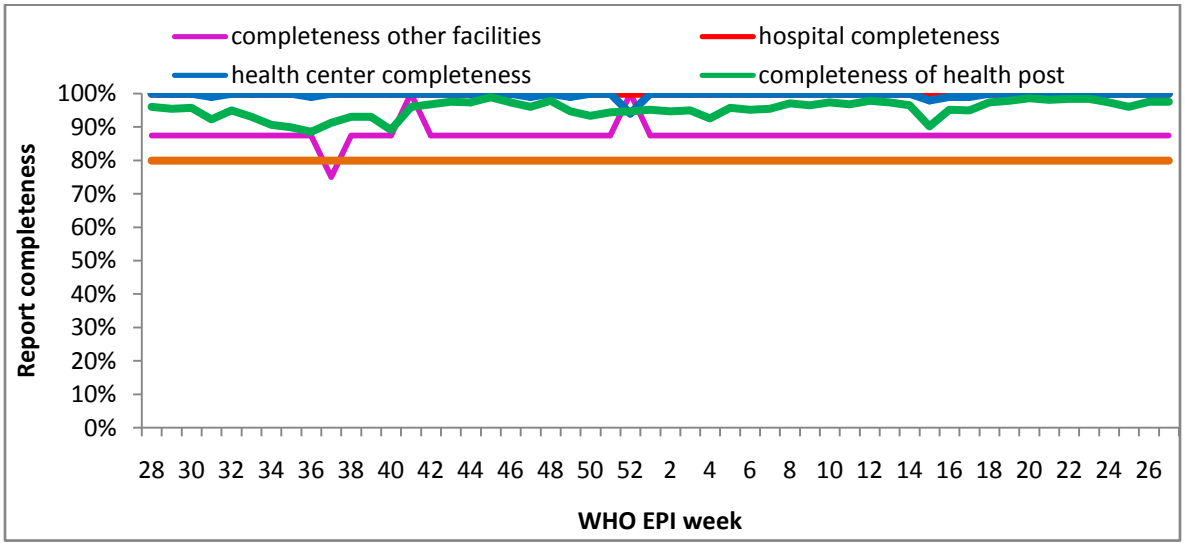

Figure 24: Weekly report timeliness of health facilities in South Gondar, Amhara, 2015

Sensitivity

The capacity of the surveillance system to capture cases in the community is dependent on different reasons: one reason could be the health seeking behavior of the community- which was generally commented as poor, particularly for measles**.** The sensitivity of the surveillance system to detect an outbreak is relatively low,

Acceptability

Acceptability reflects the willingness of persons and organizations to participate in the surveillance system. It encompasses the willingness of persons on whom the system depends to provide accurate, consistent, complete, and timely data (6).

All reporting agents accept and well engaged to the surveillance activities the report completeness status of reporting agents is 100% for health centers, 94.5% for health posts and 91% for private health facilities all the reporting agent use the current reporting format and case definitions however some health care workers who were not trained on surveillance are not familiar on the case definitions and reporting formats

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. It is assessed by comparing the characteristics of reported events to all such actual events(13). The primary health care coverage of the zone 100% and 89% for health center and health posts respectively.

The surveillance system enables to follow health related events in all groups of population both in the urban and rural community. However the health seeking behavior of the community is not satisfactory specially for measles in which people prefer stay home rather than visiting health facilities while they were sick with measles and all socio demographic variables are not represented (age and sex) are not represented by the weekly reporting format.

Positive predictive value

Predictive value positive (PVP) is the proportion of reported cases that actually have the health-related event under surveillance(13). It is difficult to calculate the predictive positive value for measles since all suspected measles cases were not confirmed using laboratory. All malaria suspected was examined by RDT or microscopy. In 2014/2015, 308,337 suspected malaria cases were examined by microscopy and RDT in South Gondar zone. Only 99,332 samples were positive for both species (24,299 PF and 12,186 PV) with positive predictive value of 32.2%

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. The surveillance system helps to collect manage and provide data properly and it was operational at any time, but the continuity of the system was interrupted at health post level when health extension workers were not available.

Discussion

The understanding of health care providers towards surveillance was good at all levels. Case definitions and reporting formats were available in most of the visited health facilities but reporting formats are scarce at woreda health office. Reports at health posts were not sent in the same period and reporting formats are left empty instead of writing zero. Reports from health post do not flow in the right reporting period usually. HEWs sent weekly PHEM report on Saturday. The completeness and timeliness status of the districts is good which above the level recommended by the WHO for both public and private facilities.

The major challenges in the reporting system were the lack of communication utilities like Telephone and network access. The overall reporting completeness of for the year 2014/2015 is above 80% for all health offices and public health facilities. Even though it is greater than the target the report, completeness of private facilities is lower than governmental facilities.

Surveillance is information for action. Analyzing and interpreting public health surveillance data were the links between the design and operation of a surveillance system and the use of data from the system to implement public health action and disease control program. Surveillance data are used to detect epidemics, suggest hypothesis, characterize trends in disease or injury, evaluate prevention program, and project future public health needs.

Only 50% of the districts have assigned PHEM officer responsible for data analysis and activities. Others handled by delegation given to other program officers. However, focal person at facility levels are trained on PHEM however health extension workers are not trained on public health emergency management. Data analysis is not done below the zonal level districts does not do data analysis they simply transfer to the next level, skill gaps and scarcity of computers were the main challenges to do data analysis at district level .

Being prepared to respond an outbreak and any event is the crucial component of the public health emergency management system. The epidemic preparedness and response status the zone and districts were generally poor. They only have emergency preparedness and response plan none of the districts allocated budget for emergency preparedness and response. They did not have logistics reserved for emergency response at woreda stores. In case of emergency, they use logistics from health facilities. This makes response activities to be delayed and they faced

shortages of drugs for case management during an outbreak (Lay Gaynt). In additional epidemic preparedness committees and rapid response, team has no regular meeting it is only active when there is an emergency or an outbreak situation. Regarding the outbreak response no outbreak were investigated and they have no standard outbreak investigation checklist. They only provide case management and do not give due attention for outbreak investigation.

To improve and strengthen the surveillance system supervision and feedbacks should be conducted in regular bases. supervision and feedback is good at regional and zonal level but which is offered on weekly bases however districts and health centers does not provide feedback regularly and supervisions are conducted as integrated supportive supervision but no program specific supportive supervision were conducted both from woredas to all health facilities. Health centers conduct supervision but do not provide feedback for health posts

Conclusion

Health care providers and health extension workers have good understanding about the case definitions of malaria, measles and sever acute malnutrition and the other priority diseases and about surveillance .Report completeness and timeliness were good which above the national target both for the public and private facilities. Laboratory diagnosis for malaria was available at all level unlikely the emergency preparedness status of the districts and health facilities were not satisfactory. They only prepared plan there is no ready budget and resource to respond any emergency.

Data analysis is only done at zonal level there was lack of skill and resources for data analysis at district and facility level. Outbreak investigation **a**nd response activities were not done. Supervision activities were poor at zonal and district level there was no program specific supervision activities other than integrated supportive supervision which is conducted in each quarter. In conclusion, the surveillance activities of the zone were not satisfactory.

Recommendation

- Emergency preparedness plan should prepare at all levels, budget must be allocated for emergency preparedness and response, and logistics must ready for public health emergencies.
- Multi sectoral task force and Rapid response team should be strengthened and must conduct regular meeting to evaluate the preparedness status regularly

- Plan for program specific supportive supervision for PHEM department should be prepared in each level and should be conducted regularly based on the schedule.
- Feedback should be given to lower level based on the supervision findings and there reports.
- Data analysis and interpretation must be regularly practiced at each level
- Computers should be available at least at for woreda health office.
- Capacity building should be given for zonal, district officers and facility focal persons on standard procedures of outbreak investigation.
- Health extension workers in Simada must use the standard weekly reporting period from Monday to Sunday
- Feedbacks from the national reference laboratory should sent to respective woredas and zones timely
- PHEM focal person must have motor cycle driving license to strengthen the surveillance activities.

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Annex II. Surveillance System Evaluation questionnaire

Background

Date of assessment _____

Interviewer name: _____

Respondent name & position: _____

Address: Office no _____ Cell phone no ---------- E-mail

_____

Catchment population_____

Male _____Female_____

Urban_____ Rural_____

Hospital _____HCs _____HPs_____ Private_____

Number of malarious Woredas ___ Number of malarious kebeles___ Total pop. A risk for malaria

Questionnaire for Attributes and level of Usefulness:

Total population under surveillance ------male-------female-----Under5--------

Level of Usefulness of the Surveillance System for country priority diseases is the surveillance system help? ----------

1. To detect outbreaks of priority diseases early on time to permit accurate diagnosis? ☐ Yes ☐ No

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

3. Permit assessment of the effect of prevention and control programs? ☐ Yes ☐ No

4. To estimate research intended to lead to prevention and control? ☐ Yes ☐ No

Describe Each System Attributes:

I. Simplicity:

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

2. The surveillance system allow all levels of professionals to fill data ☐ Yes ☐ No

3. Does the surveillance system help to record and report data on time? ☐ Yes ☐ No

4. Does the surveillance system have necessary information for investigation? ☐ Yes ☐ No

5. Does the surveillance system allow updating data on the cases? ☐ Yes ☐ No

6. How long it takes to fill the format? ☐ <5 minute ☐ 5 to 10 minute ☐ 10 to15minut ☐ >15 minutes

7. How long does it take to have laboratory confirmation? ----------

ii. Flexibility

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

2. Did you think that any change in the existing procedure of case detection and reporting formats will be difficult to implement? ☐ Yes ☐ No, Add your explanation----------

---

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

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

5. Is the surveillance system easy to add new disease on report? ☐ Yes ☐ No

6. Is the system easy to add new information technology? ☐ Yes ☐ No

iii. Data quality

1. Are all reported forms Complete? ☐ Yes ☐ No

2. If answer for Q1 is No, how many unfilled spaces are in your 2007 EFY report? ----------

3. Percentage of unknown or blank responses to variables from the total reports of 2007 EFY report- ----------

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

5. Is the recorded data clear to read and understand? ☐ Yes ☐ No

6. If answer for Q5 is No, how many records are not clear/are difficult to understand in 2007 EFY report? ----------

7. Percent of records which are difficult to read/ understand. ----------

iv. Acceptability

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

2. If yes, how many are active participants (of the expected)? ----------

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

A) Lack of understanding of the relevance of the data to be collected

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

C) Reporting formats are difficult to understand

D) Report formats are time consuming

E) Other: ----------

4. Were all participants using the standard case definition to identify cases? ☐ Yes ☐ No

5. Were all the reporting agents send their report using the current and appropriate surveillance reporting format? ☐ Yes ☐ No

6. Were all the health professionals aware about the surveillance system? ☐ Yes ☐ No

7. Was all PHEM officers send report on time? ☐ Yes ☐ No

v. Representativeness

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

2. If answer for Q1 is no, who do you think is well benefited by the surveillance system? ☐ The urban ☐ the rural ☐ both

3. Are all the Socio demographic variables included in the surveillance reporting format? ☐ Yes ☐ No

4. If the answer for Q3 is No, which a) Sex---------- b) age group---------- C) ethnic group----- d) religion---------- is less represented?

vi. Timeliness

1. Are all woredas/health facilities reporting on time? ☐ Yes ☐ No

2. Percent of woredas that report on time. ----------

3. Are all Hospitals reporting on time? ☐ Yes ☐ No

4. Percent of hospitals that report on time. ---------- Fill the table below

A). Weekly Zonal reports received on time for 2007 report by WHO epidemic week to be field at Zonal health department)

WHO Epi Wk	No of woredas expected to report	No of woredas that report on time	No of hospital expected to report	No of Hospital that report on time	No of private expected to report	No of private that report on time

27						
28						
29						
30						
31						
32						
33						
34						
35						
36						
37						
38						
39						
40						
41						
42						
43						
44						
45						
46						
47						
48						
49						
50						
52						

B). Weekly woreda reports received on time for 2007 report by WHO epidemic week to be field at woreda health department)

WHO Epi Wk	No of Hcs expected to report	No of HCs that report on time	No of HP expected to	No of HP that report on time

			report	
27				
28				
29				
30				
31				
32				
33				
34				
35				
36				
37				
38				
39				
40				
41				
42				
43				
44				
45				
46				
47				
48				
49				
50				
52				

vii. Completeness

1. Are all woredas reporting (including late report)? ☐ Yes ☐ No

2. Percent of woredas that send report of each week in 2007EFY ----------

3. Are all hospitals reporting? ☐ Yes ☐ No

4. Percent of hospitals that send report of each week in 2007 EFY ----------

viii. Stability

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

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

3. Was there any time /condition in which the surveillance is not fully operating? ☐ Yes ☐ No

4. If the answer for Q3 is yes When/what is the condition that talks the system not to function properly?----------

NB: the above assessment check lists for the system attribute and level of usefulness are for both Zonal and woredas health offices.

Questionnaires for Zonal health department

A. Communication and reporting system assessment

1. Which communication material did you have? ☐ E-mail ☐ wired phone ☐ mobile ☐ radio ☐ fax ☐ other----------

2. Did you have address of regional PHEM officers? ☐ Yes ☐ No

3. How frequently are you communicating with the regional PHEM officers on emergencies and other daily activities? ☐ Daily ☐ weekly ☐ every 2 week ☐ monthly ☐quarterly ☐ every 6 month ☐ yearly ☐ others

4. Did you have address of woreda/health facility PHEM officers? ☐ Yes ☐ No

5. How frequently are you communicating with the woreda/health facility PHEM officers on emergencies and other daily activities? ☐ Daily ☐ weekly ☐ every 2 week ☐monthly ☐ quarterly ☐ every 6 month ☐ yearly ☐ others----------

6. When are you expected to send weekly report to the Regional PHEM unit? ☐ Monday ☐ Tuesday ☐ Wednesday ☐ Thursday ☐ Friday ☐ Saturday ☐ Sunday

7. When are you expected to receive weekly report from woredas /health facilities? ☐ Monday ☐ Tuesday ☐ Wednesday ☐ Thursday ☐ Friday ☐ Saturday ☐ Sunday

8. How is the Zone communicating the woredas/health facility PHEM officers in case of immediately reportable diseases? ☐ By e-mail ☐ by phone ☐ by fax ☐ regular weekly report ☐ others----------

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

10. If answer for Q9 is yes to whom did you send? ----------

--- ----------

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

-- ----------

- ----------

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

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

1. Did you have National Guide line for PHEM? ☐ Yes ☐ No ☐ Not Applicable

2. Did you have standard case definition for all country priority diseases? ☐ Yes ☐ No ☐ Not Applicable

3. Was the case definition posted? ☐ Yes ☐ No

4. If answer for Q2 is No, for which disease(s) did you lack the case definition? ----------

----

5. Did you have case reporting formats for out breaks?☐ Yes ☐ No ☐ Not Applicable

6. Was there national manual for surveillance? ☐ Yes ☐ No ☐ Not Applicable

7. Was there guide line for specimen collection, handling and transportation to the next level? ☐ Yes ☐ No ☐ Not Applicable

8. Did you have line list for reporting outbreaks? ☐ Yes ☐ No ☐ Not Applicable

9. Did you face shortage of surveillance reporting and recording formats?☐ Yes ☐ No

10. If answer foe Q9 is yes, which form? ----------

C. Data analysis, Computer skill and training assessment

1. Had you trained on surveillance system? ☐ Yes ☐ No

2. If answer for Q1 is yes a) when----------? b) Topic----------? c) For how long? ----------

3. Did you give any onsite training / orientation about surveillance system for the woredas or health facility PHEM focal persons? ☐ Yes ☐ No

4. Was data compiled and registered? ☐ Yes ☐ No

5. Did you have computer on your office? ☐ Yes ☐ No

6. Did you have computer on your department (PHEM unit)? ☐ Yes ☐ No

7. What is the data entry and compilation instrument? ☐ Manual ☐ Computer ☐ other

8. Did you have computer skill on ☐ MS word ☐ MS excel ☐ MS power point ☐ Epi-info 9. Did you analyze data of the surveillance system? ☐ Yes ☐ No

10. If answer for Q9 is yes, did you describe data by ☐ time ☐ place ☐ person

11. Did you have denominators for data analysis?☐ Total population ☐ male ☐ female ☐ U5

12. Please indicate the frequency of your data analysis. ☐ Weekly ☐ every two week ☐ Monthly ☐ quarterly ☐every 6 month ☐ annually ☐ No regular time

13. Did you notify the results of your analysis to the higher level PHEM? ☐ Yes ☐ No 14. Did you notify the results of your analysis to the lower level PHEM? ☐ Yes ☐ No

15. If answer for Q9 is No, what is the reason? ☐ lack of knowledge ☐ shortage of time do you to work load ☐ less attention given to data analysis ☐ shortage of materials ☐ analysis is not familiar activity in place ☐ negligence ☐ Other----------

D. Epidemic response and preparedness assessment

1. Did you have plan for epidemic response and preparedness? ☐ Yes ☐ No

2. Did you have emergency stocks of drugs and supplies? ☐ Yes ☐ No

3. If answer for Q2 is No, how did you control epidemics? ---------- ----- ----------

4. Had you experienced shortage of drugs, vaccines and supplies in 2007 EFY? ☐ Yes ☐ No

5. Was an epidemic management committee built in your office?☐ Yes☐ No ☐Not Applicable

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

7. Was Rapid response team built in your office? ☐ Yes ☐ No ☐ Not Applicable

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

9. Did you have case management protocol for epidemic prone diseases? ☐ Yes ☐ No ☐ Not Applicable

10. Did your PHEM have multi sect oral emergency preparedness and response task force? ☐ Yes ☐ No ☐ Not Applicable

11. In what frequency did the task force meet during outbreaks? ----------

12. Were partners working together with your office on emergencies? ☐ Yes ☐ No

13. If answer for Q12 is yes, what type of supports did they give to your office? ----------

---

14. Was there a budget for epidemic response? ☐ Yes ☐ No

15. Who had the authority to mobilize the emergency finance? ☐Zonal head ☐ Zonal health department ☐ experts ☐ other----------

16. Had you a car assigned for emergencies (PHEM)? ☐ Yes ☐ No ☐ Not functional

17. If answer for Q16 is NO, how did you address emergencies? ----------

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18. Had you faced any Challenges on epidemic response and preparedness in 2007 EFY? ☐ Yes ☐ No

19. If answer for Q18 is yes, a) list the challenges----------

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b) What measures did you take to tackle the challenges? ----------

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E. Outbreak investigation and case confirmation assessment

1. Had you investigated any outbreak in 2007 EFY? ☐ Yes ☐ No

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

3. If answer for Q2 is No, how did you know possible factors for the outbreak? ----------

---

4. Where was laboratory confirmation of cases done? ☐ Regional laboratory ☐ Hospital ☐ EHNRI

☐ health center ☐ contracted private laboratory ☐ other----------

5. Who was responsible to investigate an outbreak? ☐ Rapid response team ☐ HEW ☐ staffs of woreda health office ☐ experts organized randomly ☐ health facility staffs ☐ other----------

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6. If answer for Q1 is yes how many out breaks did you investigated in 2007 EFY ----------

---

7. Had you faced any challenge in outbreak investigation in 2007 EFY? ☐ Yes ☐ No

8. If answer for Q7 is yes, a) list the challenges----------

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b) List the alternatives that you take to tackle the challenges ----------

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F. Supervision and feedback assessment

1. Did you have supervision plan in 2007 EFY? ☐ Yes ☐ No

2. If answer for Q1 is No, how did you supervise? ----------

------ ----------

3. If answer for Q1 is yes, did you supervise the woredas and health facilities? ☐ Yes ☐ No 4. If answer for Q3 is No, what is the reason? ----------

----

5. If answer for Q3 is yes, how many times did you supervise each woreda and health facilities in 2007 EFY? Woreda---------- Health facility----------

6. Had you reviewed about surveillance practice by higher level supervision ☐ Yes ☐ No

7. Did you have regular supervision checklist? ☐ Yes ☐ No

8. If answer for Q7 is No, how did you supervise the woredas and health facilities? ----------

----

9. Were you supervised by higher level (regional) officers in 2007 EFY? ☐ Yes ☐ No

10. If answer for Q9 is yes, how many times in 2007 EFY? ----------

11. Did you send feedback of your supervision to the woredas and health facilities commenting/indicating their strong and weak sides? ☐ Yes ☐ No 12. If answer for Q11 is No, why? ----------

----

13. If answer for Q11 is yes, for how many woredas and health facilities did you send a feedback in 2007 EFY? Woredas---------- health facilities----------

14. Had you received feedback from higher level supervisors in 2007 EFY? ☐ Yes ☐ No

15. If answer for Q14 is yes, how many feedbacks did you received in 2007 EFY? -------

16. Had you faced any challenge on supervision and feedback in 2007 EFY? ☐ Yes ☐ No

17. If answer for Q16 is yes, a) list the challenge ----------
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---------- ----------
b) list the measures that you take to tackle the challenges.----------
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---------- ----------
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Questionnaire for the Wereda health offices

A. Communication and reporting system assessment

1. Which communication material did you have? ☐ E-mail ☐ wired phone ☐ mobile ☐ radio ☐ fax ☐ other---2. Did you have address of Zonal PHEM officers? ☐ Yes ☐ No

3. How frequently are you communicating with the Zonal PHEM officers on emergencies and other daily activities? ☐ Daily ☐ weekly ☐ every 2 week ☐ monthly ☐ quarterly ☐ every 6 month ☐ yearly ☐ other

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

5. How frequently are you communicating with the HC/HP PHEM focal persons on emergencies and other daily activities? ☐ Daily ☐ weekly ☐ every 2 week ☐ monthly ☐ quarterly ☐ every 6 month ☐ yearly ☐ others----------

6. When are you expected to send weekly report to the Zonal PHEM unit? ☐ Monday ☐ Tuesday ☐ Wednesday ☐ Thursday ☐ Friday ☐ Saturday ☐ Sunday

7. When are you expected to receive weekly report from HCs/HPs? ☐ Monday ☐ Tuesday ☐ Wednesday ☐ Thursday ☐ Friday ☐ Saturday ☐ Sunday

8. How is the woredas communicating the HCs/HPs PHEM officers in case of immediately reportable diseases? ☐ By e-mail ☐ by phone ☐ by fax ☐ regular weekly report ☐ others

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

10. If answer for Q9 is yes to whom did you send? ----------
---------- ---------

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

--------- ----------

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

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

1. Did you have National Guide line for PHEM? ☐ Yes ☐ No ☐ Not Applicable

2. Did you have standard case definition for all country priority diseases? ☐ Yes ☐ No ☐ Not Applicable

3. Was the case definition posted? ☐ Yes ☐ No

4. If answer for Q2 is No, for which disease(s) did you lack the case definition? ----------

---------- ---------

5. Did you have case based reporting formats for out breaks?☐ Yes ☐ No ☐ Not Applicable

6. Was there national manual for surveillance? ☐ Yes ☐ No ☐ Not Applicable

7. Was there guide line for specimen collection, handling and transportation to the next level? ☐ Yes ☐ No ☐ Not Applicable

8. Did you have line list for reporting outbreaks? ☐ Yes ☐ No ☐ Not Applicable

9. Did you face shortage of surveillance reporting and recording formats?☐ Yes ☐ No

10. If answer foe Q9 is yes, which form? ----------

C. Data analysis, Computer skill and training assessment

1. Had you trained on surveillance system? ☐ Yes ☐ No

2. If answer for Q1 is yes a) when----------? b) Topic----------? c) For how long? ----------3. Did you give any onsite training / orientation about surveillance system for the HC and HP PHEM focal persons? ☐ Yes ☐ No

4. Was data compiled? ☐ Yes ☐ No

5. Did you have computer on your office? ☐ Yes ☐ No

6. Did you have computer on your department (PHEM unit)? ☐ Yes ☐ No 7. What is the data entry and compilation instrument? ☐ Manual ☐ Computer ☐ other----------

----

8. Did you have computer skill on ☐ MS word ☐ MS excel ☐ MS power point ☐ Epi-info

9. Did you analyze data of the surveillance system? ☐ Yes ☐ No

10. If answer for Q9 is yes, did you describe data by, ☐ time ☐ place ☐ person

11. Did you have denominators for data analysis? ☐ Total population ☐ male ☐ female ☐ under five

12. Please indicate the frequency of your data analysis. ☐ Weekly ☐ every two week ☐ Monthly ☐ quarterly ☐every 6 month ☐ annually ☐ No regular time

13. Did you notify the results of your analysis to the higher level PHEM? ☐ Yes ☐ No

14. Did you notify the results of your analysis to the lower level PHEM? ☐ Yes ☐ No

15. If answer for Q9 is No, what is the reason? ☐ lack of knowledge ☐ shortage of time do you to work load ☐ less attention given to data analysis ☐ shortage of materials ☐ analysis is not familiar activity in place ☐ negligence ☐ Other----------

D. Epidemic response and preparedness assessment

1. Did you have plan for epidemic response and preparedness? ☐ Yes ☐ No

2. Did you have emergency stocks of drugs and supplies? ☐ Yes ☐ No 3. If answer for Q2 is No, how did you control epidemics? ---------- ----------
---

4. Had you experienced shortage of drugs, vaccines and supplies in 2007 EFY? ☐ Yes ☐ No

5. Was an epidemic management committee built in your office? ☐ Yes ☐ No ☐ Not Applicable

6. Did the epidemic management committee have regularly scheduled meeting time? ☐ Yes ☐ No 7. Was Rapid response team built in your office? ☐ Yes ☐ No ☐ Not Applicable

8. Did the Rapid response team have regularly scheduled meeting time during epidemics? ☐ Yes

☐ No

9. Did you have case management protocol for epidemic prone diseases? ☐ Yes ☐ No ☐ Not Applicable

10. Did your PHEM have multi sect oral emergency preparedness and response task force? ☐ Yes

☐ No ☐ Not Applicable

11. In what frequency did the task force meet during outbreaks? ----------
------- ----------

12. Were partners working together with your office on emergencies? ☐ Yes ☐ No

13. If answer for Q12 is yes, what type of supports did they give to your office? ----------
------- ----------

14. Was there a budget for epidemic response? ☐ Yes ☐ No

15. Who had the authority to mobilize the emergency finance? ☐Woreda head ☐ woreda health department ☐ experts ☐ other----------

16. Had you a car assigned for emergencies (PHEM)? ☐ Yes ☐ No ☐ Not functional

17. If answer for Q16 is NO, how did you address emergencies? ----------
------- ----------

18. Had you faced any Challenges on epidemic response and preparedness in 2008 EFY? ☐ Yes ☐ No

19. If answer for Q18 is yes, a) list the challenges----------
-------- ----------

b) What measures did you take to tackle the challenges? ----------
---------- ----------

E. Outbreak investigation and case confirmation assessment

1. Had you investigated any outbreak in 2007 EFY? ☐ Yes ☐ No

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

3. If answer for Q2 is No, how did you know possible factors for the outbreak? ----------
----

4. Where was laboratory confirmation of cases done? ☐ Regional laboratory ☐ Hospital ☐ EHNRI ☐ health center ☐ contracted private laboratory ☐ other----------

5. Who was responsible to investigate an outbreak? ☐ Rapid response team ☐ HEWs ☐ staffs of woreda health office ☐ experts organized randomly ☐ health facility staffs ☐ other----------

6. If answer for Q1 is yes how many out breaks did you investigated in 2007 EFY? ----------

7. Had you faced any challenge in outbreak investigation in 2007 EFY? ☐ Yes ☐ No 8. If answer for Q7 is yes,

a) List the challenges---------- ----------

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

F. Supervision and feedback assessment

1. Did you have supervision plan in 2007 EFY? ☐ Yes ☐ No
2. If answer for Q1 is No, how did you supervise? ----------
---

3. If answer for Q1 is yes, did you supervise the health centers (HCS) and health posts (HPs) according to your plan in 2007 EFY? ☐ Yes ☐ No
4. If answer for Q3 is No, what is the reason? ----------
---

5. If answer for Q3 is yes, how many times did you supervise each health center (HC) and health post (HP) in 2007 EFY? Health center---------- health post----------
6. Had you reviewed about surveillance practice by higher level supervision? ☐ Yes ☐ No
7. Did you have regular supervision checklist? ☐ Yes ☐ No
8. If answer for Q7 is No, how did you supervise the woredas and health facilities? ----------
---

9. Were you supervised by higher level officers in 2007 EFY? ☐ Yes ☐ No
10. If answer for Q9 is yes how many times in 2007 EFY? ----------
11. Did you send feedback of your supervision to the health centers (HCS) and health posts (HPs) commenting/indicating their strong and weak sides? ☐ Yes ☐ No
12. If answer for Q11 is No, why? ----------
---

13. If answer for Q11 is yes, for how many HCs and HPs did you send a feedback in 2007 EFY? HC-- ---------- and health post----------
14. Had you received feedback from higher level supervisors in 2007 EFY? ☐ Yes ☐ No
15. If answer for Q14 is yes how many feedbacks did you received in 2007 EFY? ----------
-

16. Had you faced any challenge on supervision and feedback in 2007 EFY? ☐ Yes ☐ No
17. If answer for Q16 is yes a) list the challenges. ----------
---

b) List the measures that you take to tackle the challenges. ----------
---

Questionnaires for Health centers

Woreda ---------- Name of health center_____

Catchment population _____ Number of health posts ----------

A. Communication and reporting assessment

1. Which communication material did you have? ☐ E-mail ☐ wired phone ☐ mobile ☐ radio ☐ fax ☐ other----------

2. Did you have address of Zonal/woreda PHEM officers? ☐ Yes ☐ No

3. How frequently are you communicating with the Zonal/woreda PHEM officers on emergencies and other daily activities? ☐ Daily ☐ weekly ☐ every 2 week ☐ monthly ☐ quarterly ☐ every 6 month ☐ yearly ☐ others----------

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

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

---

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

7. If answer for Q6 is yes, to whom did you send? ----------

-- ----------

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

- ----------

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

- ----------

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

1. Did you have National Guide line for PHEM? ☐ Yes ☐ No ☐ Not Applicable

2. Did you have standard case definition for all country priority diseases? ☐ Yes ☐ No ☐ Not Applicable

3. Was the case definition posted? ☐ Yes ☐ No

4. If answer for Q2 is No, for which disease(s) did you lack the case definition? ----------
-- ----------
- ----------

5. Did you have case reporting formats for out breaks? ☐ Yes ☐ No ☐ Not Applicable

6. Was there national manual for surveillance? ☐ Yes ☐ No ☐ Not Applicable

7. Was there guide line for specimen collection, handling and transportation to the next level? ☐ Yes ☐ No ☐ Not Applicable

8. Did you have line list for reporting outbreaks? ☐ Yes ☐ No ☐ Not Applicable

9. Was there a clinical register/logbook in your health facility? ☐ Yes ☐ No ☐ Not Applicable

10. Did you face shortage of surveillance reporting and recording formats?☐ Yes ☐ No

11. If answer for Q10 is yes, which form? ----------

C. Data analysis, Computer skill and training assessment

1. Had you trained on surveillance system? ☐ Yes ☐ No

2. If answer for Q1 is yes a) when----------? b) Topic----------? c) For how long? ----------

3. Was data compiled? ☐ Yes ☐ No

4. Did you have computer on your office? ☐ Yes ☐ No

5. Did you have computer on your department (PHEM unit)? ☐ Yes ☐ No

6. What is the data entry and compilation instrument? ☐ Manual ☐ Computer ☐ other----------
----

7. Did you have computer skill on ☐ MS word ☐ MS excel ☐ MS power point ☐ Epi-info

8. Did you analyze data of the surveillance system? ☐ Yes ☐ No 9. If answer for Q8 is yes, did you describe data by ☐ time ☐ place ☐ person

10. Did you have denominators for data analysis? ☐ Total population ☐ male ☐ female ☐ U5

11. Please indicate the frequency of your data analysis. ☐ Weekly ☐ every two week ☐ Monthly ☐ quarterly ☐every 6 month ☐ annually ☐ No regular time

12. Did you notify the results of your analysis to the higher level PHEM? ☐ Yes ☐ No

13. If answer for Q8 is No, what is the reason? ☐ lack of knowledge ☐ shortage of time do you to work load ☐ less attention given to data analysis ☐ shortage of materials ☐ analysis is not

familiar activity in place ☐ negligence ☐ Other----------

D. Epidemic response and preparedness assessment

1. Did you have plan for epidemic response and preparedness? ☐ Yes ☐ No

2. Did you have emergency stocks of drugs and supplies? ☐ Yes ☐ No

3. If answer for Q2 is No, how did you control epidemics? ----------
-- ----------

4. Had you experienced shortage of drugs, vaccines and supplies in 2007 EFY? ☐ Yes ☐ No

5. Was an epidemic management committee built in your facility? ☐ Yes ☐ No ☐ Not Applicable

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

7. Was Rapid response team built in your office? ☐ Yes ☐ No ☐ Not Applicable

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

9. Did you have case management protocol for epidemic prone diseases? ☐ Yes ☐ No ☐ Not Applicable

10. Did your PHEM have multi sectorial emergency preparedness and response task force? ☐ Yes ☐ No ☐ Not Applicable

11. In what frequency did the task force meet during outbreaks? ----------
---- ----------

12. Were partners working together with your office on emergencies? ☐ Yes ☐ No

13. If answer for Q12 is yes, what type of supports did they give to your office? ----------
-- 14. Was there a budget for epidemic response? ☐ Yes ☐ No

15. Who had the authority to mobilize the emergency finance? ☐Zonal/woreda head ☐ Zonal/woreda health department ☐ experts ☐ other---------- ---
----

16. Had you faced any Challenges on epidemic response and preparedness in 2008 EFY? ☐ Yes ☐ No 17. If answer for Q16 is yes, a) list the challenges----------
---------- ----------

b) What measures did you take to tackle the challenges? ----------
----

E. Outbreak investigation and case confirmation assessment

1. Had you investigated any outbreak in 2007 EFY? ☐ Yes ☐ No

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

3. If answer for Q2 is No, how did you know possible factors for the outbreak? ----------

- ----------

4. Where was laboratory confirmation of cases done? ☐ Regional laboratory ☐ Hospital ☐ EPHI ☐ health center ☐ contracted private laboratory ☐ other----------

5. Who was responsible to investigate an outbreak? ☐ Rapid response team ☐ HEW ☐ staffs of woreda health office ☐ experts organized randomly ☐ health facility staffs ☐ other----------

6. If answer for Q1 is yes how many out breaks did you investigated in 2007 EFY

7. Had you faced any challenge in outbreak investigation in 2007 EFY? ☐ Yes ☐ No

8. If answer for Q7 is yes, a) list the challenges----------

-- ----------

- b) list the alternatives that you take to tackle the challenges.----------

---- ----------

------- ----------

F. Supervision and feedback assessment

1. Had you reviewed about surveillance practice by higher level supervision? ☐ Yes ☐ No

2. Were you supervised by higher level (regional) officers in 2007 EFY? ☐ Yes ☐ No

3. If answer for Q2 is yes, how many times in 2007 EFY? ----------

4. Had you received feedback from higher level supervisors in 2007 EFY? ☐ Yes ☐ No

5. If answer for Q4 is yes, how many feedbacks did you received in 2007 EFY? ----------

6. Had you faced any challenge on supervision and feedback in 2007 EFY? ☐ Yes ☐ No

7. If answer for Q6 is yes a) list the challenges. ----------

------ ----------

b) List the measures that you take to tackle the challenges. ----------

----- ----------

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Questionnaires for Health post

A. Communication and reporting assessment

1. Which communication material did you have? ☐ E-mail ☐ wired phone ☐ mobile ☐ radio ☐ fax ☐ other----------

2. Did you have address of woreda PHEM officers? ☐ Yes ☐ No

3. How frequently are you communicating with the woreda PHEM officers on emergencies and other daily activities?

☐ Daily ☐ weekly ☐ every 2 week ☐ quarterly ☐ every 6 month ☐ yearly ☐ others----------

4. When are you expected to send weekly report to the woreda PHEM unit? ☐ Monday ☐ Tuesday

☐ Wednesday ☐ Thursday ☐ Friday ☐ Saturday ☐ Sunday

5. How are you communicating the woreda PHEM officers in case of immediately reportable diseases? ☐ By e-mail ☐ by phone ☐ by fax ☐ regular weekly report ☐ others----------

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

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

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

1. Was there national manual for surveillance? ☐ Yes ☐ No ☐ Not Applicable

2. Did you have standard case definition for all country priority diseases? ☐ Yes ☐ No ☐ Not Applicable

3. Was the case definition posted? ☐ Yes ☐ No

4. If answer for Q2 is No, for which disease(s) did you lack the case definition? ----------

5. Did you have case reporting formats for out breaks?☐Yes ☐ No ☐ Not Applicable

6. Was there guide line for specimen collection, handling and transportation to the next level? ☐ Yes ☐ No ☐ Not Applicable

7. Had you line list for reporting outbreaks? ☐ Yes ☐ No ☐ Not Applicable

8. Was there a clinical register/logbook in your health facility? ☐ Yes ☐ No ☐ Not Applicable

9. Did you face shortage of surveillance reporting and recording formats?☐ Yes ☐ No

10. If answer foe Q9 is yes, which form? ----------

C. Data analysis and training assessment

1. Had you trained on surveillance system? ☐ Yes ☐ No

2. If answer for Q1 is yes a) when----------? b) Topic----------? c) For how long? ----------

3. Did you analyze data? ☐ Yes ☐ No

D. Outbreak investigation and case confirmation assessment

1. Was there any outbreak in your Kebele in 2007 EFY? ☐ Yes ☐ No

2. If your answer for Q1 is yes, what did you do? ☐ Reported to the woreda PHEM ☐ reported to administrative leaders ☐ we investigated ☐ cases referred to health center/hospital ☐ other----------

3. Where was laboratory confirmation of cases done? ☐ Regional laboratory ☐ Hospital ☐ EHNRI ☐ health center ☐ contracted private laboratory ☐ other----------

4. Who was responsible to investigate an outbreak? ☐ Woreda health office PHEM

5. If answer for Q1 is yes how many out breaks were occurred in your Kebele in 2008 EFY? ----------

6. Had you faced any challenge in outbreak investigation in 2007 EFY? ☐ Yes ☐ No

7. If answer for Q6 is yes, a) list the challenges----------

---

b) List the alternatives that you take to tackle the challenges ----------

---

F. Supervision and feedback assessment

1. Had you reviewed about surveillance practice by higher level supervision? ☐ Yes ☐ No

2. Were you supervised by higher level (regional) officers in 2008 EFY? ☐ Yes ☐ No

3. If answer for Q2 is yes how many times in 2008 EFY? ----------

4. Had you received feedback from higher level supervisors in 2008 EFY? ☐ Yes ☐ No

5. If answer for Q4 is yes how many feedbacks did you received in 2008 EFY? ----------

Chapter IV – Health Profile Description Report

4.1. Health Profile Description of Libokemkem District, South Gondar Zone, Amhara Region, North West Ethiopia, 2015

Abstract

Introduction: Health profile description is a system of collecting, organizing and summarizing health and others health related events. The summarized data and prioritized health events are important for public health officials and decision makers use it for planning, implementation and evaluation of public health programs. The aim of this study was describe health and health related issues using health indicators and to identify problems for priority setting

Methods: We conducted the study in Libokemkem district. We collect the data by using semi structured questionnaire**.** The data was analyzed entered into Epiinfo, and Arc GIS

Result: The district is divided into five urban and 29 rural kebeles. According to the 2014/2015 population estimate, the district population was 251,760 with age dependency ratio of 46.1% .The district has one primary hospital, nine health centers and 41 health posts. Six (66.7%) health centers and 32(78.4%) health posts in the district had no electric power. Similarly six (66.7%) HCs and all the 41(100%) health posts have no water supply whereas 3 (33.3%) HCs and three (7.3%) HPs have borehole water in their compound. 38,749 (15.4) women received family planning. Similarly 6249(74%), 3382 (40%) mothers receive first and fourth antenatal care services respectively. Only 1791 (21%) deliveries attended by skilled health care providers and 629 (7.4%) delivered by HEWs and 4272 (50.4%) receive post natal care. With regard to child health activities, 5872 (69.2%) of the children were fully vaccinated. The latrine utilization coverage of the district was 80.6% whereas the safe drinking water coverage was 64.3%. The district had good TB treatment success rate and cure rate (94.6%) but it has poor case detection (33.3%).There was an outbreak of measles with total of 51 cases. PHEM focal persons are assigned at all health centers.

Conclusion: The district has poor infrastructures like electric and water for health facilities that are essential for health care service delivery. It has very low TB case detection rate which was far from the national target besides, skilled delivery coverage in the district is low which needs

close attention. The safe drinking water access is low in the district it must be given due attention by the district attention.

Introduction

Health profile description is a system of collecting, organizing and summarizing health and others health related events. This includes, demographic, socio-economic, vital statistics, political, economical, cultural and others aspect of a particular geographic areas of interest. It helps in prioritizing health and others health related condition occurred within the communities.

The summarized data and prioritized health events are important for public health officials as well as decision makers. They use it for planning, implementation and evaluation of public health programs.

The purpose of this project is to assess and describe Libokemkem district health profile which will help in identifying the district‘s health and health related events to use it for programs planning and intervention.

The health profile description of the district was not done before and Leishmaniasis, Malaria and other communicable diseases are common in the district. Due to this I have selected the district to identify the gaps since no profile description conducted before.

Rationale of the study

Describing health profile of Libokemkem district is important to understand the demographic, socio-economic, morbidity, mortality and other data of the district. The finding from the health profile description project will help the district and other stakeholders for public health decision making that can be used at community level.

Objectives

General objective

- To describe health and health related issues using health indicators and to identify problems for priority setting.

Specific objectives

- To describe burden/magnitude of endemic diseases and other health related events in the district
- To assess human resources of the district
- To identify priority health problems in the district
- To assess the major causes of morbidity and mortality in the district

Methods

Study area: Libokemkem district is one of the 12 districts in South Gondar zone. It is located 63 km west to Debre Tabor, 80 km north to Bahir Dar 645 Km North West of Addis Ababa on the main road to Gondar. According to the 2014 / 2015 population estimate the total population of the Woreda was 251,760.

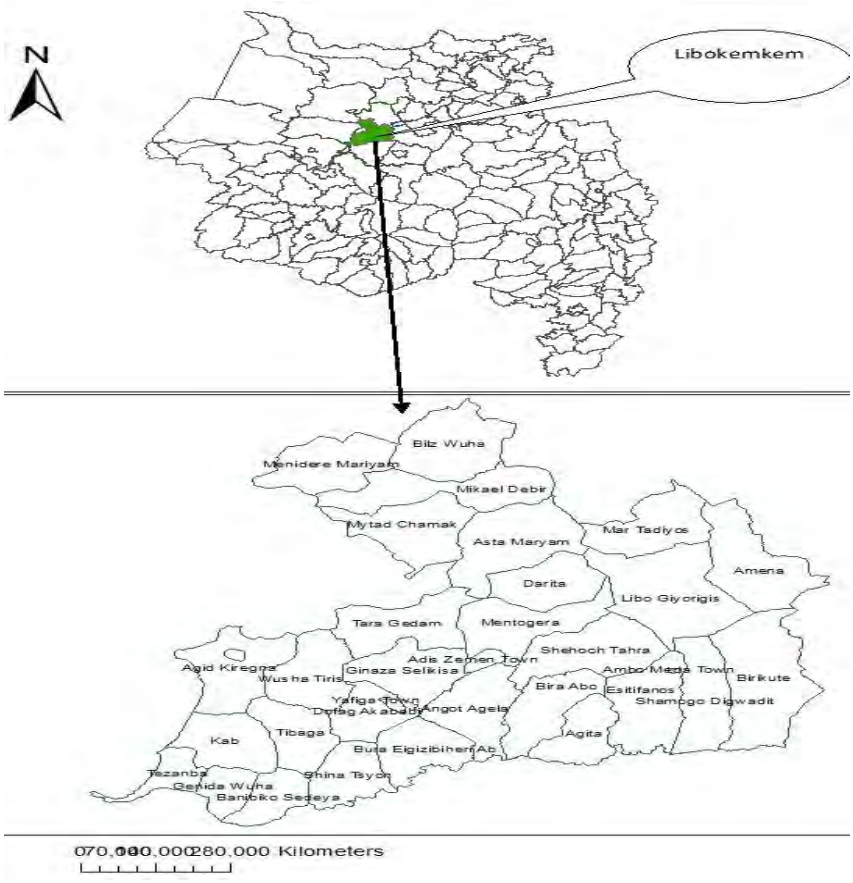

Figure 25: Map of Libokemkem district by Kebeles, Amhara, Ethiopia, 2015

Study design: Descriptive crossectional study design

Study period: The study was conducted from April 14 -20/2015

Data collection procedure: The data was collected from district health, agricultural, education, water, finance and economic development, Administrative, culture and tourism offices by:

- Review available data in health offices and health institutions
- Review available data in Health, Finance, Education, Agriculture, Culture & Tourism, Water, municipality offices
- Review of publications and literatures about the area
- Interview and discussion with concerned health office heads, experts, professionals etc by using checklists

Data analysis: Data was entered and analyzed using Microsoft Excel spread sheets and Arc GIS and presented using tables, graphs and maps.

Results

Historical Background and Culture

According to the district culture and tourism office, the district capital Addis Zemen was established since 1950 G.C. Initially the town was located in the mountainous and forest area of Tara Gedam. This area was scarce of water and there were also monasteries in the forest. The presence of the town near the monasteries makes their spiritual service of monks difficult, and the local administrator *Dejach* Asfaw decided to form a new town near the local river shine and named this town Addis Zemen. Because it was a new event for them during that time they named it *Addis Zemen*. The district is rich in many natural, spiritual and historical sites like *Yifag*; this was the trade center for the Northern Ethiopia during the time of the slave trade. Due to this inhumaniterian event and the pain that the slaves suffer from, the area got its name yifag by combing two Amharic words *‗Yifa‘* meaning open and *‗gif‘* meaning abuse. Besides there are spiritual sites such as the monastery of Tara Gedam, Brkute Maryam, Endryas cave and many others.

Around 95% of the population follows Orthodox Christianity and the rest were Muslims. All the district population (almost 100%) is Amhara.

Geography and Climate: The district capital; Addis Zemen is found 62 kilometers west to the zonal town Debre Tabor , 80 kilo meters north of Bahir Dar, and 645 kilometers north west of Addis Ababa on the main road to Gondar. It shares boundaries with Belesa in the north ,Fogera in the south, Ebnat in the eastern direction and lake Tana in the west the district covers a total area of 1081.57 square kilometers, 95.9% Woina Dega, 4.1% Dega Climatic zones. The median annual rain fall is 2025 mm (with range 1200- 2850 mm), median temperature of 19.5 0C (with range of 11.1-270C) and located at 121159north of equator and 372359 east of the prime meridian (1, 2)

Administration and politics

Starting from 2010, the district is divided into two Addis Zemen town and Libokemkem but most of the sectors in the district were not yet completely separated including the health sector. Hence in this profile it was considered as one. The district is divided into five sub districts with 34 kebeles (29 are rural and five urban). All offices of the district are found in Addis Zemen. The main supporting organizations were Care Ethiopia, PADET, save the children, UNICEF, and WHO. The ruling political party in the district is the Amhara National Democratic Movement (ANDM/EPRDF) with its own representative in the parliament.

Demographic information

The 2014/2015 population estimate for the district was 251, 760. Of which males constituted 126,635 (50.3%). Of this 35100 (13.9%) reside in the urban area. Most of the populations were orthodox Christians, few Muslims and Protestants are found. The predominant ethnic group in the district was Amhara small number Tigre, Oromo were also found.

The broad based population pyramid shows predominantly younger age group and very few on top of the pyramid >70 years (see figure below). People aged less than 15 years account nearly 43% (106,470) of the population and people age above 65 years was (9145) 3.7 % with dependency ratio of 46.7%. The pyramid also shows higher no of people in the age range 0-9 years.

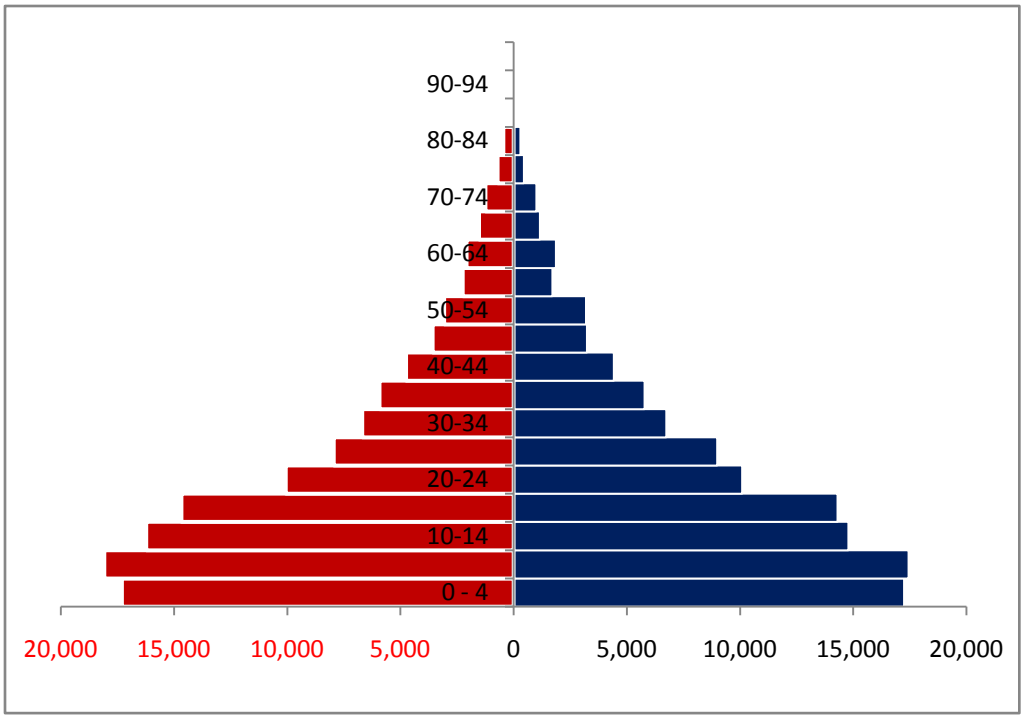

Figure 26 : Population pyramid of Libokemkem, Amhara, 2015

The distribution of the population varies from kebele to kebele. The highest population is found in Michael Debr 19,384 and the lowest is Ambo Meda town which is 1,585. Blb was the furthest kebele from all kebeles in the district which 70 kilometers from Addis Zemen tow

Table 17: Population distribution by Kebeles of Libokemkem district Amhara, 2015

S.No	Kebeles	population size			<1 years	<5 years	Pregnant Women	Distance From the district
		male	female	total				
1	Addis Zemen 01	4288	4237	8525	265	1154	287	0
2	Addis Zemen 02	3471	3429	6900	215	934	233	0
3	Addis Zemen 03	5141	5079	10220	318	1384	344	0
4	Deriba	2981	2945	5926	184	802	200	-
5	Tara Gedam	3696	3651	7347	228	995	248	10
6	Agel Mantogra	2988	2953	5941	185	804	200	-
7	Angot	4180	4131	8311	258	1125	280	16
9	Yfag Town	3151	3114	6265	195	848	211	18
10	Yfag Zuria	2594	2564	5158	160	698	174	18
11	Bura	4074	4025	8099	252	1097	273	12
12	Gizana	4359	4307	8666	270	1173	292	10
13	Shena Tsion	2887	2853	5740	179	777	193	36
15	Ambo Meda Town	1605	1585	3190	99	432	108	36
16	Estifanos	4343	4292	8635	269	1169	291	-
17	Shamo Godguadi	3423	3383	6806	212	922	229	46
18	Brkute	4890	4831	9721	302	1316	328	46
20	Michael Debr	9750	9634	19384	603	2625	653	70
22	Asta Maryam	4338	4286	8624	268	1168	291	-
23	Blb Wuha	3780	3734	7514	234	1017	253	76

25	Tibaga	3486	3445	6931	216	938	234	28
26	Kab	2771	2737	5508	171	746	186	-
28	Libo Giworgis	5217	5154	10371	323	1404	350	38
29	Martadewos	3187	3148	6335	197	858	213	-
30	Ameno	3174	3137	6311	196	855	213	-
32	Banbiko	3535	3492	7027	219	951	237	42
33	Gendawa	3071	3035	6106	190	827	206	-
34	Tezamba	2952	2917	5869	183	795	198	-
36	Shewoch Teharan	5011	4951	9962	310	1349	336	8
37	Bir Abo	3964	3916	7880	245	1067	266	20
38	Agta	2679	2648	5327	166	721	180	28
40	Agd Kregna	4614	4558	9172	285	1242	309	36
41	Wusha Trs	2955	2920	5875	183	795	198	28
	Total	126635	125125	251760	7830	34088	8484	

- No data

Infrastructure

The district has five urban Kebeles and 28 rural kebeles accessed for communication with mobile. But only the town was accessed with cable based tell phone service. One health center had neither mobile nor cable based telephone services. All health centers have access to road. Seven kebeles of the district had no road access. Six (66.7%) health centers and 32 (78.4%) health posts in the district had no electric power. Similarly six (66.7%) HCs and all the 41(100%) health posts have not piped water supply where as three (33.3%) HCs and 3(7.3%) HPs have bore hall water in their compound. However, the rest 38 HPs and three HCs had no water source in their compound.

Education

Education is one of the most critical variables in epidemiological and health service research in Ethiopia. Illiteracy is usually associated with high risk and low health seeking behavior. In addition to a wide range of disease and child mortality associated with illiteracy or under education, unfortunately HIV/AIDS infection is disproportionately high in out of school youth. The general level of education in a country becomes a marker significantly influencing the spread of disease, shaping the health seeking behavior of individuals and communities including the utilization of modern health care service(3).

The district has two kinder Gartons with 138 children, 53 first cycle elementary schools (1-4), 38 second cycle primary schools (5-8), four high schools (9-10) and one preparatory school (11-12) and one technical and vocational education training (TVET) college. There were a total of 39,292 students in grades 1-4, 11,300 students in grades 5-8, 4,165 students in grade 9-10 and 1,553 students in grades 11-12. The proportion female students was 18,674 (47.5%) from 1 -4 grade, 5690(49.6%) in grades 5-8, 2120(50.9%) in grades 9-10 and 691(44.5%) in grades 11-12.

In the district, only 46 schools have latrine either both sexes separately or together. From the total schools in the woreda 42 have access to water either with pipe or pump .The rest have no access to water supply.

All the schools had also clubs like anti HIV/AIDS, anti malaria, anti trachoma which works jointly with the health care providers and health extension workers engaged in different activity

Productivity and income

Agriculture remains the main stay of livelihood in the district. The farming system of the study areas is characterized by crop-livestock mixed farming. Farmer households depend mainly on crops both for food and cash income. The areas are more suitable for cereals, pulses and horticultural crops and to a lesser extent to oil crops. Teff, sorghum, finger millet, maize, rice, wheat and barley, among cereals; chick pea, grass pea and lentil, among pulses; Niger seed and safflower among oil crops; potato, pepper, tomato, shallot and garlic among annual horticultural crops are commonly grown in the area.

Growing a diverse group of crops helps farmers to minimize potential risks of crop failure and helps them to fulfill their household requirements. The productivity of the land per hectare was

11 quintal for Teff, 55 quintal for rice, 18 for finger millet, 25 for maize for ,26 for wheat and 21 for sorghum(4).

The district health sector

The core elements of the health policy are democratization and decentralization of the health care system, development of the preventive, promotive and curative components of health care.

The BPR of the health sector has introduced a three-tier health care delivery system which is characterized by a first level of a woreda/district health system comprising a primary hospital (with population coverage of 60,000-100,000 people), health centers (1/15,000-25,000 population) and their satellite Health Posts (1/3,000-5,000 population) that are connected to each other by a referral system. A Primary Hospital, Health center and health posts. The second level in the tier is a General Hospital with population coverage of 1-1.5 million people; and the third a Specialized Hospital that covers population of 3.5-5 million(3).

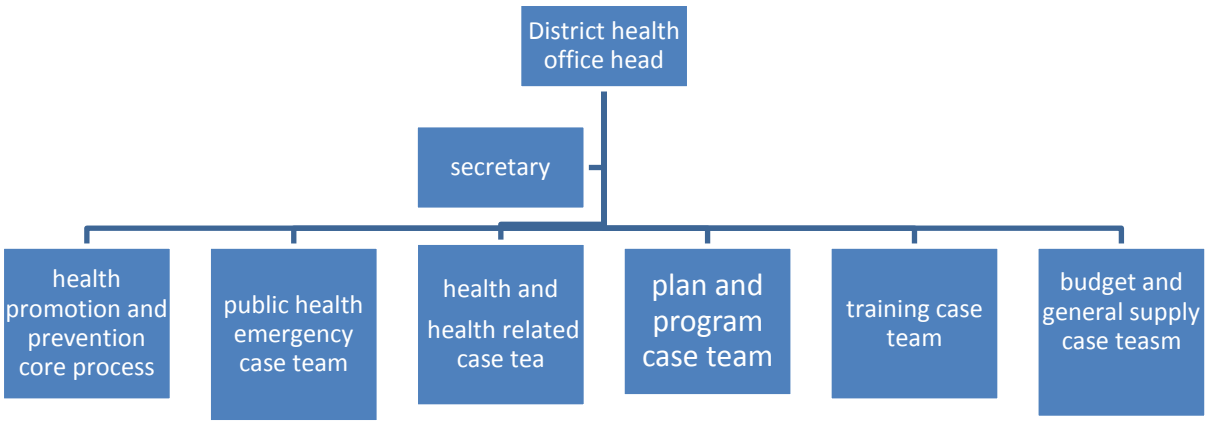

Figure 27: Organizational structure of Libokemkem district health office, Amhara, 2015

The primary health service coverage for the district is 95% for health centers and 93 % for health posts. Other services like finance and purchasing services were offered the district finance and economic development office.

Health service institutions:

The district has one newly constructed primary hospital, nine health centers and 41 health posts. The ratio of health facility to population was below the target.

Table 18: Population to health facility ratio in Libokemkem, Amhara, 2015

S.No.	Types of health facility	Number	Ratio	remark
1	Primary hospital	1	1:251,760	new
2	Heath centers	9	1:27973	
3	Health posts	41	1:6141	5 urban
4	Private clinics	9		
5	Pharmacy	4		
6	Rural drug vendors	1		
7	Diagnostic laboratories	3		
8	Total.	68		

Regarding the distribution of health facilities at least one health post is available at each kebele Two to seven health posts are linked to one cluster health center at various distance and population. However the population to health center ratio varies from cluster to cluster Addis Zemen health center serves for 47,244 (18.75%) population (highest) and Shumana cluster serves only for 12,324 populations (the lowest).

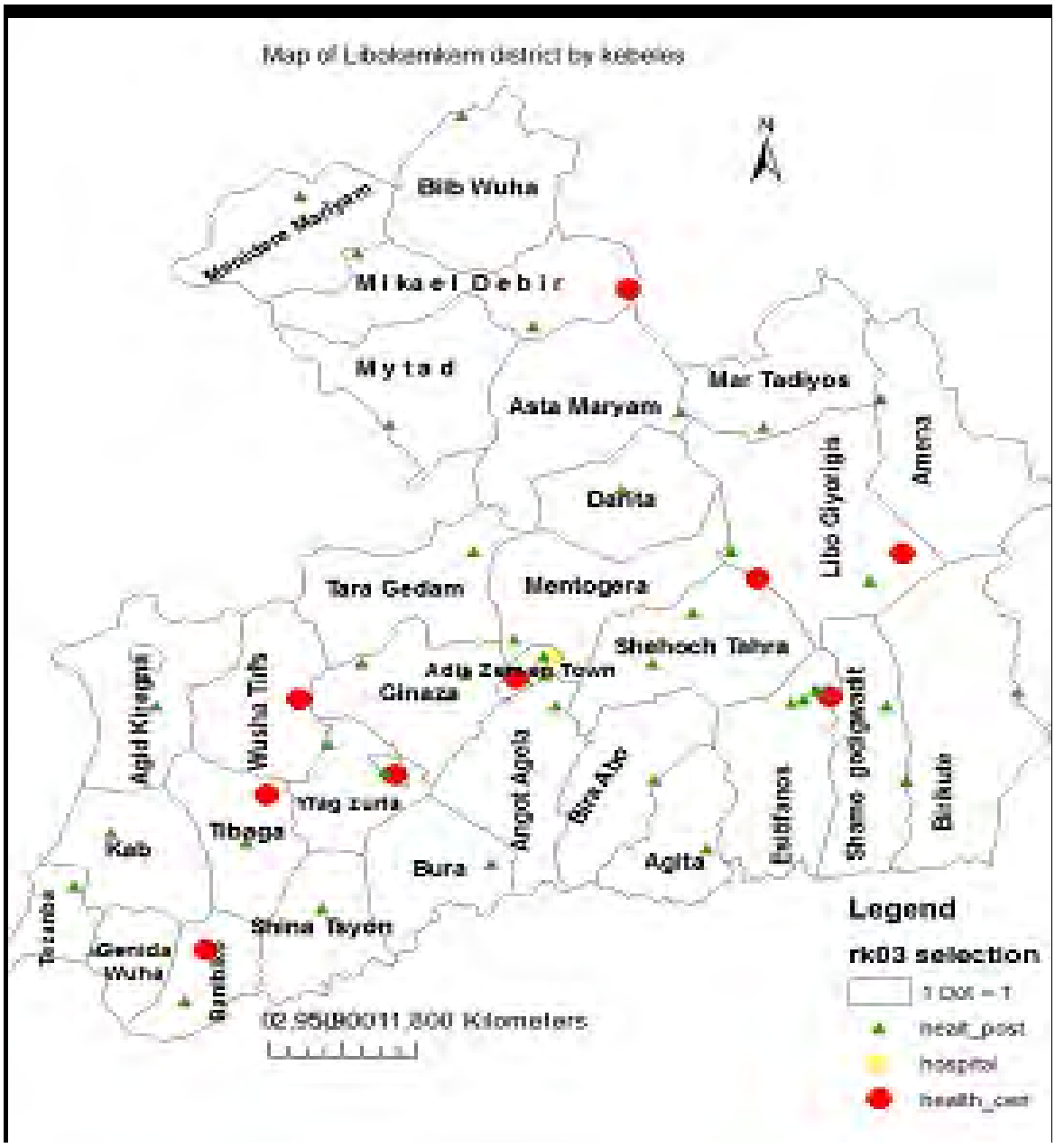

Figure 28: Distribution of health facilities by kebeles in Libokemkem, 2015

The human resource of the district is composed of a variety of professions like physicians, health officers, nurses, midwifery, laboratory professionals and pharmacists etc.

Table 19: Summary of available human resource in Libokemkem, Amhara, 2015

S.No	Number of health care providers				Needed	remark
		male	female	total		
1	Physicians	0	2	2	25	
2	Health officers	12	5	17	25	
3	Nurses	39	20	59	51	
4	Laboratory technologies /technicians	9	5	14	23	
5	Pharmacy technician /pharmacist	8	5	13	20	
6	Midwifery	10	9	19	32	
7	X-ray technician	0	0	0		
8	ENHS	2	0	2		
9	HEW	0	73	73	101	10 urban
10	HIT	1	3	4		
11	Health assistant	1	1	2	0	

Health care providers to population the ratio of nurses to population is adequate even it is above that of recommended by the world health organization however still number of midwives, health extension workers and health officers is below the recommended by the WHO.

Table 20: Proportion of health care providers to population, 2015(**5)**

S no	Professional category	No. of professionals	Population to health professional ratio		
			standard	Current Amhara region	Libokemkem district
1	Health officer	17	1:10,000	1:12,616	1:14,809
2	Nurse	59	1:5000	1:2,338	1:4267
	Midwife	19	1:8000	1:10,526	1:13,251
3	HEWS	73	1:2500	1:2755	1:3,499

Maternal and child health service coverage

Child health*:* The expanded program on immunization (EPI) has a significant role in reducing child morbidity and mortality from vaccine preventable diseases. In 2014/2015, 5849 (69.3%) children were provided with BCG vaccine and the pentavalent$_3$ vaccine coverage was 5720 (73%) with dropout rate 3.7% and measles 5463(69.7%) with dropout rate 8%, 5872 (69.2%) children protected against neonatal tetanus and only 69.2% (5872) of the children were fully vaccinated (6).

Maternal health service:

Family planning**,** ante natal care, delivery and post natal care are the core components of maternal health services in the district. Pregnant mother‘s conference moderated by midwives and other health professionals from the health center, which is abetted by a manual, has played a pivotal role for the improvements recorded. Identifying and addressing the long rooted bottlenecks related to pregnancy, such as cultural, religious, traditional beliefs (overlooking the importance of ANC, questioning the importance of facility delivery by the mere logic that home delivery was a dominant value and lack of trust on the capabilities of facilities on proper delivery care services) was a tough task(7). In 2014/2015 the family planning services 38,749 women got family planning methods five (0.9%) permanent and 2452 (11%) long acting methods where the rest prefer short acting methods. In the same year 6249(74%), 3382 (40%) mothers receive first and fourth antenatal care services respectively and tetanus toxoid vaccine was given to 3145 (37.1%) pregnant and 10945 (21.5%) non pregnant women. However, only 1791 (21%)

deliveries attended by skilled health care providers and 629 (7.4%) delivered by HEWs and 4272 (50.4%) receive post natal care. There were three maternal deaths reported in the district.

Water, Hygiene and sanitation

In Libokemkem district 92.1% (53941) of the households have latrine however, only 80.6% were utilizing the latrine. In the 2007 Ethiopian fiscal year four kebeles were open defecation free (ODF). There is also limited access to safe water in the district. Safe drinking water supply in the urban is only for 39467 (67.4%) households. In the rural community the access to safe water was 64.3%. They obtain drinking water mainly from shallow well, borehole (hand pump); deep well, protected spring and tie inflate whereas piped water is for the urban community.

Morbidity

The district morbidity data showed most cause of morbidity in the district was from infectious diseases. Acute febrile illness was the leading cause of morbidity in above five it accounts more than one fifth of the cases in district similarly pneumonia was the leading cause morbidity in children less than five years.

Table 21: Top 10 causes of above five years morbidity in Libokemkem, March, 2015

S.No.	Illness	Total	Percent
1	AFI	5628	21.2
2	Malaria	5380	20.3
3	AURTI	4780	17.9
4	Pneumonia	2542	9.5
5	Dyspepsia	2238	8.4
6	Trauma	2008	7.5
7	Helminthiasis	1788	6.8
8	Skin infection	1460	5.4
9	Non bloody diarrhea	430	1.6

10	Urinary tract infection	352	1.4
	TOTAL	26606	100

Table 22: Top ten causes of morbidity in children under five years in Libokemkem, Amhara, July 2014-March 2015

S.No.	Diseases	number	percent
1	Pneumonia	2292	28.9
2	Diarrhea Non Bloody	2126	26.8
3	AFI	1008	12.7
4	AURTI	826	10.4
5	Diarrhea With Dehydration	545	6.9
6	Unspecified Diseases Of The Eye And Adnexa	199	2.5
7	Dysentery	265	3.3
8	Infection Of Skin And Sub Coetaneous Tissue	311	3.9
9	Helmintiasis	299	3.8
10	Unspecified Disease Of Ear And Mastoid	65	0.8
11	Parasitic	7936	100

Endemic diseases

Malaria and Lehimaniasis

Malaria is endemic in all kebeles of the district however; it had no history of malaria outbreak. In 2014/2015 a total of 7,197 malaria cases were reported from the district. Of the total only three (.04%) were treated as in patient and no deaths due to malaria were reported in the same year. From the total case 5098 (70.8%) were plasmodium falciparum, 2097 (29.1%) cases were plasmodium vivax and the rest two (.01%) were clinical. Regarding malaria prevention activities 98,356 bed nets were distributed and additionally IRS and environment control activities were undertaken.

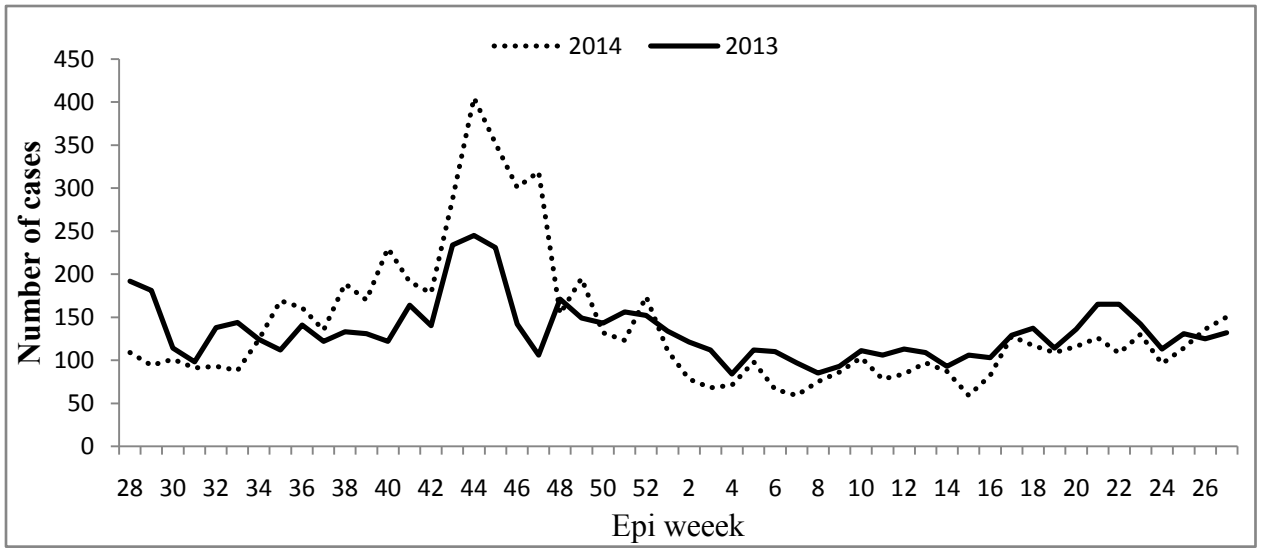

Figure 29: Trend of malaria cases in Libokemkem, Amhara, 2013 and 2014

Leishmaniasis is endemic in 15 kebeles of the district. It has one of the few treatment centers for kala-azar in the region at Addis Zemen health center. A total of 228 and 178 Lehimaniasis patients were reported from Addis Zemen health center in 2013 and 2014 respectively. The numbers of Lehimaniasis patients were higher in the third quarter (July to September) for both years

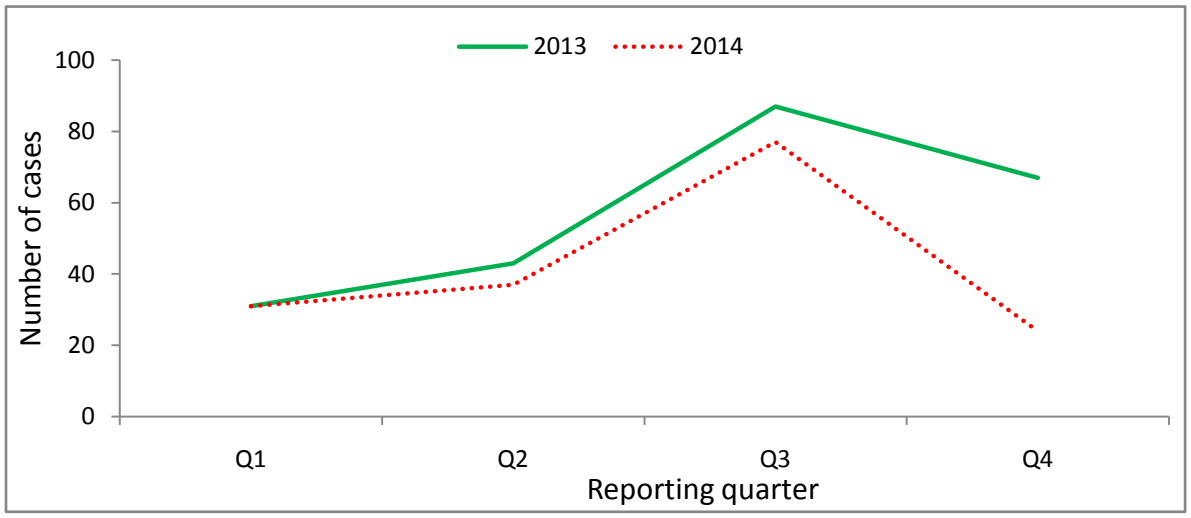

Figure 30: Trend of Leishmaniasis in Addis Zemen treatment center, Amhara, 2013 and 2014

HIV/AIDS

HIV testing is one of the major activities it is offered in VCT, PMTCT and PITC. In the district males had proportion of being tested. In 2014 for the last nine months 13,258 clients were tested for HIV 7,946 was female and 3,461 were tested for PMTCT. ART service was given at two health centers and 2033 were ever enrolled, 1164, ever started and 871 currently on ART care and treatment.

Table 23: HIV prevention and treatment activities in Libokemkem, Amhara, 2015

S.No.	Activities	male	female	Total
1	VCT	2920	2498	5498
2	PITC	2389	1990	1990
3	PMTCT	-	3461	3461
5	HIV positive	30	32	62
4	Total PLWHA	845	1188	2033
5	On ART	469	576	1164

Tuberculosis/leprosy

The district has good TB treatment success rate and cure rate however there had low TB case detection rate. All the TB patients were tested for HIV.

Table 24: TB prevention and treatment activities in Libokemkem, 2015

S.No.	Indicators	Planned	achieved	percent
1	TB detection (CDR) (all forms)	483	160	33
2	TB cure rate	100	94.6	94.6
3	TB treatment success rate	100	94.6	94.6
4	Death on TB treatment	0	2	1.25
5	Total TB patients screened for HIV	100	100	100
6	Prevalence of leprosy	12	3	25

Public Health Emergency Management

The following thirteen diseases were targeted to be reported immediately/weekly using case based reporting format and line listing depending on the number of occurrence of cases in the district. All health centers in the district had one PHEM focal person responsible for the surveillance activities in the cluster. From 2010 to 2015, 17 suspected AFP samples were sent to the national reference laboratory but none of the samples were positive. And an outbreak of measles 51 cases occurred in the district from February to March 2015 with no death. There was no natural disaster for the last five years. In2014/2015, 262 street dogs were killed by communicating with veterinarians in the district. The district does not allocate any budget for public health emergency management which reflects the districts lack of preparedness for taking action for public health emergencies.

Table 25 : List of weekly and immediately reportable diseases, Libokemkem, 2015

Immediately reportable		Weekly reportable	
1	Acute flaccid paralysis	1	Malaria
2	Measles	2	meningitis
3	NNT	3	Dysentery
4	Anthrax	4	Typhoid fever
5	Avian human influenza	5	Sever acute malnutrition
6	Cholera	6	Maternal death
7	Guinea worm	7	Relapsing fever
8	Yellow fever	8	Epidemic typhus
9	Viral hemorrhagic fever (VHF)	9	Leishmaniasis*
10	Human influenza (H1N1		
11	Rabies		
12	Sever acute respiratory syndrome (SARS		
13	Small pox		

*Amhara region only

Nutrition, food shortage and any other disasters

The district was one of the foods insecure areas in the region it is supported by PSNP and HABP. In 2014/2015, 7725 children and pregnant women were screened for malnutrition 116 SAM and 3068 MAM. There is only one SC in the district at Addis Zemen health center 24 children got treatment.

Health budget allocation

The total budget allocated for the district is 79,781,782 ETB in 2014/2015. Only six percent (6,238,342) of budget was allocated to the district health sector which is by far lower that is expected to be 15% or above. Two health centers in the district did not implement health care financing reform. The health sector finance is also assisted by nongovernmental organizations (partners) like UNICEF, world vision etc.

Discussion

Acute febrile illness was the leading causes of morbidity in the above five population followed by malaria 5308 (PF=, 3840 other than PF =1468) accounts about 28.1%. However no death due to malaria was reported in the reporting period which might be due to early treatment. Pneumonia and diarrheal diseases were the leading causes of under-five morbidity in the district which account 28.9% and 33.9 % respectively. The highest proportion of diarrheal in the district might be attributed to the low safe drinking water in the district in which only for 64% and the poor hygiene and sanitation practices in the district.

Antenatal care is more beneficial in preventing adverse pregnancy outcomes when received early in the pregnancy and continued through delivery. It helps for early detection of problems during pregnancy. Leads to more timely referrals for women in high-risk categories or with complications; this is particularly true in Ethiopia, where three-quarters of the population live in rural areas and where physical barriers pose a challenge to providing health care.

Under normal circumstances, the World Health Organization (WHO) recommends that a woman without complications should have at least four antenatal care visits. The district shows progress from the 2011 DHS finding where only 19 % receive the fourth ante natal follow up but has lower performance compared to the average regional performance in maternal health programs. Only 40% of the pregnant mothers receive ANC4. Delivery attended in health institutions is 21% shows improvement compared to the 2011 DHS finding (9%) lower than the regional performance which was 38%. Similarly post natal care is 50.4% where the regional is 62% this needs close attention which might be due to transport inaccessibility and low health seeking behavior of the community (8).

Expanded immunization program is one of preventions and control measures program performed under child health department. WHO set EPI coverage target for the control of vaccine preventable diseases. In the last nine months, the overall EPI performance was less than the target. $Penta_3$ and measles coverage was less than regional performance of 2014/ 2015, which was 84% and 80% respectively. In addition the dropout rate for pentavalent vaccine was three percent and that of measles eight percent% both were in the acceptable range (9).

The district had good performance of TB treatment success rate and cure rate both are greater than the national target and all TB Patients were tested for HIV however, the case detection rate

is much lower both the regional and national target it is only 33% which is much lower than the global TB case notification in 2013(10).

The latrine coverage of the district (92.1) is better than the regional coverage(60%) on the other hand the latrine utilization (80.6%) was lower than the region average there for there was a need to improve this gap(8). Only six percent of the total district budget was allocated for the district health sector in 2014/2015 and no budget was allocated for public health emergency management this might be due to poor attention given by leaders

Limitation

Unavailability of fertility, mortality records and reports in the district

Conclusion

The district has poor infrastructures like electric and water for health facilities that are essential for health care service delivery. It had very low TB case detection rate which was far from the national target besides, skilled delivery coverage in the district was low which needs close attention. The safe drinking water access is low in the district it must be give due attention by the district. HIV is another major problem in the district with 62 new HIV infections in the last nine months

Recommendations

- The regional health bureau has to increase TB cases detection rate
- The district administrator should allocate budget for public health emergency management
- The district health office should fulfill Human resource especially midwifery and health officers
- Improve access to electric power and water access for health institutions
- The district water office has to improve the safe water coverage of the district
- The district health office must improve ante natal and skilled delivery coverage by promoting community awareness on institutional delivery
- Enhance the utilization of permanent and long acting family planning options

Action plan

Prioritized problems

- Low vaccination coverage
- High burden of malaria
- Low institutional delivery
- Low TB case detection rate
- Poor access and quality of water

Table 26: Action plan of Libokemkem district health office for the year 2015/2016, South Gondar , Amhara , Ethiopia, 2015

S. No	Activities	Timeframe	Responsible Body
1	Increase community awareness on vaccination and improve vaccination coverage	Every time	WoHO and HEW
2	Increase community awareness on the prevention & control of malaria: (Proper use of LLINs, IRS, treatment environmental management, etc)	Every time	WoHO
3	Improve skilled delivery coverage of the district	Every time	WoHO
4	Community mobilization and awareness raising on early diagnosis of people screening of people who has cough more than two weeks	Every time	WoHO
5	Improve water access and quality and work closely with the district water resource office	Every time	WoHO and district water office
6	Increase the scarce human resource of the district	July 2015	WoHO and regional health bureau

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Annex II: Data Collection Tool for Health Profile Description in Libokemkem District

Health profile of _____ District

Date: _____-

Respondent (s):

_____

_____

_____

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

Location _____ _____ _____

Altitude _____

Annual rain fall_____

Climatic zones_____ _____ _____ _____

3. Political and Administrative Organization

No of woredas _____

List their names _____

_____

_____

Zone boundary_____ _____ _____ ____

4. Population and population structures

Total_____

Male _____

Female_____

Under 1yrs_____

Under five yrs_____

Sex ratios_____

urban_____

rural_____,

Ethnic composition _____ _____ _____

_____ _____

Literacy status_____

< 15 years_____

>64 years_____

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

Average income/year_____

6. Education

7. Facilities (Transport, Telecommunication, Power supply,)

How many of the health centers have access to transportation_____ (%)

telecommunication_____ (%)

Electric power_____ (%)

8. Disaster Status in the area

Was there any disaster in the zone in the last one year?

_____

9. Vital Statistics and Health Indicators

Infant Mortality Rate_____

Child Mortality Rate_____

Crude Birth Rate_____

Crude Death Rate_____

Maternal Mortality Rate_____

Contraceptive Prevalence rate_____

ANC coverage_____

Immunization Coverage;

Measles_____

Pentavalent_____

Health staff to population ratio:

Health officers_____

Nurses_____

Medical lab_____ Pharmacy_____, Env'tal _____

Health extension workers_____

Other_____

10. Health Services

Hospital_____Health center_____health post_____

Private facilities; _____, _____, _____

Health institution to pop ratio_____

Health service coverage

Top and leading causes of OPD visit:

1. _____
2. _____
3. _____
4. _____
5. _____
6. _____
7. _____,
8. _____,
9. _____
10. _____

Admission_____

Health budget allocation_____

11. Community Health Services;

Status of services provided by community health workers namely:

TBAs_____

CHWs_____

HEWs_____

Other_____

12. Status of Primary Health Care Components – with focus on the eight PHC elements

MCH/FP

_____

_____

EPI _____

_____

_____

Environmental Health

_____

_____

_____

Health Education_____

_____

_____

Endemic diseases;

Malaria_____

_____

_____

_____

TB/Leprosy

Total TB cases_____ PTB negative_____ PTB positive____ Extra PTB _____

TB detection rate _____

TB treatment success rate_____

TB cure rate_____

TB defaulter_____

Death on Tx_____

Total Leprosy cases_____

_____

_____

HIV positive screened for HIV_____

HIV/AIDS;

HIV prevalence_____

HIV Incidence_____

PLWHA_____

VCT_____

PMTCT_____

ON ART_____

PITC_____

Nutrition_____

Epidemic prone diseases_____

_____

_____

What do you think the main problems of the district are?

_____

_____

_____

_____

Discussion of the highlights and the main findings of the health profile assessment and

_____

_____

_____

_____

_____

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

Chapter V – Scientific Manuscripts for Peer reviewed Journals

5.1. The Magnitude of Multi Drug Resistance Tuberculosis and Related Comorbidties in Amhara Region, Ethiopia, 2010-2014

Abstract

Introduction: Organisms that are resistant to the most effective anti-TB drugs (isoniazid and rifampicin) cause Multidrug-resistant TB (MDR-TB). Globally in 2013, 45.3% of the estimated MDR-TB patients have been detected, diagnosed and notified; About 97,000 patients were enrolled on MDR-TB treatment. Treatment was started in Amhara region in August 2010.

Methods: We conducted retrospective descriptive using record review from patients from 2010 to 2014. All MDR TB patients were included. We collected data from three multi drug resistant tuberculosis treatment centers in Amhara region and review patient register and charts.

Result: Of 342 MDR TB patients, males constituted 192 (56.1%). Case fatality rate was 41 (12%). The age specific attack rate was higher (4/100,000) in 25-44 years, while that of mortality was higher in >65 years old (1/100000). Urban areas had higher number of cases. HIV testing was done for 331 (96.8%) of the patients and 81(24.5%) were found HIV positive. Of these, 50% were on ART. Only 22(6.4%) were primary MDR TB cases. From 222 (64.9 %) screened for malnutrition, about half had moderate to severe malnutrition. The performance for MDR TB case detection for the years 2013 & 2014 was 48.7% & 66.4 % respectively. Treatment success rate was 84.6%, 80% and 77.9% for the cohorts of 2010, 2011and 2012 respectively.

Conclusion and recommendation: The burden of MDR TB increases from year to year due to the expansion in diagnostic and treatment centers with higher prevalence in males and urban areas. The performance of case search was lower than the global target but the treatment success rate found to be higher than the global average. Therefore, we recommend intensified case finding, strengthening strict follow up and observation of cases in first line anti TB treatment and nutritional screening.

Key words: MDR TB, co-morbidities, Amhara region, Ethiopia .

Introduction

Multidrug-resistant TB (MDR-TB) is caused by organisms that are resistant to the most effective anti-TB drugs (isoniazid and rifampicin). It results from either infection with organisms which are already drug-resistant or may develop in the course of a patient's treatment(2). Primary MDR arises in settings where anti tuberculosis chemotherapy has been applied inappropriately for several years(3).

In 2013, 136 000 of the estimated 300 000 MDR TB patients who could have been detected were diagnosed and notified. This represents a tripling in MDR-TB detection compared with 2009 (4). Nutritional assessment and regular monitoring of the nutritional state by a dietician are essential for the successful management of MDR-TB patients and should be an essential part of tuberculosis control programmes(5). With the exception of two Ethiopian studies all other studies showed no association of any anti-TB drug resistance to either HIV positives or HIV negatives (6).

The adverse events from lifelong treatment of HIV with antiretroviral therapy (ART) coupled with side effects from MDR-TB drugs make the management and outcomes of MDR-TB in co-infected patients very challenging (7). Outcomes of MDR-TB did not differ significantly between patients who started ART before or after initiation of MDR TB except mortality was higher among patients who commenced ART before initiating MDR TB treatment, being severely underweight and underweight, cavitary lesions on baseline chest x-ray, the presence of other opportunistic infections and other co-morbidities(7).

Information on the extent of MDR-TB from Africa region is very limited, probably due to poor laboratory facilities, poor surveillance mechanisms and reporting procedures, outdated databases and sub-optimal coverage of the infrequent surveys. Sub-Saharan Africa stands the burden of both very high TB incidence and the highest HIV prevalence rates in the world, and represents 14 % of the global burden of new MDR-TB cases(8).

Ethiopia stands 15th out of the 27 high MDR TB burden countries in the world and 3rd in Africa next to South Africa and Nigeria (8). In Ethiopia 1.6% of new TB patients and 12% of previously treated patients had MDRTB (9).In 2014, 558 MDR TB cases and 413 were enrolled and outcome was recorded for 116 cases in Ethiopia(9).

The first patients were admitted for MDR-TB treatment in Ethiopia in 2009 in St. Peter‘s Hospital in Addis Ababa. In the same year, 45 /MDR-TB patients were enrolled initially in the

second phase at St. Peter‘s Hospital. However, there has been a rapid scale-up of drug-resistant TB care in the last five years; in 2014, at the national and regional state level, there were 19 care sites for drug-resistant cases and therapy was initiated on 811 patients in 2012. This is because the expanding access to care for MDR-TB cases is limited to the main and regional large cities. As a result of this, MDR-TB patients in rural and remote areas may not have access to health care services, may prefer consultation with traditional healers that are more readily available and come late to health care centers (personal communications).

Delayed case detection and treatment of MDR-TB cases might also contribute to the spread of the disease in the community. Thus, there is a need to train health extension workers and volunteers how to screen and care for MDR-TB cases at the community level. Continuous public health awareness about MDR-TB at the community level is also very important to reduce the spread of this deadly disease.

The purpose of effective treatment of drug susceptible TB is curing the patient, interrupting transmission of TB to other persons, and preventing the development of drug resistant strains . These goals are not being achieved in many regions of the country though anti-tuberculosis drugs are available. This might be due to either patient non-adherence to treatment or clinicians‘ non-adherence to the national treatment guidelines or both(10). In Amhara region MDR TB treatment was started in august 2010 at Gondar university hospital (11).

Analysis of MDRTB data was not conducted in the region previously hence the data will help to explain the trend of drug resistant tuberculosis and the regional profile of the disease. This is important to figure out the magnitude and severity of the disease in different parts of the region. It also enables to evaluate the effectiveness of the efforts mitigated to halt the burden of tuberculosis. Besides, the data will help public health officials and program managers to set priorities for future prevention and control of the disease. The Objective of this study is to describe the magnitude of MDR TB and related co morbidities and to provides guidance for intervention

Methods

We conducted the study in Amhara national regional state. It is found in the northwestern part of the country with a total area of 170, 000 square kilometers. Situated between 9 ^{0}20‘ to14 ^{0}20‘ latitude and 36 ^{0}20‘to 40 ^{0}20‘east longitude. The region shares boundaries with Tigray in the north, Oromia in the south, Afar in the East, Benishangul Gumuz in the southwest and shares an international border with the Republic Sudan in the North West. The region is divided into nine administrative zones and three city administrations. The 2014 population estimate shows that 20,002,911 which contributes about 1/4th of the country‘s total population. The study was conducted in three MDR TB treatment initiating hospitals in the region. This was Gondar University hospital, Boru Meda hospital and Debre Markos referral hospital.

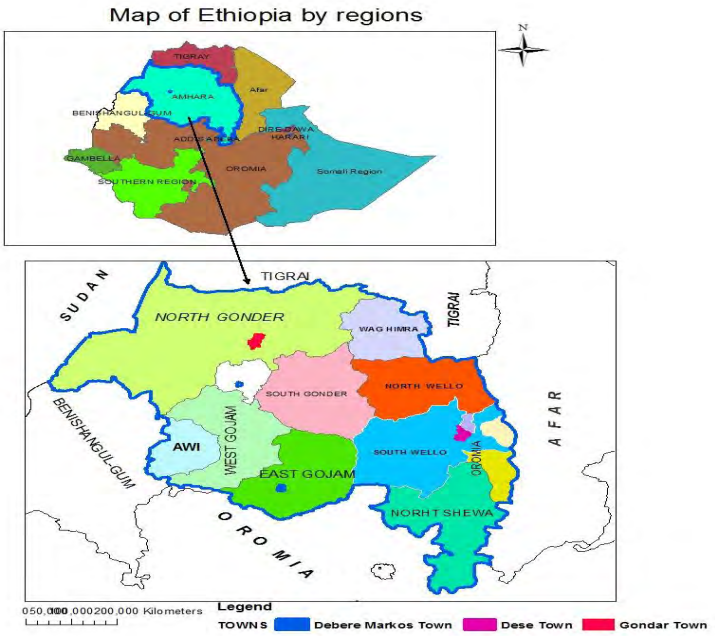

Figure 31: Map of Amhara region, 2015

We conducted retrospective descriptive crossectional study from August 2010 to December 2014. We had collected the data by revising patient registry and charts in three MDR TB treatment-initiating hospitals (Gondar university Hospital, Boru meda Hospital and Debre Markos referral Hospital). Data was analyzed using Microsoft excel, Epi Info version 7 and Arc GIS. We calculated proportions, rates and present using tables, graphs maps and charts. Patient names and identifiers were not used for the study

Result

A total of 342 MDR TB patients were treated in the previous five years from (2010 to 2014) in the three treatment initiating centers of Amhara region. The annual average number of cases was 69. Both morbidity and mortality was higher in males. Of these 192 (56.1%) were males. From recorded 41 deaths males accounted 23 (56.9%). None of the patients had history of treatment with second line anti TB drugs.

The median age is 28 years old the age ranges between 1 and 75 years and the majority [169 (49%)] of cases belongs to the age group of 25-44 years old.). Only three (0.9%) and seven (2%) of the cases were under five children and above 59 years respectively.

The morbidity due to MDR TB was higher in the age categories 25-44 years old 169 (4/100,000) followed by the age groups 15-24 (3/100,000) and lower in children aged 5-14years (3/100,000). The age specific mortality rate increases with age. It is highest in people aged more than 65 years (1/100,000) and no death was recorded is among children under five years.

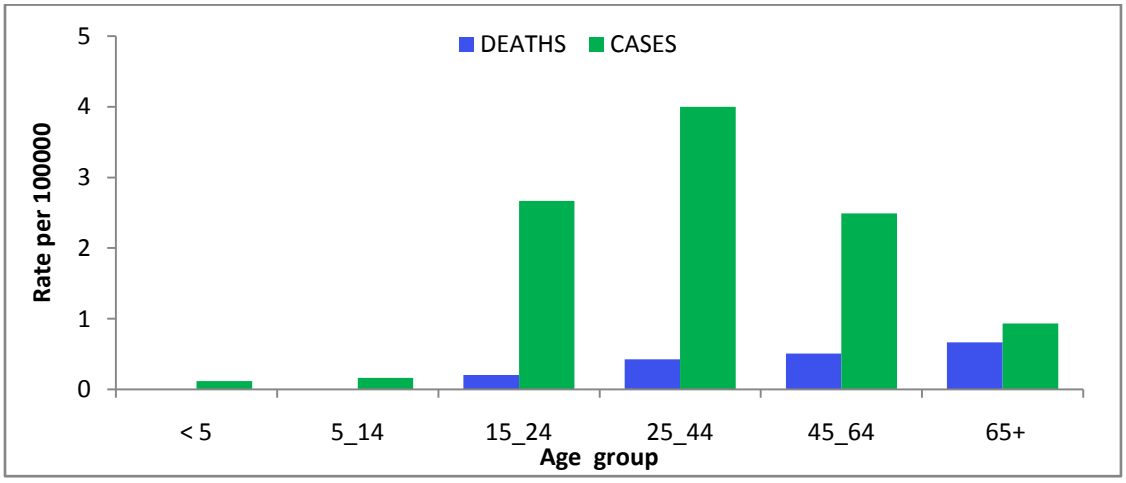

Figure 32: MDR TB age specific mortality and morbidity Amhara, 2010 to 2014

The treatment of MDR TB has been given in three treatment initiating hospitals. From 342 MDR TB patients, the majority (67.5%) were from Gondar university hospital

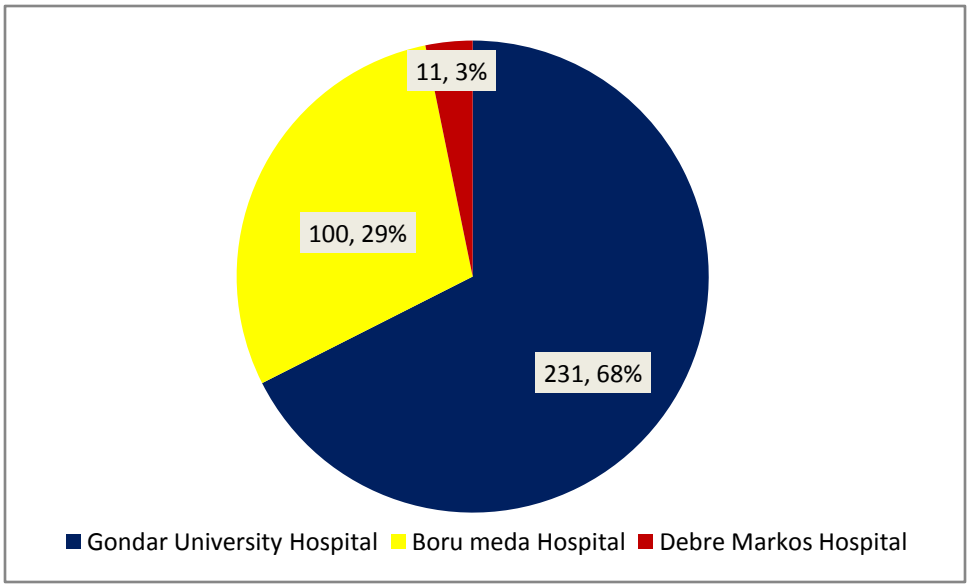

Figure 33: MDR TB age specific mortality and morbidity Amhara, Ethiopia 2010 to 2014

The highest prevalence of MDR TB was seen in Gondar city 40 (3/100, 0000) followed by Bahir Dar city 19 (1.4/ 100000) and Desse city 8(1/100000). From zones the highest prevalence was seen in Awi 0.84/100000 followed by North Gondar (0.55/100,000) and the lowest was in Waghimra 2 (0.47/100, 0000)

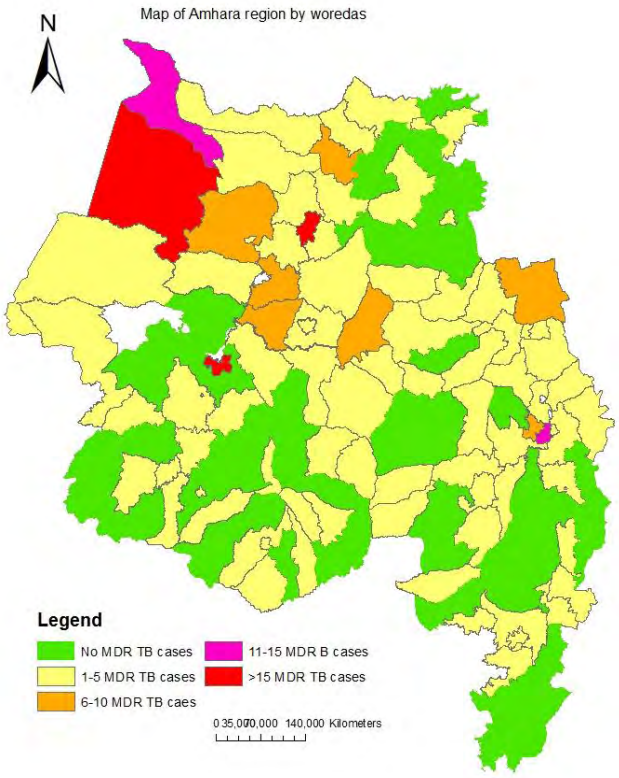

Figure 34: Distribution of MDR TB by woredas of Amhara Region, 2010-2014

The trend of MDR TB increases from year to year. Initially there were only 13 in 2010, which increases to 123 cases in 2014.The annual average number of patients was 69.

The annual regional case notification performance for MDR TB for 2013 & 2014 was 48.7% & 66.4 % respectively. Regarding the anatomical site, 95% (325) were pulmonary where the rest 5% (17) were extra pulmonary.

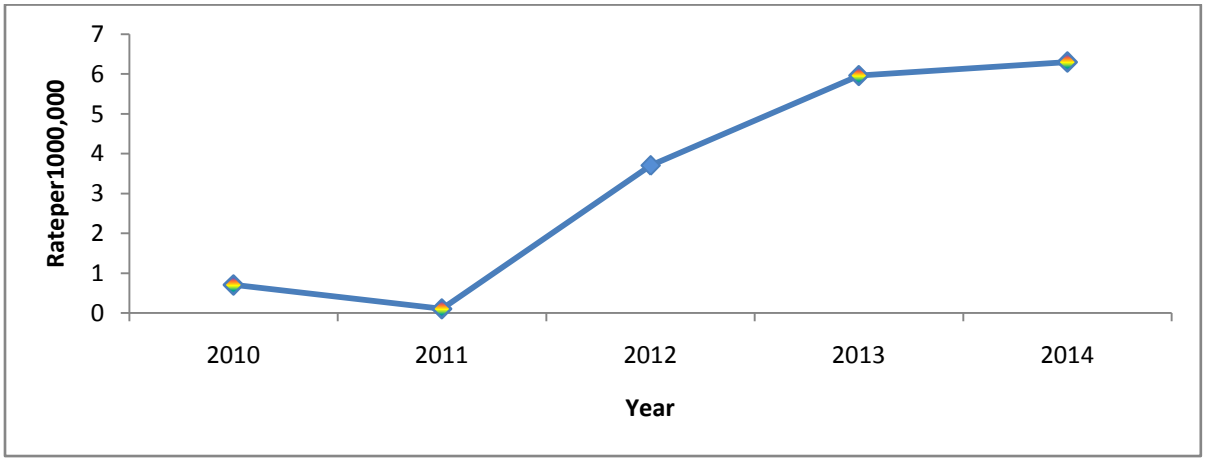

Figure 35: Trend of MDR TB cases in Amhara region, 2010 to 2014

Laboratory diagnosis

The majority [195 (57%)] of patient samples were done using Line probe assay (LPA, 75(22%) using gene xpert and 68(20%), were using culture and drug sensitivity tests (DST) which were the most commonly practiced methods of diagnosis. Ninety seven percent (330) of the patients' diagnosis is confirmed by either one or more of the above diagnostic modalities while the rest three percent (12 patients) were clinical cases of multi drug resistance tuberculosis. Besides out of the 342 patients 288 were MDR cases, 42 of them mono resistance (mostly Rifampicin), two suspected and the rest three were NTM cases.

MDR TB and HIV co infection

Regarding HIV co infection from the total 342 patients, 331(96.8%) were tested for HIV, 81 (24 %) of them were HIV positive.

Table 27: Proportion of HIV test result of MDR TB patients in Amhara, 2010-2014

HIV test result	Frequency	Percent
Non reactive	250	73
Reactive	81	24
Unknown	11	3
Total	342	100

From 81 HIV co-infected patients, 43(53.1%) were female, of this 40 (49.4%) patients started anti retroviral therapy (ART) and 35 (43.2%) patients started Cotrimoxazole preventive therapy. The outcomes of 47 patients were recorded, two (4.2%) completed their treatment, 27 (57.4%) cured, 12 (25.5%) died and five (10.6%) were lost to follow up. The proportion of MDR TB HIV confection was higher in Oromia zone (24%) followed by Gondar town and lowest in Waghimra where there was no MDRTB and HIV co infection.

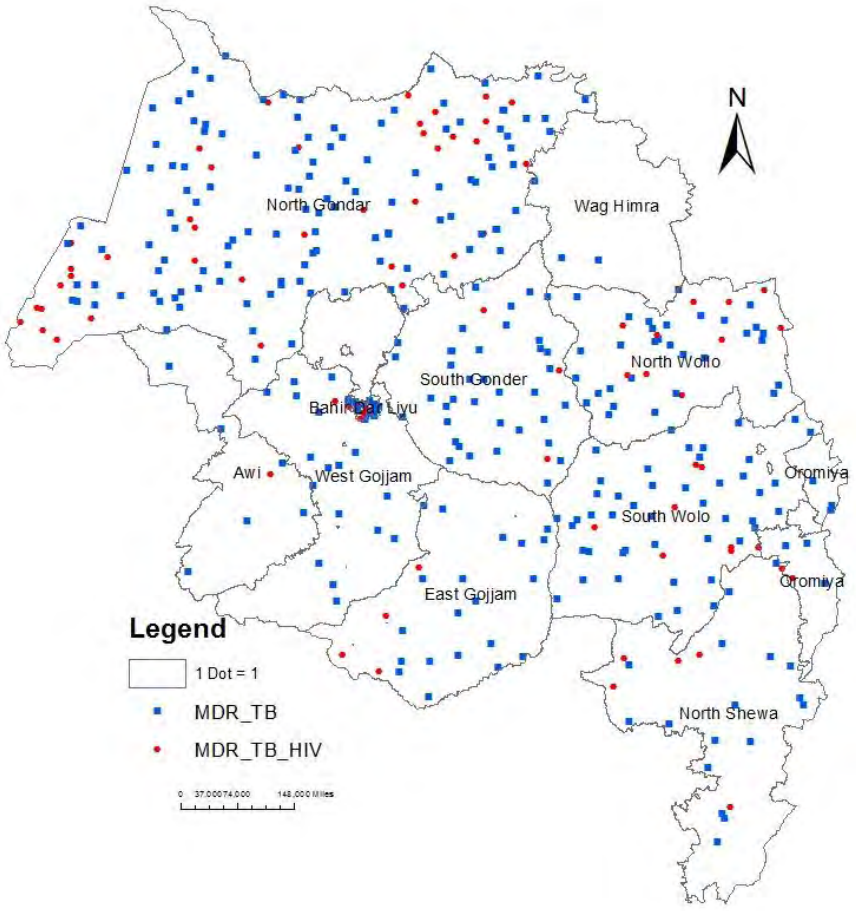

Figure 36: Distribution of MDR TB and MDR TB HIV co infection in Amhara region, 2015

Regarding the previous history of anti TB treatment from the total 342 MDR TB cases in the region only 22 were primary MDR TB cases the rest were on first line anti TB treatment .The majority of cases 226 (66%) were after failure of first line anti TB retreatment regimen, and11.7%(40), were failure of new regimen.10% (34) were relapse cases.

From 342 patients, 222 (64.9%) were screened for malnutrition and of these 77 (34.7%) were found to be severly malnurtioned (BMI less than 16) ,32(14.4%) were moderatly malnuritined BMI (16-16.99), 31 (13.9%) have had mild malnutrition BMI (17-18.49) ,while 78 (35.14% %) were normal.The rest one and three patients were obese and over weight respectively.

Four patients were XDR suspects in which one of them was lost to follow up and three were treatment failures. All these XDR suspects were from Gondar University Hospital. The MDR TB

treatment success rate decreases from year to year for cohorts of 2010 was 84.6%, 80 % cohorts of 2011 and 77.9 % for cohorts of 2012

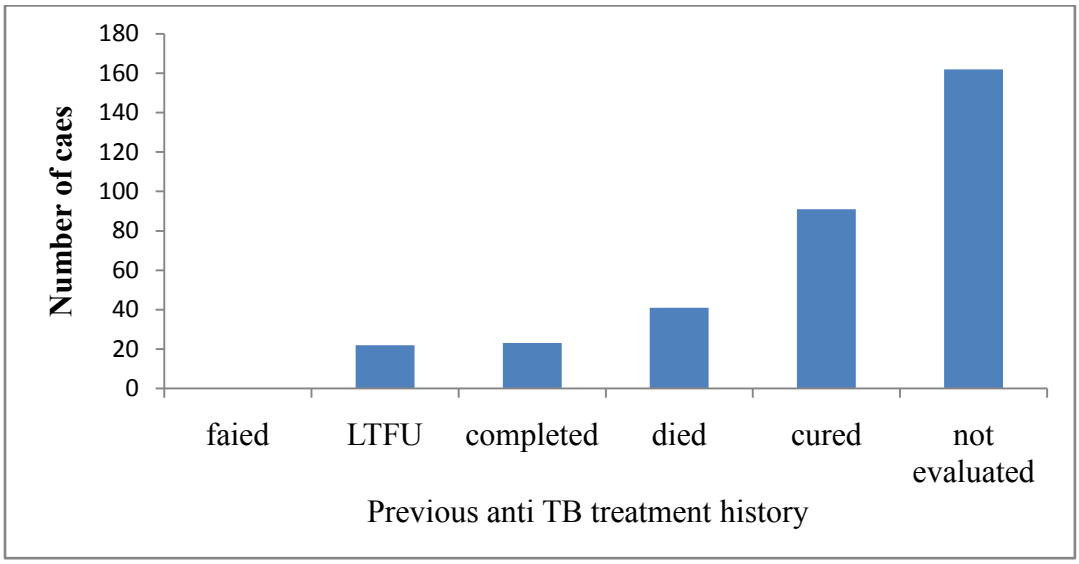

Figure 37: Treatment outcomes of MDR TB cases in Amhara region, 2010-2014

Discussion

The trend of the diseases increases from year to year which might be due to the expansion in diagnostic and treatment centers. Morbidity and mortality was higher in males. The Age specific mortality was higher for people aged from 25-44 years where mortality increases with age. Urban areas reported higher number of cases and about half of the patients screened for malnutrition had moderate to severe malnutrition.

Both morbidity and mortality due to MDR TB was found to be higher in males (56%). This result reveals consistent finding with the study conducted in St. Peter TB specialized hospital 59% MDR were male) and it is also similar with the study done in Kenya; that 62 % of the cases were male (12). Morbidity from multi drug resistance tuberculosis was higher among people aged from 25-44 years but the mortality increases with age which is consistent with the 2014 WHO global TB report people who are 65 years and older this result also goes in line with .

The prevalence was higher in more urbanized areas like Gondar, Bahir Dar and Desse cities administrations and this might be wrongly recording of more cases as residents of the cities and it might also be due to the accessibility of diagnosis and treatment service in urban areas besides it might be due to the better health seeking behavior of the community in Urban areas.

The trend of MDR TB increases from year to year with sharp increase from 2011 to 2013. This result also goes in line with the result reported in St. Peter specialized hospital(6) & it might be due to the implementation of intensified case finding strategies and improvement and expansion in diagnostic and treatment facilities and improvement in the national TB program.

About 96.8% of the patients were tested for HIV with positivity of 24.5% death, LTFU was more common in HIV co infected 25% and 10.5 % respectively, and this might be that the burden of both drugs may have negative impact on patient‘s adherence and overlapping toxicity. This result shows higher percentage of co infection compared the study done in south west Ethiopia (9.6%)(13) and India where only 14.2% have co infection But lower than the finding from Uganda (14).

Only 6.4 % of the cases were primary MDR TB cases the rest were on first line anti TB treatment and of these 66% were after failure of first line retreatment regimen. This result also shows similar finding with the study done in Kenya 7.4 %(12). About 222 (64.9%) of the patients were screened for malnutrition and 63 % of them found to have malnutrition. Of which

49.1% had moderate to severe malnutrition. Additionally 34.7% have severe malnutrition comparable with the same study in Philippines (15) where 33.3% have severe malnutrition. This finding shows lower prevalence of malnutrition compared to the study done in India where 68.6% of the patients have body mass index less than 18.5% (16).

The overall treatment success rate in this study (our study) is found above 77%, which fulfilled the WHO target of a treatment success rate of above 70 %(18).

This data analysis doesn‘t show the time of sputum conversion. Data was not available on the degree of resistance for each first line anti TB drug.

The prevalence was found higher in males and urban areas. The risk of MDR TB is higher in retreatment TB cases (67.5%) and HIV co infected (24%).The prevalence of malnutrition among MDR TB cases was also high (63%). MDR TB detection rate was found low but treatment success rate much higher than the global average.

The Amhara National Regional State Health Bureau has to implement intensified case finding to increase the case detection and strict follow up should be implemented on first line anti TB treatment. Further research should be conducted on the effect of HIV infection on MDR TB treatment outcome and why the disease is more common in the urban area.

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5.2. Assessment of risk factors for measles outbreak in Mota Town, East Gojjam, Amhara, Ethiopia, May 2015: case control study

Abstract

Background: Measles is the leading causes of death among young children. Though a safe and cost-effective vaccine is available measles occur as outbreak. In 2013, there were 145,700 measles deaths globally. In Africa, about 13 million cases and 650,000 deaths occur annually, with sub-Saharan Africa having the highest morbidity and mortality. Due to an increase in vaccination coverage in developing countries there has been a significant change in the epidemiology of measles such as higher incidence in older children and young adults. The aim of investigation was to assess risk factors and institute doable intervention measures.

Methods: We applied the case definition, a maculopapular rash and fever with coryza, conjunctivitis or cough, to select cases of measles. We conducted 1:2 unmatched case-control study from May 2-10 /2015. Data was collected using structured questionnaire. Analysis was done using Epi Info 7 and SPSS software. Then, Odds Ratio with 95% CI and P-value were used to measure the significance of association in bivariate and multivariate analysis.

Results: Of 143 reported cases, half of them were females. The median age of cases was10 (Q1=4, Q3=19) years while that of controls was 9 (Q1=5, Q3=15) years. The overall attack rate (AR) was 218/100,000. It was higher among 15-44 years (471/100,000). No death reported throughout the outbreak. Being vaccinated against measles reduce the risk of contracting measles by 85% [AOR: 0.15, (95% CI: 0.06, 0.38, P< 0.0001)], contact history with cases [AOR: 7.1, (95% CI: 2.4, 12.6, P < 0.0001)].

Conclusion: Adults and children greater 15 years old were more affected. Absence of vaccination and contact with cases were found to be risk factors. We searched cases house to house and provided case management to stop the epidemic. Strengthening the routine surveillance activity and EPI program were recommended to the district health office.

Key words: Measles, Mota, Case control, outbreak

Background

Measles is an acute and highly infectious disease caused by measles virus, a member of genus Morbillivirus of Paramyxovirus family(1). It is one of the communicable diseases still causing preventable mortality and morbidity. Infection is characterized by cough, Coryza, fever and the onset of a generalized maculopapular rash several days after initial symptom onset. Although most individuals recover from infection, complications can occur including otitis media, pneumonia, croup, diarrhea, encephalitis and, very rarely, sub acute sclerosing pan encephalitis(1).

An infected person spreads measles from slightly before the onset of symptoms to four days after the onset of rash (2). Measles is one of the leading causes of death among young children even though a safe and cost-effective vaccine is available. In 2013, there were 145,700 measles deaths globally about 400 deaths every day or 16 deaths every hour(3). In Africa, about 13 million cases and 650,000 deaths occur annually, with sub-Saharan Africa having the highest morbidity and mortality.

Due to an increase in vaccination coverage in developing countries there has been a significant change in the epidemiology of measles such as higher incidence in older children and young adults. Under nourished people are more susceptible to measles complications, slow recovery, and higher fatalities. Being vaccinated against measles gives protection against measles up to 99% and the World Health Organization recommends that all children who receive the first dose of vaccine should also have a second opportunity for vaccination(4).

Ministries of Health (MoH) report annual administrative coverage (i.e. number of doses delivered divided by estimated number of children in the targeted age group) based on population estimates. In many contexts, however, population estimates, are often not up-to-date (i.e. population censuses might not be frequently performed and vital event registration may be absent or partial), resulting in biased or inaccurate estimates. Consequently, population-based surveys are often the best available means to estimate vaccination coverage at both local and national levels(5).

The national Expanded Programme on Immunization (EPI) was established in 1980 in Ethiopia (9). The Measles Initiative developed a joint strategic plan to reduce measles-related deaths by strengthening routine immunization, supplementary immunization activities (SIAs) in the form

of mass vaccination campaigns, reinforced surveillance, and adequate case management. Measles vaccines have dramatically reduced cases and deaths during recent decades and includes provision of the first dose of measles-containing vaccine (MCV1) provided at or shortly after the ninth month of age (6).

In African countries, including Ethiopia, CRS is widely under-recognized as a public health problem, and information on(7). In Ethiopia according to the 2014 WHO report, 16028 suspected and 2370 laboratory confirmed measles cases were reported with annual incidence of 14.61/100,000(8).

In Amhara region in 2014/2015 from (July to March) 65 districts report measles outbreak with total cases 4833 and 40 deaths were reported due to measles (9).

Methods

Mota town is one of the town administration found in East Gojjam zone, Amhara Region. The town is located at a distance of 371 kms from Addis Ababa and 120 kms from regional town Bahir Dar, and bounded by Hulet Eju Ense district. The town is situated at an altitude of 2487 masl. The woreda has total population of 38,200 about half 18,748 were males. The woreda has four urban kebele, and it has one district hospital, one health centers and four health posts with physical health service coverage of 100%.

Unmatched case control study was conducted in Mota town from 2-10 May 2015. Cases were defined as any person with fever and maculopapular (non-vesicular) generalized rash and cough, coryza or conjunctivitis (red eyes) or any person in whom a clinician suspects measles (1,12). Cases were selected randomly from the line list and recruited into the study. Controls were neighbors of cases who did not develop measles during the period of the study. Two controls for per case were selected from the neighbors of cases. Cases and controls that were not voluntary to participate in the study were not included under the study. Sample size was calculated using Epiinfo 7 stat calc for unmatched case-control study by taking:

Two sided confidence level (1-α) = 95%, power (% chance of detecting) = 80% , ratio of controls to cases = 2, Proportion of controls with exposure =13%, Proportion of cases with exposure = 33%.

When the sample size was calculated using Epiinfo 7 statcalc a 180 samples (60 cases and 120 controls) were selected. Structured questionnaire was used as data collection tool. Additional

data were also collected by line listing which used for the descriptive analysis. The data was primarily collected by principal investigator and co-investigator by translating the questionnaire into Amharic. Prior to entering the data in to the computer the missing variables and consistency of filling of questionnaires and completeness of data was checked every day during data collection.

Data was entered and analyzed using Epi Info 7 and Arc GIS software. After data, cleaning and recoding both descriptive and advanced statically analysis were under taken. Results were presented using graphs, tables, charts and attack rate, proportions, were calculated. Odds ratio, 95% CI, and p-value were constructed to measure association and significance. The dependent variable was measles infection and age, vaccination status, contact, travel, educational status of the family and owning radio or television were the independent variables.

Result

Descriptive Epidemiology

The outbreak lasts for more than three months with 143 cases of measles and no death. The index patient was a seven years old female child with unknown vaccination status. She had travelled to Ayehu Birhan kebele of the adjacent woreda (Huleteju Enese) to visit her relatives on 24/1/2015. She had cured from the illness without receiving any medical intervention. When it was reported on 03/6/2015 the woreda team verified the existence of the outbreak on the same day. On 03/12/2015 sample from four cases was collected and sent to the national measles laboratory. Three samples were found to be positive for measles IgM. Two field epidemiology residents went to the district on May 2, 2015 to investigate the outbreak. Control study was conducted to determine the contributing factors for the occurrence of the outbreak. A total of 143 cases, 71(49.6%) male and 72(50.4%) female were line listed. From the total 143 cases 60 cases and 120 community controls were recruited. The median age of cases was 10 (Q1=4, Q3=19) years while that of controls was 8 (Q=5, Q3=15). Majority of the cases 155 (85.6%) belong to the orthodox Christian followers the rest 25 (13.4%) were Muslim.

Fever (100%), maculopapular rash 58(97%), conjunctivitis 54(90%) and cough 45(75%) were the most frequently reported symptoms.

Only 15(25%) of the cases and 67(56%) of the controls were vaccinated against measles. Vaccination status was less than 50% in all age groups of cases and better vaccination status was seen in under 5 year controls

Table 28: Measles vaccination status of study participants, Mota town, Amhara, 2015

Age group	vaccination status						Total
	cases			controls			
	yes	no	total	yes	no	total	
<5	4	12	16	20	5	25	41
5-14	8	12	20	33	20	53	73
>= 15	3	21	24	14	28	42	66
total	15	45	60	67	53	120	180

Measles vaccination coverage for the Woreda for 2010, 2011, 2013, 2014 and 2015 was 76.3%, 85.5%, 87.6%, and 71.9 % respectively. From the 143 suspected cases, most of 91(64%) the cases in the district were not vaccinated against measles only 30% of the cases had taken one or more dose of measles vaccine where10 (7%) had unknown vaccination status.

The most common reason raised by interviewed residents 46(25%) of mota town for not vaccinating children against measles was not knowing the time (schedule) when measles vaccine is given. In addition, some13 (25.6%) parents or caregivers still believe that the vaccine would hurt their child.

Table 29: Summary of reasons not to vaccinate against measles Mota town, Amhara, 2015

Reason not to vaccinate	Number	Percent
Do not know time of vaccination	46	25.6
Hurt my child	13	7.2
Far	9	5
Do not prevent measles	5	2.8
Child not 9 months	4	2.2

The over all attack rate was 218 /100,000. Both age spesfic attack rate and number of cases was higher in adolecents and adults groups from 15-44 years (471/100,000) and there were no measles cases in people aged more than 45 years .

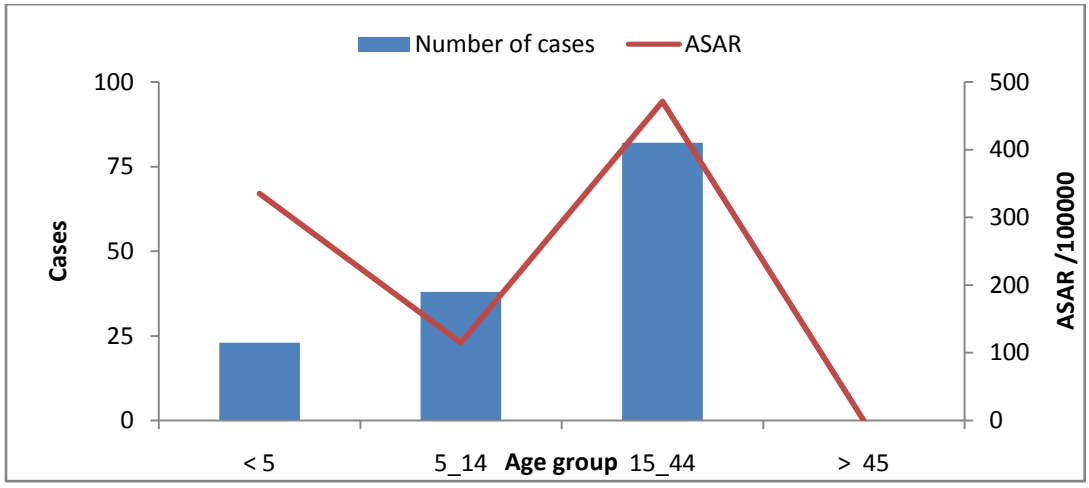

Figure 38: Numbers of measles cases and ASAR Mota town, Amhara, 2015

Forty-nine (81.7%) sought treatment in health facilities while 11(18%) were treated for measles at home and seven (11.7%) three (5%) patients were taken to local healer. The median duration for seeking treatment after onset of illness was three days (Q1=2; Q3=7).

The index case had onset of symptoms 26 of January 2015. Rumor was reported from the community to the district after two month the outbreak was reported to the region. Outbreak last for about four months affecting about 143 cases.

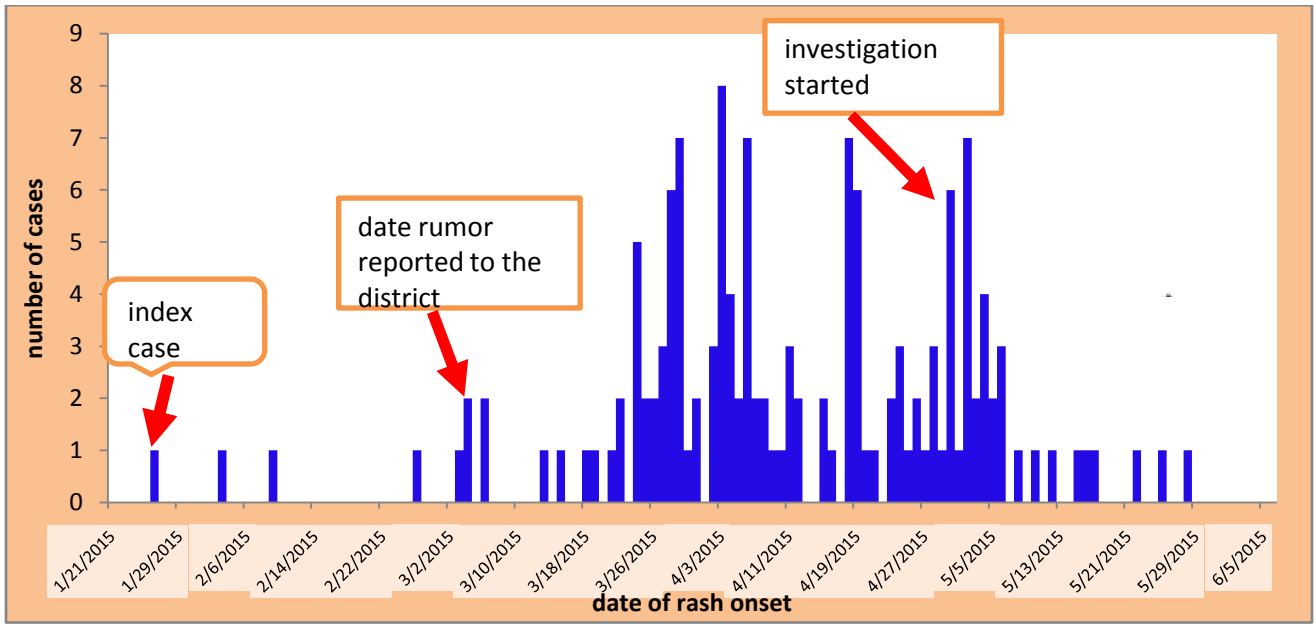

Figure 39: Number of measles cases by date of onset of rash Mota town, Amhara, 2015

Most measles cases were from Kebele 2 of Mota town which accounts about 78 (55%) of the cases this is because most residents of the kebele came from the rural kebele of the adjacent woreda and the least is kebele 4 which has only 19 (13%) cases.

Analytic epidemiology

We compared the 60 cases with 120 community controls the statistically significant variables were being vaccinated against measles was 85% less likely contracting measles (AOR= 0.15, 95% CI, 0.06, 0.38) history of travel 7-21 days prior to the onset of rash COR 6.19 (95 % CI 3.1, 12.3) where as family size, having radio or television and educational level of care givers has no statically significant association on multivariate analysis the odds of contracting measles was 7.1 times higher among those who has contact history with measles cases (AOR=7.1 ,95% CI 2.4,20.6).

S.No	variables		COR,95% CI,P-value			AOR,95% CI,P-value		
1	Sex	M/F	1.19	(0.63,2.24)	0.57	0.57	(0.23,1.36	0.20
2	Age	5-14/<5	0.69	(0.26,1.34)	0.21	0.54	(0.18,1.6)	0.27
		15-44/<5	1.03	(0.45,2.36)	0.93	0.57	(0.18, 1.7)	0.33
		>45/<5	0.7	(0.15,3.08)	0.63	0.32	(0.04,2.3)	0.26
3	Contact history Yes/No		9.6	(4.49,20.62)	0.0001*	7.1	(2.4,12.6)	0.0003*
4	Owning TV Radio Yes/No		1.9	(1,3.7)	0.047*	2.6	(1.1,6.2)	0.02*
5	Vaccination Yes/No		0.19	(0.096,0.39)	0.0001*	0.15	(0.06,0.38)	0.0001*
6	travel history Yes/No		6.19	(3.11,12.33)	0.0001*	2.2	(0.8,6)	0.12
7	Overcrowding Yes/No		1.1	(0.59,2.07)	0.832	1.3	(0.56,3.2)	0.49

- Significant

Discussion

Both the number of cases and ASAR was higher in the age group from 15-44 years this shows different finding from the study done in Simada, south Gondar where the ASAR is higher in under five children (12).Similar investigation in China Wenzhou City shows highest attack rate in children less than one year(171/100,000)(13). The attack and case fatality rates were 218 /100000 inhabitants and zero respectively this attack rate is higher compared to similar study done in Cameroon (34/100000)(14).

Only 42 (29%) of 143 cases were vaccinated against measles these result shows higher proportion of measles among vaccinated as compared to similar study done where 153 cases, only 34(22.2%) had measles vaccination status this discrepancy might be due to the impaired potency of the vaccines due to mishandling .In countries with >50% average MCV1 coverage, the age distribution of cases shifted to older children and young adults. At the median and 75th percentile of cases, the age of infection increased with higher coverage; however, for infants, the age of infection decreased slightly with higher vaccination coverage. The shift to older children and adults has implications for disease burden estimates and may disproportionately lower the measles mortality burden relative to the morbidity burden, because case fatality ratios are lower in older cases(15). The outbreak started from the 4^{th} to the 24^{th} epidemiological week of 2015 with a peak on the 10^{th} week after onset

Males and females were equally affected by the diseases .The Epi curve had multiple peaks this might be due to the late detection of the outbreak leads to person to person transmission. The average coverage of the first dose of measles vaccine in the districts was 80.3 % (range: 71.9 – 87.6). Districts repeatedly failed to meet the target of 90% this might also contribute to the occurrence of the outbreak.

This study tried to identify several risk factors associated with contracting measles in Mota town having contact with measles found to be risk factor for contracting measles it is associated with 9.6 fold increase in the odds of contracting measles(95%CI ,4.49-20.62) this result shows comparative finding with the study done in china Wenzhou City(13). Being vaccinated against measles reduces the risk by 85% contracting measles (AOR= 0 .15 CI, 0.06-0.38). This has similar finding with the study done in Zimbabwe (6).

In addition history of travel to an area where there was measles case was associated with developing illness. Educational level of the mother or care giver, owning and listing news and messages with radio, television and size of the family in the house hold has no statistically significant association with contracting measles. This study reveals different finding from other studies that both the number of cases and ASAR is higher in people aged >15years and the risk increase with increase in age. This might be due to the high vaccination coverage in children and infants who might lead the disease to shift to older ages who were not vaccinate against measles during their childhood.

People aged 15-44 years were more affected by the outbreak, being unvaccinated against measles, and history of travel 7- 21 days prior to rash onset and contact to measles cases contributes to the occurrence of the outbreak. Educational level of the mother or care giver and size of the family in the household had no statistically significant association with contracting measles.

Technical assistance was provided for health workers on case management, recording and reporting situation. Active home to home case search, routine surveillance and vaccination was strengthened and the situation was closely followed at each level on a daily basis until the epidemics became over.

Late detection and response of the outbreak leads the disease to affect more people hence the district health office and health extension workers have to increase their surveillance activity. Promote the awareness of the community on the modes of transmission of measles to avoid or minimize contact with cases. Strengthen cases management and conduct supplementary immunization campaign.

The ministry of health should conduct measles vaccination campaign for adults because the case is higher in people aged more than 15 year.

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Chapter VI: Abstracts for scientific presentation

6.1. The Magnitude of Multi Drug Resistance Tuberculosis and Related Co Morbidities in Amhara Region, Ethiopia, 2010-2014

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Introduction: Organisms that are resistant to the most effective anti-TB drugs (isoniazid and rifampicin) cause Multidrug-resistant TB (MDR-TB). Globally in 2013, 45.3% of the estimated MDR-TB patients have been detected, diagnosed and notified; About 97,000 patients were enrolled on MDR-TB treatment. The objective of the study was to describe the trend and magnitude of the disease.

Methods: We conducted retrospective descriptive using record review from patients from 2010 to 2014. All MDR TB patients were included. We collected data from three multi drug resistant tuberculosis treatment centers in Amhara region and review patient register and charts.

Result: Of 342 MDR TB patients, males constituted 192 (56.1%). Case fatality rate was 41 (12%). The age specific attack rate was higher (4/100,000) in 25-44 years, while that of mortality was higher in >65 years old (1/100000). Urban areas had higher number of cases. HIV testing was done for 331 (96.8%) of the patients and 81(24.5%) were found HIV positive. Of these, 50% were on ART. Only 22(6.4%) were primary MDR TB cases. From 222 (64.9 %) screened for malnutrition, about half had moderate to severe malnutrition. The MDR TB case detection for the years 2013 & 2014 was 48.7% & 66.4 % respectively. Treatment success rate was >80%.

Conclusion: The burden of MDR TB increases from year to year which might be due to the expansion in diagnostic and treatment centers with higher prevalence in males and urban areas. The performance of case search was lower than the global target but the treatment success rate found to be higher than the global average. Therefore, we recommend intensified case finding, strengthening strict follow up and observation of cases in first line anti TB treatment and nutritional screening.

Key words: MDR TB, co-morbidities, Amhara region, Ethiopia

Presented at the EPHA 27th annual conference (oral)

6.2. Assessment of Risk Factors for Measles Outbreak in Mota Town, East Gojjam, Amhara, Ethiopia, May 2015: A Case Control Study

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Background: Measles is one of the leading causes of death among young children. In Africa, about 13 million cases and 650,000 deaths occur annually, with sub-Saharan Africa having the highest morbidity and mortality. In 2014/15, 4833 cases and 40-suspected deaths reported in Amhara region. Increase in vaccination coverage leads lower incidence in younger children. The aim of the investigation was to determine risk factors and guide prevention and control measures.

Methods: We applied the case definition, a maculopapular rash and fever with coryza, conjunctivitis or cough, to select cases. We conducted 1:2 unmatched case-control studies from 2-10 May 2015. Data was collected using structured questionnaire. Analysis was made using Epi Info and SPSS software. Then, Odds Ratio, 95% CI and P-value used to measure the significance of association in bivariate and multivariate analysis.

Results: Of 143 reported cases, half of them were females. The median age of cases was10 (Q1=4, Q3=19) years while that of controls was 9 (Q1=5, Q3=15) years. The overall attack rate (AR) was 218/100,000. It was higher among 15-44 years (471/100,000). No death reported throughout the outbreak. Being vaccinated against measles reduce the risk of contracting measles by 85% [AOR: 0.15, (95% CI: 0.06, 0.38, P< 0.0001)], contact history with cases [AOR: 7.1, (95% CI: 2.4, 12.6, P < 0.0001)] and travel history [COR = 6.19, (95% CI 3.1, 12.3, P < 0001)] were significantly associated with measles infection.

Conclusion: People older than 15 years were more affected. Absence of vaccination and contact with cases and travel history to affected areas were found to be risk factors. We searched cases house to house and provided case management to stop the epidemic. Strengthening the routine surveillance activity and EPI program were recommended.

Key words: Measles, Mota, Case control, outbreak

Presented at the EPHA 27th annual conference (poster)

6.3. Scabies Outbreak Investigation in Tach Gaynt District, South Gondar Zone, Amhara Region, October, 2015

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Introduction: Human scabies is a parasitic infestation caused by Sarcoptes scabiei var hominis. Scabies affects people from every country. Risk factors including: age, gender, ethnicity, overcrowding, hygiene, and season proposed to contribute for the occurrence of scabies. The objective of the investigation is to determine the contributing factors and guide intervention.

Methods: We conducted unmatched case control study from October 8-15/2015 in Tach Gaynt district South Gondar zone. We included 61 cases and 122 controls. Cases were defined as those any resident Tach Gaynt district that has popular pruiritic rash. We collected the data using interviewer administered questionnaire. Data was entered into Epi Info 7 and analyzed using SPSS version 21, Epi Info 7 and Arc GIS.

Results: A total of 2,969 scabies patients were reported. Of which, 1436 (48.3%) of them were females. The median age of cases was 12 (1 to 70) years. The overall attack rate was 9.4%. It was higher for people older than 60 years (17.7%). On bivariate analysis educational level [COR=2.8, (95%CI,1.3,7.6)], infrequent changing of clothes [COR=2.4, (95% CI ,1.1,6.5)], infrequent bathing [COR=3,(95% CI,1.5,5.7)], infrequent washing of clothes [COR=2.6 (95% CI,1.2,5.2)], family size >=6 [COR=2, (95% CI,1.1,4.4)], contact with scabies patients [COR=8 ,(95% CI 3.7,17.5)], sharing of bed clothes [COR=10.8 (95% CI,5.2,22.4)] and sleeping together with scabies patient [COR=9.5,95% CI,4.6,19)] were associated with scabies diseases. On multivariate logistic regression analysis sharing bed clothes had association with counteracting scabies disease (AOR =10.2, 95%CI, 4.9.21.4)

Conclusion: People aged greater than 60 years had the highest attack rate and poor personal hygiene practices contributed for the outbreak. Intensifying surveillance activities, case management and including scabies under the public health emergency management reporting system were recommended.

Key words: Scabies, Tach Gaynt, case control

Chapter VII – Narrative Summary of Disaster situation visited

7.1. Rapid Belg Assessment (verification) Report Non-Food, Amhara Region, May 2015

Executive summary

We conducted Belg season assessment from 22 June to 22 July 5, 2015 in three zones and ten selected Woredas. We assessed food and non- food causes of hazards, magnitude, capacity to manage and gaps. Non- food assessment comprised of health and nutrition, WASH and education emergencies. Many suffer from multiple natural and manmade crises. Malaria, AWD, measles, malnutrition, dysentery due to lack of safe and adequate water and school absenteeism or dropouts are all associated with natural calamities or disruption of healthy human activities in the given ecosystem or living environment.

The objectives of the assessment were to determine magnitudes of hazards of different types, to identify risk factors, gaps/challenges and make recommendations to take reliable intervention measures that address problems encountered.

Assessment findings have revealed that AFI, upper respiratory tract infections (URTI), pneumonia, malaria and skin infection were the leading cause of morbidity in both under five and above five years of age in the year 2007 (July 2014/ May 2015).

In the last three months, 480 measles cases and 4 deaths were reported from N/Shewa, North and South Wollo zones. There was no ongoing measles outbreak in the assessed zones. However, regional PHEM weekly report has shown that there is ongoing malaria outbreak in two kebeles of Fogera woreda of South Gondar zone.

In the regional stock, drugs and supplies for meningitis control (meningitis vaccine, LP set, RDT for meningitis and oily CAF), drugs and supplies for AWD (CTC kits, PPE such as duty gloves) were the major gaps.

It was found that there is an established multi sectorial PHEM coordination forum at regional, zonal and in most visited woredas but it is not active at zonal and woreda levels. Except regional EPR plan, most of the assessed woredas allocated some amount of money for emergency purpose.

Regarding malnutrition, currently the nutrition situation is normal and stable in the region. However, slight SAM increment reported from North Wollo in May 2015 and sharp rise in March and sharp fall in April of SAM was reported from South Wollo. 2,719,534 beneficiaries are estimated for malaria, AWD, measles and meningitis and 19,261,194 ETB is required to address them. Reactivation of multi sectorial PHEM coordination forum at all levels, strengthening surveillance and preparedness activities, capacity building, strengthening of malaria prevention and control activities were recommended.

Introduction

Amhara region is one of the nine administrative regions in the federal democratic republic of Ethiopia. It is the second populated region according to the 2014 population estimate it has total population of 20,002,911. The region shares boundary with four national regions (Oromia, Tigray, and Afar& Benishangul Gumuz) and one international border with Sudan. In the region, there are nine zones and three administrative cities, 167 woredas and about 3345 kebeles, from which 318 are urban kebeles.

The livelihood of Amhara population has been affected by different types of hazards including recurrent drought, and disease outbreaks such as acute watery Diarrhea (2006-2009), H1N1 influenza (2009 in Gondar University), Typhoid fever (mostly Eastern Amhara (North Wollo & South Wollo), Meningitis (2009 in South Wollo), Measles (2010/2011 in all zones and still in some areas of the region), Rabies (usually from North & South Wollo), Bloody diarrhea (2011 in Gondar University, North & South Wollo), Malaria (predominantly from Western part of the region), and flood and flood associated problems. In the region, 5287 suspected measles cases were reported in the year 2014/15 and 574,004 malaria cases were reported in the same year. Currently, malaria cases build up/focal outbreak was reported from South Gondar.

The Current assessment has identified immediate risk factors associated with the possible occurrence and distribution of health and nutrition emergencies such as Acute Watery Diarrhea (AWD), measles, Malaria, meningitis outbreaks and Sever Acute Malnutrition (SAM) in the region. Woredas/Zonal/regional capacity was also assessed to confront the situation.

Objectives

General objective

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

Specific objectives

- To assess the extent, types, magnitude, severity and likely of the different hazards (drought, disease epidemics, sever and acute malnutrition, etc) and risks to the populations in the most vulnerable Woredas (including to identify the most vulnerable populations) for epidemic prone problems considering health and nutrition emergencies.
- To assess the existing capacity of the health services to address health and nutrition emergencies likely to occur during the coming six months of 2015.
- To determine the shortcomings (gaps) in the capacity of the existing health services to address health and nutrition emergencies likely to occur.
- Based on the findings on the assessment of risks for, and the need to address, potential health and nutrition emergencies for the next six months, to formulate workable mechanisms and develop necessary plans for fostering preparedness of Health and nutrition for appropriate and adequately addressing the potential emergencies;
- To identify areas where health and nutrition emergency assistance might be needed during the coming six months of 2015 due to acute problems and come up with reasonable estimates of the size of the population needing emergency assistance.

Methods

Study design: A cross-sectional study design was used to assess and identify health and nutrition emergency needs in the next six upcoming months.

Study Area Profile: we conducted the assessment in North Wollo, South Wollo and North Shewa zones of Amhara Region. From all the three zones a minimum of three or four districts were selected to be visited during the assessment. The zones and districts were selected based on their natural, manmade disasters and diseases trends

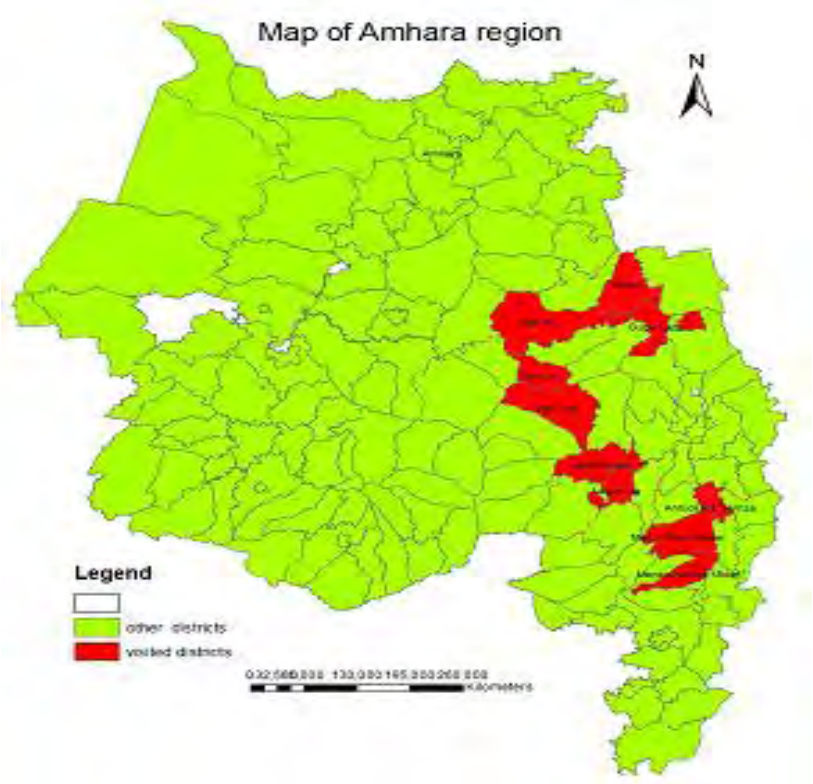

Figure 40: Map of Amhara region by woredas, 2014/2015

Selection of Assessment area: Hot spot districts were identified by respective regional and zonal disaster prevention and risk management and health department offices. During the selection of districts to be addressed by assessment the regional health bureaus and zonal health departments take into consideration both natural disasters and diseases trends such as drought, shortage of normal rain, ongoing diseases outbreaks, floods, landslides, conflict etc.

Assessment Team: The assessment team was composed of experts from federal DRMFSS, EPHI, Amhara region DRMFSS, Amhara regional health bureau, WHO and National

meteorology agency, world food program, food and agricultural organization. The half a day training was given for all assessment teams at Amhara regional DRMFSS before deployed to zones. The team was classified to food and non food section based on their working organization and collect data from respective sectors.

Assessment Tools: Structured questioners were used for data collection. Two different questioners were used to collect health and nutrition related data at district and zonal levels. The questioners addresses socio-demographic profile, health profile, status of epidemic prevention and control multi sectoral coordination committee at all levels and go through asking ongoing epidemic situation and check availability of emergency drug at zonal and district levels.

Source of Data: Both primary and secondary data were collected from zonal health departments and district health offices. Head of zonal health office and district health offices, pharmacist, and public health emergency management officers, nutrition and EPI officers were interviewed.

Result

Regional level

Coordination

Amhara regional health bureau has functional multispectral coordination forum which conducts meeting every month. But, it is not represented particularly by all relevant government sectors (Education & water).

Ongoing outbreak

In the region, there are reported ongoing outbreaks of malaria, suspected bacillary dysentery, and measles, were reported from South Gondar, North Gondar, West Gojjam and Oromia zones.

Outbreak in the last three months

There were outbreak of Measles(South Gondar, west Gojjam ,North Gondar ,East Gojjam zones) malaria, typhoid fever, food poisoning, and whooping cough outbreaks in South Wollo zone .

Anticipated Epidemics

Diseases such as Malaria, AWD, Measles, Meningitis outbreaks and malnutrition as well as flood are expected in the coming six months due to unprecedented malaria reduction program, with the overall result that malaria morbidity and mortality has been significantly reduced. However, El Nino year will increase the risk of wide range of malaria outbreaks and sever acute malnutrition. The presence of stagnant water, traditional irrigation and interrupting rain are suitable condition for mosquito breeding especially as a result of El Nino effect. Based on the above contributing risk factors and seasonal malaria transmission all populations living in the malarias area could be affected by malaria in the next six months.

The likelihood of hazards such as flood, malnutrition, and displacement with low vaccination coverage against measles antigen increase the risk of measles epidemics. Vaccination coverage of 85% has been needed to prevent transmission among the population. Among all vaccinated children at nine months 85% will protect by measles immunization.

Table 30: Anticipated Epidemics in Amhara Region, June 2015

Region	Woreda at risk	Type of risk	At risk population	Required finance
Amhara	154	Malaria	574,004	6,630,027
	12	AWD	406,660	10,261,124
	65	Measles	400,000	756,000
	41	Meningitis	1,338,870	2,215,600
		Malnutrition		
Total				19,261,194

Public Health Emergency Management

At regional level, there is public health emergency preparedness and response plan but not budgeted or funded. However, most of the assessed zones were started budgeting for emergency preparedness and response activities. Emergency preparedness and response plan preparation is not strong enough at zone and woredas level.

Emergency drugs and supplies

In the regional stock, drugs and supplies for meningitis control (meningitis vaccine, LP set, RDT for meningitis and oily CAF), drugs and supplies for AWD (CTC kits, PPE such as duty gloves) doxycycline and Ringer Lactate (R/L, ORS, Amoxicillin suspension ,Cotrimoxazole, for measles Tetracycline Ointment ,Vitamin A. supplies RDT (Malaria)), were the major gaps.

Table 31: List of available supplies and gap for emergency preparedness, Amhara, 2015

Items	Unit	Required	Available	Gaps	Unit Price	Total price in BIRR
RL/NS bag of 1000ml	Bag	9756	0	9756	25	243900
ORS [sachets]	Each	264290	0	264290	2	528580
Doxycycline 100 mg 0f 1000 Caps/tin	Tin	97	0	97	245	23765
PNGT	Each	914	0	914	1.5	1371
ANGT	Each	4819	0	4819	1.5	7228.5
IV Cannula	Each	6505	0	6505	10	65050
Scalp Vein	Each	609	0	609	0.5	304.5
Erythromycin 250 mg tab, 1000/Tin	tin	10	0	10	345	3450
Amoxaciline 250mg/5ml susp,100 ml/bottle	Bott	6099	0	6099	25	152475
CTC of 100	PK	41	0	41	10000	410000
Artemether 120 mg plus 20 mg lumefantr of 24 tab	Dose	18942	0	18942	15	284130
Artusinate(Rectal) of 50	Dose	287	0	287	5	1435

mg						
Quinine 600 mg (PO) of 1000 tab	Tin	2583	0	2583	200	516600
Chloroquine 150 mg of 1000tab	Each	9758	0	9758	9	87822
RDT of 25 pieces	pk	574004	0	574004	10	5740040
CAF oil of 3gm injection of 100	Box	16066	0	16066	120	1927920
TI bottle	Each	167	0	167	250	41750
LP set		167	0	167	640	106880
syringe with needle 5 ml 1000	Box	335	0	335	150	50250
Vit A Of 1000 caps	Box	240	0	240	370	88800
Tetracyclline eye ointment of 100 tube	Box	30	0	30	210	6300
Amoxaciline Syrup of ml250/5ml of 100	Bottle	30	0	30	30	900
ASA of 100 mg	Tin	3000	0	3000	220	660000

Zonal level

Health and nutrition part of the Belg Assessment 2015 was conducted in South Wollo, North Wollo, and North Shewa zones of Amhara region.

Coordination

Multispectral coordination forum is established in all assessed zones but not active.

Outbreak situation

There was an outbreak of typhoid fever (432 cases) in legambo and Mekdela, whooping cough (543 cases) in Mekdela, Food poisoning (9 cases) in legehida and measles (480 cases) and 4 deaths in the last three months.

Currently there is no ongoing outbreak in the assessed belg woredas of three zones, South Wollo, North Wollo and North Shewa

Anticipated epidemics

Water borne diseases (AWD, typhoid fever, and dysentery), malaria, measles, meningitis and malnutrition are the anticipated epidemics as well as flood and North Wollo & North Shewa anticipates displacement. South Wollo also reported risk of landslide in the coming months.

Public Health emergency management

In the assessed zones, there is public health emergency preparedness and response plan, which is not funded but in most cases it, is supported by current budget to provide immediate response. With respect to emergency drugs and supplies, health sectors have got directly from PFSA for routine health activities. They can use those supplies for emergency, which will be reimbursed from the allocated budget, by districts. This does not mean that the budget allocated is adequate and cover the demand during emergencies.

Woreda level

Socio-demographic profile

During Belg human health and nutrition emergency needs, assessment one district was visited from each zone. North Wollo (Meket, Gidan and Gubalafto), Delanta, Legambo, Legehida and Mekedela districts were visited from South Wollo and Menz Mama, Menz Gera Midr and Antsokia Gemza were visited from North Shewa. Respective zonal health departments and disaster prevention offices based on diseases trend and natural disasters selected the districts.

A total 10 woredas (four from South Wollo, three from North Wollo, three from North Shewa) were included in the assessment. Total population of 1,463,149(22.6%) was covered by the assessment.

Table 32: Socio-demography of Population included in Belg assessment, 2015

Zones	Assessed Woredas	Total Population	Population Assessed	Male	Female
North Wollo	Meket, Gidan and Gubalafto	1553346	588932(37.9%)	292,699	296233
South Wollo	Delanta, Mekdela, Legambo and Legehida	2,858,592	565,476(19.8%)	281042	284,434
North Shewa	Antsokia Gemza, Menz Gera Midr & Menz Mama	2,056,131	308741(15%)	153444	155297

Health Profile

According to the assessment findings; Pneumonia, Diarrhea, Upper respiratory tract infections (URTI), Helmintiasis, skin disease and AFI were the leading cause of morbidity in children under five years of age. In adults and children above the age of five, AFI, URTI, pneumonia, malaria, and unspecified Gastro Intestinal diseases (GI) were reported to be the leading cause of morbidity in the year 2007 E.C (2014/15) in the visited Woredas.

Morbidity and Mortality Data

Malaria

A total of 2230 malaria cases and no death were reported from ten woredas of North Wollo (1057), North Shewa (364) and South Wollo (809) from January to May 2015.

Mealses

A total of 480 measles cases and four deaths were reported from the assessed woredas of South Wollo, North Shewa and North Wollo zones.

Other diseases

Diseases such as Whooping cough (Mekdela), Typhoid fever (Legambo), food poisoning (Legehida) and suspected rabies (Guba Lafto) were reported.

North Wollo zone had reported destruction of 81 houses by fire, which affected 403 people in five woredas (Habiru, Raya Kobo, Gidan, Dawunt and Wadila). Expected reasons were social problems and use of modern chimney. However, it needs further study.

Outbreak

There were measles, whooping cough, and food poisoning and typhoid fever outbreaks in the last three months.

Ongoing outbreak

Currently there is no ongoing outbreak in all visited districts during the Belg human health and nutrition needs assessment.

Emergency drugs and supplies for preparedness

All visited districts in South Wollo allocated budget of public health emergency management (30,000 to 60,000 ETB) in addition health facilities allocate for PHEM from their budget. All visited districts could not keep emergency drugs at district store, they distribute any drugs they received from zonal health department to health facilities. In case of any outbreak they will mobilize necessary drugs from health facilities which will be reimbursed later. Ringer lactate, ORS, doxycycline, gloves, amoxicillin suspension, tetracycline, vitamin A, Coartem, RDT (malaria) were available but CTC kit and RDT (pastorex) for meningitis and sample collection tubes were not available.

Coordination

All the visited nine districts in three zones have multisectoral PHEM coordination forum but not active/functional. It was reported that their RRT is rather active. Most woredas have EPR plan, which is partly funded by Government.

Risk Analysis

Malaria

Except Menz Gera and Menz Mama Woredas in North Shewa, all the assessed woredas (eight) in three zones have endemic kebeles, breeding sites, interrupting rivers and unprotected irrigations. Legambo, Legehida, Mekedela and Delanta in South Wollo zone, Meket Woreda in North Wollo and Antsokia Gemiza woreda in North Shewa zone have LLINs coverage less than 80% and

were not replaced. IRS coverage is more than 80%. A total population of 363,486 is at risk of malaria.

Meningitis

All the visited woredas reported no meningitis epidemic in the last three years. However, most of them in the meningitis risk zones did not conduct vaccination in the last three years.

AWD

There was no AWD epidemic in the last three years in all assessed woredas. However, most are at risk of outbreak due to history of AWD in the years in different areas of the region, flood risk (Antsokia Gemiza in North Shewa, Kobo in North Wollo, Dewa Chefa & Kemissie in Oromia zone), low safe potable water coverage in most assessed districts, absence regular water treatment and high population movement and gatherings in Minjar Shernkora and Mojana Wedera districts in North Shewa zone.

Measles

All the visited woredas in three zones reported measles coverage more than 90%. However, there was no SIA in all the assessed woredas.

Table 33: Number of cases from January to May 2015 in visited woredas, South Wollo

		AWD		Malaria		measles		meningitis	
District	Month	cases	deaths	4	0	cases	deaths	cases	deaths
	Jan-2014	0	0			12	0	0	0
	Feb-2014	0	0	6	0	0	0	0	0
	Mar-2014	0	0	6	0	0	0	0	0
	Apr-2014	0	0	6	0	15	0	0	0
Delanta	May-2014	0	0	0	0	0	0	0	0
	Jan-2014	0	0	16	0	0	0	0	0
	Feb-2014	0	0	16	0	3	0	0	0
Legambo	Mar-2014	0	0	28	0	2	0	0	0

	Apr-2014	0	0	27	0	0	0	0	0
	May-2014	0	0	20	0	0	0	0	0
	Jan-2014	0	0	6	0	0	0	0	0
	Feb-2014	0	0	2	0	0	0	0	0
	Mar-2014	0	0	3	0	0	0	0	0
	Apr-2014	0	0	5	0	0	0	0	0
Legehida	May-2014	0	0	0	0	0	0	0	0
	Jan-2014	0	0		0	0	0	0	0
	Feb-2014	0	0		0	0	0	0	0
	Mar-2014	0	0		0	0	0	0	0
	Apr-2014	0	0		0	0	0	0	0
Mekedela	May-2014	0	0		0	0	0	0	0

II. Nutrition

Currently regional nutrition situation is normal and stable. However, in some assessed belg woredas of three zones SAM cases found to be increased in May 2015. The current figure can be increased due to failure in the belg season harvesting.

With respect to supply, no major supply issues were raised by woredas, except Mekedela where shortage of F 75 was reported. However, it needs to strengthen supply chain system and capacities in logistics to make sure, when urgent responses are in need.

According to the assessment findings, crop production expected by North Wollo, North Shewa and South Wollo is 14.1%, 16.2% and 10 % respectively. This has shown great loss of production and great risk of household food insecurity, which could exacerbate and intensify malnutrition among children and lactating mothers and pregnant women. Zones presented 34, 0259 beneficiaries for emergency food support. January to May 2015 generally malnutrition has been sharp risen and sharp fallen in South Wollo for unexplained reason and slightly increased in North Wollo starting from April 2015, however the trend seemed stable in north Shewa. Some

of the woredas such as Mida (260), Gishe (122) and Basso (116) that were not assessed have shown significant SAM cases.

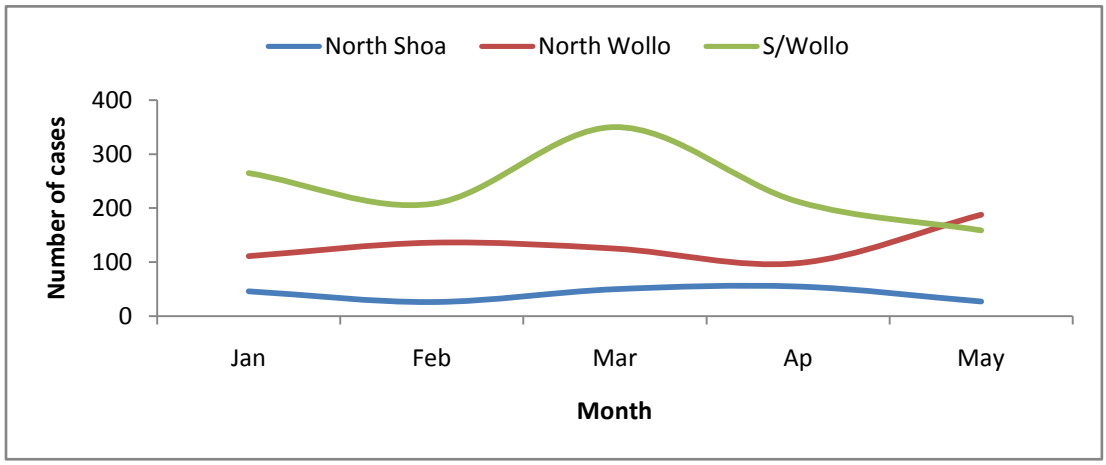

Figure 41: Trend of Malnutrition by assessed zones, Jan-May 2015

Malnutrtion trend in South Wollo indicated that Mekdela district had increased case load in March comparing other woredas in the zone.

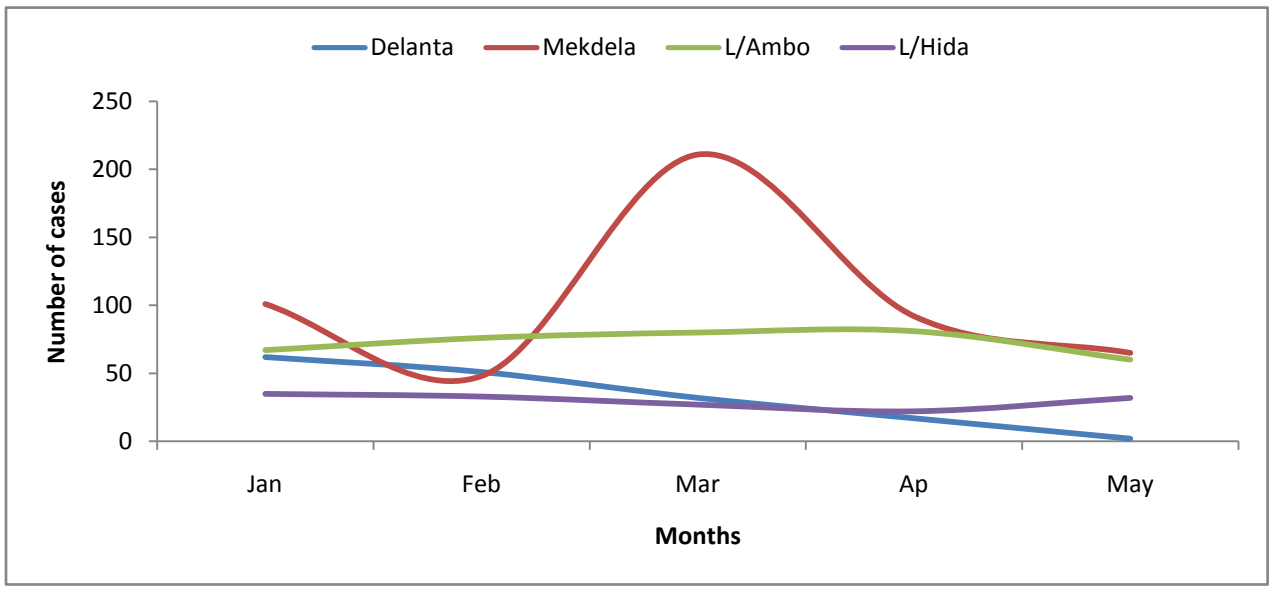

Figure 42: Trend of SAM by woredas in South Wollo, 2015

Challenges/ gaps

- Non participation of some government sectors in emergency preparedness and response forum and inactive forum
- Lack of budget/fund for EPRP at regional and zonal and shortage in some woredas.
- Measles outbreak in some woredas despite high measles vaccination coverage.
- Shortage of budget and chemicals responsible for IRS operation.
- Low action in environmental activities for prevention and control of malaria
- Getting the right person/expert for information during woreda visiting
- There is no emergency drugs and medical supply stock at different level

Recommendation

- Strengthen the surveillance preparedness for the identified risk
- The multispectral forum should be activated and involve both government sectors and partners.
- The prepared EPRP budget should be funded especially for RHB/PHEM and zones
- EPI activities should be strengthened.
- Prevention and control of malaria should be enhanced
- Attention should be given during such national assessment
- Enhance the supply chain management or logistics need to be contacted soon and get them ready as resource funding and mobilization may take its own time.
- Different emergency nutrition program interventions need to be strengthened
- Strengthening nutritional programs, or work on capacity building of staffs and health system service deliveries.

Annex IV: Rapid Belg assessment Tool- Health Sector

Interviewer name_____ Institution:_____

Region:_____

Interview Date:

(dd)____/(mm)_____/2015_____

Zone:_____

Woreda_____

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

SECTION I: SOCIO- DEMOGRAPHIC PROFILE				
Woreda total population:	M:_____F:_____		Under 5_____	Total:____
Special Population *(if any):*	Pastorals___	Refugees____	IDPs___	Migrant Workers___

SECTION II: HEALTH PROFILE	
2.1.Morbidity (List top 5 causes of Morbidity) in the year 2007 EC (2015 GC)	
Morbidity below 5	Morbidity above 5
1.	1.
2.	2.
3.	3.
4.	4.
5.	5.

2.2.List number of cases/deaths from Tir 2007 to Ginbot 2007 (Jan-–May 2015)

Month	AWD		Malaria		Measles		Meningitis		Other (specify)
	Cases	Deaths	Cases	Deaths	Cases	Deaths	Cases	Deaths	
Jan 2015									
Feb									

2015									
Mar 2015									
April 2015									
May 2016									
2.3.Ongoing outbreak									
Is there any ongoing outbreak of any disease? YES_____ NO_____									
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)_____									
4.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□			
Amox suspension (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 M 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?			
2.5.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□	

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 2004		
	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 2004, less than one year (Hamle 2003-Megabit 2004)		
	Has SIA been conducted in 2004 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 January to May 2012

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	
Sept									
Oct									
Nov									
Dec									
Jan									
Feb									

Any comment

_____

_____

_____

CHAPTER VIII –Protocol/Proposal for Epidemiologic Research Project

Prevalence of MDR TB and Associated Risk Factors among HIV Patients Attending Felegehiwot Referral Hospital ART Clinic, Bahir Dar, Ethiopia

Addis Ababa University

Faculty of Medicine

School Of Public Health

Master of Public Health

Research Project

This Proposal Submitted to the School of Public Health Addis Ababa University in Partial Fulfillment of the Requirements for the Degree of Masters in Field Epidemiology.

Name of investigator	Misganaw Ayalew Adane (BSc)
Name of advisors	Mr. Belay Bezabih Beyene(MPH) Mr. Teklehaymanot Gebrehiwot Kidanemariam(MPH)
Full title of the research project	Prevalence of MDR TB and associated risk factors among TB suspected HIV Patients Attending Felegehiwot Referral Hospital, Bahir Dar, Ethiopia
Duration of the project	Five months
Study area	Felegehiwot Referral Hospital, Bahir Dar
Total cost of the project	89,149.7 ETB
Address of the investigator	Phone +251910714466 Email- misganawayalew1@gmail.com

Summary

Background: In 2014, 6.3 million cases of TB were notified by national tuberculosis programmes (NTPs) and reported to World Health Organization. Tuberculosis (TB) is a leading cause of morbidity and mortality in people living with HIV, including those on antiretroviral therapy.

People living with HIV are 29 times more likely to develop TB disease. It is unclear whether HIV infection is a risk factor for drug-resistant or multidrug-resistant tuberculosis. Mortality rates among MDR-TB patients have been reported to be as high as 37% and 89% among HIV-negative and HIV-positive patient respectively

Methods: We will conduct a facility based cross-sectional study among HIV patients in Felegehiwot referral hospital**.** Study subjects will be selected by simple random sampling using the unit ART register as sample frame. The total calculated sample size will be 423. We will collect data using structured interviewer administered questionnaire. Study subjects that fulfill the WHO MDR TB diagnosis algorithm will be instructed to provide one sputum sample and gene Xpert test will take place. We will enter data into Epi Info7 and will be analyzed using SPSS version 21. Bivariate and multivariate analysis will be undertaken and results will be displayed in frequencies tables, charts and maps

Work plan: The data collection and analysis procedure will take place from May, 1/2016 to September 30/2016. The total budget required to run the research is 89,149.7 ETB

Dissemination of results: Findings of the study will be disseminated to the Amhara national regional state health bureau, Addis Ababa university school of public health, federal ministry of health, Felegehiwot Referral Hospital and other concerned bodies. Hence the result will help for planning and decision making by the responsible authorities. Any attempt will also be made to present the paper on annual scientific meeting and conferences and to publish on reputable research journals.

Key words: MDR TB, HIV, Felegehiwot Hospital

Introduction

In 2014, 6.3 million cases of TB were notified by national tuberculosis programmes (NTPs) and reported to world health organization: just over 6 million individuals were newly diagnosed and 261 000 were previously diagnosed TB patients whose treatment regimen was changed.

Tuberculosis (TB) is a leading cause of morbidity and mortality in people living with HIV, including those on antiretroviral therapy (2). In Ethiopia, HIV adult prevalence is estimated at 1.5% in 2011.

The adult prevalence was almost twice as high among females compared to males at 1.9% versus 1.0% respectively. The distribution of HIV prevalence also varies by age, peaking earlier in females in the 30-34 years age group compared to 35-39 years in males. Looking at the younger age groups it can be seen that young women have a two to six fold higher HIV prevalence than young men (ranging from 15-17 years: 0% males vs. 0.2% females to 20-22 years: 0.1% males vs. 0.6% EDHS 2011. Higher prevalence in Addis Ababa and large towns may be associated with labor migration to large urban areas and large scale construction projects as well as a growing service industry (3).

TB organisms resistant to the antibiotics used in its treatment are widespread and occur in all countries surveyed. Drug resistance emerges as a result of inadequate treatment and once TB organisms acquire resistance they can spread from person to person in the same way as drug-sensitive TB (4). HIV-infected patients are more likely to be affected by multidrug-resistant TB (MDR-TB) (5). Globally, 5% of TB cases were estimated to have had MDR-TB in 2013 (3.5% of new and 20.5% of previously treated TB cases). A new analysis of trends focusing on the years 2008−2013 shows that, at the global level, the proportion of new cases with MDR-TB remains unchanged at around 3.5%. However, serious MDR-TB epidemics in some countries jeopardize progress (6). In Ethiopia 1.6% of the newly diagnosed TB cases and 12% of the retreatment cases are estimated to be MDR TB cases(7).

Statement of the problem

TB organisms resistant to the antibiotics used in its treatment are widespread and occur in all countries surveyed.

Globally, TB is among the leading causes of serious illness and death in people with HIV. TB treatment outcomes can be excellent in HIV-positive patients, but the treatment and control of TB is complicated by the growing epidemics of MDR-TB. The presence of HIV infection increases the risk of acquiring tuberculosis about 30 times.

The increasing occurrence of drug-resistant TB, especially multidrug-resistant TB, is particularly alarming. It has possessed a substantial peril to the treatment and control of the disease in several parts of the globe, where the incidence of MDR-TB can be as high as 14%.

Sub-Saharan Africa stands the burden of both very high TB incidence and the highest HIV prevalence rates in the world, and represents 14 % of the global burden of new MDR-TB cases.

Ethiopia is the third African country that has highest magnitude of Multi drug resistance next to South Africa and Nigeria.

There is much apprehension that the TB situation may become even shoddier with the spread of HIV globally, a virus that significantly weakens the host immune system and allows latent TB to reactivate and makes the victim more vulnerable to re infection with either drug-susceptible or drug-resistant strains.

It is unclear whether HIV infection is a risk factor for multidrug-resistant tuberculosis. In Amhara region MDR TB was reported from most parts of the region. According to the data analysis from 2010 to2014 342 patients were reported from different parts of the region.

Research Question

This study tries to answer the magnitude and risk factors of multi drug resistance tuberculosis among HIV patients in Felege Hiwot referral hospital.

Literature review

TB HIV co infection

Tuberculosis and HIV are the deadliest infectious diseases worldwide next to malaria, and tuberculosis is one of the main causes of death in HIV-infected persons (8). People living with HIV are 29 times more likely to develop TB disease (9). Less than 50% of the 1.2 million HIV-positive people estimated to have developed TB in the same year, although there was considerable variation among regions. The proportion was highest in the European Region (81%), followed by the Region of the Americas (60%) and the African Region (50%), and much lower in the Eastern Mediterranean, South- East Asia and Western Pacific Regions (13%, 29% and 39%, respectively) (7). In the study done in Cape town South Africa 15–24 year olds, HIV-positive patients were nearly five times more likely to die, whereas for patients 55– 64 years, HIV-positive patients were only marginally more likely to die. Individuals with sputum smear-positive disease, those with HIV were more likely to die than those without HIV(10). HIV positive TB patients comprised one third out of whom only (9%) were registered in HIV treatment clinics and had started using anti-retroviral treatment at the initiation of their TB treatment. Generally the study population had a relatively poor nutritional status; mean body mass index (BMI) 18.9kg/m2 (11).

MDR TB

Multidrug-resistant TB (MDR-TB), defined as resistant to at least isoniazid and rifampicin(12). MDR TB shows threefold increase in 2013 from the 2009 (6). Emerging and spread of drug resistance TB has encountered as a great challenge in Africa region, Sub-Saharan Africa in particular. Information on the extent of MDR-TB from Africa region is very limited, probably due to poor laboratory facilities, poor surveillance mechanisms and reporting procedures, outdated databases and sub-optimal coverage of the infrequent surveys. Among a representative sample of retreatment patients in Harare, a high proportion of case-patients (24%) had MDR TB(13). At least one drug resistance high resistance rates were reported for SM (16.2%) and INH (11.6%)(14). Resistance to at least one drug was detected in 5.8% patients. Any and mono resistance to isoniazid was found in 3.0% and 2.3% respectively. Rifampicin resistance was detected in (0.5%) patients out of whom two 0.2% were multi drug resistant (MDR) TB. Another study done in Cameroon shows prevalence of Multi drug resistance of 5.9%(15) . All the patients with MDR-TB had concurrent streptomycin resistance(11). According to the study done in

Metema and west Armchiho Northwest Ethiopia the overall prevalence of MDR-TB was 5.6 % and prevalence of MDR-TB among new smear positive TB cases was 2.3 % and among previously treated smear positive TB cases 13.9 %(16). Another study done in southwest Ethiopia revealed that pervious history of treatment failure and defaulters were risk factors for Rifampicin resistance(17).

MDR TB HIV co infection

It is unclear whether HIV infection is a risk factor for drug-resistant or multidrug-resistant tuberculosis(8). Despite the fact that HIV epidemic _spæds up' the emergence of drug resistance in communities by shortening the natural history of TB, resulting in a higher proportion of individuals to develop TB disease, there is no evidence of an association of drug resistance with HIV infection per se(12). Sub-Saharan Africa stands the burden of both very high TB incidence and the highest HIV prevalence rates in the world, and represents 14 % of the global burden of new MDR-TB cases(16). HIV has a strong impact on TB incidence rates and HIV infection has been associated with MDR-TB through outbreaks in institutional settings(18). Mortality rates among MDR-TB patients have been reported to be as high as 37% and 89% among HIV-negative and HIV-positive patient respectively (19). Treatment outcomes were not significantly different between patients on ART before and after the commencement of MDR-TB treatment (20). Patients who received ART prior to commencing MDR-TB treatment were 1.7 times more likely to die compared with those who commenced ART after initiation of MDR-TB treatment (20). In high-HIV-prevalence and drug-resistant TB setting, a history of prolonged hospitalization and previous TB treatment failure were strong risk factors for MDR and high mortality observed among patients with HIV and drug-resistant TB co-infection, previously treated and hospitalized patients should be considered for empiric second (21). The HIV prevalence among the study population for who drug resistance testing result available was 19.1 %. The occurrence of drug resistance was not related to HIV infection status (22). A documented previous TB episode continued to be the strongest possible risk factor for MDR-TB status. A study done in china showed that risk of developing drug resistance is associated with previous history of anti TB treatment but there was no significant association with socio demographic characteristics (23). Patients with previous treatment history had a more than fivefold increased risk(24). Poor treatment Outcomes were associated with BMI less than 18.5 kg/m2), retreatment, diabetes, tumor. The aim of the present study was to obtain baseline data on the level of drug

resistance among HIV infected patients attend HIV care and treatment at Felegehiwot specialized hospital

Justification of the study

Currently, multi drug resistant tuberculosis becomes major health problem around the world. However researches revealed contradictory findings i.e. most researches revealed that there is no relationship between HIV status of patients and the risk of multi drug resistance tuberculosis whereas other researches show presence of HIV infection is one of the risk factors for developing multidrug resistance tuberculosis. HIV has a strong impact on TB incidence rates and HIV infection has been associated with MDR-TB through outbreaks in institutional settings however, there is no conclusive finding about the relationship between HIV infection and multidrug resistance. So far there is limited research on the association between these two deadly diseases in Ethiopia .A five years regional MDR TB data analysis shows that Bahir Dar city is the second place that has high burden of multidrug resistance but there was no study in the area that explains whether it was associated with HIV infection or not. Hence this study will help to answer the association between the two diseases and to take appropriate measures.

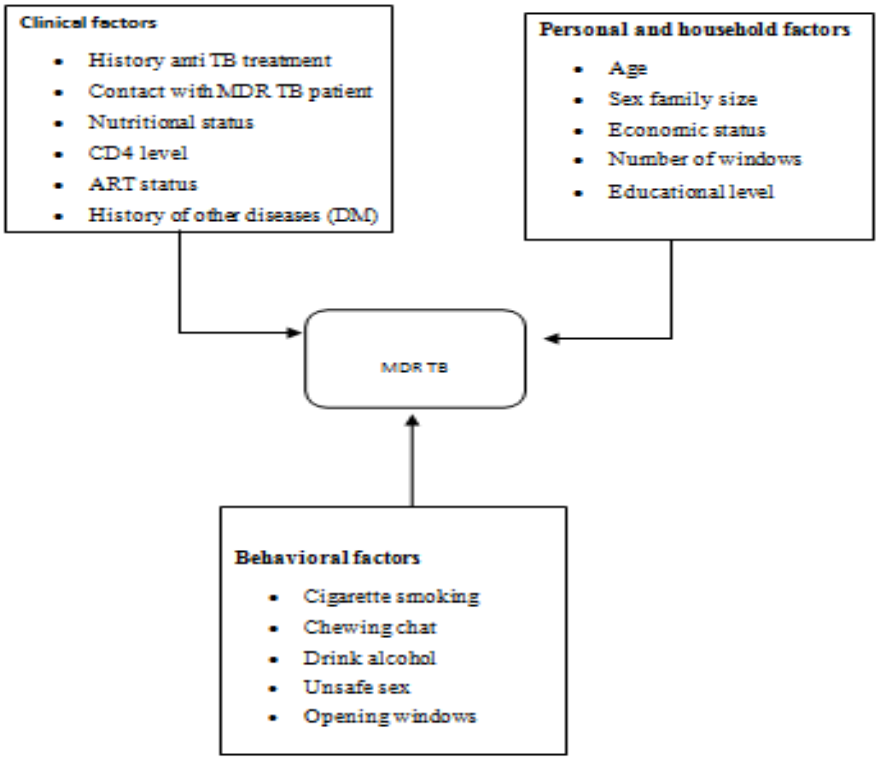

Figure 43: Conceptual frame work of factors affecting MDR TB infection

Objectives

General objective

- To assess the prevalence of MDR TB among HIV patient and associated factors

Specific objective

- To determine the prevalence of MDR TB among HIV patients
- To identify the associated factors for the occurrence of MDR TB

Methods and materials

Study area: We will conduct the study in Felegehiwot referral hospital, Bahir Dar city. Bahir Dar is the Capital city of the Amhara national regional state located 560 km North West of Addis Ababa. It is situated 1135‘60”.00N and 3722‘59.88”E with an altitude of 1840 meters above sea level. According to the 2016 population projection the total population of the city is 311,724

The study will be conducted in Felege Hiwot referral hospital. The hospital was founded since 1960 G.C. It has been providing service for about six million people with 410 beds and it has been giving ART service since 2003 G.C currently it is providing service for 17,771 HIV patients of this 6,025 are currently on ART therapy while the rest 11,746 are pre ART patients the Hospital also started to provide MDR TB treatment since 2015.

Study design: This will be a facility based cross-sectional study among HIV-infected patients attending Felege Hiwot referral hospital ART clinic. Selected patients with presumptive MDR TB will be assessed with gene xpert technique.

Study period: We will conduct the study in Felege Hiwot referral hospital from May to September 2016

Source population: All HIV infected patients who have follow up at Felege Hiwot referral hospital in Bahir Dar city

Study population: All TB Suspected HIV infected patients presenting Felege Hiwot referral hospital who are on HIV care and treatment follow up will be enrolled in the study.

Sampling technique and procedure: All HIV patients attending Felege Hiwot referral hospital in the study period will be screened for tuberculosis. Patients with presumptive tuberculosis will be investigated using WHO standard diagnostic algorithm. A simple random sampling technique will be used to select study subjects that are going to be included under the study using the list in the unit ART and pre ART registration books. Patients who are positive for presumptive MDR

tuberculosis will be listed and participants will be included into the study using simple random sampling technique.

Study subjects: Those individuals selected to be included under the study

Sample size determination: The sample size will be determined using a single population proportion formula.

$$n = \frac{z^2 1-\alpha/2 \times p(1-p)}{d^2}$$

$$n = \frac{(1.96)^2 (0.5)(0.5)}{(0.05)^2}$$

$$= 384$$

Assumptions:

n = the number of MDR TB suspected HIV patients

Z = standardized normal distribution value at the 95% CI, which is 1.96

P = the proportion of MDR tuberculosis suspected among HIV patients, by assuming that the prevalence of MDR TB is taken as 50% because no study was available.

w = the margin of error, taken as 5%. Assuming 10% non-response rate the final sample size will be 423.

Data collection

ART center attendees will be screened by trained nurse working at the ART clinic. Patients with presumptive MDR TB will be investigated using the standard WHO diagnostic algorithm.

Laboratory sample collection

Trained laboratory technologists and microbiologist will run the laboratory sample collection and analysis procedure. TB suspected patients that fulfill the algorithm for MDR TB, will be properly instructed about procedures of sample collection. One sputum sample will be collected from each patient. Samples will be collected and confirmed by gene Xpert for rifampicin resistance. Standard laboratory operating procedures will be strictly followed.

Data quality control

Data collection questionnaire will be pretested before the actual data collection procedure. We will give training for data collector nurses and laboratory technologists who will process the samples. Questionnaires will be rechecked before data entry and data will be cleaned after it is

entered into computer Epi Info 7. Standard operating procedures for sample collection will be strictly followed. .

Data analysis

After data collection is completed questionnaire will be revised for completeness and consistency of data .Then data will be entered into Epi Info 7 and analysis will be done using SPSS version 21.We will perform descriptive and advanced statical analysis. Odds ratio will be used as measure of association between sociodemographic variables, associated risk factors and the occurrence of multidrug resistance tuberculosis among HIV patients. Logistic regression analysis will be used to estimate the effect of risk factors on acquiring multidrug resistance tuberculosis P-value less than 0.05 and 95% CI will be used as measure of statically significance.

Ethical consideration

This study will be conducted after the ethical clearance given by the research and ethics committee of Addis Ababa University, school of public health and Amhara regional health bureau ethical review board. Informed consent will be also obtained from the health facility and study participants and the confidentiality of the information collected from them will be maintained. In addition, the clinical specimen collected during the study period will be used for the stated objectives only and the study participants will be participated once in the study period. For those participants who are positive for MDR tuberculosis, patients will be linked into the MDR TB treatment program.

Variables

Dependent variables

The outcome variable is MDR TB

Independent Variables

The independent Variables are risk factors for multidrug resistance tuberculosis in HIV infected patients this includes socio demographic factors, previous episode TB, contact with MDR TB patient, behavioral factors such as alcohol consumption smoking and chewing and household factors such, income family size, housing condition.

Dissemination of the result

Findings of the study will be disseminated to Felege Hiwot Referral Hospital, Amhara national Regional State Health Bureau, Addis Ababa University School of Public Health, Federal Ministry of Health and other concerned bodies. Hence the result will help for planning and decision making by the responsible authorities. Any attempt will also be made to present the paper on annual scientific meeting and conferences and to publish on reputable research journals.

Work plan

Table 34: Work plan for major activities to be conducted during the project.

S. No.	Activities	Responsible body	Time frame																			
			May				June				July				August				September			
	Topic selection	PI																				
1	Proposal writing	PI																				
2	Submission to mentors and academic coordinators	PI																				
3	Ethical approval	AAU Ethical committee																				
4	Budget release	AAU																				
5	Pretest	PI,DC																				
6	Data collection	PI,DC																				
7	Data analysis	PI																				
8	Writing first draft submission to advisors	PI																				
9	Writing final draft and submission to mentors	PI																				

DC - data collectors

PI –principal investigator

Budget

Table 35: Budget breakdown for different costs required to conduct the research.

Titles	Qualification/quantity	Rate	Duration/days	Total	Remark
Personnel					
Two nurses	Degree	150	60x2x100	12000	
Two lab technologists	Degree	150	60x2x100	12000	
One microbiologist	Msc	200	150x60	12000	
Supervisor	Msc	200	150x60	9000	
Principal investigators		200	150x60	9000	
For principal investigator transport	50	35	50x35	350	
Supplies and reagents					
Pen lexi	20	5	5x20	100	
Dot Pencil	3	1.5	1.5x3	4.5	
Printing and binding cost	4	100	4x100	400	
Sputum cup(pack/1000)	0.5	1000	0.5x1000	500	
Glove (pack/50)	5	200	5x200	1000	
Soap	10	15	10x15	150	
70% alcohol	2 lit	50	2x50	100	
5% NaOCl	5 lit	40	5x40	200	
Xpert cartridge	130	200	130x200	26,000	
Wooden applicator stick	3 pack	100	3x100	300	
Gauze	1 roll	200	1x200	200	
Cotton	4 roll	100	4x100	400	
Lab coat	6	200	6x200	1200	
Total				**84904.5+5% 89149.7 ETB**	

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Annex v. Dummy table

Dummy tables on socio demographic and risk factors of MDR tuberculosis cases among HIV patients in Felegehiwot referral hospital, Amhara, Ethiopia, 2016

		Frequency	Percent
Age	<5		
	5_14		
	15_29		
	30-45		
	46-65		
	>65		
Sex	Male		
	Female		
Occupation	Farmer		
	Government employee		
	Self employed		
	Merchant		
	Daily labor		
	Others		
Educational level	Illiterate		
	1_8		
	9_12		
	>12		
Residence	Rural		
	Urban		
Marital status	Single		
	Married		
	Divorced		
	Widowed		

	N/A		
Ethnic	Amhara		
	Oromo		
	Tigre		
	Others		
Religion	Orthodox		
	Muslim		
	Protestant		
	Others		
Monthly income	<500		
	501-1000		
	>1000		
Number of Families	<6		
	>=6		
Number of windows	<2		
	>=2		
Frequency of opening the window	Always		
	Usually		
	Sometimes		
	Rarely		
	Not at all		

Dummy table Clinical condition of MDR TB suspected HIV patients who had follow up at Felegehiwot referral hospital, Bahir Dar, Amhara, 2016

		Frequency	Percent
Cough	Yes		
	No		
Night sweating	Yes		
	No		
Fever	Yes		
	No		
Weight loss	Yes		
	No		
BMI	<18.5		
	>18.5		
MUAC	<12		
	>=12		
ART status	On ART		
	Pre ART		
Baseline CD4	<500		
	>=500		
Recent CD4	<500		
	>=500		
Previous history of TB	Yes		
	No		
TB treatment category	New		
	Retreatment		
Treatment outcome	Cured		
	Completed		
	Defaulted		
	UK		

Contact with known TB patient	Yes		
	No		
Contact with MDR TB patient	Yes		
	No		
Contact with known TB patient	Yes		
	No		
Contact with people who have cough	Yes		
	No		
Smoking	Yes		
	No		
Duration of smoking	Never		
	Less than six month		
	Greater than six month		
Drink alcohol	Yes		
	No		
Chew chat	Yes		
	No		
	No		
Resistance to rifampicin	yes		
	No		

Factors that might associate with MDR TB among PLWHA at Felegehiwot referral hospital, Amhara North West Ethiopia, 2016

		Positive n (%)	Negative N (%)	OR (95%CI)	P-value
Sex	Male				
	Female				
BMI	< 18.5				
	>18.5				
ART status	Pre ART				
	On ART				
Contact history with MDR TB patient	Yes				
	No				
Previous TB treatment category	New				
	Retreatment				
Previous TB treatment outcome	Cured				
	completed				
	Defaulted				
	UK				
Drink Alcohol	Yes				
	No				
Contact with TB patient	Yes				
	No				
Smoke cigarette	Yes				
	No				
Smoking cigarette	Never				
	Less than one year				
	Greater than one year				

	Yes				
	No				
Chew chat	No				
Body mass index	< 18.5				
	>= 18.5				
Base line CD4	< 500				
	>= 500				
Family size	< 6				
	>=6`				
Open Window	Yes				
	No				
Previous history of TB	Yes				
	NO				
Income	< 500				
	501-1000				
	>1000				

Annex VI. Questionnaire for Epidemiologic Project

My name is _____I am a nurse working at this clinic. There is postgraduate student at Addis Ababa University, School public health who wants to assess how many people are suffering from multi drug resistance TB and the factors that contribute for this disease. The purpose of the study is to provide information on the magnitude of multi drug resistance TB among PLWHA and develop appropriate intervention strategies by the relevant bodies.

I have identified you as a study participant hoping that you would be willing to responding to questions and giving one sputum sample that would be examined for the presence of MDR TB causing agents. As your participation is very important to the outcome of the study I kindly request you to give me your sincere and reliable answers. All your words and the laboratory results will be fully confidential. The physician will prescribe appropriate medicine if you have MDR tuberculosis in the laboratory result.

Do you agree to participate in the study?

1. Yes, thank you Employee the interview followed by collecting sputum specimens.
2. No, thank you

Consent form

I have been briefly informed about the study and clearly understood the objective of the study. So I, here approve my consent with my signature to take part in the study. Signature _____ Date _____

Name of data collector---------- signature----------

Name of supervisor---------- signature----------

	Serial No.	Questions	Options	Remark
Socio Demography		MRN		
	1	ID		
	2	Age		
	3	Sex	Male……..…...1 Female ……..…..2	
	4	Occupation	Farmer…….1 Government	

			Employee……..….2 Merchant……3 Daily labor……4 Other specify…..……..5	
	5	Educational (highest grade level attended)		
	6	Address------woreda ---- Kebele ---- Phone -------	Rural ……..……1 Urban ……..2	
	7	Marital status	Single…….....1 Married…….....2 Divorced……..……..3 Widowed…….....4 N/A…….....5	
	8	Ethnic	Amhara…….....1 Oromo ……..2 Tigre ……3 Others……...4	
	9	Religion	Orthodox…….....1 Muslim…….....2 Protestant…….....…….....3 Other…….…….....4	
	10	Monthly income		
	11	Number of families		
	12	Total rooms in the house		
	14	Number of windows in the house		
	15	How often do you open windows in your home	Always ……..……1 Usually…….....2 Sometimes…….…….....3 Rarely ……..……4 Not at all…….……...5	

Clinical information	16	Cough	Yes ……..…..1 duration ---------days No ……..…..2	
	17	Night sweating	Yes…….1 duration--------days No…….….2	
	18	fever	Yes,…….1 duration--------days No ……..2	
	19	Weight loss	Yes…….1 ----------% No ……..……2	
	20	Height(m)		
	21	Weight (kg)		
	22	BMI		
	23	MUAC		For children < 5yrs and pregnant women
	24	Date HIV tested (diagnosed)	DD/MM/YY(------/------/---	
	25	ART status	Pre ART ……..…..1 ART……..2	
	27	Date ART started	DD/MM/YY(-------/-----/---	
	28	CD4 count baseline		
	29	CD4 count recent		
	30	Previous episode of TB	Yes…….1 No …….2	
	31	If yes when	DD/MM/YY(------/------/---	
	32	If yes how many episodes	New ……......1 Retreatment……..……2	

	32	If yes what was your treatment outcome	Cured……...1 Completed……....2 Defaulted…….....3 UK…….4	
	33	Do you have contact with known TB patient	Yes…….……1 No ……....2	
	34	Do you have contact with known MDR TB patient	Yes…….....1 No ……2	
	35	Do you have contact with someone who has current cough?	Yes……....1 No ……...2	
Behavior	36	Smoking	Yes…….……..1 specify amount -------- No ……..2	
	37	Drink alcohol	Yes……..1 specify(type)---------- amount daily ---------- No …….....2	
	38	Chew khat	Yes ……....1 No ……...2	
Resistance to first line anti TB drugs	39	Rifampicin	Yes…….……..1 No ……...2	

Chapter IX - Additional outputs

9.1. Emergency health and nutrition preparedness and response in drought affected districts of South Gondar zone of Amhara regional state , August to October 2015

9.2. Training on public health emergency management system for Zonal, woreda PHEM officers and facility PHEM focal persons prepared by the Amhara regional health bureau held at Woreta ,Woldia ,Debretabor , Dangla and Shewarobit , 2015/6

9.3. Participated in Ebola screening at the 23rd annual summit of African Union, December 2014

9.4. Integrated supportive supervision in North Wollo and Waghimra zones July 2015

9.5. Supportive supervision malaria and scabies outbreak response in North Wollo and Oromia zones of Amhara region, February 2016

9.6.Supportive supervision on influenza outbreak response in South Gondar and Awi zones of Amhara region, February 2016

9.7. Preparation of weekly epidemiologic bulletin and reports

9.8. Conferences.

9.1. Emergency Health and Nutrition Preparedness and Response in Drought Affected Districts of South Gondar Zone, Amhara Regional State, August to October 2015

Introduction

The global climate information indicated that there will be an El-Nino effect which affects many countries globally including Ethiopia. According to USA National Oceanic Atmospheric Administration (NOAA) El Nino has an 80% chance of lasting into early spring 2016. El Niño is a periodic appearance of unusually warm sea-surface temperatures (SSTs) in the central and eastern Pacific Ocean. It is the most prominent known driver of interannual variability in weather and climate around the world. Nationally about 98 woredas were on priority one which need emergency response 175 and 55 woredas were on priority two and three in all the three scenarios 39,401,502 people are expected to be affected by the drought. In Amhara region about forty one districts are on priority one requiring an immediate response where there 22and 7 woredas on priority two and which needs close follow up. In general there are people expected to be affected in the region in all the three scenarios. Ebnat Lay Gaynt, Tach Gaynt and Simada woredas are one of the first priority woredas in the region about 28 kebeles were vulnerable by the drought

about 162,031 people at risk of malnutrition and related health problems however the problem may not be limited to this kebeles only. Screening result reveals that there is an increasment in the number of sever and moderate acute malnutrition. Major El Nino Southern Oscillation (ENSO) events were recorded in 1972–73, 1982–83 and 1997–98, with the 1997-1998 episodes being one of the strongest ever. The impacts of El Niño are felt most in different regions and seasons in Africa.

Objectives

- To assess the preparedness status of priority one woredas in order to detect and respond for nutritional emergencies
- To provide technical support in the management of malnutrition
- To assess and strengthen the surveillance activities of the districts

Methods

Study area: The assessment was conducted in four priority one woredas found in South Gondar zone (Ebinat, Tach Gaynt , Lay Gaynt and Simada) the woredas account 848,439 of the population in the zone. Most kebeles affected totally while some affected partially or not. Additionally in Simada there is also a hailstorms damage of crops in another eight non drought affected areas.

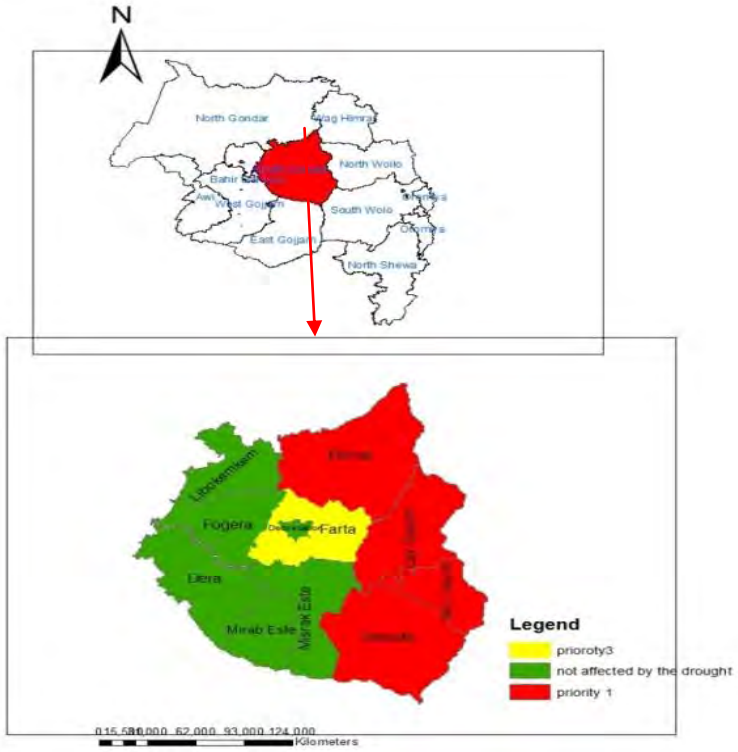

Figure 44 : Map of districts affected by drought in South Gondar zone, August 2015

We conducted briefing with the Zonal PHEM and nutrition officer before we went to the woredas and discussion held with woreda health office staffs, woreda administrators, technical committees, visit health center and health posts. We concluded our assessment by conducting debriefing with zonal health department.

Table 36: Number of drought affected population and woredas in South Gondar Zone, 2015

Woreda	Number of kebeles affected	Total Kebeles	Total population of the woreda	Number of population in the affected	Proportion of affected population
Ebnat	9	37	255,266	52,635	20.6%
Lay Gaynt	5	29	201,787	29745	14.7%
Simada	8	40	257,446	39578	15.3%
Tach Gaynt	6	14	114,484	40,073	35%

Coordination

Although it doesn‘t include some of the relevant sectors the woredas had preexisting multi sectoral coordination committee. It had no regular meeting regarding the nutritional emergency. Similarly the multi sectoral technical committee was not actively acting against the nutritional emergency. During our supervision we held meeting with the technical committee and we give an orientation about their term of reference and all the activities they should do in the next months regarding the nutritional emergency. The coordination committee is not established at kebele level and we gave recommendations to the woreda health office staff to strengthen committee at kebele level.

Human resource

The districts had scarcity of trained health care providers trained on the management of sever acute malnutrition. Only Ebnat district has adequate number of health care providers (12) trained on the management of sever acute malnutrition in six health centers. Health extension workers were trained by the ICCM program on the management of SAM. On the other hand there were no trained person on WASH at health facility and no trained health worker assigned for logistic & supply management. Team for social mobilization activity was not formed besides training is no given to the HDA at community level for nutritional emergency response. Cases were identified daily there is functional anthropometric measurement instruments.

WASH (water, hygiene and sanitation)

Lack water treatment chemical and poor access of safe and potable water was critical problem. In all visited woredas most sources of water were dried. Unprotected spring, rivers and ponds have been used for house hold consumption. In most kebele like Tach Gaynt the community cannot access even from the above type of sources. This inaccessibility of water for both drinking and hygiene leads the community to water related diseases like scabies (Tach Gaynt) and diarrheal diseases (Lay Gaynt 50 cases).

Figure 45: Water sources in Endwa kebele Tach Gaynt South Gondar, 2015

To respond this problem the districts arranged to dig ponds for animal consumption and Tach Gaynt district also allocate 100,000 ETB to buy roto in order to truck water to the community

The other problem was shortage /absence of water treatment chemicals at household level. Water treatment agents like *wuha agar*, *bishan gaari* and aqua tab were not available.

Case management

All the districts had at least one health center which was ready to provide SC service. Ebinat has six health centers which have been providing SC service and OTP is given in all health posts. These facilities had functional anthropometric measurement, supplies and skilled health workers. The major challenges were the stabilization centers were not well equipped intermes of materials (like foams cups, red scope, guidelines, kerosene) water supply, especially in Quailsa health center. The SC rooms were narrow in all the health centers to accommodate the patient flow that were going to be treated in patient services. HEWs have technical gaps in the management of SAM (amox, vitA, measles were not given and High number of defaulters (Balarb health and Segno Gebeya health post). The other major problem was the health centers were located at the woreda town which is far (upto150km) from the areas affected by the drought and had no transportation access.

Epidemiological surveillance

All visited health facilities had functional weekly disease surveillance system. They conduct nutritional screening routinely and those affected kebeles were identified and mapped. However data was not analyzed at woreda and facility levels, no functional RRT, budget was not allocated

for public health emergency and there was no functional community base surveillance to report any unusual event.

Logistics and supply management: Most supplies required for the management of nutritional Emergency were not available in adequate amount in all woredas (ReSoMal, OTP card, antibiotics, pulpy nut, TSF).Task force was not established for logistic management. The IPLS system was not implemented properly health development armies were not oriented to monitor the utilization of RUTF and TSF at household. There was no trained person on logistic management at woreda level. Some supplies were not properly stored exposed to rodents and damage

Conclusion

Most of the woredas were not well prepared to respond the current nutritional emergencies.

Activities done

- We gave half day orientation about nutritional emergency for the staffs of the woreda health offices at each woreda.
- We assisted and facilitate screening procedure in the woredas.
- Meeting conducted with the woreda nutrition technical committees
- We gave onsite orientation and technical support to health care providers and health extension workers during our assessment of health facilities
- We have assisted assist to develop emergency preparedness plan
- We discussed with HC heads to arrange class for SC service and fulfill the necessary equipments
- We discussed with the woreda health office to avail food for care takers.
- We gave feedback for the woreda administration on the vehicle arrangement during transportation of logistics, to take solution on staff shortage and strengthening the woreda coordination committee Simada)
- Orientation was given to woreda health office heads and officers, woreda administrative about current nutritional issues

- We Conducted supervision to health centers and health posts and tried to give orientation and technical support and we made another health centers to be ready to give SC by giving on job training until formal training is arranged.
- We have assisted in planning of logistic requirement and contingency plans
- Rearranging training schedule with the regional health bureau for those have not trained person
- We coordinated mass drug administration campaign for scabies outbreak response
- We discussed with the regional water bureau and responsible partner to avail water treatment chemicals

Challenges

- Perception of the zonal and woreda health departments towards current nutrition
- Inaccessibility of most of drought affected areas
- Absence of health extension workers at the kebele because of IRT training in some woredas
- Unavailability of water treatment chemical at zonal and regional level.

Recommendations

- The district coordination and technical committees should be established immediately (strength the already existing and conduct regular meeting evaluation and monitoring) and must be functional
- Strengthen the health development army concerning the current nutritional emergency to take part in the social mobilization activities.
- Capacity building activities health care providers must get refreshment training and clinical mentoring additionally; new health professional must be trained
- The woreda administrations must allocate budget for care givers food to minimize the number of defaulters and for Emergency management
- The water treatment chemicals should be available to the communities and clear responsibility should be assigned either to the health or water sector regarding treating water and availing chemicals.

- The district PHEM officer should consistently follow any changes in public health event and avail case definitions and national guide lines to health facilities.
- ITN distribution for Ebnat woreda
- The woreda had better to construct health posts that does not fulfill the standard requirement (Brukoch health post) even the roof cannot protect rains it also so has no space to offer any service
- Clear TOR should be given for the technical committee
- Conducting regular meeting and evaluating the performance of the technical committee
- The technical committee should also conduct weakly meeting and should present real situation of the problem to the coordination committee
- We recommended conducting nutritional screening at all kebeles screening continuously
- All the necessary supplies (ReSoMal, NG tube, antibiotics etc) should be fulfilled urgently.
- Water treatment chemicals should be availed by the responsible organ and Drinking water sources should be treated properly
- Therapeutic supplementary feeding should be given to the people who are moderately malnourished

9.2. Supportive Supervision Malaria and Scabies Outbreak Response in North Wollo and Oromia Zones of Amhara Region, February, 2016

Objectives

- To assess the overall PHEM undertakings especially, malaria morbidity &scabies outbreak situation in Oromia and North Wollo Zones
- Identify the areas (kebeles) most affected by malaria(scabies)
- To figure out the determinant factors for seasonal malaria morbidity increment
- To identify the gaps in PHEM undertakings
- To provide technical support on surveillance and outbreak management

Method

We conducted supportive supervision in North Wollo and Oromia zones of Amhara national regional state. Artuma Fursi and Jile Timuga Woredas of Oromia Zone .Two health posts in each and one health center in Jile Timuga (Bete HC) were visited. In North wollo three woredas Meket (Debre Zebit health center, Lasta (Belbela health center and Loza Maryam health post) and Raya kobo (Amaya health center) were visited. The woredas were selected based on the malaria burden and ongoing scabies transmission. We emphasized the latest four consecutive weeks (week1 to week 4) malaria data of year 2007 & 2008.

We reviewed reports& records; weekly PHEM report (2007 and 2008) was analyzed to figure out the malaria morbidity. We also interviewed the key informants (PHEM officers, Heads) at woreda and Zonal level and Health Extension Workers. Five households in the catchment of the health posts were conveniently selected to check for LLIN utilization and scabies cases.

We briefed the Zonal health department and Woreda health office on the purpose of the visit and also debriefed the finding after the field visit.

A. Oromia zone

Finding

Malaria Morbidity Situation: The weekly malaria morbidity in Amhara Region in 2008 E.C has declined by 10% between week 28 and week 4; compared to the previous year of the same reporting period. The decline varied from 0.86% (Oromia) to 44 %(Bahir Dar). Remarkable weekly malaria morbidity increment in Oromia Zone was observed between week two and week four as compared to previous year of the same reporting period. The median weekly increment was 72 % which was the highest increment rate in the region however Oromia zone accounted

for 2 and 3 % of the total malaria cases reported in by the region in 2007& 2008 in the same period .The median weekly decline rate of malaria morbidity in the region in the indicated was 4.6% compared to 2007 (week1 through week 4)

The median weekly increment (week 1 to week 4) as compared to the previous year of the same period was highest in Jile Timuga (three fold), Bati Town Admin (88%) Artuma Fursi Woreda (58%). The malaria morbidity in 2008 (week1 to week 4) in Jile Timuga and Artuma Fursi has shown tremendous increment for four consecutive weeks.

The increment was highest in week three in Artuma Fursi, threefold; from 18 in 2007 to 53 in 2008 and in week four in Jile Timuga was eight times as large as the previous year of the same period ;from 19 in 2007 to 148 in 2008

The total malaria cases reported by the zone in week 4 of 2016 has surpassed the threshold, 222 (2*previous year, 2015) by 75.Surpassing the threshold has been also noted in the three woredas; Artuma Fursi, Bati Town Admin, and Jile Timuga.

Table 37: Woredas of Oromia zone who surpass the threshold from week2 - 4, 2016

Sr. No.	Woreda	Week (threshold surpassed	Threshold (2*previous yr .data		Reported cases	Difference
1.	Artuma Fursi	Week 3	36		53	17
2.	Bati Town	Week 02	24		26	2
		Week 4	20		28	8
3.	Jile Timuga	Week 2	66		154	88
		Week3	116		167	51
		Week 4	38		148	110

In Jile Timuga Woreda the total malaria cases surpassed the threshold (2*previous year malaria) for three consecutive weeks ;week 2 to week 4.The malaria morbidity exceeds the threshold by 88 ,51 and 110 cases in week 2 , week 3 and week 4 respectively which was indicative /call alert for the likely hood of malaria outbreak occurrence .

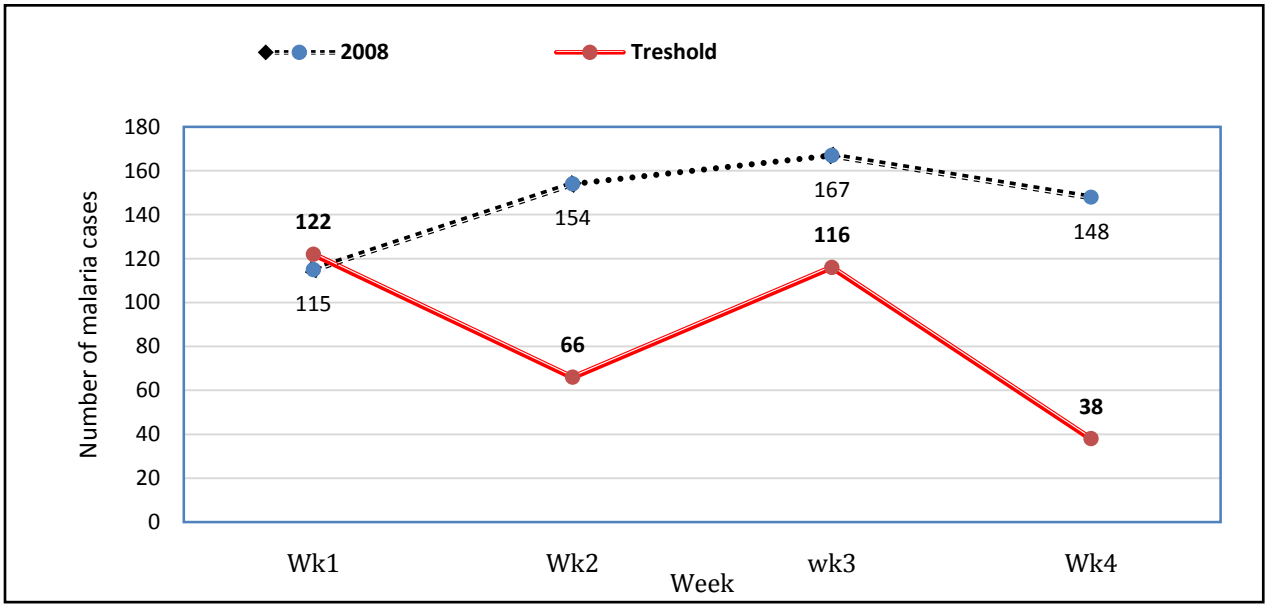

Figure 46: Malaria morbidity in Jile Timuga, Oromia, Amhara, week 1-3, 2015 & 2016

The proportion of plasmodium falciparum cases from total malaria cases in Jile Timuga between week 1 and week 4 of 2016 was 99%.

Scabies

So far, a total of 888 cases have been reported from three woredas; Artuma Fursi, Bati, Dawachefa, Bati Town and Jile Timuga; the majority 748 (84%) cases were reported from Jile Timuga. Artuma Fursi.

The number of scabies cases reported between week one and week four in 2016 were 140. (as shown in the graph below) .Week 1 all cases, week 3 two cases and week four 31 cases were reported from Dewa chefa and two cases from total reported in week 3 and two cases from 33 cases reported in week 4 were from Bati Town Admin and the remaining cases 2 who were reported in week four were from Artuma Fursi.

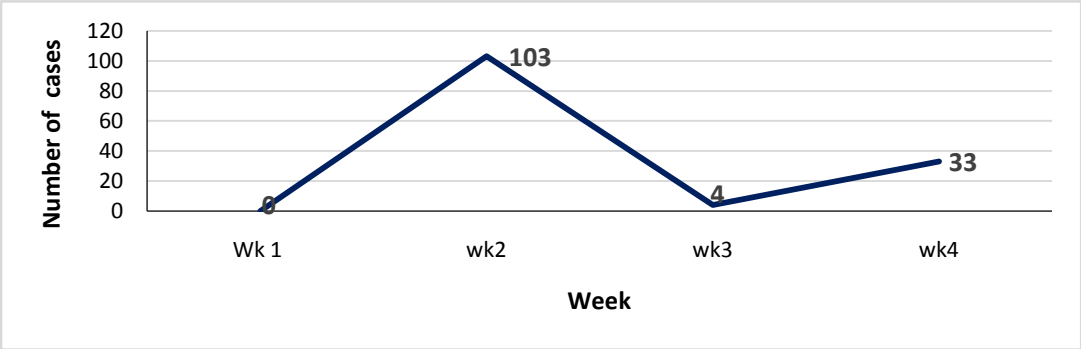

Figure 47: Scabies cases reported in Oromia zone, Amhara, Week 1-week 2, 2016

The region couldn`t find clear information on the true incidence of the scabies outbreak and the containment activities as well. The ZHD has not yet reported the treatment report based on the standard report format prepared by regional PHEM. The disease seems to be increasing from week to week.

Gaps identified during the field visit

Stocked out/Scarcity of anti-malarial drug: The two health posts Muti Fecha (Jile Timuga) and the Chire (Artuma Fursi) were stocked out of antimalarial drug. The antimalarial drugs available in Jile Timuga were not sufficient to treat cases if the malaria morbidity situation remains unchanged.

Low utilization /unavailability of malaria morbidity monitoring chart: None of the facilities (two HPs & one HC) had malaria morbidity monitoring chart to uncover and respond for malaria outbreaks.

Low LLINs coverage and utilization in the visited woredas: We found only 4 LLINs for 32 family members in the five visited households in Kulashi Got, Muti Fecha Kebele and we also observed that only two LLINs were given for a household with eight family members in Chire, Artuma Fursi

Undistributed LLINs: About 825 LLINs in Artuma Fursi were found at different health posts and 4200 LLINs were found in the ware house of Jile Timuga Woreda Health office of which the large number 3650(87%) were donated from World Vision ,the remaining 550 were from FMOH(GF) of which 400 belong to one kebele ,Kodema Ereti .

Poor outbreak response /Investigation: In Bete cluster where malaria morbidity revealed tremendous increment; neither the woreda nor the health center conducted rapid assessment (per the guideline) and concrete response.

Scabies treatment approach: Only scabies cases were treated in all the woredas that report the disease.

Under reporting: The scabies problem in the visited woredas was likely overlooked. We found 19 cases in Bete Health center that were not treated to the next level. None of the facilities were routinely reporting scabies based on the weekly report format.

Data quality: Most of the variables on the line list of scabies were left blank. There were cases that were recorded twice on the line list (Jile Timuga Woreda)

- List of treated cases (scabies) was not found in Muti Fecha Health post
- Case based not properly filled
- Vaccination status – measles vaccination status of the three of the total four cases that were reported by Bete Health center was filled as if they received two doses ; the vaccination date for the last dose was recorded as October 2015 ,though all of the three cases were not in the target group for SIAS ,2015 and the last vaccination date is mostly important for cases who are less than one years of age .

Failure to analyze the data: The data collected were not routinely analyzed and interpreted at all level for local consumption.

Failure to distribute Guidelines: Scabies outbreak management Guideline and brochures were not distributed to woredas and health facilities. There were no PHEM Guideline, Malaria Guideline and case based report format (pad) in Bete, Jile Timuga

The determinant factors for seasonal malaria increment might be:

- Resettlement/ Displacement : Number of households in Muti Fecha Kebele displaced following rail way construction and resettlement of households was also done so that the farmers will be near to their farm (near to Mediresa River)
- Irrigation project :The increment of malaria was noted in kebeles where irrigation is mushrooming
- Low IRS coverage in Jile Timuga and Low LLINs utilization rate

Recommendation

- Mass fever test and treatment – Bete cluster ,Jile Timuga
- LLIN distribution and ensuring proper utilization

- Distribute the remaining LLINs in Kebeles where there was misdistribution(not based on family size)
- Health information on proper utilization of nets

- Use abate chemical on irrigation projects ponds
- Environmental management
- Ensure proper malaria morbidity monitoring chart utilization
- Intensify scabies containment undertakings
- Determine base line prevalence/real burden by kebele in each woreda ,
- Treatment campaign (Treat both cases and contacts simultaneously)
- Post treatment assessment
- Strengthen programmatic supervision

North wollo

The woredas were doing well in terms of listing the cases reported from health facilities. There were 1595, 1074 and 12,512 scabies cases line listed in Lasta, Raya Kobo and Meket respectively. Meket Woreda accounted for more than half of the cases that have been reported in the zone. Two Kebeles in Meket woreda; Kebele 40 & kebele 39 were with the highest prevalence; with prevalence of 36 and 18% respectively.

The major constraints were:

Treatment approach: the woredas neither treated all the cases nor any of the contacts. Meket Woreda has treated 7704(61%) of cases where as Lasta only 263 (16%) cases have been treated in Lasta Woreda. The treatment is not based on the Guideline. Treating cases and contacts

- All cases were given one tube of sulfur irrespective of their age
- Most of health workers lack knowledge on how the patients used topical treatments

Active cases: despite the woreda health offices are saying that they managed in containing the scabies, there are still new cases. In Dibiza, Kebele, Meket Woreda we found a list of 16 cases who had been treated in the health post a couple of hours ago before we arrived there .We also found one student who contracted scabies; according to her, two of her friends and her brother had scabies too. In Amaya Health post, Raya kobo Woreda we found 17 cases treated yet not reported and also we found additional six new cases in a village, Gederu Got during house to house visit

Registration: In the visited facilities (Meket Woreda) the cases were registered by kebele not by Got /village which may make the contact tracking difficult. Some variables such as sex, age were missed while line listed /only names of cases were recorded in Ayub Health center, Raya Kobo Woreda.

Reporting: None of the visited health facilities have managed to include scabies report on weekly PHEM report formats .Scabies report formats (treatment report format) have not yet delivered to reporting health facilities.

Case finding: case finding /active case search is not undertaken periodically .Had active searches were conducted the real burden of cases would have not been overlooked.

Data quality: There was inconsistency /figure fallacy in number of reported scabies cases in Raya Kobo; what had been reported to the region from ZHD, (3200) was by far larger than what we had from the woreda (1074)

Data analysis: The data is not sensitized and analyzed for local consumption at health facility level; what is being done is merely recording /listing

Insufficient medication supplies; the supplies estimation didn`t take the total number of cases and contacts into consideration. The amount was not adequate even to treat cases.

Low LLIN coverage and utilization in the visited villages of Gederu ,Amaya kebele During our visit we found LLIN in two of the six visited households and only three LLINs for 35 family members in the visited six households (one LLIN:11 individuals)

Malaria morbidity monitoring chart /MMC: All the visited health facilities have malaria monitoring chart however none of them were up-to-date. The charts in some facilities were not properly plotted; in Belbela health center, Lasta the threshold was not properly set; the previous year data was simply used without doubling; the graph revealed the occurrence malaria outbreak throughout the year.

Absence of laboratory technician: only two from total six health centers in Lasta are currently doing blood film for malaria; the remaining four health centers are diagnosing malaria using RDT

Other PHEM activities

Report

In Belbela Health center, we found several hard copies of weekly reports, that should have been summated to the woreda health office after reporting had been made via phone .The report of

week 33 of 2015 has not been recorded on the report format , however it was reported via phone to the woreda health office .

Guideline: We couldn‘t find PHEM and scabies guideline in Ayub Health center, Raya kobo

Recommendation

- **Intensify scabies containment undertakings**
  - Determine base line prevalence (the real burden) by kebele in each woreda ,
    - Active case search
    - Reporting newly identified cases weekly using PHEM report format
    - Verify rumors of suspected cases before reporting
    - Data cleaning –clean the on the data line list
  - Treatment campaign (treat both cases and contacts simultaneously)
    - Request treatment supplies (ivermectin & Sulfur) from RHB
    - Avail guidelines and brochures to all health facilities as soon as possible
    - Post treatment assessment
  - Health information
    - Ensure proper utilization of self-monitoring tools MMC ,EPI monitoring chart
    - Distribute LLINs (if there is any) for those who didn`t take during distribution – Ameya,Raya Kobo
    - Strengthen programmatic supervision
  - Provision of feedback

9.3. Public health emergency management training for facility focal persons, woreda and zonal PHEM officers

To strengthen the surveillance activities the Amhara National Regional Health Bureau Public Health Emergency Management (ANRHB/PHEM) core process planned to conduct training. This training was given to make familiar and motive lower level health professionals on public health Emergency management program.

Power point presentations, discussions were used as training methods. Soft copies of the training materials were given for the trainees. The training was given for 373 trainees from health centers woreda health offices and zonal health departments.

The training addressed contents like introduction to public health emergency management system, surveillance and early warning, public health emergency preparedness ,response and recovery, outbreak investigation ,surveillance of rabies measles ,malaria ,meningitis ,malaria, NNT ,Influenza ,Typhoid fever, Relapsing fever and Scabies . The training was successfully conducted according to the schedule. Most of expected trainees from zones and woredas had participated. The participants were from different disciplines like health officers, nurses and environmental health professional

Table 38: Participants of training on public health emergency management from 2015-2016

Place of training	Address of participants	Number of participants	Date of training	
Woldia	North Wollo, Waghimra ,South Wollo and North Shewa	79	August 12-16/2015	Woreda and zone PHEM officers
Woreta	Prison, Private and University clinics	36		Prison, private clinics and university clinics
Woreta	South Gondar	48	March 23-27/2016	Facility focal persons ,and woreda officers
Dangla	Awi	78	January 21-24/2016	Facility focal persons ,and woreda officers
Shewarobit	North Shewa	132	April 11-17 /2016	Facility Focal persons and woreda officers

Disease Surveillance Training for Hospital and Health center PHEM focal persons

Date: 11--17/April 2016E.C. **Venue:** Shewarobit Town

Time	Topic	Presenter/Responsible	
Day one			
08:30 – 09:00 AM	Registration		
09:00 – 09:15	Opening speech	N-S ZHD	

09:15 – 09:30	Pre Test	Participants	
09:30 – 09:55	Introduction to PHEM	Solomon Getachew	
09:55 – 10:30	Early warning and surveillance	Misganaw Ayalew	
10:30 – 10:50	Tea Break	Organizers	
10:50 – 12:30	Early warning and surveillance… contd	Misganaw Ayalew	
12:30 – 02:00 PM	Lunch Break	Individual	
02:00 – 03:30	Planning for Surveillance	Dr Gebrie	
03:30 – 03:50	Tea Break	Organizers	
03:50 - 4:40	Emergency preparedness	Meklit Mekonen	
04:40 –05:30	AWD surveillance	Meklit Mekonen	
Day Two			
08:30 – 08:45 AM	Recap of Day 1	Participants	
08:45 – 10:30	AFP Surveillance & Exercise	Dr Gebrie	
10:30 – 10:50	Tea Break	Organizers	
10:50 – 12:30	Measles Surveillance & Exercise	Dr Gebrie	
12:30 – 02:00 PM	Lunch Break	Individual	
02:00 – 03:30	NNT Surveillance & Exercise	Dr Gebrie	
03:30 –03:50	Tea Break	Organizers	
03:50 – 04:30	Malaria: Surveillance part	Addissu	
04:30 – 05:30	Scabies surveillance & Influenza	Misganaw/Tadele	
Day Three			
08:30 – 08:45 AM	Recap of Day 2	Participants	
08:45 – 09:50	Surveillance and Mgt of Rabies, Anthrax	Misganaw Ayalew	
09:50-10:30	Surveillance of other diseases (Meningitis)	Dr Gebrie	
10:30 – 10:50	Tea Break	Organizers	
10:50 – 11:50	Surveillance of other diseases (Typhoid fever,	Dr Gebrie	

	Typhus)		
11:50 – 12:30	Outbreak Investigation and Mgt	Meklit Mekonen	
12:30 – 02:00 PM	Lunch Break	Individual	
02:00 – 03:00	Response and Recovery	Meklit Mekonen	
03:00- 03:15	Post test	Participants	
03:00 – 03:30	Current issue & Closing remark	N-S ZHD	
03:30 – 03:50	Tea Break	Organizers	
03:50 – 05:30	Admin issue	N-S ZHD	

9.4. Conference

i. Participated at the 26 annual EPHA conference held at Bahir Dar

ii. Participated at the 27 annual EPHA conference held at Addis Ababa and presented two Abstracts

Oral presentation (title: The Magnitude of Multi Drug Resistance Tuberculosis and Related Comorbidties in Amhara Region, Ethiopia, 2010-2014)

Poster presentation (title: Assessment of risk factors for measles outbreak in Mota Town, East Gojjam, Amhara, Ethiopia, May 2015: case control study

9.5. Weekly Epidemiological bulletin preparation


AMHARA NATIONAL REGIONAL STATE HEALTH BUREAU

PUBLIC HEALTH EMERGENCY MANAGEMENT (PHEM) CORE PROCESS

WEEKLY PHEM BULLETIN

Vol II-28| Week 28 May 09- May 15, 2016

Major Issues in the bulletin:

- Weekly surveillance report completeness and timeliness
- Weekly malaria trend in the region
- Regional PHE situation
- Other issues

Malaria Case by District (Woreda)

Comparison of 2007 and 2008 EFY (Week 1 – 35/2016)

Annex VI: CURRICULUM VITAE

1. **Personal information**

- Name: Misganaw Ayalew Adane
- Date of Birth: 05/24/1990 G.C
- Place of Birth: Farta, South Gondar
- Sex: Male
- Marital Status: Single
- Nationality: Ethiopian
- Address: Tel. +251910174466
  E-mail misganawayalew1@gmail.com

2. **Educational background**

- ***Duration:*** September 2008-July 2011
- ***Testimonial :*** Bsc Degree in Public Health Officer
- ***Institution:*** Jigjiga University
- ***Grade:*** 3.35
- ***Duration:*** September 2006-June 2007
- ***Institution:*** Tewodros second preparatory school ,Debre Tabor
- ***Grade:*** 328/500 (Excellent)
- ***Duration:*** September 2004-June 2005
- ***Institution:*** Kimer Dingay Senior Secondary School
- ***Grade:*** 3.57 (Distinction)

3. **Work Experience:**

✓ From October 2012 up to October 2014 worked as health officer at Densa health center Mehal Saint District ,South Wollo Zone , Amhara Region

4. **TRAININGS**

1. Training on: Basic Knowledge of HIV /AIDS

Institution: *Handi cap international in collaboration with Somali regional state health bureau and Jigjiga University, Jigjiga*

Duration: April 20-25 /2010

2. Training on: Basic Emergency Obstetric and Newborn Care (BEMONC)

Institution: Jhpiengo in collaboration with ministry of health, UNICEF and Ethiopian Midwives association, Desse

Duration: May 14-June 2 / 2012

3. Training on: Comprehensive TBL&TB /HIV training

Institution: Amhara regional health bureau in collaboration with MSH/Heal TB and USAID

Duration: August 20-25/2012

4. Training on: Training of trainers on integrated pharmaceutical Logistics System (IPLS)

Institution: PFSA in collaboration with Amhara Regional Health Bureau and Supply Chain for Community Case Management (JSI/SC4CCM), Desse

Duration: February 24-26/2012

5. ***Training on:*** National Comprehensive HIV Care/ART /training

- ***Institution:*** MSH/ENHAT/CS in collaboration with Amhara regional health bureau, Desse
- ***Duration:*** July 15- August 10/2013

6. **Computer skills:** Literate with basic computer skills (MS-word, MS-excel, MS-power point, Internet) and software like EPI INFO, SPSS, Arc GIS

7. **Language**

		Speaking	Writing	Reading	Listening
1.	Amharic	Excellent	Excellent	Excellent	Excellent
2.	English	Excellent	Excellent	Excellent	Excellent

8. **Hobbies:** Reading Novels, books, newspapers and magazines, Listening music, watching movies, doing Physical exercise

9. **Professional Membership:**

Member of the Ethiopian public health association (EPHA

10. **References**

1. Mr. Teklehaymanot Gebrehiwot

Acting PHEM core process owner at Amhara regional health Bureau, Bahir Dar

Tel: +251913059519

Email:wagsyuom@gmail.com

2. Mr. Tesfa Getanew

   Response and Recovery officer at Amhara Regional health bureau Bahir Dar

   Tel: +25191864749

   Email: tesfayegetanew2007@gmail.com

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 suitably acknowledged.

Name: Misganaw Ayalew

Signature: _____

Place: Addis Ababa, Ethiopia

Date of Submission----------

The thesis has been submitted for examination with my approval as a university advisor.

Name of advisors: Mr. Belay Bezabih (MPH)

Mr. Teklehaymanot Gebrehiwot (MPH)

Signature: _____

Date_____