Addis Ababa University College of Health Sciences School of Public Health

Ethiopian Field Epidemiology Training Program

(EFETP)

Compiled Body of Works in Field Epidemiology

By Habtamu Yimer

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

May 15/2015

Addis Ababa

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List of Abbreviations & Acronyms

AAU	Addis Ababa University
AD	Auto Disable
AFI	Acute Febrile Illness
AFP	Acute Flaccid Paralysis
AIDS	Acquire Immune Deficiency Syndrome
ANC	Anti Natal Care
ANRHB	Amhara National Regional Health Bureau
AR	Attack Rate
ART	Anti Retro viral Therapy
AURI	Acute Upper Respiratory Infection
AURTI	Acute Upper Respiratory Tract Infection
AWD	Acute Watery Diarrhea
BF	Blood Film
BPR	Business Processing Re-engineering
BSC	Balanced Score Card
BSc	Bachelor of Science
CAR	Contraceptive Acceptance Rate
CBN	Community Based Nutrition
CDC	Center for Disease Control and prevention
CDCs	Communicable Disease Controls
CFC	Case Fatality Rate
CHD	Community Health Day
CMAM	Community Management Acute Malnutrition

CPR	Contraceptive Prevalence Rate
EC	Ethiopian Calendar
EDRMFSS	Ethiopia Disaster Risk Management and Food Security Sector
EFETP	Ethiopian Field Epidemiology Training program
EFY	Ethiopian Fiscal Year
EHNRI	Ethiopian Health and Nutrition Research Institute
EOS	Enhanced Outreach Strategy
EPHA	Ethiopian Public Health Association
EPRP	Epidemics Preparedness and Response Plan
ETB	Ethiopia Birr
Fops	Food by Prescription
FMoH	Federal Ministry of Health
FP	Family Planning
FY	Fiscal Year
GC	Gregorian calendar
GP	General Practitioner
GPEI	Global polio Eradication Programme
HC	Health Center
HDA	Health Development Army
HEW	Health Extension Worker
HH	House Hold
HIT	Health Information Technician
HMIS	Health Management Information System

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HP	Health Post
HO	Health Office
HSDP	Health Sector Development Plan
HWs	Health Workers
IgM	Immunoglobulin M
IMNCI	Integrated Management of Neonatal and childhood Illness
IT	Information Technician
ISS	Integrated Supportive Supervision
JICA	Japan International Corporation Agency
KG	Kinder Garden
KM	Kilo Meters
MAM	Moderate Acute Malnutrition
MCH	Mother and Child Health
MCV	Measles-Containing Vaccine
MDG	Millennium Development Goals
MIS	Malaria Indicator Survey
MoH	Ministry of Health
NGO	Non-Governmental Organization
NID	National Immunization Day
NSP	National Strategic Plan
NVP	Nevirapine
OPD	Outpatient Department
OR	Odds Ratio

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OTP	Outpatient Therapeutics Program
PAB	Protected At Birth
PBUH	Peace Be Up on Him
PEI	Polio eradication initiative
PF	Plasmodium Falciparum
PHEM	Public Health Emergency Management
PMTCT	Preventing Mather to Child Transmission
PICT	Provider Initiated Counseling and Testing
PLW	Pregnant and Lactating Women
PNC	Post Natal Care
PSNP	Productive Safety Net Program
PV	Plasmodium Vivax
RDT	Rapid Diagnostic Test
RH	Reproductive Health
RL	Ringer Lactate
RRT	Rapid Response Team
SC	Stabilization Center
SAM	Sever Acute Malnutrition
SIA	Supplementary Immunization Activity
SNID	Sub National Immunization days
SPH	School Of Public Health
TB	Tuberculosis
TBA	Traditional Birth Attendants

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TCC	the Carter Center
TFP	Therapeutic Feeding Program
TSF	Targeted Supplementary Food
TTBA	Traditional Trained Birth Attendance
TVET	Technical Vocational Education and Training
U5	Under 5
UNICEF	United Nation Children's Fund
UTI	Urinary Tract Infection
VCT	Voluntary Counseling and Testing
VitA	Vitamin A
WBHP	Woreda Based Health Sector Plan
IT'S	World Health Organization
ZHD	Zonal Health Department

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Executive Summary

This document contains a two years Field Epidemiology and Laboratory Training Program outputs which is equivalent with thesis to be submitted to graduate school of public health for partial fulfillment of master degree in Field Epidemiology. It includes reports of disease outbreak investigations, public health surveillance data analysis, surveillance system evaluation, narrative summary of disaster situation report, manuscripts, abstracts, and training reports.

This compiled body of works contains total of outputs which all of them were done during my residency time in the program. The body of works is categorized in to nine chapters as follows: The first chapter contains two outbreak investigations: the first outbreak investigation conducted was measles outbreak investigation in YilmanaDensa district, WestGojam zone, Amhara from January 8-20/2014. The second outbreak investigated was measles outbreak investigation in Grawa district, East Harrerge zone, Oromia Region, April 27-March 8/2015. The second chapter is surveillance data analysis on prevalence of HIV among TB patients in Debre Tabor Hospital, in Amhara Region, from May 2009 to December 2013. The third chapter is evaluation of malaria surveillance system in North Wollo zone of Amhara region from December 24/2014 - January 7/ 2015. The fourth chapter is description of Health profile of Bati district in Oromia special zone of Amhara region from 09-20 March2014. The fifth and sixth chapters are development of manuscript and abstracts for scientific presentations and according to this three abstracts have been written and three of them were submitted.

The seventh output is Belg humanitarian need assessment which was conducted in selected districts of South Wollo zone of Amhara region on June 23 to July 4, 2014, The eighth output is an Epidemiologic Protocol/Proposal for Epidemiologic Research Project namely, Aassessment of immunization status and factors affecting it among children aged 12-23 months old in Mekidela Woreda of South Wello Zone Amhara Region, North west Ethiopia, 2015.

The ninth chapter contains activities done in addition to the main out puts which are mentioned as follows; Ebola virus disease outbreak preparedness assessment report in Humera (Tigray Region) and Metema(Amhara Region), September 2014.Ebola Screening on land port entry in Lare District, Gambella Region, Ethiopia, 15-21/10/2014. Trainings, conference and other activities and participate in the preparation of weekly bulletin article in Amhara regional health bureau of PHEM core process.

Different trainings and conferences of public health have been conducted in different places at different times, to mention some of these: -I have attended 5th AFENET scientific conference in Addis Ababa starting from 17-21 Nov 2013. I have attended training by mentor Initiative organization

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sponsor by AFENET on vector borne diseases in Dubai March 23-27/2015.Measles Post Epidemic Evaluation, I have attended and presented outbreak investigation on Measles post epidemic evaluation, at Dangila Town from 22 and 23/02/2014.PHEM National Review Meeting, I have attended PHEM National annual review meeting in Hawassa, August 15-19, 2014. Training for HWs on EVD, In Gambella regional state, on 11 October 2014 Training was given for a total of 20 Health Workers working in Lare HC. Those are mention above and others, included as the additional outputs.

Meanwhile, since the program's philosophy is learning by doing, numerous activities were carried out at the field base, which greatly contributes to strengthen the public health workforce capacity through training, conducting disease surveillance and emergency planning, preparedness and response activities.

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Chapter I – Outbreak/Epidemic Investigations

1.1 Investigation of Measles Outbreak in Yilmana Denssa Woreda, West Gojam Zone, Amhara Regional state, January/2014

Abstract

Background: Measles is an extremely contagious and remains a common disease and major contributor to child-mortality worldwide and kills approximately 1-3 of every 1000 infected individuals. An estimated 10 million cases and 164,000 deaths from measles occur worldwide each year. On January 17/2014 West Gojam zone, Amhara region reported suspected measles cases from Yilmana Denssa district. As part of it West Gojam zone has been reporting remarkable measles cases started On December 5/2013. An investigation was conducted to identify the cause of the outbreak and to undertake appropriate prevention and control interventions

Method: Unmatched Case control study design was used to investigate the outbreak and identify risk factors for the occurrences of the outbreak**.**We useda structured questionnaire to solicit information from cases and controls. Analysis was made using Epi Info version 7.1.3.3 and Microsoft Excel

Result: Totally 292 cases and 5 deaths (4 facility and 1 community deaths) were identified. Sample was taken for seven cases and all of them found to be positive for measles IGM. . Out of 292 total cases 169 (58%) were females. The mean ages 13 years and overall attack rate (AR) of the case was 120/100,000 populations. 92.5% of affected cases were unvaccinated. Exposure to a measles cases was significantly associated with illness (OR= 6.3, CI (1.78-22.73) with p-value 0.001)

Conclusion: Unvaccinated children less than 15 years of age were primarily affected by the outbreak. Most of the cases were unvaccinated. So mass vaccination campaign from 6 months -14 years of age groups should be conducted to stop the transmission.

Introduction

Measles is an extremely contagious acute viral infection, disease caused by a virus in the family Paramyxoviridae, genus morblli virus ((Organization., 2008)1). Measles is a highly contagious viral illness characterized by fever, malaise, rash, cough, coryza, and conjunctivitis. There are no known measles virus reservoirs outside of humans (2). Measles kills more children than any other vaccine preventable disease. Because the disease is so infectious, it tends to occur as epidemics, which may cause many deaths especially among malnourished children (3). Measles can result in complications such as diarrhea (8% of cases), otitis media (7 to 9% of cases), pneumonia (1 to 6%), and convulsions (one in 200). Other, rarer complications include nervous system complications, including encephalitis (overall rate of one per 1000 cases of measles) or seizures (involuntary movements (0.6-0.7%) and death (0.2%). Complications are more common in children under the age of five, or adults over the age of 20(6). Since the introduction of effective measles vaccines, the epidemiology of measles has changed in both developed and developing countries. As vaccine coverage has increased, there has been a marked reduction in measles incidence, and with decreased measles virus circulation, the average age at which infection occurs has increased (7). In 2001, countries in the World Health Organization (WHO) African Region started implementation of the regional measles mortality reduction strategies with a goal to reduce the estimated number of measles deaths in 2005 to half of the estimate for 1999(9). This goal was achieved, and a new goal was established to reduce measles mortality in 2009 to 90%. The measles mortality reduction strategy adopted by the African Region includes improving routine measles vaccination coverage, providing a second opportunity for measles vaccination through supplementary immunization activities (SIAs), monitoring the impact of vaccination activities through case-based measles surveillance, and improving measles case management(9). In developing countries with low vaccination coverage, epidemics often occur every two to three years and usually last between two and three months, although their duration varies according to population size, crowding, and the population's immune status. Outbreaks last longer where family size, and hence the number of household contacts, is large. In the absence of measles vaccination, virtually all children will have been infected with measles by the time they are 10 years old (10). As 5 years(2005-2009) country measles data analysis of Ethiopia Shows 46 zones Experience measles outbreak and all most all the zones in Amhara region Experienced measles outbreak in 2010/2011(12). Outbreaks of measles were reported by the woreda health office PHEM officer from four kebeles, West Gojam Zone onJanuary 8/2014, one case of measles was recorded in unvaccinated child from Yilmana Denssa woreda. Lately on WHO week 1 of 2014 the Yilmana Denssa woreda health office detected increasing number of cases of suspected measles which later confirmed by lab test for measles IgM. These cases were distributed among four Keble's in the Woreda. A

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team composed of one Jaica emergency officer and two field Epidemiology residents travelled to the woreda and collected information about the outbreak from woreda health office, Chinkulit health center and health extension workers. The woreda informed us there was a new outbreak in Yizora kebeles. On the next day, the investigator of the outbreak and the woreda health office PHEM officer travelled to the Epidemic site (Yizora kebeles) on foot and discussed with the community in the Kebele.

On January 8/2014, one case of measles was recorded in unvaccinated child from Yilmana Denssa woreda. Lately on WHO week 1 of 2014 the Yilmana Denssa woreda health office detected increasing number of cases of suspected measles which later confirmed by lab test for measles IgM. These cases were distributed among three Keble's in the Woreda.

Transmission

Measles is an infectious disease, caused by the measles virus and affecting nearly every susceptible individual in a given population. The contagious period begins three to four days prior to and after onset of rash. Transmission is primarily person-to-person via droplet spread; direct contact with nasal or throat secretions of infected persons, and less commonly by articles freshly soiled with nose or throat secretions. Measles is highly contagious, with one case often infecting twenty other individuals. Man is the only known reservoir of the measles virus (5, 6, and 13).

Laboratory Diagnosis

The symptoms of acute measles are so distinctive that laboratory diagnosis is seldom required. However, as the vaccination program progresses, atypical forms of measles have emerged and laboratory diagnosis may be required. Measles infection can be diagnosed by either of Microscopy, Immunofluorescence, virus isolation and serologic methods (14).

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Objectives

General Objective:

- To describe measles magnitude and identify risk factors associated with measles outbreak in YilmanaDensa district and undertake appropriate public health control measures.

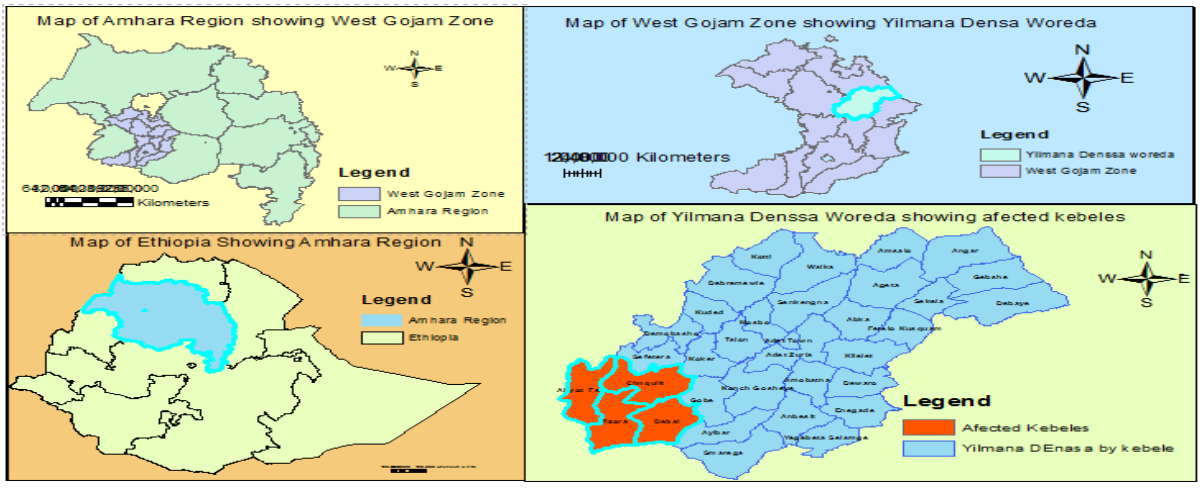
Specific objectives

- To verify the reported outbreak
- To Describe the occurrence of the outbreak by time, place and person
- To identify the risk factors associated with measles outbreaks

Methods

Study area and population

Yilmana Denssa is one of the woreda in west Gojam zone, Amhara regional states. It is located at a distance of 42 kms from Bahir Dar (Capital city of Amhara Regional state) and 607 kms from Addis Ababa. The woreda have shares boundaries with GonjiKolela woreda to the east, Mecha and Bahir Dar Zuria woreda to the south west, South Gonder zone to the North and Sekela& Quartic woreda to the South. He catchment population of the woreda is 243,068 {122,540 (50.4%) male and 120,528 (49.6%) female} with the total area of 99,180 hectares. The ethnic composition of the woreda is 100% Amhara and as for the religious composition & 99.3% of the resident are Orthodox Christian and 0.7% are follower's Muslim religions. The woreda has 36 kebeles (33 rural and 3 urban),the physical health service coverage of the woreda is 98 %. Currently 33 health posts and 10 health centers were serving the community.



Map 1Map of Yilmana Denssa Woreda by Keble and Showing measles affected kebeles, West Gojam Zone, Amhara Region, North west Ethiopia, 2014

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Study period

The study was conducted from 8-20/1/ 2014.

Study Design

Unmatched Case control study design was used to investigate the outbreak and identify risk factors for the occurrences of the outbreak.

Data collection

Exposure and risk factor information was collected by face to face interview of cases and controls by using structured questionnaire. Additional data was collected using the line list for measles and WHO case definition was used to classify study participants as case or control.

Case Definition:

A suspected measles case: anyone with at least 3 days fever, rash and either one or all of the following symptoms: cough, coryza (running nose) and conjunctivitis (red eye)

Probable case:fever*and* a generalized maculopapular rash *and* either cough, coryza or conjunctivitis and an epidemiological link to a laboratory confirmed case.

Confirmed case:a laboratory confirmed case *and* fever *and* a generalized maculopapular rash and either cough, coryza or conjunctivitis, and who has not been recently vaccinated (most commonly rash occurs about a week after immunization) 4. Care should be taken to investigate a laboratory confirmed case that does not meet the clinical case criteria.

Discarded case (not measles):A suspected measles case that has been completely investigated, including negative laboratory testing, can be classified

Data entry and Analysis

Primary data collected from the respondents was entered in to the computer and analysis was made using Epi Info version 7.1.3.3 and Microsoft Excel

Data Quality control

We used line listing for describing measles cases interims of time, place and person. However, all data were checked for completeness before entry and analysis

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Result

Descriptive Epidemiology

Totally 292 cases and 5 deaths (4 facility and 1 community deaths) were identified and case fatality rate 1%. Sample was taken for seven cases and all of them found to be positive for measles IGM. Out of 292 total cases 169 (58%) were females. On 5 December 2013, one case of measles was recorded in unvaccinated child from Yizora kebeles of YilmanaDensa woreda. The case had travelled history to neighboring woreda a confirmed measles outbreak before one month. The epidemic stayed for 7 weeks. The mean age of the cases was 13 years with a range of 6 months to 32 years. The overall attack rate (AR) of the case was 120/100,000 populations. The attack rate is high in females (140 cases per 100,000 populations) than males (102 cases per 100,000 populations). Attack rate (209/100,000 population) was higher in less than 15 years old age group than the others.

1 measles case by age and sex distribution in Yilmana Denssa Woreda, West Gojam Zone, Amhara Region, 2015

Ag Group	Population	Measles cases			percentage	Attack rate/100,000
		Male	Female	Total		
<5	41322	13	19	32	11%	77
5-14	109381	45	72	144	49%	132
15-44	75351	65	78	116	40%	154
45+	17015	0	0	0	0%	0
total	243068	123	169	292	100%	120

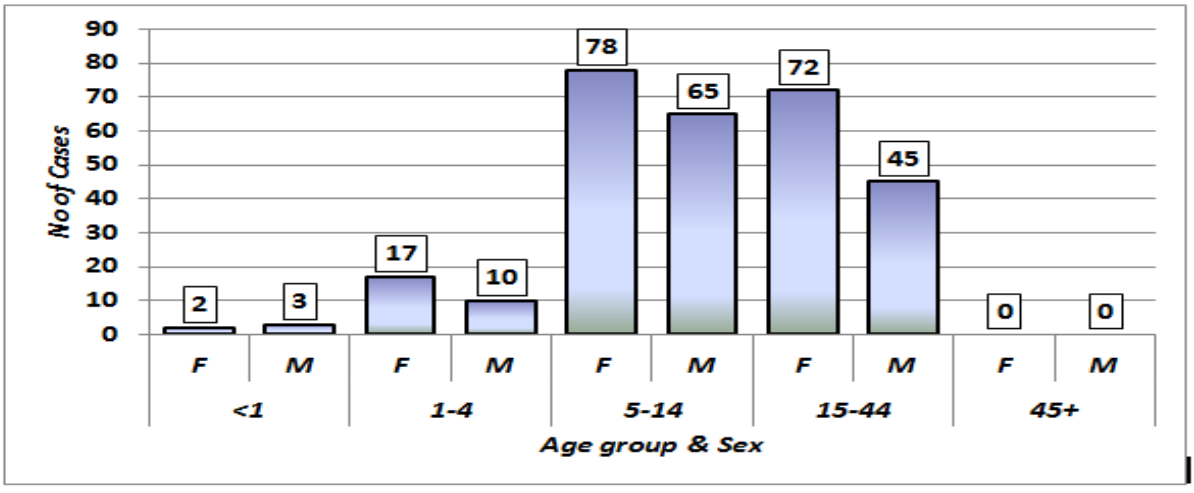

Figure 1 Distribution of measles cases by age group and sex in Yilmana Denssa woreda, West Gojam Zone, Amhara Regional state, 2014

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Yizora Kebele vaccination service is weak and it is hard to reach area (it lays on the boarder of Sekela Woreda). Because of that reason the case load is high in this Kebele (figure 2).The highest attack rate (11.7%) was registered in Yizora Kebele followed by AbiyotFirie (8%).

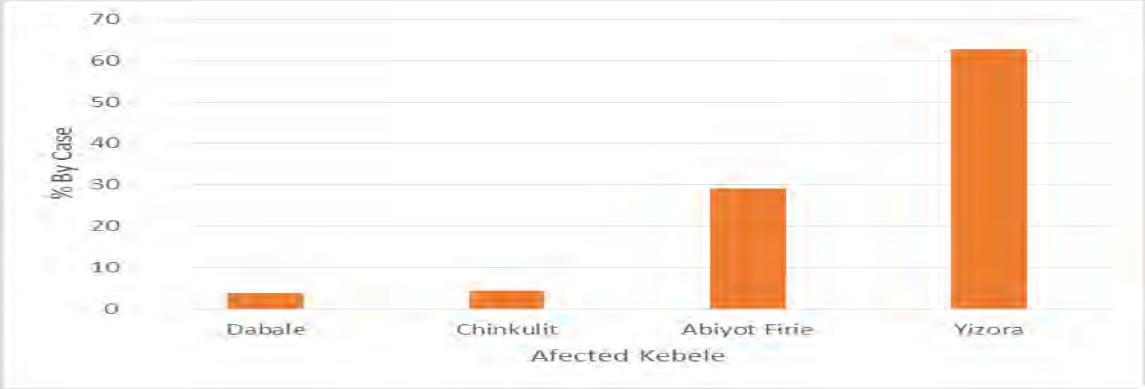

Figure 2Measle cases by kebele in YilmanaDensa Woreda, Amhara Region, 2014

The response of the outbreak (the cases) was late by 5 weeks. The outbreak stayed for about 7 weeks. This might be due to insufficient interventions covering all affected kebeles. Most of the affected kebeles are hard to reach areas. The cases build up gradually to reach its peak on January 01, 2014 and have multiple peaks.

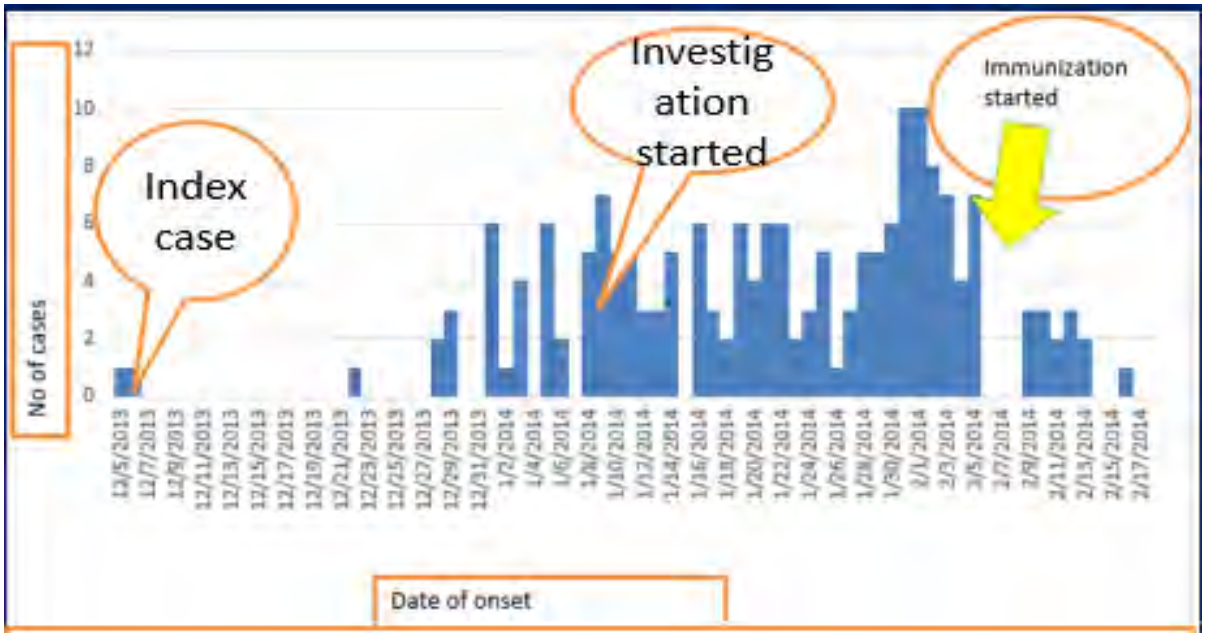

Figure 3Measles outbreak Epi curve by date of onset in Yilmana Denssa woreda West Gojam Zone, Amhara Region, North West Ethiopia, January/2o14

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Vaccination Coverage

The measles vaccine coverage was 52 %, in 2013. From the affected cases 92.5% of them had not received any dose of measles vaccine. Moreover, 46% of the patients aged between 1 year and 15 years (the age range in which a high level of vaccination coverage is to be expected) had not vaccinated

Analytical Epidemiology

From the total 84 cases and 84 controls interviewed for exposure and contact history, 76% of the cases and 92% of the controls had contact history with measles cases either at school, home or neighbors.

Table 2 Risk Factors, Yilmana Denssa Woreda, West Gojam zone, Amhara region 2014

Characteristics	Case	Control	P-Value
Contact History			
Yes	64(76%)	77(92%)	<0.001*
No	20(24%)	7(8%)	
Vaccination Card			
Yes	9(10.7%)	59(70.2%)	<0.001*
No	75(89.3%)	25(29.8%)	

Exposure to a measles cases was significantly associated with illness (OR= 6.3, CI (1.78-22.73) with p-value 0.001).When the vaccination status of the cases and controls was assessed only 9 (10.8 %) of the cases and 59 (70.2%) of the controls were vaccinated with a single dose of measles vaccine. When we see the vaccination status of individuals in each age group, from the 3 cases in the <1year age group, only 1(33%) were vaccinated and the rest 2(67%) were not vaccinated. From a total of 3 control in the 1-4 years age group 3(50%) and 3(50%) were vaccinated and not vaccinated respectively. Out of 49 individuals with measles between 5-14 years, a high proportion (43/49, 90%) were unvaccinated. In the age group 15 years and above 30(90 %) of the cases were not vaccinated. (Fig.4). Measles vaccination was associated with a statistically significant in the odds of developing illness (OR 19.6 with p-value <0.001).

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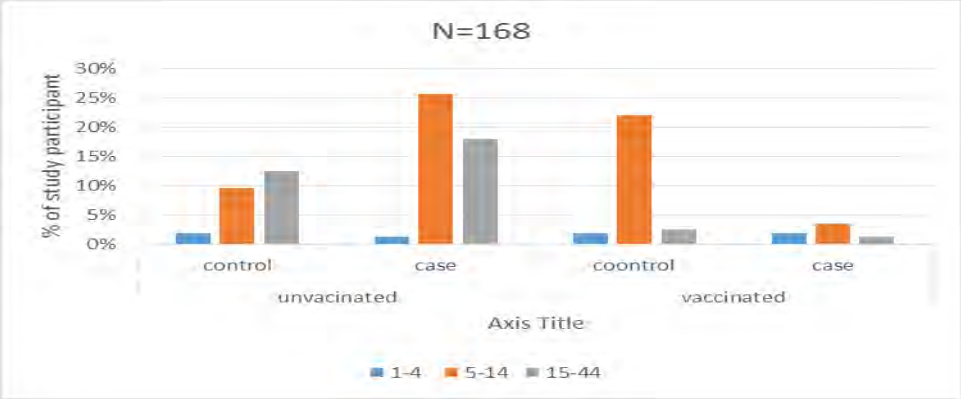

Figure 4 .Vaccination status of cases and controls by age group in Yizora Kebele, Yilmana Denssa woreda, Amhara Region, Ethiopia, January/2014

All of the cases presented with high fever at the beginning of illness and then with cough rash and others. Only two cases present with diarrhea. (See table 3)

Table 3 Vaccination status of cases and controls by age group in Yizora Kebele, Yilmana Denssa woreda, Amhara Region, Ethiopia, January/2014

Clinical signs and symptoms	Frequency	Com.%
Fever	84	100
Rash	84	100
Conjunctivitis	57	84
Coryza	36	53
Cough	60	88
Diarrhea	2	2.9

Intervention Undertaken

The investigation team identified and characterized the measles outbreak. Technical assistance was given for health workers on case management, recording and reporting situation. Cases were treated to prevent further spread; and reduce morbidity and mortality attributed to measles. Routine surveillance was enhanced and the situation was closely followed at each level on a daily bases, health education given and vaccination campaign was given age 6 month up to 15 years for 10 kebeles bordering the affected kebeles.

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Table 4 vaccinated kebeles in YilmanaDensa woreda, Amhara Region, Feb 2014

	Number of kebeles	Plan	Vaccinated	Coverage	Time
Yilmana Denssa woreda	10	28690	27051	94%	Feb ,2014

Discussion

The majority of the cases (49%) were in the 5-14 years age group, which is high compared to the outbreak which occurred in US from January to May 2011 in which the 5-14 age group accounted for just 19% of the cases. According to the interviewed study group, 89.3% of cases had contact history with an individual who had a similar illness. This might be an indication for extensive transmission of the disease.

The Majority of measles affected children had not received measles vaccination which is similar with study done in the Netherlands and Minnesota, 94% and 96% of affected children by measles outbreak were unvaccinated (14, 15).Vaccination is found to be the main protection against Measles. The recent (2013) measles vaccination coverage was less than 90 %(16). Among the total kebeles half of them were reported low vaccination coverage in 2013 compared to the target (especially those measles affected kebeles) According to this study findings, there is a strong association between vaccination and the chance of acquiring measles virus. Thismay be due to the high proportion of unvaccinated cases in those ages 5 years and above. This outbreak was characterized with an absence of complications due to measles infection which is different from the outbreak that occurred in France in the first 4 weeks of 2011 (cases of encephalitis and pneumonia were reported in 0.12% and 3.6% of the cases respectively). The attack rate was low as compared with a study done at Godie district, Somali region Ethiopia (>5%) in 2000and global case fatality rate estimate for developing countries (3-6%) but the case fatality rate was high as compared with the outbreak which occurred in France in the first four months of 2011 for which case fatality rate was 0.06%. The case fatality rate was also high compared to a 5 years (2005-2009) measles data analysis done in Ethiopia (0.7%).The measles case fatality rate in adults(12.5%) is increased as in very complex emergencies or in isolated areas where there is low immunity (10-30%).

Conclusion

Unvaccinated children less than 15 years of age were primarily affected by the outbreak. The case fatality was less than 3%. The woreda routine measles vaccination coverage was much less than the

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expected national target for year 2013. Low vaccination coverage and exposure (contact history) were likely contributed for the occurrence of this measles outbreak.

Recommendations

Non selective mass vaccination campaign should be undertaken. Even thoughroutine measles vaccination coverage was much less than the expected and the attack rate was high and huge number of cases were reported among children 5-14 years old. This indicates that children age of six months to 14 years old should be included in mass vaccination campaign. Strengthen measles routine vaccination activities and social mobilization activities, active case search and case management should be continued

Acknowledgement

My sincere appreciation and recognition of invaluable contributions goes to the study community, health workers at the district health offices of YilmanaDensa Woreda in West Gojam zone. EFETP, Jica and Amhara Regional Health Bureauthanksfor their technical and financial support.

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1.2 Investigation of Measles Outbreak in Grawa Woreda, East Harrerge Zone, OromiaRegion, 2014

Abstract

Background: -Measles is one of the most contagious diseases known to man and often occurs in explosive epidemics. Measles is still a public health problem in many developing countries, particularly in parts of Africa and Asia. According to the World Health Organization (WHO), more than 20 million people are affected by measles each year with more than 95% of measles deaths occur in countries that have low per capita incomes and weak health infrastructures. In developing countries with low vaccination coverage, epidemics often occur every two to three years and usually last between two and three months, although their duration varies according to population size, crowding, and the population's immune status. On February 30, 2015, one case of measles was recorded in unvaccinated child from Grawa woreda. An outbreak investigation was carried out to assess the occurrence of the outbreak and identify factors associated with contracting measles in Grawa Woreda.

Methods:-Unmatched Case control study design was used to investigate the outbreak and identify risk factors for the occurrences of the outbreak

Result:-A total of 316 measles case of them were 54 % females, the mean age of 6 year (range 6 month to 35 years), overall attack rate (AR) of the case was 11/10,000 populations and the attack rate is high in less than 5 years (29 cases per 10,000 populations) than >=5 years (7 cases per 100,000 populations), 76% of the cases had not vaccinated. Risk factors: -Absence of vaccination risk (OR: 2.5; 95% CI: 1.14-5.52; P: 0.002), knowledge of the family (OR: 2.36.; 95% CI: 1.07-5.16; P: 0.03), contact history (OR: 3.73, CI: 1.68-8.28; P ;< 0.001)

Conclusion:-Unvaccinated children less than five years of age were primarily affected by the outbreak. The woreda routine measles vaccination coverage was less than the expected national target for year 2014. Low vaccination coverage, low community awareness and were likely contributed for the occurrence of this measles outbreak. We recommend non-selective mass vaccination campaign should be undertaken aims to increase population immunity by focusing upon quickly increasing measles coverage for all children regardless of vaccination status. Undertaking of routine vaccination, enhancing active case search, strengthening case management and social mobilization activities to the public at large should be continued.

Introduction

Measles is one of the most contagious diseases known to man and often occurs in explosive epidemics. It usually does not kill children directly; however, as a result of its associated immune suppression, measles can lead to lethal complications, such as pneumonia, croup, and diarrhea. Measles can also lead to lifelong disabilities, including blindness, brain damage, and deafness (1, 2)

Measles has been, and remains, a major killer disease of children around the world. Despite the introduction of the measles vaccine in 1963, measles caused an estimated 2·6 million deaths in a single year as recently as 1980(1). According to the Assessment result of the 2010 global measles mortality reduction goal: results from a model of surveillance data, estimate that, after more than 45 years of measles vaccine availability, the disease caused nearly 140 000 deaths in 2010(2). Measles is still a public health problem in many developing countries, particularly in parts of Africa and Asia. According to the World Health Organization (WHO), more than 20 million people are affected by measles each year with more than 95% of measles deaths occur in countries that have low per capita incomes and weak health infrastructures(3).

It usually does not kill children directly; however, as a result of its associated immune suppression, measles can lead to lethal complications, such as pneumonia, croup, and diarrhea. Measles can also lead to lifelong disabilities, including blindness, brain damage, and deafness (4). It is a highly contagious and vaccine preventable respiratory paramyxovirus infection. The incubation period is 10 – 12 days from exposure to the virus to the onset of fever, and a rash usually appears at around day 14 (range 7 –18 days). Patients are contagious from about 4 days before eruption of the rash until 4 days after the eruption (5). Measles occurs naturally only in human being (6). All persons who do not had the disease or who have not been successfully immunized are susceptible (7, 8). Since the introduction of effective measles vaccines, the epidemiology of measles has changed in both developed and developing countries. As vaccine coverage has increased, there has been a marked reduction in measles incidence, and with decreased measles virus circulation, the average age at which infection occurs has increased (7). In 2001, countries in the World Health Organization (WHO) African Region started implementation of the regional measles mortality reduction strategies with a goal to reduce the estimated number of measles deaths in 2005 to half of the estimate for 1999(9). This goal was achieved, and a new goal was established to reduce measles mortality in 2009 to 90%. The measles mortality reduction strategy adopted by the African Region includes improving routine measles vaccination coverage, providing a second opportunity for measles vaccination through supplementary immunization activities (SIAs), monitoring the impact of vaccination activities through case-based measles surveillance, and improving measles case management(9). In developing countries

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with low vaccination coverage, epidemics often occur every two to three years and usually last between two and three months, although their duration varies according to population size, crowding, and the population's immune status. Outbreaks last longer where family size, and hence the number of household contacts, is large. In the absence of measles vaccination, virtually all children will have been infected with measles by the time they are 10 years old (10). On 30 January 2015, one case of measles was recorded in unvaccinated child from Grawa woreda. Lately on WHO week 4 of 2015 the Grawa woreda health office detected increasing number of cases of suspected measles which later confirmed by lab test for measles IgM. These cases were distributed among fourteen kebeles in the Woreda.

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Objective

- To assess the magnitudes of measles outbreak and identify risk factors associated with measles outbreak in Grawa district and undertake appropriate public health control measures

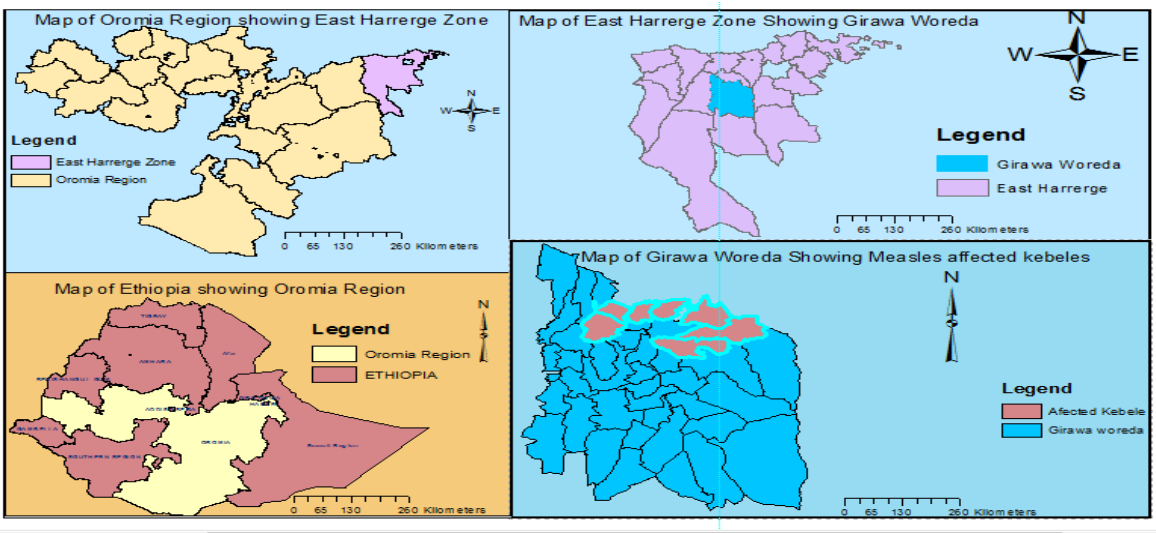
Specific objective

- To Describe the occurrence of the outbreak by time, place and person
- To identify the risk factors associated with measles outbreaks
- Toundertake appropriate public health control measures

Methods

Study area and Population

The investigation was conducted in Grawa woreda of East Harrerge zone. It is 700 KM far from Addis Ababa and 75 Km from Zone town. The district has an estimated projected population of 297338 which constitute 146,545 femalesin 2015(11)



Map 2 Map of Grawa woreda, East Harrerge Zone, Oromia Regional State 2015

Study period

The study was conducted from February24 –March 4/2015.

Study design

We conducted unmatched case-control study to investigate the outbreak and risk factors.

Study population

Cases: Anyone with generalized, maculopapular rash lasting ≥3 days; and temperature ≥101°F or 38.3°C; and cough, coryza, or conjunctivitis (41 cases)

Controls: were all people without measles symptoms (82 controls)

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Operational Definitions:

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.

Sampling

The sample size was calculated using Stat calc function of Epi-info version 7.1.3 Using the confidence level of 95%, power of 80%, and assuming a 37% prevalence of a previous contact with someone with measles like disease in under ones and an OR 5, with 1:2 cases to controls a total of 41 cases and 82 controls were required. Of 316 cases sent through line list 41 cases were included in the study. The sampling was conducted without replacement and if more than one eligible in the family member the youngest child was taken as control with nearest house hold to the case until the sample size was reached.

Data collection

Exposure and risk factor information was collected by face to face interview of cases and controls by using structured questionnaire. Additional data was collected using the line list for measles and WHO case definition was used to classify study participants as case or control.

Data Processing and Analysis

The data were entered and analyzed using Epi-Info7 version 7.1.3. Results were presented using graph, table and spot map. Attack rate and case fatality rate were also calculated.

Data Quality Control

We used line listing for describing measles cases interims of time, place and person. However, all data were checked for completeness before entry and analysis.

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Result

Descriptive Epidemiology

A total of 316 measles case detected based on the WHO clinical case definition, from January 30th to March 5, 2015. From total measles case were 54 % female and detected from Grawa woreda with the mean age of 6 year (range 6 month to 35 years), no death were reported. The overall attack rate (AR) of the case was 11/10,000 populations. The attack rate is high in less than 5 years (29 cases per 10,000 populations) than >=5 years (7 cases per 100,000 populations)

Table 5 measles case by age and sex distribution in Grawa district, East Harrerge Zone, Oromia region, 2015

S.No	Age Group	Population	Measles cases				
			Male	Female	Total	Percentage (%)	Attack rate/10,000
1	Less than 5	49062	75	69	144	46%	29
2	5 to 14	136778	8	23	31	10%	2
3	15 to 44	92171	61	80	141	45%	15
Total		297338	144	172	316	100%	11

The affected kebeles were presented on the figure 5, which shows the measles case integration with vaccination coverage for 2014.

Figure 5 Case by kebele in Grawa woreda, East Harrerge Zone, Oromia Region February 2015

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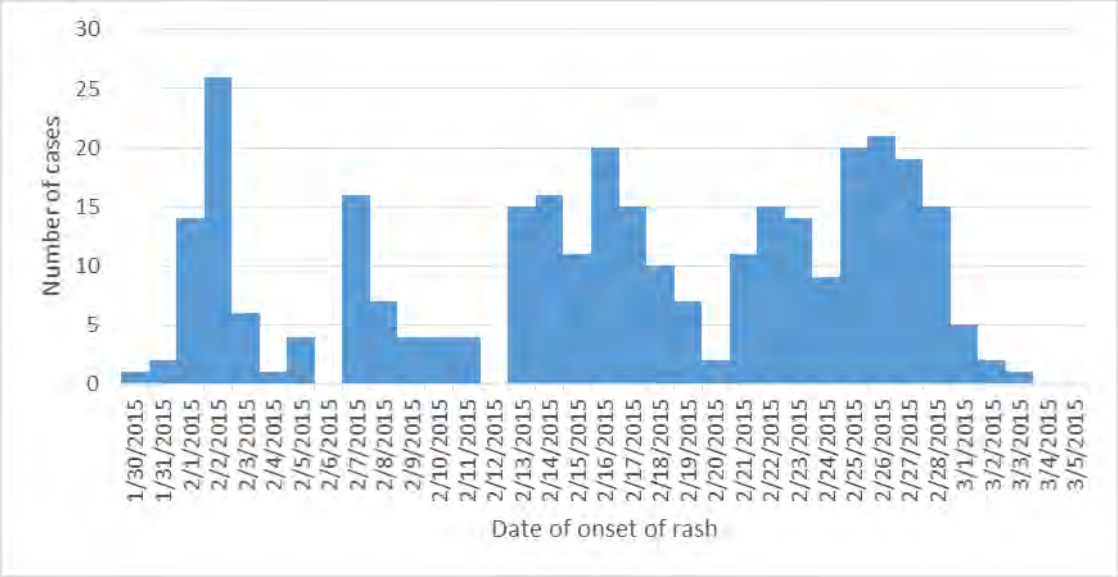

Figure 6 cases by date of onset of rash in Chinaksen woreda, Oromia Region, 2015

Onset of rash occurred 30 January 2015 was presented in figure 6.The response of the outbreak (the cases) was late by 2 weeks. The outbreak stayed 5 week. This might due to insufficient interventions covering all affected kebeles. Most of the affected kebeles are hard to reach areas.

The cases build up increase during active case search to reach its peak on February 02, 2015 and have multiple peaks during social mobilization and health education.

Vaccination Coverage

The measles vaccine coverage was 67 %, in 2014. From the total cases 79 % of them had not received any dose of measles vaccine. Moreover, 76% of the cases had not vaccinated. The rest 21%, of the patients had received one dose of measles vaccine. The highest unvaccinated cases were reported from B/Gudena Kebele which was 45% from the total unvaccinated cases and followed by Ejersatobota and K/Biyo which was 17% and 10% respectively.

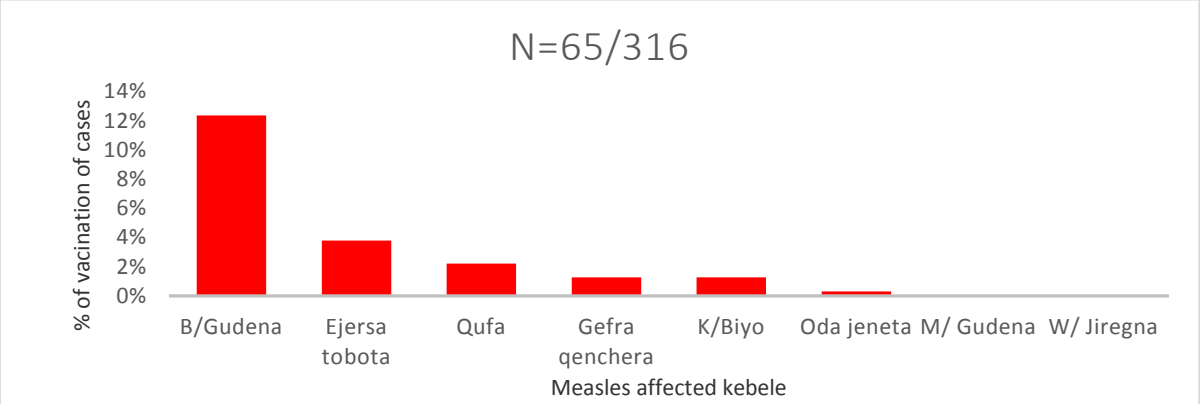

Figure 7Vaccination status of measles affected Kebele in Grawa woreda, East Harrerge zone, OromiaRegion 2015

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Moreover, 69% of the patients under five year (the age range in which a high level of vaccination coverage is to be expected) had not vaccinated. The rest of 13% of the patients had received one dose of measles vaccine.

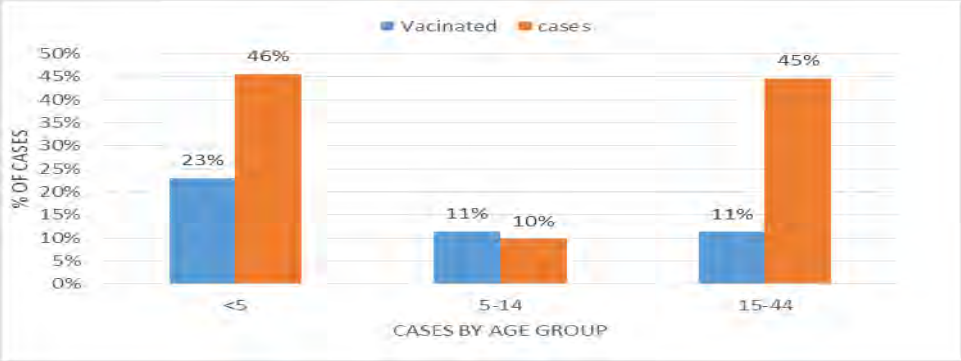

Figure 8 Vaccination status of cases by age group in Grawa Woreda, Oromia Region, 2015

Analytical Epidemiology

A total of 41 cases and 82 community controls unmatched were join up into the study. All interviewed measles cases had a history of maculopapular rash and fever, 32% had conjunctivitis, 36% had coryza and 39% had cough. Risk factors: -Absence of vaccination risk factor for developing with (OR: 2.5; 95% CI: 1.14-5.52; P: 0.002), knowledge of the family was the risk factor for developing with (OR: 2.36.; 95% CI: 1.07-5.16; P: 0.03). Health facility distance from the house more than 5km was a risk factor with (OR: 537; 95% CI: 2.39-12.1; P: <0.005), Family size also more than 4 was a risk factor with (OR: 4.15, 95%CI (1.87-9.25, P <0.0004), contact history also risk factor with (OR: 3.73, CI: 1.68-8.28; P ;< 0.001)

.**Intervention Undertaken**

The enquiry team identified and described the measles outbreak. Technical support was given for health workers on case management, recording and reporting situation. Health education and advocacy, active case search house to house and Cases were treated to prevent further spread; and reduce morbidity and mortality attributed to measles. Routine surveillance was enhanced and the situation was closely followed at each level on a daily bases.

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Discussion

The risk factors for measles virus infection include: infants who lose passive antibody before the age of routine immunization, children with vitamin A deficiency and immunodeficiency due to HIV or AIDS, leukemia, alkyl ting agents, or corticosteroid therapy, regardless of immunization status and children who travel to areas where measles is endemic or contact with travelers to endemic areas. Malnourished and young children are at higher risk of developing complications and mortality from measles infection. (3)

This study identified several factors that were associated with diminishing measles in Grawa woreda. Being unvaccinated against measles was a risk factor for fading measles. A similar result obtained in study done in Abaya, Borena zone, South Eastern Oromia, Ethiopia 2013 a measles outbreak that cases were high in unvaccinated children than those who were completely vaccinated(1).Vaccination has protective effect during this outbreak time.

Majority of cases did not believe in seeking treatment for measles and the study found that knowledge towards measles, where to treat and which age group is affected, so in this outbreak knowledge of the family was the risk factor for developing measles, in similar study done in Zaka, that was the factors associated knowledge (2)

In this outbreak time total of 316 cases was identified with highest attack rate compared with the attack rate of measles outbreak recorded nationally, 4.1 per 100,000 population, in 2008(3). The attack rate is high in less than 5 years (29 cases per 10,000 populations) than >=5 years (7 cases per 100,000 populations), in EHNRI guideline, the most at risk population are children under the age of 5 years (3).

The association between measles more common in the house holds having more than one child posed as a risk factor to contracting measles. This was also reflected in our study that had a median number of siblings of four and the WHO also reports that overcrowding in developing countries is a risk factor for contracting measles [5, 6].In this outbreak the family size more than four and measles was stronger association for measles transition.

Conclusion

Unvaccinated children less than five years of age were primarily affected by the outbreak. The woreda routine measles vaccination coverage was less than the expected national target for year 2014. Low vaccination coverage, presence of high family members, low community awareness and were likely contributed for the occurrence of this measles outbreak.

Limitation:-The index cases were not possible to get due to inadequate data in the Grawa woreda.

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Recommendation

Alert message should be sent to other neighboring districts. A huge number of cases were reported among children less than 5 years old so non-selective mass vaccination campaign should be undertaken aims to increase population immunity by focusing upon quickly increasing measles coverage for all children regardless of vaccination status. Undertaking of routine vaccination, enhancing active case search, strengthening case management and social mobilization activities to the public at large should be continued.

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Chapter II – Surveillance Data Analyses Report

2.1. Surveillance Data Analyses on Prevalence of HIV among TB patients inDebretabor Hospital, Amhara Region, From May 2009-December 2013

Abstract

Background: Tuberculosis (TB) and HIV co-infections have a global prevalence with devastating morbidity and massive mortality, Sub-Saharan Africa being the worst hit.

Objectives: To assess the magnitude of HIV among TB patients and factors related in co-infection

Methods: A retrospective analysis of the record of all TB patients registered at the Debretabor Hospital delivering service between 2009 and 2013 was conducted. A total of 768 TB cases were reviewed and assessed regardless of HIV status.

Results: A total of 768 TB cases reviewed from the hospital medical review. Out of 768 TB cases, 744 (96%) were tested for HIV infection and 222 (31%) of these were sero-positive (co-infected). All of HIV positive patients were PTB cases. The Male to Female TB-HIV co-infection prevalence ratio (PR) was 1.55.

Conclusion: This data analysis study reports the prevalence of HIV co infection among TB cases was 33%, which was high. Therefore, every concerned body should focus on prevention and control of HIV co-infection among TB case patients through strengthening policy, supplying adequate services, conducting awareness creation for the general community and strengthen TB-HIV surveillance.

Key words: Tuberculosis, HIV co-infection, high prevalence, TB diagnosis

Words contact:174

Introduction

Tuberculosis (TB) and Human immunodeficiency virus (HIV) co-epidemics remain a major public health challenge, particularly in resource-limited settings. There were an estimated 1.1 million TB/HIV co-infected patients worldwide in 2011; 79% of these cases were in the African Region (21). There has been a strong link between TB and HIV, as they are capable of disarming the host's immune responses. TB is the most common opportunistic disease which kills those infected with HIV (22). The combined impact of HIV and TB co-epidemic has challenged the weak healthcare systems in resource limited settings. To improve the diagnostic and intervention outcomes for TB/HIV co-infected patients, WHO developed a framework of strategic collaborative activities to be performed as parts of the health sector response to control co-epidemic (7). Ethiopia has started implementing the TB/HIV collaborative activities since 2002 (25). However, only few studies state that HIV co-infection has been a major public health challenge among TB patients of the country (24). Therefore, knowledge about HIV co-infection among TB patients might help to understand the spread of the dual infections and to monitor the performances of TB and HIV control activities (1). In response to this, the study was conducted to determine the prevalence of HIV among TB patients in Debretabor Hospital, South Gonder Zone, Amhara Region, Ethiopia.

Statement of the Problem

The human immunodeficiency virus (HIV) pandemic presents a significant challenge to global tuberculosis (TB) control (1). In 2011, 1.1 million (13%) of the 8.7 million people who developed TB worldwide were HIV-positive (2). TB is a leading killer among people living with HIV. At least one in four deaths among people living with HIV can be attributed to TB (3). To mitigate the dual burden of TB/HIV in populations at risk of or affected by both diseases, the World Health Organization (WHO) published a document on priority research questions in 2010 (3), and an updated policy on collaborative TB/HIV activities in 2012 , which emphasize the importance of surveillance of HIV among TB patients and surveillance in all countries (1).

Rational of the study

In Debre Tabor Hospital TB/HIV surveillance data analysis was not done before and about HIV co-infection among TB patients might help to understand the spread of the dual infections and to monitor the performances of TB and HIV control activities (1). In response to this, the study was conducted to determine the prevalence of HIV among TB patients in Debretabor Hospital.

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Objective

General objectives

- To assess the magnitude of HIV among TB patients and factors related in co-infection

Specific objectives

- To describe the prevalence of HIV co-infection among TB patient
- To assess factors associated with the co-infection

Method

Study setting and Population

The study was conducted at Debre Tabor Hospital in Debre Tabor, which is 120 km away from Bahir Dar. The hospital provides health service to more than 2.3 million populations in its catchments. In the hospital, DOTS clinic is operating under the National Tuberculosis and Leprosy Program (NTLCP) of Ethiopia, under which patients are diagnosed with tuberculosis by examination of morning spot sputum smears by Zeihel-Nieelsen staining, for the presence of Acid fast bacilli (AFB), chest radiographs, and for EPTB, pathological investigations were used. A patient with at least two sputum specimens who were positive for acid-fast bacilli is smear positive pulmonary TB. A patient with symptoms suggestive of TB and radiographic abnormalities consistent with pulmonary TB is smear negative pulmonary TB. EPTB is confirmed by taking needle aspiration from organ other than TB, run AFB and radiographic abnormalities. Patients are referred to the DOTS clinic where they are registered and treated according to the National Tuberculosis and Leprosy Control Program (NTLCP) [8].

Study period: -From July 19-25, 2014

Study area and population

This study was undertaken in Debretabor Hospital, South Gonder Zone, and Amhara, Ethiopia. The estimated population of 2.3 million, like the rest of the districts in the northern part of the country, the local community's livelihood largely depended on subsistence agriculture .The hospital delivering Service for TB patients in the community.

Study design and data collection

We analyzed a five year retrospective cross sectional study records of 768 tuberculosis patients registered at Debre Tabor Hospital`s DOTS clinic from May 2009 to December 2013. Weight of patient was measured by weight balance. The data conducted from TB registration book. The reviewed documents contained basic information such as patient's age, sex, weight address, TB type, and HIV status.

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Inclusion and exclusion criteria

Inclusion criteria: All data from 2009-2013 in DOTS clinic of Debre Tabor hospital.

Exclusion criteria: Incomplete data on log book of DOTS clinic

Data analysis

The data will be entered and analyzed by Microsoft excel andEpi info version 7.1.3

Definition

The following standard clinical case definitions of the National Tuberculosis and Leprosy Control Program guideline adopted from WHO (25) were used:

Smear-Positive Pulmonary TB (SPPTB)

One sputum smear examination positive for Acid Fast Bacilli (AFB) by direct microscopy and laboratory confirmation of HIV infection or strong clinical evidence of HIV infection.

Smear-Negative Pulmonary TB (SNPTB)

At least two sputum specimens negative for AFB and radio graphical abnormalities consistent with active TB, and laboratory confirmation of HIV infection or strong clinical evidence of HIV infection and decision by a clinician to treat with a full course of anti-TB chemotherapy, or a patient with AFB smear-negative sputum which is culture -positive for M. tuberculosis.

Extra-Pulmonary TB (EPTB)

One specimen from an extra-pulmonary site culture-positive for M.tuberculosis or smear-positive for AFB, or histological or strong clinical evidence consistent with active EPTB and laboratory confirmation of HIV infection or strong clinical evidence of HIV infection and decision by a clinician to treat with a full course of anti-TB chemotherapy.

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Results

Characteristics of study participants

A total of 768 TB patients were enrolled in this study. Of whom, 371 (51.7%) were males with mean age of 32.6 years. The mean initial weight during intensive anti-tuberculosis treatment was 43.2 KGs (SD ± 16.3). New cases 655 (85.3%) and had smear negative pulmonary TB 297(38.7%)

TB and HIV co-infection

Five year data analysis on TB case patients shows a total of 768 TB (both PTB and EPTB) cases were reported in Debre Tabor Hospital. Among the total 768 TB cases; 472 (61%) were Pulmonary TB cases, from which 175 (37%) was SPPTB cases. Out of the total TB case Patients, HIV test were offered for 744 (97%) and 721(96%) were tested. Among the total HIV positive TB case patients 135 (61%) were males. The majority, 199(89.6%), of the HIV infected TB patients belonged to the age group of 15 or above years. Out of the HIV infected TB patients, 162 (73%) had SPPTB followed by 60 (27%) had SNPTB and no EPTB co HIV infected. (Table 5).

Table 6 Analysis of all forms of TB case patients by age and sex from 2009-2013 in Debra Tabor Hospital, Amhara Regional state, North western Ethiopia, August/ 2014

	ALL Forms of TB		
AGE	SNPTB	SPPTB	EPTB
0-14	33(4.3%)	12(1.6%)	38(4.9%)
15-39	150(20.4%)	132(17.2%)	188(24.5%)
=>40	114(19.5%)	31(4%)	70(9.1%)
Sex			
Female	150(19.5%)	87(11.3%)	133(17.3%)
Male	147(19.1%)	88(11.5%)	163(21.2%)

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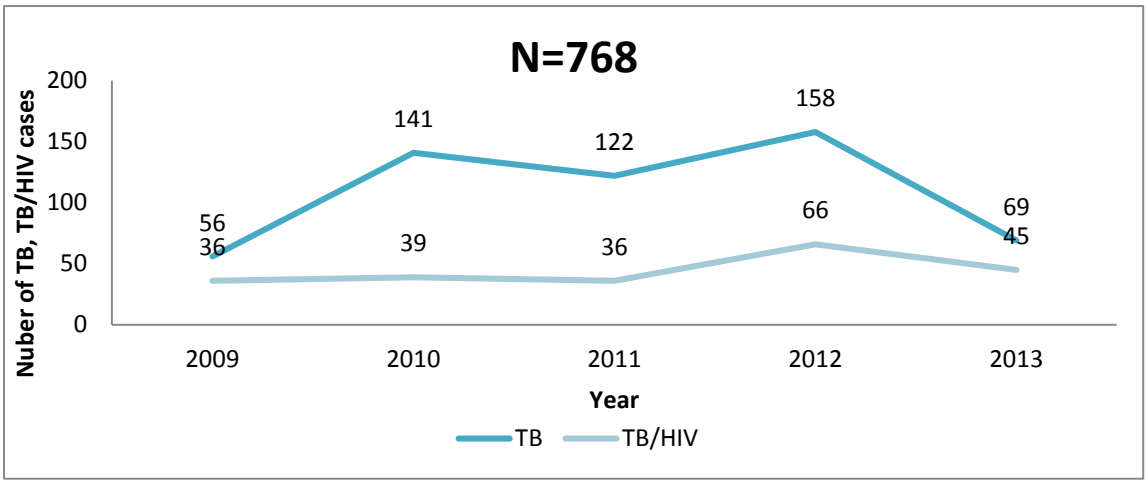

Figure 9Trend of tuberculosis and TB-HIV cases during September 2009 to August 2013 in Debretabor hospital Tuberculosis clinic, West Amhara, Ethiopia, May/2014.

The five year data analysis on HIV infected among TB case patients conducted in Debre Tabor Hospital shows; a total of 222 (31%) HIV virus was detected among those who had TB and tested HIV. However, no HIV case patients in those who had EPTB and tested for HIV. The result of the analysis indicated in table 5 below.

Table 7 Analysis of TB cases among HIV infected TB patients by sex and age from2009-2013 in Debre Tabor Hospital, Amhara Regional state, North western Ethiopia, August/ 2014

Forms of TB cases HIV infected among TB case patient (N=768)			
AGE	SNPTB	SPPTB	EPTB
0-14	2(1%)	29(13.1%)	0
15-39	13(5.9%)	10(4.5%)	0
=>40	45(20.3%)	123(55.4%)	0
Sex			
Female	4(1.8%)	83(37.4%)	0
Male	56(25.2%)	79(35.6%)	0

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The 5 year trend analysis of prevalence of HIV in TB case patients in Debre Tabor Hospital shows a step-up increase by 14 (63.2%) from 2009 to 2013. Trend of Co-infected HIV-TB case patients by smear result were shown in Figure 10

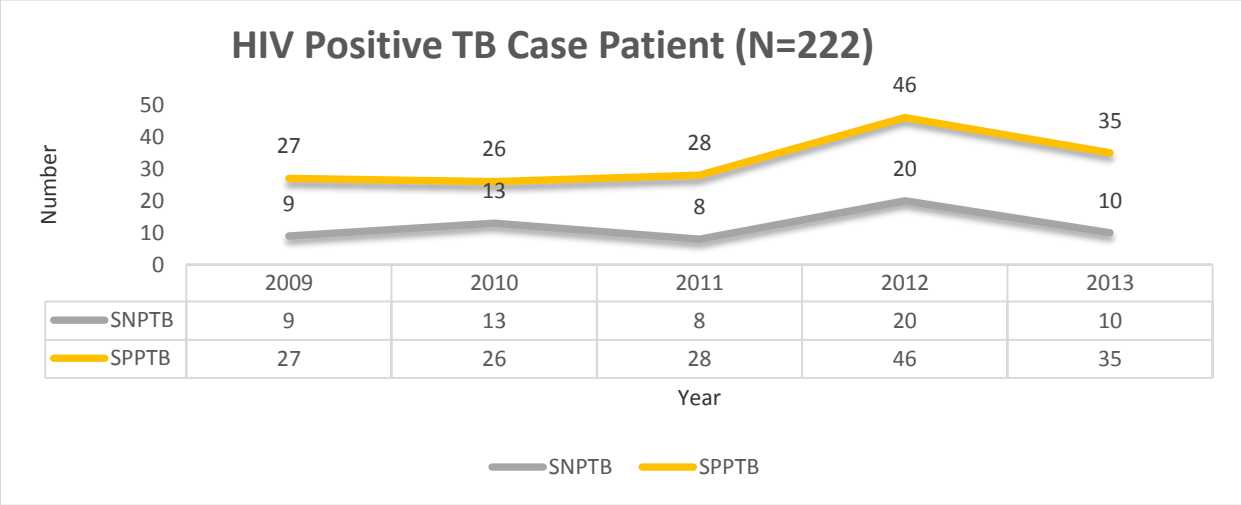

Figure 10 Trend of Co-infected HIV-TB case patients by smear result in Debretabor Hospital, Ethiopia 2009-2013

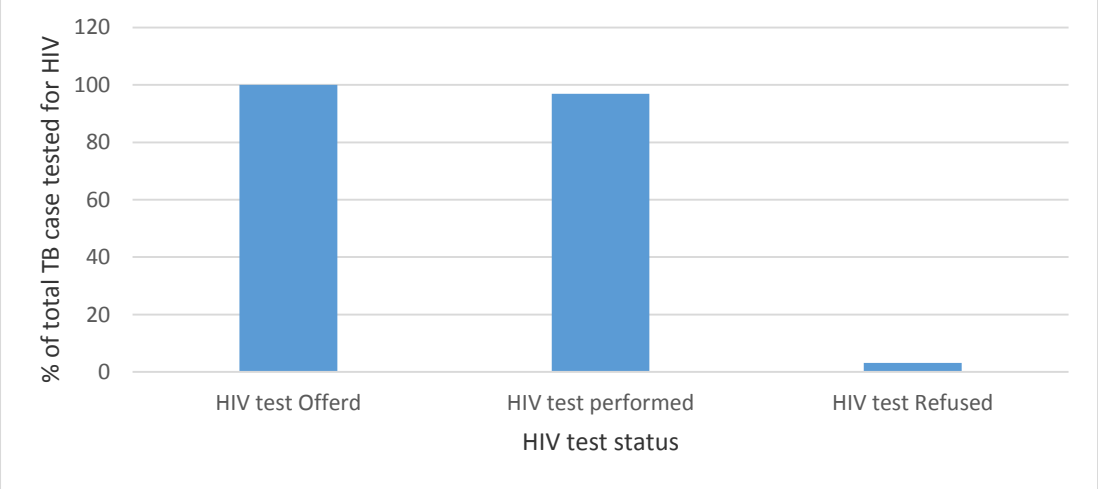

Figure 11 Description of TB case Patient by HIV test status in Debre Tabor Hospital, 2009-2013 (N=768)

In the last five year (2009-2013) a total of 222(31%) TB case patients were HIV infected in Debretabor Hospital. All co-infected HIV/TB cases were PTB. The description of HIV/TB co-infected PTB case patients by SPPTB and SNPTB shown in figure 4

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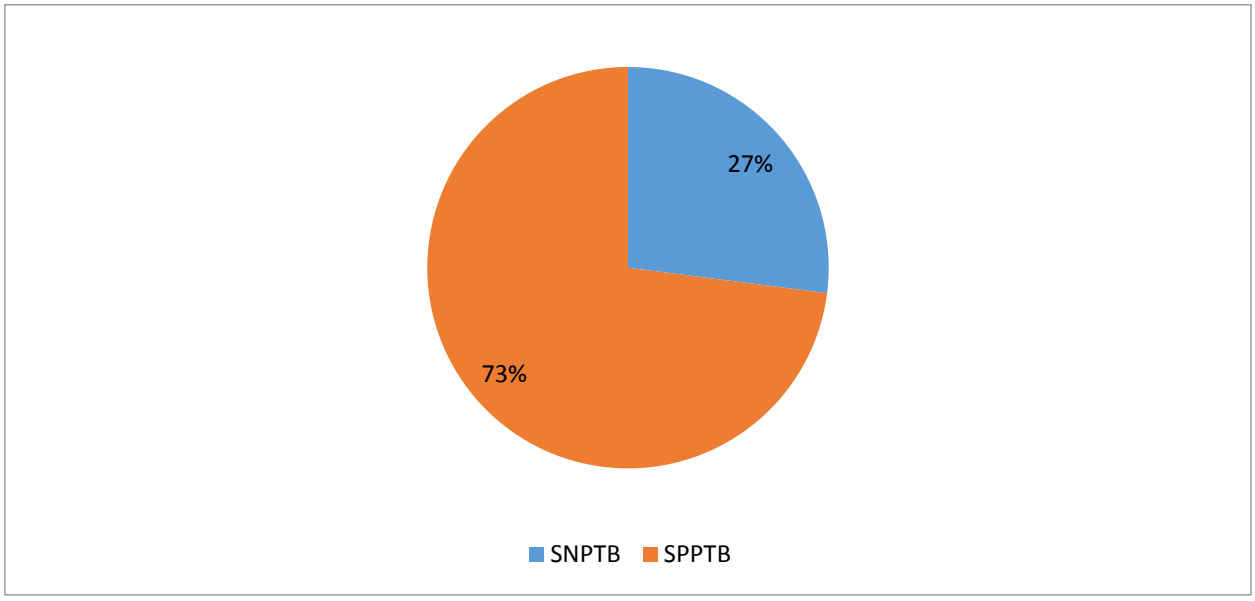

Figure 12 Co HIV-TB case Patients by Smear Result in Debre Tabor Hospital, 2009-2013 (N=222)

Table 8 Independent predictors of TB/HIV co-infection in Debretabor Hospital, Amhara region, 2014

Characteristics	**TB/HIV confection**		**COR**	**AOR**
	HIV positive	HIV Negative		
Sex				
Female	87(39.2%)	280(52.0%)	1:00	1:00
Male	135(60.8%)	258(48.0%)	1.7(1.22-2.32)	1.8(1.31-2.53)
Age				
<15 Years	23(10.4%)	59(11.0%)	2.3(1.23-4.23)	2.4(1.31-4.55)
15-39 Years	168(75.7%)	297(55.2%)	3.3(2.17-5.08)	3.5(2.29-5.41)
>= 40 Years	31(14.0%)	182(33.8%)	1:00	1:00

Discussion

This HIV in TB Case patient data analysis study conducted in Debretabor Hospital indicates. A high proportion of TB patients knowing their status provide a sufficiently robust estimate of the true HIV prevalence among TB patients for surveillance purposes (23),so in this study the prevalence of HIV co-infection among TB patients was 31%. This finding is far greater than most of the studies conducted in different countries or areas including National TB/HIV surveillance in 2013 EHNRI report in Ethiopia 20 % and Amhara 26.5 %(5). This is higher than the study done in Dabat (11.4%) (26) And northwest Ethiopia (7.5%) (24). But lower than study done in DebreMarkos Referral Hospital 44.8% (27). This high prevalence of HIV co-infection among TB patients in the Debre Tabor Hospital shows the study area need immediate assistance regardless of programmatic revision, strengthening the health system infrastructure, staff capacity building, increasing public awareness, decreasing social and perceived stigma associated with TB and HIV (31) and innovating for patient-friendly and cultural sensitive intervention approaches.

In this surveillance data analysis male have prevalence of TB/HIV co-infection than females. A similar result obtained in study conducted in North Shewa zone ,Amhara Ethiopia 2013 (28) .This might be less number of female TB cases in the Debretabor Hospital or female appear to be less likely than males to present with symptoms of cough or sputum production, social isolation, economical factors, close contact and lower rate of notification may also be a consequence of a smaller proportion of females than males with TB visiting in the facility or submitting sputum specimens for testing (WHO 2002). HIV infection among TB patients is well recognized as a major public health problem worldwide.

The higher prevalence of HIV co-infection among TB patients observed among younger age group in this study is consistent with the findings of other studies (29). This age prevalence of HIV co-infection among TB patients probably reflects the age-specific prevalence of HIV in the community. This may be related to patients' being in a sexually active age group in which both TB and HIV prevail most (30). The other possible explanation for this may be their increased family, organizational, and societal responsibilities as people in this age group involve themselves in various extraneous daily activities in order to win the socio-economic hardship which increases the frequency of their contact with other patients in their society.

Limitation

However, the major limitation of this study was conducted only using TB registration book record review. Besides, the data were collected from TB registration book and there were a problem with records because of some incompleteness clinical variables while it was filled with physicians. We

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recommend further surveys involving large sample size and many clinical variables of HIV infected TB patients to develop the full pledged knowledge

Conclusion

The prevalence HIV co-infection among TB patients was high and the trend was steadily increasing in the present study. The co-infection was significantly associated with 15-39 age groups, being male sex and having smear positive pulmonary TB. Thus, this need for programmatic revision on the ongoing intervention strategies, strengthening the health system infrastructure, and increasing public awareness on targeted interventions for reproductive age group ,actions targeting (health education and early case detection) on those predictors are necessary to effectively reduce TB-HIV co-infection.

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Chapter III – Evaluation of Surveillance System

3.1 Evaluation of Surveillance Systems for Malaria, in North Wollo Zone, Amhara Region, January, 2015

Executive summery

Introduction: - A functional disease surveillance system is essential for defining problems and taking action. The FMoH/ PHEM of Ethiopia identified 21 top priority diseases which are epidemic prone, of international concern and diseases on eradication and elimination programs for surveillance activities. Therefore, this study had been conducted to evaluate the functionality of the surveillance system, to see effectiveness and efficiency of the system and identify the gap for the better improvement of the surveillance system of malaria in North Wollo zone of Amhara Regional State in North West Ethiopia.

Method: -A cross-sectional descriptive study was conducted from December, 24/2014-7/2015 in North Wollo Zone, Amhara Region. A total of 7 study units/sites were included in the study, these were North Wollo zone health department, two district health offices, two health centers and two health posts. North Wollo zone is purposely selected two districts were selected from all districts in the zone ; based on the 2013/2014 performance report and districts health office (good and poor performing woreda in PHEM activity). From each selected district one health center and one health post were selected on convenience basis. Semi-Structured questionnaire was administered to collect primary and secondary data; Interviews were conducted, different related documents and reports were observed and checked. Then the data was entered in Microsoft Excel and Epi Info and summarized qualitative data to supplement the quantitative findings.

Result: - PHEM system has improved and became focus of even political leaders and budgeted in all districts but not based on the demand. It is helpful to detect outbreak. All of the districts and facilities has implemented prevention and control measures based on local data and gave responses within 48 hours of notification of most recently reported outbreak. All have prepared written epidemics preparedness and response plan (EPRP) but the epidemic management committee didn't evaluated their preparedness and response activities. The case definition of malaria disease for identification of suspected cases are easy to understand and apply by all levels of health professionals. The malaria confirmatory test takes 10-15 minute at health post level using RDT and near to 1 hour at health center level using microscopy. Recording and reporting surveillance data takes 10-15 minutes. Mostly used telephone and rare time e-mail to transfer data. Data analyzed by person, place and time regularly at zonal level only. The current system can detect the outbreak i.e. Malaria outbreak in Bugna woreda 2013. The system is allowed all the reporting

agents accept and well engaged to the surveillance activities. But, all participants are not accept and engaged well. 71% of sites have no lack of report formats. All assessed areas used Telephone to report but 2(29%) of sites additionally uses e-mail and fax. From week 28-52(July-December 2014) a total of 9736 cases of suspected and confirmed malaria were reported, from 5283 cases positive for *Plasmodium falciparum* and 4422 were positive for *P.vivax*. A total of 57% woreda of zones have trained personnel on disease surveillance. There are variations on the length of days and intensity of trainings among health professionals. There is turnover among disease surveillance and malaria trained staffs. There is a plan to supervise once quarterly but not conducted as planned

Discussion:-The surveillance activities became the concern of health professionals, stakeholders and political leaders. The system is useful for planning, implementing and evaluating the practice. All of the districts have written EPRP. Emergency committee didn't review their plans, actions, and learned experiences by epidemic response committees. . The emergency committee should review their plans, actions, and learned experiences. Secured budget for surveillance at all level based on the demand of the system. Capacity building for assigned and other health care providers on regular basis in disease detection, reporting and data analysis is required by providing standard training, workshop and meeting. They should build a mechanism to control the attrition of trained staffs.Regarding supportive supervision, the visited woreda health offices program specific supportive supervision was not conducted for lower level health institutions and similarly there was no feed backing system to the reporting facility. The zonal weekly surveillance reporting completeness rate was acceptable according to WHO report completes. But in the assessed health offices and health facilities there were not showing these results and the assigned responsible PHEM officers for report compilation and data analysis of routine surveillance data analysis was not exercised. The surveillance activities became the concern of all stakeholders (i.e. health professionals, private sectors, political leaders).

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Introduction

A functional disease surveillance system is essential for defining problems and taking action. Proper understanding and use of this essential epidemiological tool (public health surveillance)helps health workers at the woreda and health units to set priorities, plan interventions, mobilize and allocate resources, detect epidemics early, initiate prompt response to epidemics, and evaluate and monitor health interventions. It also helps to assess long term disease trends. (1)

Ethiopia underwent different strategies to have functioning and effective surveillance system. Too often, however, surveillance data for communicable diseases are neither reported nor analyzed on time. As a result, the opportunity to take action with an appropriate public health response and save lives is lost. Even in cases where adequate information is collected, it is often not available for use at the local level.2

PHEM is designed to ensure rapid detection of any public health threats, preparedness related to logistic and fund administration, and prompt response to and recovery from various public health emergencies, which range from recurrent epidemics, emerging infections, nutritional emergencies, chemical spills, and bioterrorism. The activities under this core process are to be implemented by appropriately trained and capable professionals. This core process is comprised of four sub-processes which are: Public Health Emergency Preparedness, Early Warning, Response, and Recovery.2

The FMoH/ PHEM of Ethiopia identified 20 top priority diseases which are epidemic prone, of international concern and diseases on eradication and elimination programs for surveillance activities. These diseases are monitored by a designated bodies through available means of communication- telephone, paper based reporting etc.(2)

These diseases are set to be reported as mandatory notification (which are immediately reportable) diseases and routine surveillance (which are to be reported weekly). (2)

They are significant disease burdens to the public. Diseases like malaria are of the ten top diseases throughout the nation for more than a decade. Over the last decade, the world has made major progress in the fight against malaria. Since 2000, malaria mortality rates have fallen by 42%globally and 49% in Africa and reduce malaria incidence by 25% globally and 31% in Africa. Health Assembly target of reducing incidence rates by more than 75%. A major scale-up of vector control interventions, together with increased access to diagnostic testing and quality-assured treatment, has been key to this progress.(3)

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But we are not there yet. Malaria still kills an estimated 627, 000 people every year worldwide, mainly children under five years of age in sub-Saharan Africa. Every year, more than 200 million cases occur; most of these cases are never tested or registered. A recent plateauing of international funding has slowed down progress, and emerging drug and insecticide resistance threaten to reverse recent gains.(3)

Malaria is ranked as the leading communicable disease in Ethiopia, accounting for about 30% of the overall Disability Adjusted Life Years lost. Approximately 57.3 million (68%) of the 84.3 million population of Ethiopia live in areas at risk of malaria. According to the FMOH, malaria was the leading cause of outpatient visits and health facility admissions in 2009/2010, accounting for 14% of reported outpatient visits and nearly 9% of admissions. Malaria also was among the ten leading causes of inpatient deaths among children less than five years of age. Because of a weak malaria disease surveillance system and the inability of the Health Management Information System (HMIS) to capture all necessary malaria related indicators, official estimates of the true burden of malaria in Ethiopia are imprecise.4

The surveillance system of North Wollo zone has not been evaluated before and malaria selected as a tool because Ethiopia aims to achieve malaria elimination in selected geographical areas with historically low malaria transmission by 2015, where universal coverage of malaria prevention interventions and strengthened surveillance has been well established. There will be an especially aggressive response to malaria case build ups and to epidemics within these areas. It is one of the main health problems of Amhara Region. Therefore, this study had been conducted to evaluate the functionality of the surveillance system , to see effectiveness and efficiency of the system and identify the gap for the better improvement of the surveillance system. The overall purpose of surveillance of these diseases is to monitor the trend against the seated tolerance limits, as early warning and early response system, and pick any deviation from the limit at the earliest point in time for prompt response. Furthermore as early warning system, it guides risk mapping and preparedness; and prevention and risk aversion actions like immunization, vector control and so on. For these purposes, each of these diseases has case definition(s) and Public health emergency prone diseases reporting formats defined by the ministry of health and the WHO; and reporting is institutionalized into the health facilities and health offices.

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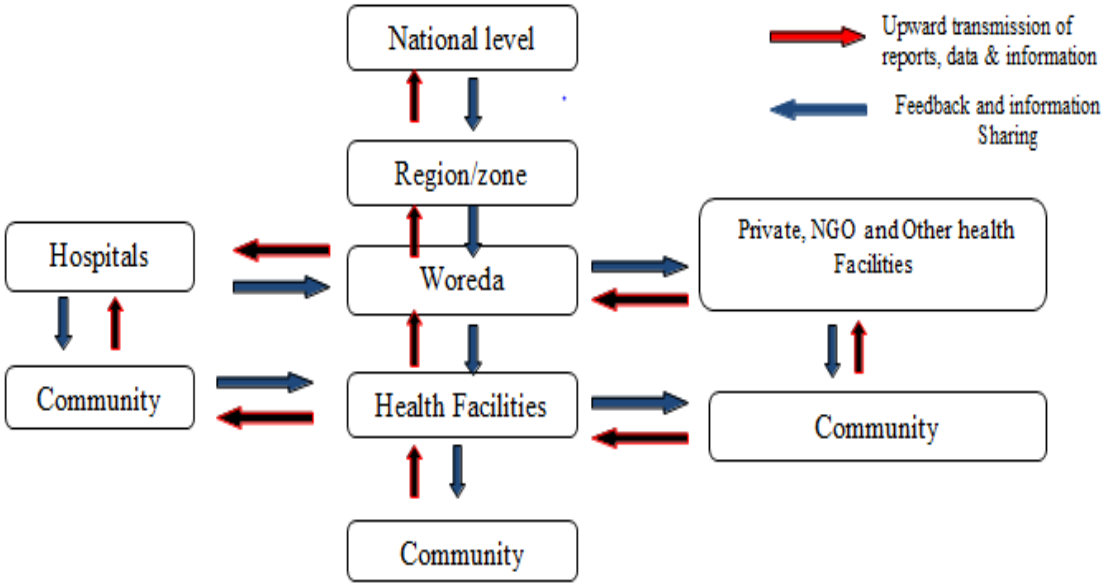
Table 9Diagram illustrating the formal and informal flow of surveillance data and information throughout a health system



Rationale of the study

Malaria is one of the leading causes of morbidity and mortality in Ethiopia. Therefore, this study was conducted to evaluate whether the system is in a way of performing to the set objective and to identify the gap for improving the surveillance system. Malaria surveillance system has been useful in providing information of malaria trends and also it provides magnitude of morbidity and mortality due to malaria in the zone. The finding of this evaluation will be utilized for planning, effective health interventions and procure of equipment that helps for diagnosis, treatment and prevention of malaria cases.

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Objective

General objective

- . To assess the performance of core activities and attributes of surveillance system of Malaria surveillance.

Specific Objectives:

- To assess the core activities such as case detection, reporting analysis and response surveillance system in the study area
- To evaluate the attributes of the surveillance system of the selected diseases in the study area
- To assess major challenges of quality surveillance system
- To assess the usefulness and utility of surveillance system in early detection of diseases and outbreaks.

Materials and Methods

Study area

North Wollo zone is one of 10 zones in the Amhara Regional of Northern Ethiopia. It is bordered on the south by DebubWollo, on the west by DebubGonder, on the north by Wag Hemra, on northeast by Tigray Region and on the east by Afar Region. Part of its southern border is defined by the Mille River. Its highest point is Mount AbunaYosef. Its town includes Labella (known for its rock-cut churches). The total population of the zone is 1,580,007 and primarily health coverage of 97.6% in 2014.

Map 3 map of North Wello zone, in Amhara Regional state in 2015

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Study Design and Period

A cross-sectional descriptive study was conducted from December 24/2014 - January 7/ 2015 in North Wollo Zone, Amhara Region.

Sample Size, Sampling Technique and study unit

The study subjects were health facilities, health offices and zonal health department. A total of 9 Study units/sites were included in the study. These were North Wollo zone health department, two district health offices, three health centers and three health posts. Selection of zones, districts and the district health facilities were performed as follows:

The zone was selected because of two reasons: - first it has not been evaluated before. Second Outbreaks have occurred in the last year and there is relatively delay in detection, reporting and response. This evaluation of the surveillance system conducted using malaria. From the zone, two districts were selected by discussing with zonal Health department (good and poor performing woredas in PHEM activity) and two district health offices were included in the study. From each selected district health center and health post were selected on convenience basis.

North Wollo zonal health department, district/woreda health offices (Raya woreda and Habru Woreda health offices), health centers (Robit and Goodbye health center from Raya and wurgesa Health center from Habru), health posts(Robit, from Raya and woremegna health post from Mersa health center cluster) were included.

Data collection methods

Primary data was collected using semi-structured questionnaire. Interviewee was conducted with surveillance focal person (officers) in the selected health offices and health facilities from study unit. Secondary data source such as surveillance report completeness and timeliness as well as malaria surveillance data, supervision report, written feedbacks, preparedness plans were also reviewed.

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Standard Cases definition

Malaria

Suspected

Any person with fever or fever with headache, rigor, back pain, chills, sweats, myalgia, nausea, and vomiting diagnosed clinically as malaria.

Confirmed

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

Operational case definitions

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

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

Case registration: is the process of recording the identified cases

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

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

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

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

Usefulness: Usefulness of the surveillance system is reflected by documented changes in policies and procedures as a result of information generated by the system.

Simplicity: Simplicity denotes the structure and ease of operation of the surveillance system.

Flexibility: Flexibility of a surveillance system is its capacity to adapt to changing information needs or operating systems within minimal additional time, personnel and funding.

Quality: The quality of data reflects the completeness and validity of the data recorded in the Zonal Health Department.

Acceptability: Acceptability is the willingness of persons, institutions or organizations to participate in the surveillance system.

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

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Positive predictive value: Positive predictive value refers to cases that actually have the health condition in question.

Representativeness: Representativeness refers to the extent to which the surveillance system accurately describes the occurrence of medical condition over time and their distribution in the population by place and person.

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

Data analysis

We entered data and analyzed using the Microsoft Excel, Epi Info and summarized qualitative data to supplement the quantitative findings.

Data dissemination

Written report of both hard and soft copies prepared and shared to Addis Ababa University/School of Public Health, Amhara Regional Health Bureau PHEM department, North Wollo zone health department and all visited district health offices, Ethiopia Field Epidemiology Training Program mentor, resident advisors and coordinators.

Result

In North Wello Zone, from all 13 districts 85 % are malarious. From week 28-52(July-December 2014) a total of 9736 cases of suspected and confirmed malaria were reported(figure 2), from these 506 inpatient cases, 26841 cases of fever suspected for malaria, 5283 cases positive for *Plasmodium falciparum* and 4422 were positive for *P.vivax.*

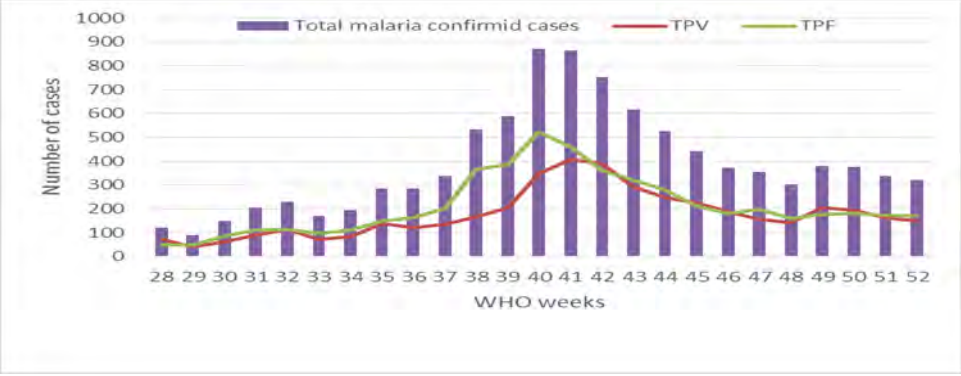

Figure 13 Weekly cases of malaria in North Wello Zone, July -December 2014

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Meeting

The principal investigator conducted a brief meeting with responsible persons (Head of institution, PHEM focal person) before assessing the objective of the study and its significance, and highlighted information after assessment, at different level. This meeting was also an important first step for assessment and recommendations; which help for the implementation of recommendations and betterment of the surveillance and response of the major priority diseases of the evaluated zone. Zonal health PHEM officer described about PHEM system has improved and became focus of even political leaders. However, costs couldn't judge with respect to the objectives and usefulness of a surveillance system all 13 woreda of zones has emergency budget totally nears to 155,197 birr for 2007 EFY. A total of 1,580,007 people under surveillance. They have accepted Ministry of Health priority disease and listed 21 under surveillance.

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 .So, all of the participants agreed up on the surveillance system is helpful to detect the outbreak of priority diseases early, to estimate the magnitude of morbidity and mortality related to these disease, including identification of factors associated with these diseases. To permit assessment of the effect of prevention and control programs and to observe /confirm interventions and diseases trends analyzed. All of the district's 100% of out breaks have been investigated within 48 hours and facilities has implemented prevention and control measures based on local data and gave responses within 48 hours of notification recently reported outbreak. Zone and All of the districts has prepared written epidemics preparedness and response plan (EPRP). All of the districts excluding zone had emergency stocks of drugs and supplies at all times in the past year. None of the areas experienced shortage of drugs, vaccines or supplies during epidemics. All levels have conducted epidemiological investigation; the offices/facilities have benefitted from their investigation for early verification and prevention of public health events. The challenge of all assessed area was none of epidemic management committee evaluated their Preparedness and response activities.

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Simplicity

The simplicity of a surveillance system refers to both its structure and ease of operation. Simplicity of the surveillance is tried to see how the standard case definition of malaria disease simple, easy and understandable and help full for data organizing, entry, data analysis, identification of suspected cases and apply by all levels of health professionals. The malaria confirmatory test takes 10-15 minute at health post level and within no power Health center using RDT and near to 1 hour at health center level using microscopy. The systemallows all professionals to fill data easily; and to record and report surveillance data on time and it takes 10-15 minutes. The report submitted to Zonal health department (ZHD), world health organization(WHO) and Amhara national regional health bureau(ANRHB).The most common way of transmitting data to the higher level is telephone, and rare times they use e-mail but ZHD uses both. They suggested to make it more simple :- using internet, , cell phone for the department, 24 hours electric services and continuous refreshment training on surveillance and orientation about report formats to all staffs. Data is analyzed by person, place and time on ZHD and district level also in the health facility.

Flexibility

Unless efforts have been made to adapt a system to another disease, it may be difficult to assess the flexibility of that system (In the absence of practical experience). Generally, simpler systems will be more flexible--fewer components will need to be modified when adapting the system for use with another disease. The current system can detect other newly occurring health conditions. The system is not complicated and easy to integrate with other systems, and able to continue its routine activities and operating appropriately. They are experience on malaria outbreak in Bugna woreda

Acceptability

Acceptability is a largely subjective attribute that encompasses the willingness of persons on whom the system depends to provide accurate, consistent, complete, and timely data. The system is allowed all the reporting agents accept and well engaged to the surveillance activities. But, all participants are not accept and engaged well in the system. Their reason is lack of understanding of the relevancy of the data to be collected and no feedback (e.g. Kobo woreda and Habru woreda no feedback to the Facility) or recognition given by the higher bodies for their contribution i.e. No dissemination of the analyzed data back to reporting facilities. The ZHD, Woreda offices and facilities have understanding on timeliness of receiving and reporting surveillance reports accordingly. For all assessed staffs reporting formats are neither difficult to understand nor time consuming. The last year timeliness performance of zone was 95%.

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Sensitivity and reporting

The sensitivity of a surveillance system can be considered on the level of case reporting, the proportion of cases of a disease or health condition detected by the surveillance system can be evaluated and the system can be evaluated for its ability to detect epidemics. Zonal health department and districts had PHEM guide line and the health facilities also had guide lines. One up to health post had enough confirmatory test for malaria. All assessed area had and posted case definition of malaria and other priority diseases. In the past one month 7 measles from 79 expected cases per year, 1 AFP from 36 expected cases per year and 2 suspected Anthrax have been detected. Among the assessed areas only two sites which are (Mersa woreda and zonal health department) has no lack of report format for the last 6 months; which means 71% of sites have no lack of report formats. All assessed areas used Telephone to report but 2(29%) of sites (Habru woreda and zonal health department) additionally uses e-mail and fax.

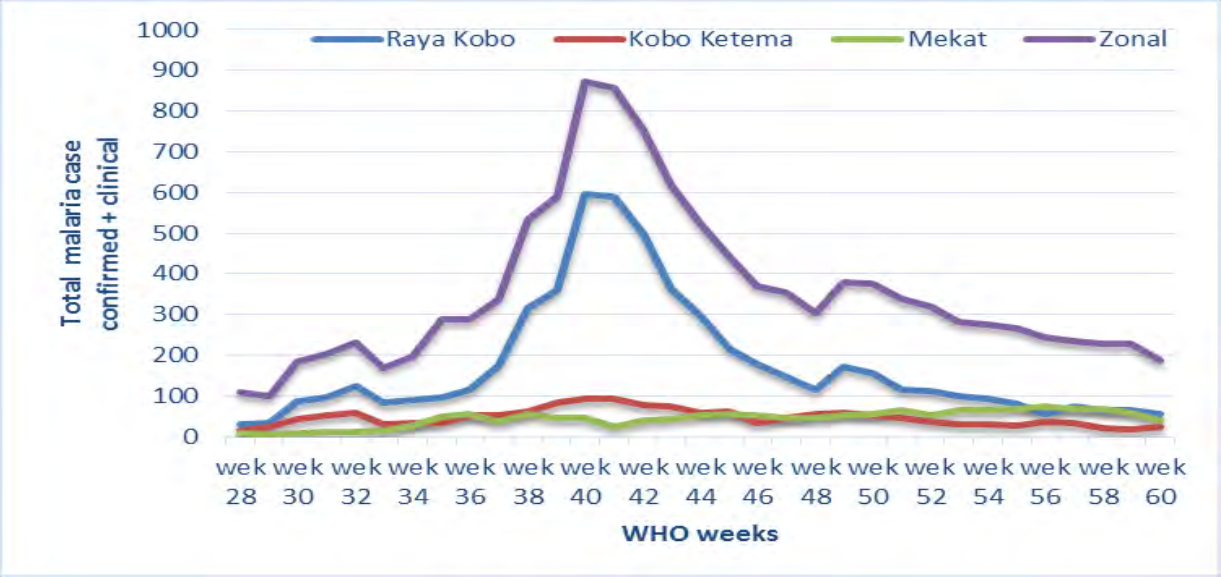

Figure 14 Malaria case trends in high risk woredas of North Wollo, Amhara regional state 2014

Representativeness and data quality

A surveillance system that is representative accurately describes the occurrence of a health event over time and its distribution in the population by place and person. Even if this issue related with the health service coverage, the reporting rate of the health facilities, the health seeking behavior of the community, and the technical capacity of the health care providers and so on, all of the participants believe that the system is do not describe accurately the occurrence of a health event over time and its distribution in the population by place and person. The quality of data may be influenced by data management, the quality of training and supportive supervision. So, the representativeness of the system is likely to be very low. The data quality was also assessed on the

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basis of completeness of the reporting format and the timeliness of the report. There are missed variables in reporting formats especially in health post level. Some of the missed variables in the weekly reporting formats are date of report, week Number, the expected number of health facilities to report and blank variables rather to fill zero case .The major reasons are not considering some of the variable as important. The reporting sites were not well trained or regularly supervised in all visited sites. There were no any regular crosschecking of the data and feedback especially at district level and Health center level.

Completeness and Timeliness

The reporting rates of the health facilities in the zone were found to be low relative to woreda health office and zonal health department. But it is difficult to set the exact figure of health facilities all over the year because of data quality. Last year in 2014 EC, zonal health department has sent a report timely to the region. So, it is almost near to 92%. As mentioned earlier in sensitivity part 10 immediately reportable disease has been detected and reported to the zone within 2-24 hrs. All over the year the report completeness of zone is above 80% and the graph below shows the trend of report completeness.

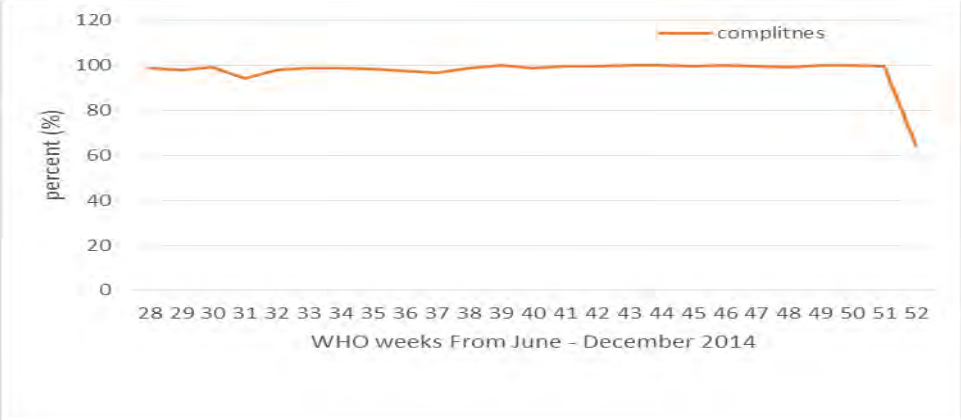

Figure 15 Trend of report completeness in North Wello Zone, Amhara Regional State, 2014

Training, supervision and Feedback

Zonal and woreda personnel have participated in PHEM training but one only from health facility has participated in PHEM training. There are variations on the length of days and intensity of trainings among health professionals. A total of 57% woredas of the zone have trained personnel on disease surveillance. But, there is no data about the general percentage of personnel trained in surveillance and epidemic management. There is turnover among disease surveillance and malaria trained staffs. It

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has implication on prevention and control activities. There is a plan to supervise once quarterly. Whether integrated with other program or disease surveillance program specific alone. Zonal health department and health centers didn't conduct program specific supportive supervision last year. Raya kobo and Habru conducted supervision by them and to them, 2 and 1 time last year respectively. Written feedback has been given by zonal health department to woreda heath office but there is no a trend of feedback to higher level as well as written feedback by woreda to Health center and Health centers to health posts. Participants reason out lack of budget, time and being busy by immediate jobs to don't conduct supervision as per planned.

Resources

From visited health offices and all of health centers 100% were compile weekly PHEM report manually. According to interviewed staffs response in zonal PHEM department, Zonal PHEM officers can use Microsoft office applications (MS word, MS excel and power point); but they don't have any clue on Epi info utilization. On the other hand, from woreda health office and health center were have no computer skill on Microsoft office application respectively. Regarding availability of computer and printer, zonal PHEM unit have computer, printer and telephone for data management and communication; from visited woredas 50% of them have computer and printer. Furthermore, 33 % of visited health centers had computer and printer. Availability of resources related to data management and communication in visited sites is presented in detail in table 9.

Table 10 Availability of resources for PHEM activities (in the visited site) in the NorthWollo Zone, Amhara Region, North West Ethiopia, 2015.

S.No.	Materials/ Item	Zone (N=1)	Woreda (N=2)	H.Cs (N=3)	Total
1	Electricity	100%	100%	67%	89%
2	Bicycles	0%	0%	0%	0%
3	motor cycle	0%	100%	100%	67%
4	Vehicle	100%	50%	0%	50%
5	Computer	100%	50%	33%	44%
6	Printer	100%	50%	33%	44%
7	Fax	100%	0%	0%	33%
8	Telephone	100%	50%	30%	60%
9	Internet service	100%	0%	0%	33%

Discussion

The purpose of the evaluation is to assess the effectiveness of the surveillance and response system in terms of timeliness quality of data, preparedness, case management, overall performance and using the indicators to identify gaps or areas that could be strengthened.(8)

The public health importance of a health event and the need to have that health event under surveillance can be described in several ways. Health events that affect many people or require large expenditures of resources clearly have public health importance. However, health events that affect relatively few persons may also be important, especially if the events cluster in time and place. Surveillance system evaluation allows us to define whether a specific system is useful for public health and is achieving that system's objectives. (7)

Surveillance system can adapt to changing information needs or operating conditions with little additional cost in time, personnel, or allocated funds and essential for planning, implementation, and evaluation of public health practice. According to the North Wollo zone all of the districts surveillance system is not complicated and easy to integrate with other systems, and able to continue its routine activities and operating appropriately.

Quality of data is influenced by the performance of the screening and diagnostic tests (i.e., the case definition) for the health-related event, the clarity of hardcopy or electronic surveillance forms, the quality of training and supervision of persons who complete these surveillance forms, and the care exercised in data management. Are view of these facets of a public health surveillance system provides an indirect measure of data quality (7)

Establishing multi-sartorial PHEM committee and rapid response team is the primary steps of preparedness at each level (9) In addition; these established committees should be oriented or trained on epidemic preparedness and response (especially for RRT). The committee should have a regular meeting as monthly basis for multi-sartorial committee and RRT will meet regularly when there is an outbreak. In the visited sites even though there is established multi-sartorial task force committee in all woredas and zone, it lacks functionality or regular monthly meeting in all levels. On the other hand, rapid response team/ technical committee were established and had meeting when there was an outbreak and most of team members were trained on epidemic preparedness and response. Has prepared written epidemics preparedness and response plan (EPRP) but they didn't review their plans, actions, and learned experiences by epidemic response committees. All of the districts excluding zone had emergency stocks of drugs and supplies at all times in the past year... Furthermore, the districts health offices were not allowed for emergency budget on hand from the district administration office

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but not based on the demand of the system, which hampers timely investigation, and mitigation of expected events in the district by the district health office.

The need for rapidity of response in a surveillance system depends on the nature of the public health problem under surveillance and the objectives of that system. Recently, computer technology has been integrated into surveillance systems and may promote timeliness. The report completeness and timeliness of the zone is above 85%. According to WHO acceptable report completeness is 80% and above and timeliness 85% and above. But on the visited facility, all reported diseases under surveillance unit not uniformly detected, record and response at all level of health profession and lack of understanding of the relevancy of the data to be collected and no feedback and supportive supervision not conducted in the visited site or recognition given by the higher bodies for their contribution i.e. no dissemination of the analyzed data back to reporting facilities and flow of data has so many difficulties with reporting means and infrastructure like vehicle for transport, telephone, fax machines and computers for data management and analysis specially woreda health office. There is also a problem of describing data by person, place and time at all level. This might be due to shortage of trained man power(computer skill) , irregular supervision and feedback system to lower level.

Limitation

Evaluating surveillance systems is not easy. There is no perfect system; trade-offs must always be made. Each system is unique and therefore requires a balancing of the effort and resources put into each of its components if the system is to achieve its intended goal. The limitations of this evaluation mainly with sampling method, sample size and unavailability of data to see trends and inadequate literatures of similar study for better approach.

Conclusion

Regarding supportive supervision, the visited woreda health offices program specific supportive supervision was not conducted for lower level health institutions and similarly there was no feed backing system to the reporting facility.

The zonal weekly surveillance reporting completeness rate was acceptable according to WHO report completes. But in the assessed health offices and health facilities there were not showing these results and the assigned responsible PHEM officers for report compilation and data analysis of routine surveillance data analysis was not exercised.

The surveillance activities became the concern of all stakeholders (i.e. health professionals, private sectors, political leaders). The system is useful for planning, implementing and evaluating the practice.

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All of the districts have written EPRP. Emergency committee didn't review their plans, actions, and learned experiences by epidemic response committees

Recommendation

The emergency committee should review their plans, actions, and learned experiences. Should be give feedback and regular supportive supervision should be programmed. Keeping up the trend of reporting and making to cover all the facility timely. Data analysis and interpretation should be performed regularly at each level. Refreshing training for all health staffs on regular basis in disease detection, reporting and data analysis is required by providing standard training, workshop and meeting.

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Chapter IV – Health Profile Description Report

4.1. Bati District Health Profile, Amhara region, Ethiopia, February, 2014

Executive Summary

Background: Health profile is vital for prioritizing prominent health and health related problems of the community. It is basic for planning and appropriate intervention; and it is an entry point for operational research. Stakeholders in health and health related areas of the community will have evidence-based information from well compiled health profile. The purpose of this document is to assess and describe the health and health related issues in Bati Town and communicate the local burden of disease and other health related information.

Methods: A cross sectional study had been conducted from 9- 20 March 2014 in Bati Town District. Health and health related data were collected using standard check list by interviewing and reviewing medical records in the District.

Results: The District has 6 kebeles which have a variable distance from Bati Town. In 2013/14 the population estimates for the District was 33,320 of which females constituted (51%). Approximately (66%) of the District population live in urban area. The age dependency ratio of the District was (84.1%). There are one health centers and 6 health posts in the District. In the District, there are 91 clinical Nurses, 4 Laboratory professionals, 3 Pharmacy professionals, 4 health officers, 1 Environmental health officers and 11 health extension workers. The leading cause of outpatient visit was Non bloody diarrhea which accounts for 4030 (16%) of all cases. The annual population growth rate of the District was 1.02.The prevalence of Non-bloody diarrhea in the District was 160 per1000 populations per year. In the year 2013/2014 pentavalent (penta 3) immunization coverage was 783 (87%), measles 738 (82%) and fully immunization coverage was 720 (80%).

Conclusion and recommendations: on bloody diarrhea was the most important public health problem of the district. Therefore, prevention and control measures should be strengthened to reduce the morbidity and mortality due to non-bloody diarrhea.

Introduction

Health profile is a summarized auditing and discussion of health related data and important health related indicators to describe the health and related social, economic, political and cultural factors in the geographic area under discussion. It is vital for prioritizing prominent health and health related problems of the community. It is basic for planning and for appropriate intervention; and is an entry point for operational research. Stakeholders of health and health related issues will have access to evidence-based information from well compiled health profile.

A community health profile includes both previously identified health issues and the identification of new, emerging issues. A comprehensive community health profile includes: A narrative description of the given community, community strengths and challenges, demographic and economic data, health status data, community resources, including services, coalitions, and systems and interpretation of data presented, from both the perspective of the health council and the broader community. However, in low income countries like Ethiopia such information especially at district level is usually not complete and not comprehensive.

In Bati Town there was no organized and well documented community health profile at one place. Different health and health related data were available at different processes of the District in disorganized situation in such a way that no one can access and use these data at the right time and place.

This document displayed a comprehensive health and health related document for Bati Town population. District sectors and other health partners will clearly understand District communities' health need from the document. So, having this document, governmental and non-governmental health stakeholders working for the District communities' have evidence based information for prioritizing and instituting appropriate public health interventions.

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Objective

General objective

- To develop Bati Town Administration health profile that could guide government health sectors and different health partners to clearly identify priority community health needs.

Specific objectives

- To assess primary health care coverage and human resources of the District
- To compile and simplify complex health information of the District.
- To identify priority problems.
- To describe existing health infrastructure of the District.

Methods

A cross sectional study was conducted from 09-20 March2014 in Bati Town Administration. All Kebeles of the District were included. Health and health related data were collected from District Health Office while data of save water coverage were collected from District water resource office. Education related data were collected from District education office. Agriculture data were collected from District Agriculture Office and other data were collected from other relevant sectors.

Structured questioners were developed and used to collect secondary data. Interviews were conducted with relevant officers of the above specified processes based on the needed data. Different register books were also assessed. Spread sheet/excel, and GIS were used for data analysis.

Results

Historical background and culture

Bati is one of the oldest woredas in Amhara Region which was established in 1930s.Bati is serving as the District capital. Around 96% of the population of the District is Muslims, 2.99% Orthodox and 1.1% others. The ethnic composition of the district is30%Amhara and 45% Oromo and 25% afar.There are no historical places in the District but there are potential historical places like Largest Market in the Town. The other potential place is Largest Metal which is found in the market place (used for historical nomination of the district is related to development (given after the establishment of the town increase in development then different people explains in oromgna"AbbooMagaallitiinBaatee" start from that the name is "Bati "·

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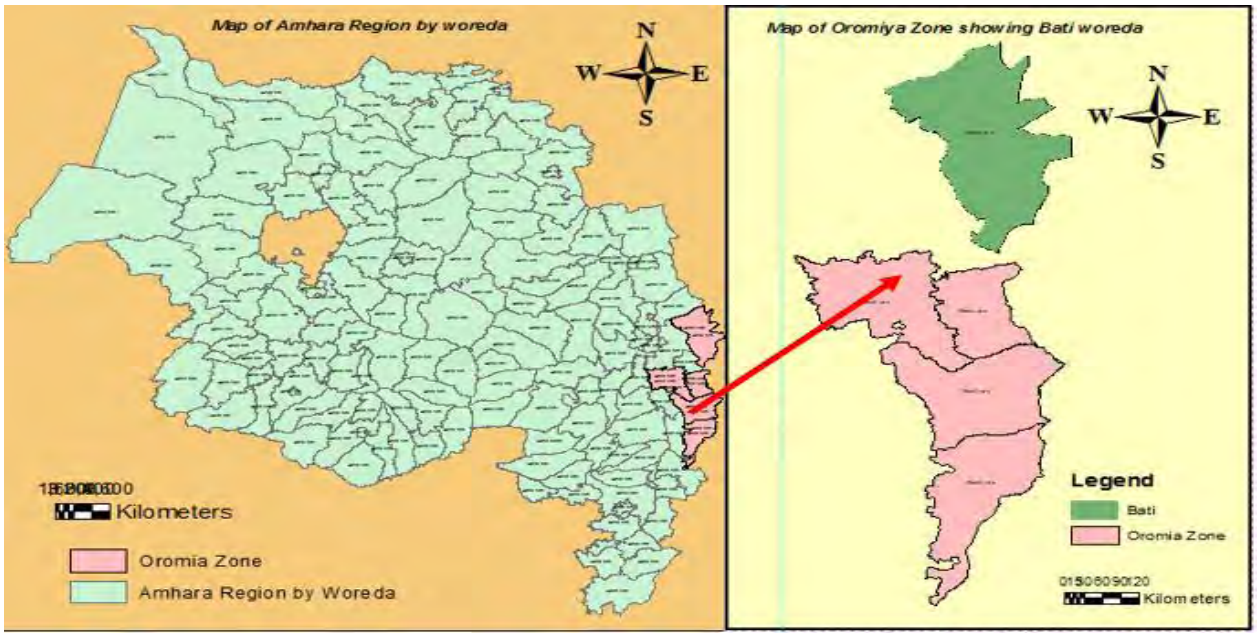
Geography and climate

Bati, the District Town is found on highway 515 kilo meters East of Bahir Dar. Bati Town share boundaries with Bati woreda to the North, Bati woreda to the south, Bati woreda to the East and South Wollo zone, Kalu woreda to the West.

The climatic condition of the District is 6% Dega, 27% WoinaDega and 67% Kola. It covers about587.95^2 kilometers, with altitude ranging from700-1502 meters above sea level and11°11′N 40°1′Elongitudes. The mean annual rain fall is 1250 mm; and the monthly temperatures ranges from 15^{0}c to23^{0}C.

Administrative and political organization

The District is divided in to 7 kebeles. The District has its own council and representative in the Federal Parliament. All sector offices are found in Bati Town. Amhara Development Association (ADA), Carter center, United States Agency for International Development (USAID), United Nations Children's Fund (UNICEF), and World Health Organization (WHO) are the main supporting organizations in the District. The Ruling Political Party in the District is the Amhara National Democratic Movement (ANDM/EPRDF).



Map 4 Map of study area Bati Woreda, Oromia Zone, Amhara Regional State

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Socio-Demographic information

The 2012/13 population estimate for the District was 33,320 of which females constituted 16,960(50.9%). Approximately21794 (65.4%) of the District's population are living in urban area. Religion composition of the District is 94% Muslim5% Christian and 1% others. Ethnic group in the town was no data, the cultural and Tourism head said most of the compos ions Oromo, Amhara, and Afar. The annual growth rate of the District is 1.7%.The average household size is estimated to be 4.3. Most of the kebeles have variable distance from Bati Town, the nearest kebeles is 5 km from Bati Town and the farthest is 15 km away from Bati Town. The District has 5 rural and 2 urban a total of 20 kebeles. The population density of the District is 200 inhabitants per square kilometer. (Table 1.1)

Table 1.1 Population distributions by kebele for 2012/13 with estimated population and distance in kilometers from the District Town (Bati)

S. No	Name of kebele	Total population	Male Population	Female Population	Distance in Km from Bati
1	BATI 01	5448	2675	2773	town
2	BATI 02	5725	2811	2914	town
3	BATI 03	5585	2742	2843	5
4	BATI 04	5036	2473	2563	10
5	SALMENE	8048	3952	4096	8
6	QAMIE	3478	1708	1770	7
7	Total	33320	16360	16960	

The population pyramid of the District is predominantly young with 14% of the population is children 5-9 years, 15.6% children 5-9 years and 13.7% children 10-14 years. Generally 43.3% of the population is under 15 years of age. The population in the productive age group 15-64 years constitutes about 54.3%. The population above 64 years is very small which constitutes about 2.4%. The sex ratio is almost equal. (Figure 15)

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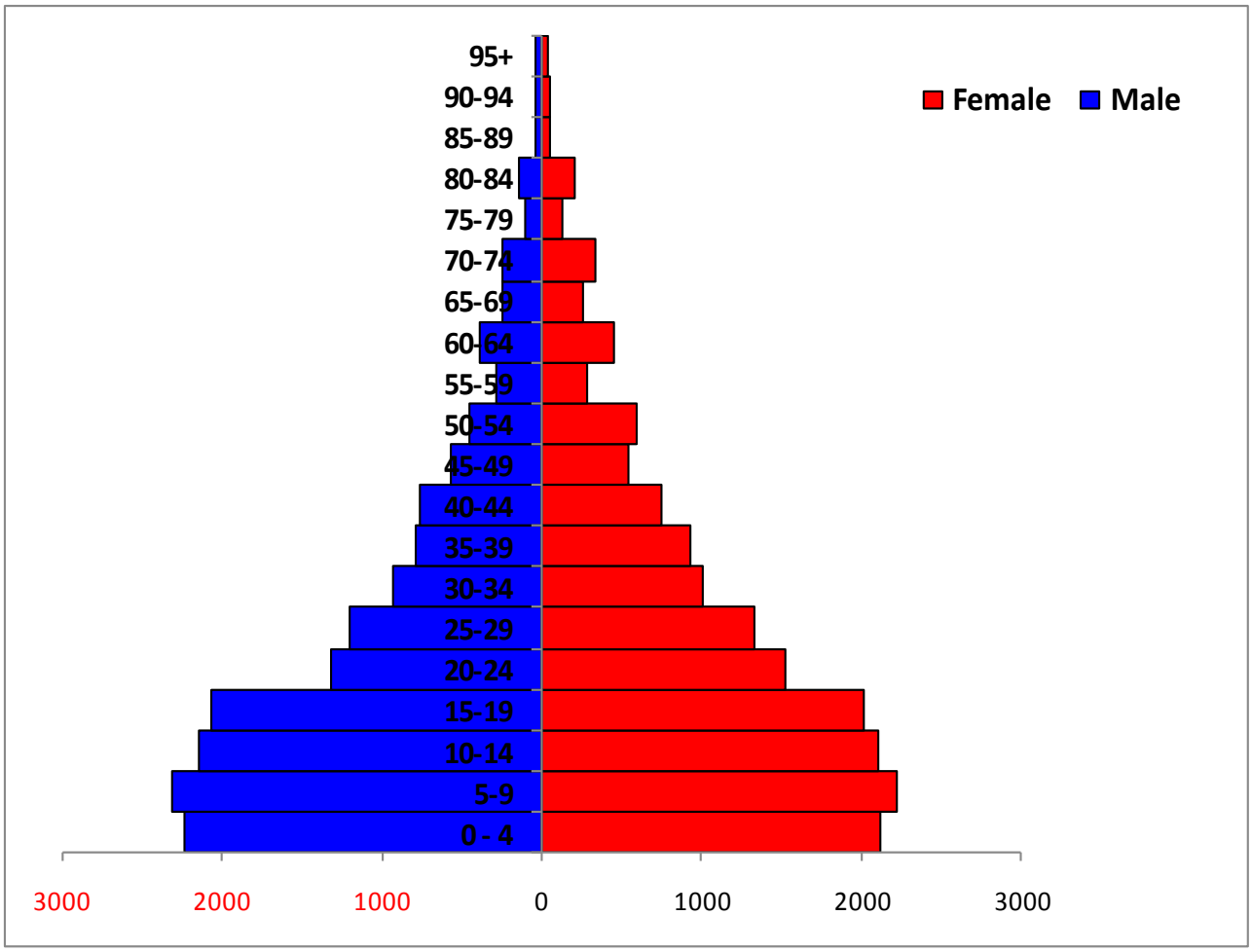

Figure 16The population pyramid of Bati Town, Amhara Region, Ethiopia 2013/2014

Facilities

Bati, the District Capital has 24 hour electric power supply, mobile and cable based telephone services, postal service and bank (commercial Bank of Ethiopia, Abaye Bank and Abyssinia Bank).. All Kebeles are accessible in transport in all seasons. All the 6 kebele offices have wireless telecommunication systems and are accessed by mobile telephone network, and all kebeles have electric power supply.

Education

Three kindergarten (zero grade) with a total of 506 students (232 male and 274 Female),currently attending their education, 7 primary schools(grade 1-8) with a total of 5380 students (2663 male and 2717 female), currently attending their education, one secondary schools(grade 9-10) with a total of 1082 students (659 male and 423 female) currently attending their education and one Preparatory school with a total of 327 students (211 male and 116 female) currently attending their education. One

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TVETs in the woreda. The total educational coverage of the woreda is 97 %(educational offices 6 month report).

The student (1-8 elementary students') dropout rate were 3.4% (193 students) and (9-12 students) drops 65. Most of the students drops because of migrate (26), sick (17), marriage (7), death (1) and the rest was by carelessness. But the proportion of students passed the next class was 75.4%.

In the Bati Town Administration, 12 schools have latrine either both sexes separately or together. Only four schools had access for tape water with pipe. The rest have no access to water supply

Productivity and income

Most of the District population lives in urban area and on trade economy. The most common stable foods/crops in the District are "Maize" "wheat" Teff", Dagusa (Melet), Barley & Pepper and the productivity of the land per hectare was 23, 55, 40, 26, 28 and 8 quintals respectively. The gross domestic product (GDP) of the District in Maher Season (regular crop season) was 62,946 quintals. The total GDP of the District for 2012/13 was 62,946 quintals (total crop production). However it was difficult to change this income in to dollar or Ethiopian Birr.

Drinking water supply

The District Water Resource Office was working to supply safe drinking water for the community in collaboration with different stakeholders and partners. But still there was a certain segment of the community using unsafe water for drinking. Almost 25% of the District population do not have access to safe water. In addition to this frequency of chlorination for drinking water sources was every 3-6 months even though the recommendation is every 3 months. (Tables 7&8)

Table 11 Distribution of drinking water sources in BatiTawon, west Gojam, Amhara, Ethiopia, 2012/2013

S.No	Type of water source	Total	Functional
1	Protected spring	23	13
2	Deep well	1	1
3	Hand dug well	50	45
4	Shallow well	25	20
5	Rope pump	19	15
Total		118	94

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Table 12 Safe water coverage by kebele in BatiTawon, west Gojam, Amhara, Ethiopia, 2012/2013

District health system

S.No.	Kebele	Kebele population	Percentage of people who have Access to safe water
1	BATI 01	5448	66.8
2	BATI 02	5725	74.0
3	BATI 03	5585	65
4	BATI 04	5036	73.8
5	SALMENE	8048	88.6
6	QAMIE	3478	80.5
Total		33320	74.7

Organo-gram of District Health Office

The District has one core process, five case teams with in a direct command of the District Health Office (Fig. 16)

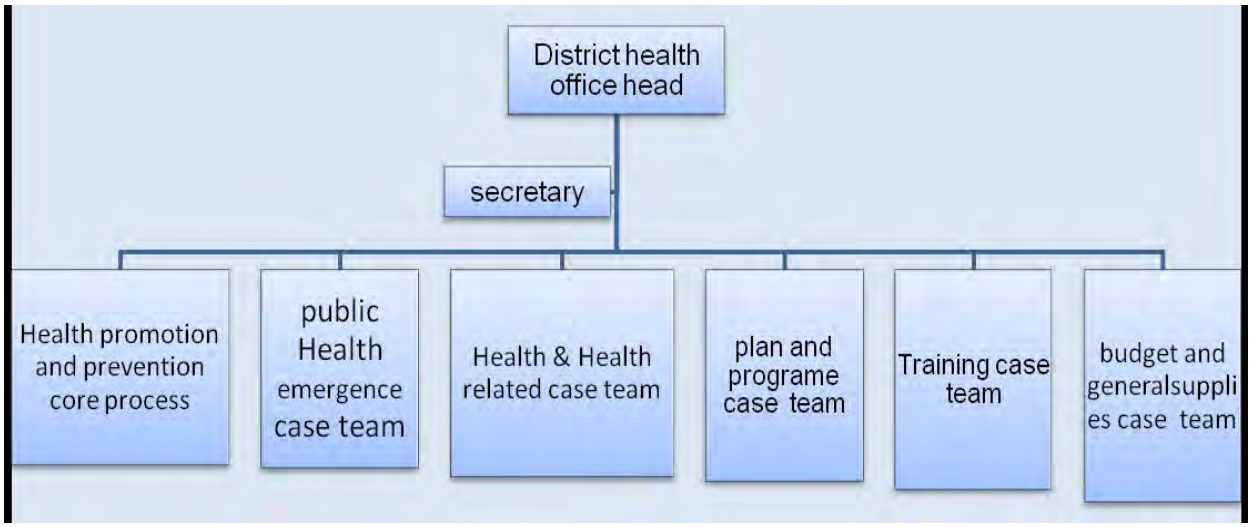

Figure 17 Organizational structures of Bati Town Health Office, Amhara, Ethiopia, 2013.

Health Infrastructure

There are 6 health posts and one health centers but there is no hospital in BatiTown Administration. Regarding the availability of telephone service and electric power supply, the health center and 6 of the health posts have 24 hour electric power supply but only the health centers has cable based telephone service. All kebeles offices have wireless telecommunication systems and are accessed by

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mobile telephone network. There are six private clinics and two drug vendors in the District. (Table 9 &Figure.17)

Table 13. Number of health facilities by type in Bati Town, 2012/2013

S.No	Type of HFs		Number
1	Number of Health Centers	with sustainable/ 24 hour electric power	1
		without sustainable/ 24 hour /electric power	1
		with telephone service (cable based/mobile)	1
		without telephone service (cable based/mobile)	0
		with piped water supply	1
2	Number of Health post		6

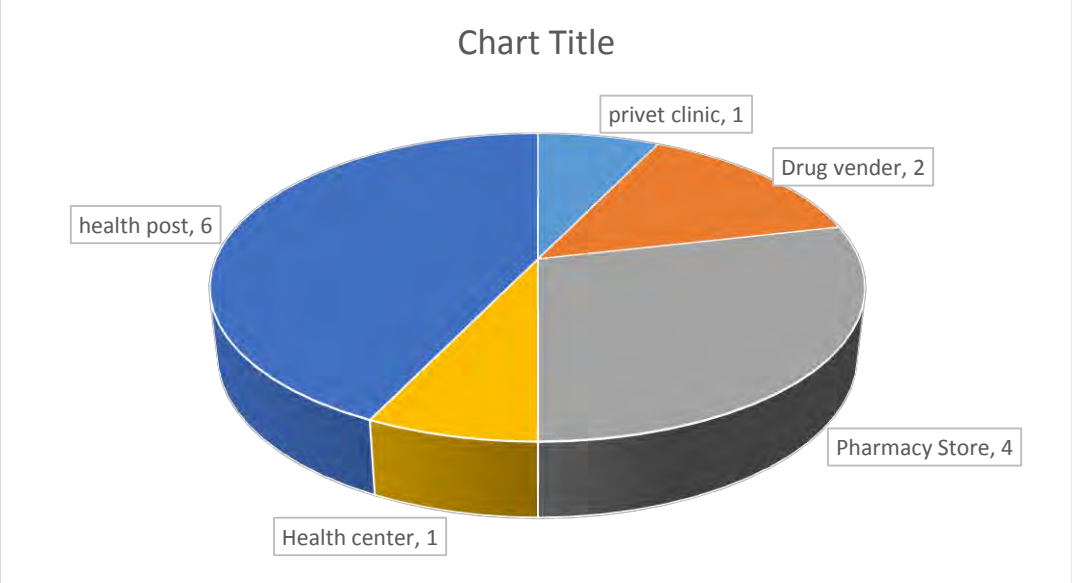

Figure 18 Distribution of Government and private Health Facilities in Bati Town, 2012/2013

The potential health service coverage in some kebeles is >100% but in most kebeles it is between 50% and 98% which shows inequitable distribution of health facilities. In general the potential health service coverage of the District is 90% based on the estimate of one health center and five health posts giving service for 40,000 populations. The potential health service coverage by kebele is shown in table 12

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Table 14 Potential Health Service Coverage of Bati District by kebele, 2012/2013

S.No	Name of Kebele	Kebele Pop.	# of HFs		# Of Popn. Getting service from the HC	Potential Health Service Coverage	
			HPs	HCs		HC	HP
1	BATI 01	5448	1	1	33320	100%	98%
2	BATI 02	5725	1				62%
3	BATI 03	5585	1				62%
4	BATI 04	5036	1				80%
5	SALMENE	8048	1				62%
6	QAMIE	3478	1				50%
Woreda		33320	6	1	33320	100	69%

Vital statistics and health indicators

Females in the reproductive age group (15-49 years) are estimated to be about 7,864 (23.58%) and non-pregnant women are estimated to be 6897 (20.34%) of the total population in the District. Children <1 year of age constitute about 900 (2.7%) and children <5 years of age constitute about 4,498 (13.5%) of the total population. But Vital statistics like total death, total births, under one and under five deaths were not recorded in the District and indices for each specific indicator mentioned in the table 11 were from the national estimates, projected from the 2007 national census.

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Table 15 Distribution of population groups and vital statistics, Bati Town, Amhara, Ethiopia, 2014.

Ser. No.	Parameter	Number (%)	Remark
1	Total population	33320(100)	
2	Male	16993(51)	
3	Female	16327(49)	
4	Under 1 years old	900(2.7)	
5	Under five years old	4498(13.5)	
6	Under 15 years old	1416(42.5)	
7	Urban	21794(65.4)	
8	Rural	11526(34.6)	
9	Female 15-49 years old	7864(23.6)	
10	Pregnancy	966(2.9)	
11	Live birth	900(2.7)	
12	Non pregnant women	6897(20.7)	
13	Average house hold size	33320/4.3 7748)	
14	IMR/1000	No data	
15	Under 5 MR/1000	No Data	
16	CBR/1000/year	No Data	
17	CDR/1000/year	No data	

Immunization coverage

In 2012/13, 900 population was targeted for immunization, pentavalent (penta3) immunization coverage was 783 (87%), measles 738 (82%) and fully immunization coverage was 720 (80%).

Maternal and child health service coverage

In 2012/13ANC achievementat least one visit was 966 (100.3%) and at least 4 visits was241 (25%).Proportion of skilled delivery was 674 (19.4%), family planning acceptance rate was 18,389 (77.9 %) (Table 12)

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Table 16 Family Health activities in Bati Town, Oromia special zone, Amhara 2012/2013

Activity	Planned	Achieved	Coverage (%)	Remark
ANC at least 1 visit	1472	1,752	100%	
ANC at least 4 visits	1472	680	46%	
Skilled Delivery	1333	565	19.7%	
Family Planning	7864	7033	89%	

Health education

Health education was given at health facilities and house to house by health care providers and the health extension workers (HEW) mainly on the prevalent health problems of the district i.e. Nutrition, personal & environmental hygiene, Expanded Program on Immunization (EPI), malaria prevention & control, HIV/AIDS prevention & control and essential drug use etc.

Leading causes of outpatient visit

Diarrhea was the top public health problem in the district accounting for about 16 %(4030) of the cases followed by AFI 15 %(3747) and acute upper respiratory infection 13 % (3223)

Table 17 Top leading causes of all outpatient visits in Bati Town Administration, Ethiopia, 2012/2013

S.N	**Disease type**	**Number**	**In %**	**Cum. Freq**
1	Diarrhea (Non-bloody)	4030	16%	16%
2	Acute Febrile Illness (AFI)	3747	15%	32%
3	Acute upper respiratory infection	3223	13%	45%
4	Typhoid fever	2713	11%	56%
5	Urinary tract infection	2289	9%	65%
6	Dyspepsia	2172	9%	74%
7	Pneumonia	1968	8%	82%
8	Other or unspecified infectious & parasitic diseases	1964	8%	90%
9	Diarrhea with bloody (dysentery)	1220	5%	95%
10	Infection of the skin & subcutaneous tissue	1189	5%	100%
Total		24515	100%	

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HIV/AIDS

There was an increment of HIV test through the years 2004 – 2010 in the District but there was a dramatic increment in 2010. Males had a higher rate of being tested for HIV than females except for the year 2006 where females had higher rate of being tested. In 2012/13 the District has planned to give voluntary counseling & testing service for 9,442 individuals but achieved only 3,302 (34.9%). The District has also planned to give PMTCT service for 3,777 mothers and achieved only 2,290 (60.6%). In PICT program 16,491 (107%) individuals got service out of 15,344 planned. 140 individuals were on ART and only one health center was giving HARRT service. However, there is no data for HIV prevalence and incidence.

Tuberculosis and Leprosy

Tuberculosis treatment success rate and cure rate in the District were good as compared to the national/regional and WHO targets except TB detection rate. Tuberculosis detection rate was 67% which is lower than the national/regional and WHO targets (84% and minimum 70% respectively). Tuberculosis treatment success rate was greater compared to the national/regional targets which is >87%. Tuberculosis cure rate is greater (91%) than the national targets which is >85%. There was no defaulter of tuberculosis patients in the District in the study period. There were no leprosy patients. (Table 16)

Table 18 Distribution of tuberculosis cases of Bati Town, Amhara, Ethiopia, 2012/2013

Indicator	Percent (%)
TB case detection rate	67
TB treatment success rate	91
TB cure rate	91
Defaulters	0
Leprosy	-

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Immediately and weekly reportable diseases

The following thirteen diseases are targeted to be reported immediately using case based reporting format and line listing depending on the number of occurrence of cases in the District.

1. Viral hemorrhagic fever (VHF)
2. Yellow fever
3. Acute flaccid paralysis (AFP/polio)
4. Anthrax
5. Avian human Influenza (AHI)
6. Cholera
7. Guinea worm
8. Measles,
9. Neonatal tetanus (NNT),
10. Human influenza (H1N1),
11. Rabies,
12. Small pox,
13. Sever acute respiratory syndrome (SARS)

The rest seven diseases or conditions are reported on weekly bases to the next level;

1. Dysentery
2. Malaria
3. Meningitis
4. Relapsing fever
5. Typhoid fever,
6. Typhus,
7. Malnutrition

Nutrition, food shortage and any other disasters

The district is one of the food secured areas in the region; hence there are no supplementary feeding units in the district. Any disaster had not been reported in the area.

Health budget allocation

The total budget for the Bati Town health office including health facilities was 9% (1,060,201) ETH Birr and budget allocated for public emergency 41,600 in 2013/2014.

Human resource: Health workers and supportive staffs

The District had a total of 89 health workers, 46Health Extension Workers and 44 supportive/administrative/ employees a total of 179 workers during the study period.

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Table 19Distribution of health workers in Bati Town, Amhara Region, Ethiopia, 2012/2013

S. N	Category	Number
1	Health officer	4
2	BSc nurse	18
3	Diploma clinical nurse	73
4	Midwife Nurse	3
5	Junior Nurse	2
6	Medical Laboratory Technologist	1
7	Pharmacist	1
8	Pharmacy technician	3
9	Medical Laboratory Technician	3
10	Environmental Health officer	1
11	Health Extension worker	11
12	Supportive workers	31
	Total	151

Essential drugs and other supplies

The District reported that there was shortage of essential drug supply and diagnostic kits were not easily accessible in market to purchase.

Discussion

The leading cause of outpatient visit in the district was Diarrhea which accounts for 4030(16%) of the total cases. The prevalence rate of malaria in the district was 121 per 1000 populations per year which needs serious attention. Even though the prevalence was quite high no death was reported in the District. This could be due to early diagnosis and treatment and quality of service or deaths was not recorded.

Acute Febrile Illness (AFI) was the second leading cause of morbidity in the district accounting for 3747 (15%) of the total cases. Diarrheal disease was also the leading cause of morbidity next to Acute Febrile Illness which constitutes for 4,900 (7.1%) of the total cases.

The status of measles immunization was 2,579 (73.6%) in under one year's which seems well matched with absence of measles cases/outbreak, food shortage/malnutrition cases and drought in the district unless under reporting was masking the situation.

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Even though ante-natal follow up in the District was in good performance which is 3,788 (100.3%) skilled delivery was quite low i.e. 674 (19.4%).This may be due to lack of awareness of mothers & bad cultures and poor management of health workers at health facilities.

Vital statistics like total death, total births, under one and under five deaths were not recorded in the District (1)According to the District Health Officials, the main problems of the district were limited budget, shortage of medical supplies at PFSA, Shortage of water and power supply in the health centers and shortage of human resources according to the Business Process Reengineering (BPR).(2)

There was no strong water quality monitoring. Chlorination was not applied as per the standard i.e. every three months. This might contribute to the higher rate of diarrhea and intestinal parasitizes in the district, which was 4900 (7.1%) and 1033 (1.5%) of the outpatient visits respectively. (3)

Limitation

Unavailability /limited researches on health and heath related issues. Absence of mortality records and reports in the district.

Conclusions and recommendations

Non bloody diarrhea was the most important public health problem of the district. Diarrhea and intestinal parasitosis were also found to be the major health problems of the district. Proportion of delivery attended by skill health personnel was low 19.4% (674), no mortality records, birth records, and shortage of medical supplies.

Therefore prevention and control measures should be strengthened the hygiene program to reduce the morbidity due to diarrhea, AFI and other priority diseases. The district should also be supported by the higher level government authorities and partners to have under one, under five years death and other deaths records for better planning and success. There should be strong water quality monitoring and regular chlorination as the standard.

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Chapter V – Scientific Manuscripts for Peer reviewed Journals

5.1. Investigation of Measles Outbreak- in Yilmana Denssa woreda, West Gojam Zone, Amhara Regional State, January 2014

Abstract

Title: Investigation of Measles outbreak in Yilmana Denssa Districts, West Gojam zone, Amhara

Regional State, Ethiopia, 2013

Authors: Habtamu Y.Nega[1], T.H. G/Hiwot[2]Mer'Awi A. [3]

Authors Affiliation: [1]Ethiopian Field Epidemiology Training Program, Addis Ababa University School of Public Health, [2] Amhara National Health Bureau Public Health Emergency Management Early warningofficer1.1 Investigation of Measles Outbreak in Yilmana Denssa Woreda, West Gojam Zone, Amhara Regional state, January/2014

Abstract

Background: Measles is an extremely contagious and remains a common disease and major contributor to child-mortality worldwide and kills approximately 1-3 of every 1000 infected individuals. An estimated 10 million cases and 164,000 deaths from measles occur worldwide each year. On January 17/2014 West Gojam zone, Amhara region reported suspected measles cases from Yilmana Denssa district. As part of it West Gojam zone has been reporting remarkable measles cases started On December 5/2013. An investigation was conducted to identify the cause of the outbreak and to undertake appropriate prevention and control interventions

Method: Unmatched Case control study design was used to investigate the outbreak and identify risk factors for the occurrences of the outbreak**.** We used structured questionnaire to solicit information from cases and controls. Analysis was made using Epi Info version 7.1.3.3 and Microsoft Excel

Result: Totally 292 cases and 5 deaths (4 facility and 1 community deaths) were identified. Sample was taken for seven cases and all of them found to be positive for measles IGM. . Out of 292 total cases 169 (58%) were females. The mean ages 13 years and overall attack rate (AR) of the case was 120/100,000 populations. 92.5% of affected cases were unvaccinated. Exposure to a measles cases was significantly associated with illness (OR= 6.3, CI (1.78-22.73) with p-value 0.001)

Conclusion: Unvaccinated children less than 15 years of age were primarily affected by the outbreak. Most of the cases were unvaccinated. So mass vaccination campaign recommend from 6 months -14 years of age groups should be conducted to stop the transmission.

Introduction

Measles is an extremely contagious acute viral infection, disease caused by a virus in the family Paramyxoviridae, genus morblli virus ((Organization., 2008)1). Measles is a highly contagious viral illness characterized by fever, malaise, rash, cough, coryza, and conjunctivitis. There are no known measles virus reservoirs outside of humans (2). Measles kills more children than any other vaccine preventable disease. Because the disease is so infectious, it tends to occur as epidemics, which may cause many deaths especially among malnourished children (3). Measles can result in complications such as diarrhea (8% of cases), otitis media (7 to 9% of cases), pneumonia (1 to 6%), and convulsions (one in 200). Other, rarer complications include nervous system complications, including encephalitis (overall rate of one per 1000 cases of measles) or seizures (involuntary movements (0.6-0.7%) and death (0.2%). Complications are more common in children under the age of five, or adults over the age of 20(6). Since the introduction of effective measles vaccines, the epidemiology of measles has changed in both developed and developing countries. As vaccine coverage has increased, there has been a marked reduction in measles incidence, and with decreased measles virus circulation, the average age at which infection occurs has increased (7). In 2001, countries in the World Health Organization (WHO) African Region started implementation of the regional measles mortality reduction strategies with a goal to reduce the estimated number of measles deaths in 2005 to half of the estimate for 1999(9). This goal was achieved, and a new goal was established to reduce measles mortality in 2009 to 90%. The measles mortality reduction strategy adopted by the African Region includes improving routine measles vaccination coverage, providing a second opportunity for measles vaccination through supplementary immunization activities (SIAs), monitoring the impact of vaccination activities through case-based measles surveillance, and improving measles case management(9). In developing countries with low vaccination coverage, epidemics often occur every two to three years and usually last between two and three months, although their duration varies according to population size, crowding, and the population's immune status. Outbreaks last longer where family size, and hence the number of household contacts, is large. In the absence of measles vaccination, virtually all children will have been infected with measles by the time they are 10 years old (10). As 5 years(2005-2009) country measles data analysis of Ethiopia Shows 46 zones Experience measles outbreak and all most all the zones in Amhara region Experienced measles outbreak in 2010/2011(12). Outbreaks of measles were reported by the woreda health office PHEM officer from four kebeles, West Gojam Zone onJanuary 8/2014, one case of measles was recorded in unvaccinated child from Yilmana Denssa woreda. Lately on WHO week 1 of 2014 the Yilmana Denssa woreda health office detected increasing number of cases of suspected measles which later confirmed by lab test for measles IgM. These cases were distributed among four Keble's in the Woreda. A

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team composed of one Jaica emergency officer and two field Epidemiology residents travelled to the woreda and collected information about the outbreak from woreda health office, Chinkulit health center and health extension workers. The woreda informed us there was a new outbreak in Yizora kebeles. On the next day, the investigator of the outbreak and the woreda health office PHEM officer travelled to the Epidemic site (Yizora kebeles) on foot and discussed with the community in the Kebele.

On January 8/2014, one case of measles was recorded in unvaccinated child from Yilmana Denssa woreda. Lately on WHO week 1 of 2014 the Yilmana Denssa woreda health office detected increasing number of cases of suspected measles which later confirmed by lab test for measles IgM. These cases were distributed among three Keble's in the Woreda.

Transmission

Measles is an infectious disease, caused by the measles virus and affecting nearly every susceptible individual in a given population. The contagious period begins three to four days prior to and after onset of rash. Transmission is primarily person-to-person via droplet spread; direct contact with nasal or throat secretions of infected persons, and less commonly by articles freshly soiled with nose or throat secretions. Measles is highly contagious, with one case often infecting twenty other individuals. Man is the only known reservoir of the measles virus (5, 6, and 13).

Laboratory Diagnosis

The symptoms of acute measles are so distinctive that laboratory diagnosis is seldom required. However, as the vaccination program progresses, atypical forms of measles have emerged and laboratory diagnosis may be required. Measles infection can be diagnosed by either of Microscopy, Immunofluorescence, virus isolation and serologic methods (14).

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Objectives

General Objective:

- To describe measles magnitude and identify risk factors associated with measles outbreak in YilmanaDenssa district and undertake appropriate public health control measures.

Specific objectives

- To verify the reported outbreak
- To Describe the occurrence of the outbreak by time, place and person
- To identify the risk factors associated with measles outbreaks

Methods

Study area and population

Yilmana Denssa is one of the woreda in west Gojam zone, Amhara regional states. It is located at a distance of 42 kms from Bahir Dar (Capital city of Amhara Regional state) and 607 kms from Addis Ababa. The woreda have shares boundaries with GonjiKolela woreda to the east, Mecha and Bahir Dar Zuria woreda to the south west, South Gonder zone to the North and Sekela& Quartic woreda to the South. He catchment population of the woreda is 243,068 {122,540 (50.4%) male and 120,528 (49.6%) female} with the total area of 99,180 hectares. The ethnic composition of the woreda is 100% Amhara and as for the religious composition & 99.3% of the resident are Orthodox Christian and 0.7% are follower's Muslim religions. The woreda has 36 kebeles (33 rural and 3 urban),the physical health service coverage of the woreda is 98 %. Currently 33 health posts and 10 health centers were serving the community.

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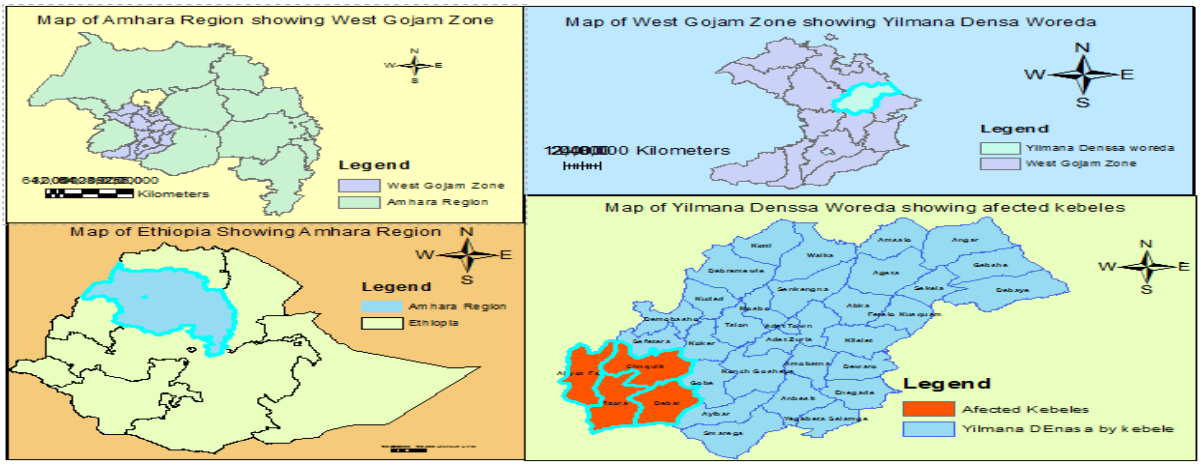

Map 5Map of Yilmana Denssa Woreda by Keble and Showing measles affected kebeles, West Gojam Zone, Amhara Region, North west Ethiopia, 2014

Study period

The study was conducted from 8-20/1/ 2014.

Study Design

Unmatched Case control study design was used to investigate the outbreak and identify risk factors for the occurrences of the outbreak.

Data collection

Exposure and risk factor information was collected by face to face interview of cases and controls by using structured questionnaire. Additional data was collected using the line list for measles and WHO case definition was used to classify study participants as case or control.

Case Definition:

A suspected measles case: anyone with at least 3 days fever, rash and either one or all of the following symptoms: cough, coryza (running nose) and conjunctivitis (red eye)

Probable case:fever *and* a generalized maculopapular rash *and* either cough, coryza or conjunctivitis and an epidemiological link to a laboratory confirmed case.

Confirmed case: a laboratory confirmed case *and* fever *and* a generalized maculopapular rash and either cough, coryza or conjunctivitis, and who has not been recently vaccinated (most commonly rash occurs about a week after immunization) 4. Care should be taken to investigate a laboratory confirmed case that does not meet the clinical case criteria.

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Discarded case (not measles):A suspected measles case that has been completely investigated, including negative laboratory testing, can be classified

Data entry and Analysis

Primary data collected from the respondents was entered in to the computer and analysis was made using Epi Info version 7.1.3.3 and Microsoft Excel

Data Quality control

We used line listing for describing measles cases interims of time, place and person. However, all data were checked for completeness before entry and analysis

Result

Descriptive Epidemiology

Totally 292 cases and 5 deaths (4 facility and 1 community deaths) were identified and case fatality rate 1%. Sample was taken for seven cases and all of them found to be positive for measles IGM. Out of 292 total cases 169 (58%) were females. On 5 December 2013, one case of measles was recorded in unvaccinated child from Yizora kebeles of YilmanaDenssa woreda. The case had travelled history to neighboring woreda a confirmed measles outbreak before one month. The epidemic stayed for 7 weeks. The mean age of the cases was 13 years with a range of 6 months to 32 years. The overall attack rate (AR) of the case was 120/100,000 populations. The attack rate is high in females (140 cases per 100,000 populations) than males (102 cases per 100,000 populations). Attack rate (209/100,000 population) was higher in less than 15 years old age group than the others.

20 measles case by age and sex distribution in Yilmana Denssa Woreda, West Gojam Zone, Amhara Region, 2015

Ag Group	Population	Measles cases			percentage	Attack rate/100,000
		Male	Female	Total		
<5	41322	13	19	32	11%	77
5-14	109381	45	72	144	49%	132
15-44	75351	65	78	116	40%	154
45+	17015	0	0	0	0%	0
total	243068	123	169	292	100%	120

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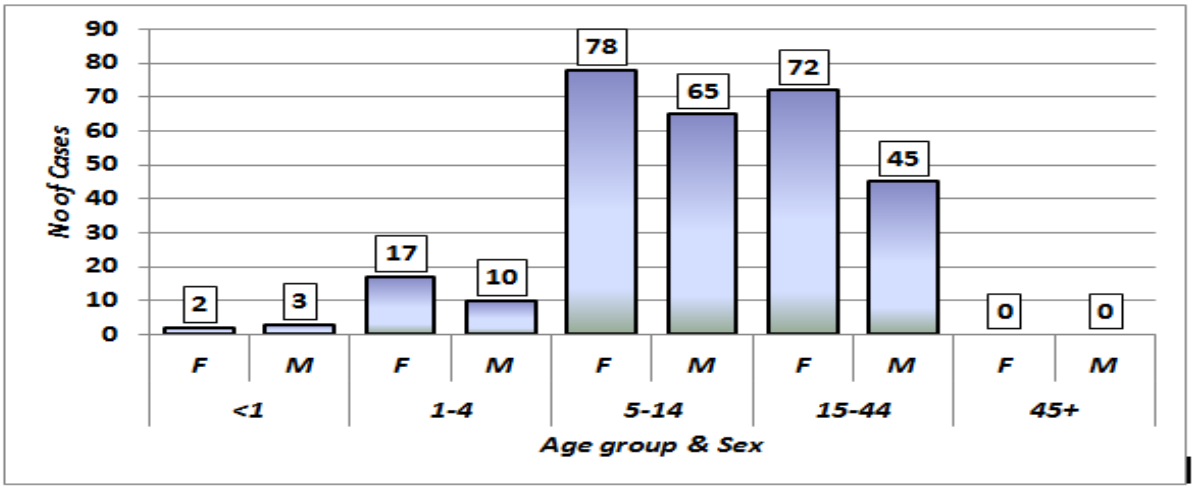

Figure 19 Distribution of measles cases by age group and sex in Yilmana Denssa woreda, West Gojam Zone, Amhara Regional state, 2014

Yizora Kebele vaccination service is weak and it is hard to reach area (it lays on the boarder of Sekela Woreda). Because of that reason the case load is high in this Kebele (figure 2).The highest attack rate (11.7%) was registered in Yizora Kebele followed by AbiyotFirie (8%).

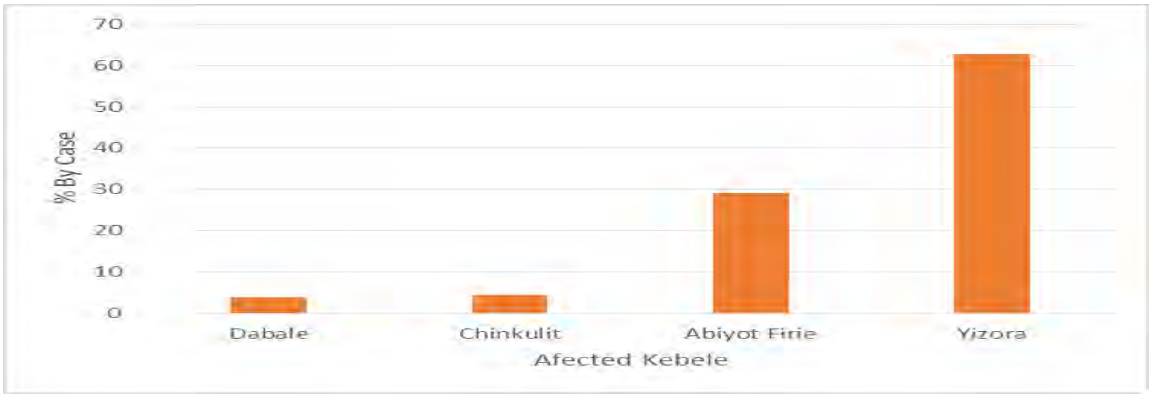

Figure 20Measle cases by kebele in YilmanaDenssa Woreda, Amhara Region, 2014

The response of the outbreak (the cases) was late by 5 weeks. The outbreak stayed for about 7 weeks. This might be due to insufficient interventions covering all affected kebeles. Most of the affected kebeles are hard to reach areas. The cases build up gradually to reach its peak on January 01, 2014 and have multiple peaks.

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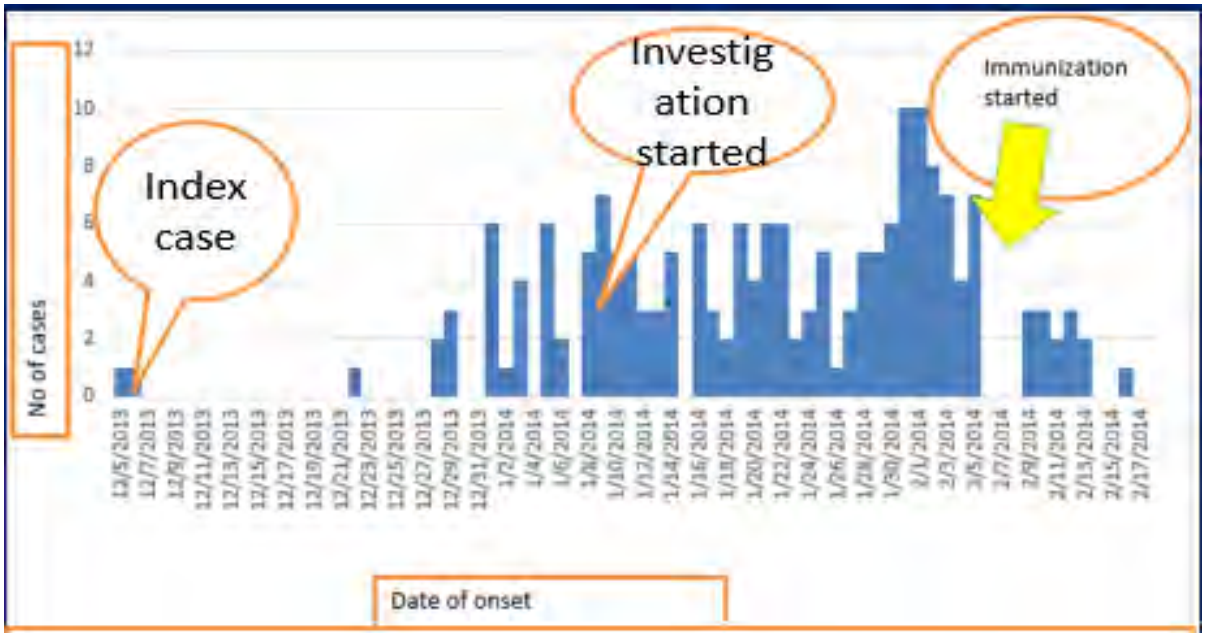

Figure 21Measles outbreak Epi curve by date of onset in Yilmana Denssa woreda West Gojam Zone, Amhara Region, North West Ethiopia, January/2o14

Vaccination Coverage

The measles vaccine coverage was 52 %, in 2013. From the affected cases 92.5% of them had not received any dose of measles vaccine. Moreover, 46% of the patients aged between 1 year and 15 years (the age range in which a high level of vaccination coverage is to be expected) had not vaccinated

Analytical Epidemiology

From the total 84 cases and 84 controls interviewed for exposure and contact history, 76% of the cases and 92% of the controls had contact history with measles cases either at school, home or neighbors.

Table 21 Risk Factors, Yilmana Denssa Woreda, West Gojam zone, Amhara region 2014

Characteristics	Case	Control	P-Value
Contact History			
Yes	64(76%)	77(92%)	<0.001*
No	20(24%)	7(8%)	
Vaccination Card			
Yes	9(10.7%)	59(70.2%)	<0.001*
No	75(89.3%)	25(29.8%)	

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Exposure to a measles cases was significantly associated with illness (OR= 6.3, CI (1.78-22.73) with p-value 0.001).When the vaccination status of the cases and controls was assessed only 9 (10.8 %) of the cases and 59 (70.2%) of the controls were vaccinated with a single dose of measles vaccine. When we see the vaccination status of individuals in each age group, from the 3 cases in the <1year age group, only 1(33%) were vaccinated and the rest 2(67%) were not vaccinated. From a total of 3 control in the 1-4 years age group 3(50%) and 3(50%) were vaccinated and not vaccinated respectively. Out of 49 individuals with measles between 5-14 years, a high proportion (43/49, 90%) were unvaccinated. In the age group 15 years and above 30(90 %) of the cases were not vaccinated. (Fig.4). Measles vaccination was associated with a statistically significant in the odds of developing illness (OR 19.6 with p-value <0.001).

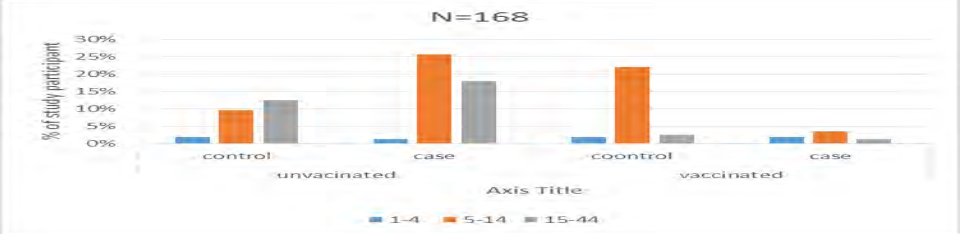

Figure 22Vaccination status of cases and controls by age group in Yizora Kebele, Yilmana Denssa woreda, Amhara Region, Ethiopia, January/2014

All of the cases presented with high fever at the beginning of illness and then with cough rash and others. Only two cases present with diarrhea. (See table 3)

Table 22 Vaccination status of cases and controls by age group in Yizora Kebele, Yilmana Denssa woreda, Amhara Region, Ethiopia, January/2014

Clinical signs and symptoms	Frequency	Com.%
Fever	84	100
Rash	84	100
Conjunctivitis	57	84
Coryza	36	53
Cough	60	88
Diarrhea	2	2.9

Intervention Undertaken

The investigation team identified and characterized the measles outbreak. Technical assistance was given for health workers on case management, recording and reporting situation. Cases were treated to

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prevent further spread; and reduce morbidity and mortality attributed to measles. Routine surveillance was enhanced and the situation was closely followed at each level on a daily bases, health education given and vaccination campaign was given age 6 month up to 15 years for 10 kebeles bordering the affected kebeles.

Table 23 vaccinated kebeles in YilmanaDenssa woreda, Amhara Region, Feb 2014

	Number of kebeles	Plan	Vaccinated	Coverage	Time
Yilmana Denssa woreda	10	28690	27051	94%	Feb ,2014

Discussion

The majority of the cases (49%) were in the 5-14 years age group, which is high compared to the outbreak which occurred in US from January to May 2011 in which the 5-14 age group accounted for just 19% of the cases. According to the interviewed study group, 89.3% of cases had contact history with an individual who had a similar illness. This might be an indication for extensive transmission of the disease.

The Majority of measles affected children had not received measles vaccination which is similar with study done in the Netherlands and Minnesota, 94% and 96% of affected children by measles outbreak were unvaccinated (14, 15).Vaccination is found to be the main protection against Measles. The recent (2013) measles vaccination coverage was less than 90 %(16). Among the total kebeles half of them were reported low vaccination coverage in 2013 compared to the target (especially those measles affected kebeles) According to this study findings, there is a strong association between vaccination and the chance of acquiring measles virus. This may be due to the high proportion of unvaccinated cases in those ages 5 years and above. This outbreak was characterized with an absence of complications due to measles infection which is different from the outbreak that occurred in France in the first 4 weeks of 2011 (cases of encephalitis and pneumonia were reported in 0.12% and 3.6% of the cases respectively). The attack rate was low as compared with a study done at Godie district, Somali region Ethiopia (>5%) in 2000and global case fatality rate estimate for developing countries (3-6%) but the case fatality rate was high as compared with the outbreak which occurred in France in the first four months of 2011 for which case fatality rate was 0.06%. The case fatality rate was also high compared to a 5 years (2005-2009) measles data analysis done in Ethiopia (0.7%).The measles case fatality rate in adults(12.5%) is increased as in very complex emergencies or in isolated areas where there is low immunity (10-30%).

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Conclusion

Unvaccinated children less than 15 years of age were primarily affected by the outbreak. The case fatality was less than 3%. The woreda routine measles vaccination coverage was much less than the expected national target for year 2013. Low vaccination coverage and exposure (contact history) were likely contributed for the occurrence of this measles outbreak.

Recommendations

Non selective mass vaccination campaign should be undertaken. Even though routine measles vaccination coverage was much less than the expected and the attack rate was high and huge number of cases were reported among children 5-14 years old. This indicates that children age of six months to 14 years old should be included in mass vaccination campaign. Strengthen measles routine vaccination activities and social mobilization activities, active case search and case management should be continued

Acknowledgement

My sincere appreciation and recognition of invaluable contributions goes to the study community, health workers at the district health offices of YilmanaDenssa Woreda in West Gojam zone. EFETP, Jaica and Amhara Regional Health Bureauthanksfor their technical and financial support.

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16. National and WHO target

5.2. Investigation of Measles Outbreak in Grawa Woreda, East Harrerge Zone, OromiaRegion, 2014

Abstract

Title: Investigation of Measles Outbreak in Grawa Woreda, East Harrerge Zone, OromiaRegion, 2014

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Background: - Measles is one of the most contagious diseases known to man and often occurs in explosive epidemics. Measles is still a public health problem in many developing countries, particularly in parts of Africa and Asia. According to the World Health Organization (WHO), more than 20 million people are affected by measles each year with more than 95% of measles deaths occur in countries that have low per capita incomes and weak health infrastructures. In developing countries with low vaccination coverage, epidemics often occur every two to three years and usually last between two and three months, although their duration varies according to population size, crowding, and the population's immune status. On February 30, 2015, one case of measles was recorded in unvaccinated child from Grawa woreda. An outbreak investigation was carried out to assess the occurrence of the outbreak and identify factors associated with contracting measles in Grawa Woreda.

Methods:-Unmatched Case control study design was used to investigate the outbreak and identify risk factors for the occurrences of the outbreak

Result:-A total of 316 measles case of them were 54 % females, the mean age of 6 year (range 6 month to 35 years), overall attack rate (AR) of the case was 11/10,000 populations and the attack rate is high in less than 5 years (29 cases per 10,000 populations) than >=5 years (7 cases per 100,000 populations), 76% of the cases had not vaccinated. Risk factors: -Absence of vaccination risk (OR: 2.5; 95% CI: 1.14-5.52; P: 0.002), knowledge of the family (OR: 2.36.; 95% CI: 1.07-5.16; P: 0.03), contact history (OR: 3.73, CI: 1.68-8.28; P ;< 0.001)

Conclusion:-Unvaccinated children less than five years of age were primarily affected by the outbreak. The woreda routine measles vaccination coverage was less than the expected national target for year 2014. Low vaccination coverage, low community awareness and were likely contributed for the occurrence of this measles outbreak. We recommend non-selective mass vaccination campaign should be undertaken aims to increase population immunity by focusing upon quickly increasing measles coverage for all children regardless of vaccination status. Undertaking of routine vaccination, enhancing active case search, strengthening case management and social mobilization activities to the public at large should be continued.

Introduction

Measles is one of the most contagious diseases known to man and often occurs in explosive epidemics. It usually does not kill children directly; however, as a result of its associated immune suppression, measles can lead to lethal complications, such as pneumonia, croup, and diarrhea. Measles can also lead to lifelong disabilities, including blindness, brain damage, and deafness (1, 2)

Measles has been, and remains, a major killer disease of children around the world. Despite the introduction of the measles vaccine in 1963, measles caused an estimated 2·6 million deaths in a single year as recently as 1980(1). According to the Assessment result of the 2010 global measles mortality reduction goal: results from a model of surveillance data, estimate that, after more than 45 years of measles vaccine availability, the disease caused nearly 140 000 deaths in 2010(2). Measles is still a public health problem in many developing countries, particularly in parts of Africa and Asia. According to the World Health Organization (WHO), more than 20 million people are affected by measles each year with more than 95% of measles deaths occur in countries that have low per capita incomes and weak health infrastructures(3). It usually does not kill children directly; however, as a result of its associated immune suppression, measles can lead to lethal complications, such as pneumonia, croup, and diarrhea. Measles can also lead to lifelong disabilities, including blindness, brain damage, and deafness (4). It is a highly contagious and vaccine preventable respiratory paramyxovirus infection. The incubation period is 10 – 12 days from exposure to the virus to the onset of fever, and a rash usually appears at around day 14 (range 7 –18 days). Patients are contagious from about 4 days before eruption of the rash until 4 days after the eruption (5). Measles occurs naturally only in human being (6). All persons who do not had the disease or who have not been successfully immunized are susceptible (7, 8). Since the introduction of effective measles vaccines, the epidemiology of measles has changed in both developed and developing countries. As vaccine coverage has increased, there has been a marked reduction in measles incidence, and with decreased measles virus circulation, the average age at which infection occurs has increased (7). In 2001, countries in the World Health Organization (WHO) African Region started implementation of the regional measles mortality reduction strategies with a goal to reduce the estimated number of measles deaths in 2005 to half of the estimate for 1999(9). This goal was achieved, and a new goal was established to reduce measles mortality in 2009 to 90%. The measles mortality reduction strategy adopted by the African Region includes improving routine measles vaccination coverage, providing a second opportunity for measles vaccination through supplementary immunization activities (SIAs), monitoring the impact of vaccination activities through case-based measles surveillance, and improving measles case management(9). In developing countries with low vaccination coverage, epidemics often occur every two to three years and usually last between two and three months,

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although their duration varies according to population size, crowding, and the population's immune status. Outbreaks last longer where family size, and hence the number of household contacts, is large. In the absence of measles vaccination, virtually all children will have been infected with measles by the time they are 10 years old (10). On 30 January 2015, one case of measles was recorded in unvaccinated child from Grawa woreda. Lately on WHO week 4 of 2015 the Grawa woreda health office detected increasing number of cases of suspected measles which later confirmed by lab test for measles IgM. These cases were distributed among fourteen kebeles in the Woreda.

Objective

- To assess the magnitudes of measles outbreak and identify risk factors associated with measles outbreak in Grawa district and undertake appropriate public health control measures

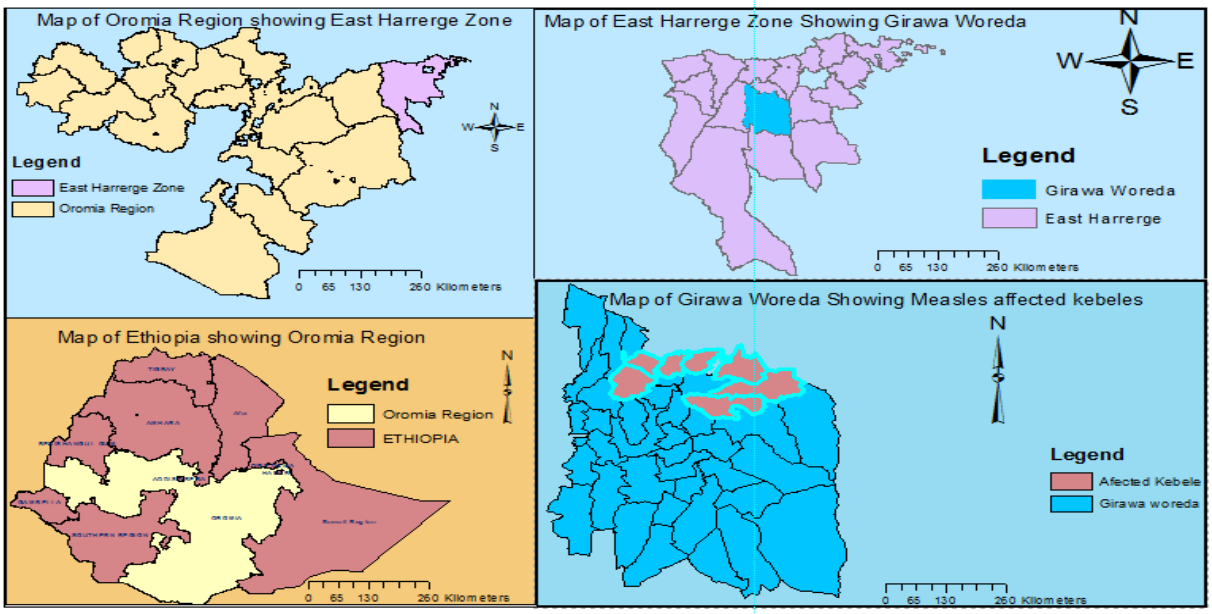
Specific objective

- To Describe the occurrence of the outbreak by time, place and person
- To identify the risk factors associated with measles outbreaks

Methods

Study area and Population

The investigation was conducted in Grawa woreda of East Harrerge zone. It is 700 KM far from Addis Ababa and 75 Km from Zone town. The district has an estimated projected population of 297338 which constitute 146,545 females in2015(11)



Map 6 Map of Grawa woreda, East Harrerge Zone, Oromia Regional State 2015

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Study period

The study was conducted from February24 –March 4/2015.

Study design

We conducted unmatched case-control study to investigate the outbreak and risk factors.

Study population

Cases: Anyone with generalized, maculopapular rash lasting ≥3 days; and temperature ≥101°F or 38.3°C; and cough, coryza, or conjunctivitis (41 cases)

Controls: were all people without measles symptoms (82 controls)

Operational Definitions:

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.

Sampling

The sample size was calculated using Stat calc function of Epi-info version 7.1.3 Using the confidence level of 95%, power of 80%, and assuming a 37% prevalence of a previous contact with someone with measles like disease in under ones and an OR 5, with 1:2 cases to controls a total of 41 cases and 82 controls were required. Of 316 cases sent through line list 41 cases were included in the study. The sampling was conducted without replacement and if more than one eligible in the family member the youngest child was taken as control with nearest house hold to the case until the sample size was reached.

Datacollection

Exposure and risk factor information was collected by face to face interview of cases and controls by using structured questionnaire. Additional data was collected using the line list for measles and WHO case definition was used to classify study participants as case or control.

Data Processing and Analysis

The data were entered and analyzed using Epi-Info7 version 7.1.3. Results were presented using graph, table and spot map. Attack rate and case fatality rate were also calculated.

Data Quality Control

We used line listing for describing measles cases interims of time, place and person. However, all data were checked for completeness before entry and analysis.

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Result

Descriptive Epidemiology

A total of 316 measles case detected based on the WHO clinical case definition, from January 30th to March 5, 2015. From total measles case were 54 % female and detected from Grawa woreda with the mean age of 6 year (range 6 month to 35 years), no death were reported. The overall attack rate (AR) of the case was 11/10,000 populations. The attack rate is high in less than 5 years (29 cases per 10,000 populations) than >=5 years (7 cases per 100,000 populations)

Table 24 measles case by age and sex distribution in Grawa district, East Harrerge Zone, Oromia region, 2015

S.No	Age Group	Population	Measles cases				
			Male	Female	Total	Percentage (%)	Attack rate/10,000
1	Less than 5	49062	75	69	144	46%	29
2	5 to 14	136778	8	23	31	10%	2
3	15 to 44	92171	61	80	141	45%	15
Total		297338	144	172	316	100%	11

The affected kebeles were presented on the figure 5, which shows the measles case integration with vaccination coverage for 2014.

Figure 23 Case by Kebele in Grawa woreda, East Harrerge Zone, Oromia Region February 2015

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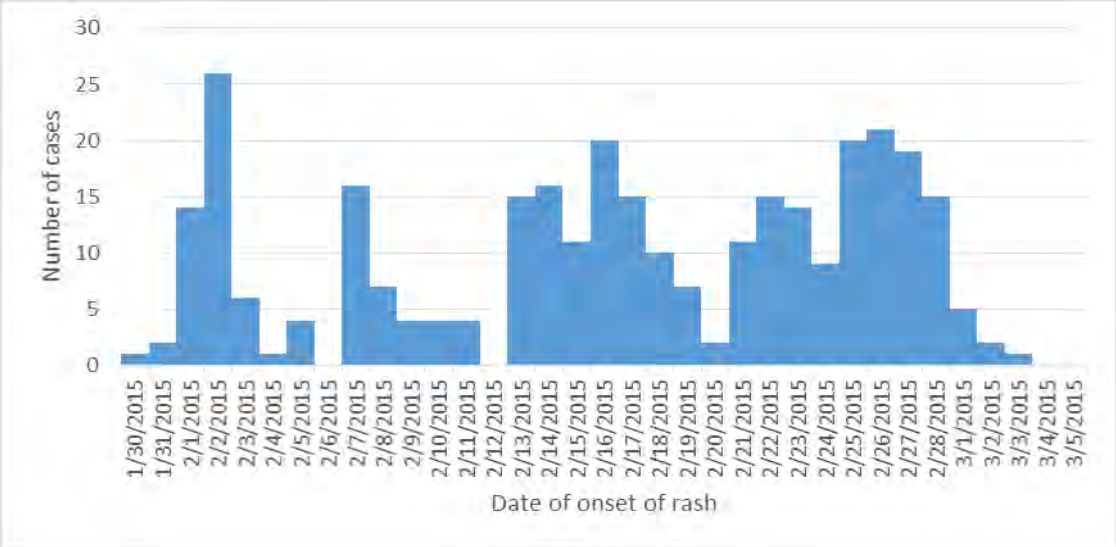

Figure 24 cases by date of onset of rash in Chinaksen woreda, Oromia Region, 2015

Onset of rash occurred 30 January 2015 was presented in figure 6.The response of the outbreak (the cases) was late by 2 weeks. The outbreak stayed 5 week. This might due to insufficient interventions covering all affected kebeles. Most of the affected kebeles are hard to reach areas.

The cases build up increase during active case search to reach its peak on February 02, 2015 and have multiple peaks during social mobilization and health education.

Vaccination Coverage

The measles vaccine coverage was 67 %, in 2014. From the total cases 79 % of them had not received any dose of measles vaccine. Moreover, 76% of the cases had not vaccinated. The rest 21%, of the patients had received one dose of measles vaccine. The highest unvaccinated cases were reported from Burka Gudena Kebele which was 45% from the total unvaccinated cases and followed by Ejersa tobota and Kurfa Biyo which was 17% and 10% respectively.

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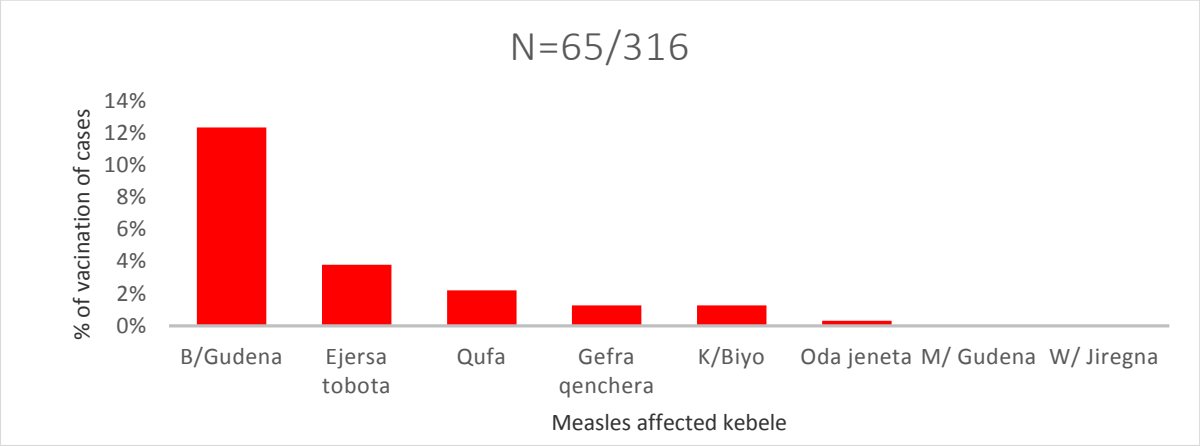

Figure 25Vaccination statusof measles affected Kebele in Grawa woreda, East Harrerge zone, Oromia Region 2015

Moreover, 69% of the patients under five year (the age range in which a high level of vaccination coverage is to be expected) had not vaccinated. The rest of 13% of the patients had received one dose of measles vaccine.

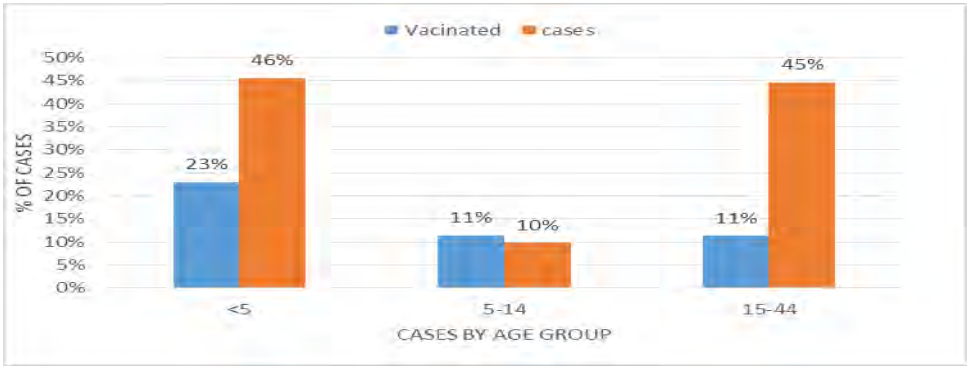

Figure 26 Vaccination status of cases by age group in Grawa Woreda, Oromia Region, 2015

Analytical Epidemiology

A total of 41 cases and 82 community controls unmatched were join up into the study. All interviewed measles cases had a history of maculopapular rash and fever, 32% had conjunctivitis, 36% had coryza and 39% had cough. Risk factors: -Absence of vaccination risk factor for developing with (OR: 2.5; 95% CI: 1.14-5.52; P: 0.002), knowledge of the family was the risk factor for developing with (OR: 2.36.; 95% CI: 1.07-5.16; P: 0.03). Health facility distance from the house more than 5km was a risk factor with (OR: 537; 95% CI: 2.39-12.1; P: <0.005), Family size also more than 4 was a risk factor with (OR: 4.15, 95%CI (1.87-9.25, P <0.0004), contact history also risk factor with (OR: 3.73, CI: 1.68-8.28; P ;< 0.001)

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.**Intervention Undertaken**

The enquiry team identified and described the measles outbreak. Technical support was given for health workers on case management, recording and reporting situation. Health education and advocacy, active case search house to house and Cases were treated to prevent further spread; and reduce morbidity and mortality attributed to measles. Routine surveillance was enhanced and the situation was closely followed at each level on a daily bases.

Discussion

The risk factors for measles virus infection include: infants who lose passive antibody before the age of routine immunization, children with vitamin A deficiency and immunodeficiency due to HIV or AIDS, leukemia, alkylating agents, or corticosteroid therapy, regardless of immunization status and children who travel to areas where measles is endemic or contact with travelers to endemic areas. Malnourished and young children are at higher risk of developing complications and mortality from measles infection. (3)

This study identified several factors that were associated with diminishing measles in Grawa woreda. Being unvaccinated against measles was a risk factor for fading measles. A similar result obtained in study done in Abaya, Borena zone, South Eastern Oromia, Ethiopia 2013 a measles outbreak that cases were high in unvaccinated children than those who were completely vaccinated(1).Vaccination has protective effect during this outbreak time.

Majority of cases did not believe in seeking treatment for measles and the study found that knowledge towards measles, where to treat and which age group is affected, so in this outbreak knowledge of the family was the risk factor for developing measles, in similar study done in Zaka, that was the factors associated knowledge (2)

In this outbreak time total of 316 cases was identified with highest attack rate compared with the attack rate of measles outbreak recorded nationally, 4.1 per 100,000 population, in 2008(3). The attack rate is high in less than 5 years (29 cases per 10,000 populations) than >=5 years (7 cases per 100,000 populations), in EHNRI guideline, the most at risk population are children under the age of 5 years (3).

The association between measles more common in the house holds having more than one child posed as a risk factor to contracting measles. This was also reflected in our study that had a median number of siblings of four and the WHO also reports that overcrowding in developing countries is a risk factor for contracting measles [5, 6].In this outbreak the family size more than four and measles was stronger association for measles transition.

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Conclusion

Unvaccinated children less than five years of age were primarily affected by the outbreak. The woreda routine measles vaccination coverage was less than the expected national target for year 2014. Low vaccination coverage, presence of high family members, low community awareness and were likely contributed for the occurrence of this measles outbreak.

Limitation:-The index cases were not possible to get due to inadequate data in the Grawa woreda.

Recommendation

Alert message should be sent to other neighboring districts. A huge number of cases were reported among children less than 5 years old so non-selective mass vaccination campaign should be undertaken aims to increase population immunity by focusing upon quickly increasing measles coverage for all children regardless of vaccination status. Undertaking of routine vaccination, enhancing active case search, strengthening case management and social mobilization activities to the public at large should be continued.

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Chapter VI – Abstracts for Scientific Presentation

6.1. Surveillance data analysis of Prevalence of HIV among TB patients in Debre Tabor Hospital, Amhara Regional state from May 2009 to December 2013

Abstract

Title: Prevalence of HIV among TB patients in Debre Tabor Hospital, Amhara regional state from July 2009 to December 2013

Authors: Habtamu Y.Nega[1], T.H. G/Hiwot[2]Mer'Awi A. [3]

Authors Affiliation: [1]Ethiopian Field Epidemiology Training Program, Addis Ababa University School of Public Health, [2] Amhara National Health Bureau Public Health Emergency Management Early warning Officer

Background: Tuberculosis (TB) and HIV co-infections have a global prevalence with devastating morbidity and massive mortality, Sub-Saharan Africa being the worst hit.

Objectives: To assess the magnitude of HIV among TB patients and factors related in co-infection Debre Tabor Hospital, Ethiopia

Methods: A retrospective analysis of the record of all TB patients registered at the Debretabor Hospital delivering service between 2009 and 2013 was conducted. A total of 768 TB cases were reviewed and assessed regardless of HIV status.

Results: A total of 768 TB cases reviewed from the hospital medical review. Out of 768 TB cases, 744 (96%) were tested for HIV infection and 222 (31%) of these were sero-positive (co-infected). All of HIV positive patients were PTB cases. The Male to Female TB-HIV co-infection prevalence ratio (PR) was 1.55.

Conclusion: This data analysis study reports the prevalence of HIV co infection among TB cases was 33%, which was high. Therefore, every concerned bodies should focus on prevention and control of HIV co-infection among TB case patients through strengthening policy, supplying adequate services, conducting awareness creation for the general community and strengthen TB-HIV surveillance.

Key words: Tuberculosis, HIV co-infection, high prevalence, TB diagnosis

Word count: 164

6.2. Investigation of Measles outbreak in Yilmana Denssa Woreda, West Gojam zone, Amhara Regional State, Ethiopia, 2014

Abstract

Title: Investigation of Measles outbreak in Yilmana Denssa Districts, West Gojam zone, Amhara Regional State, Ethiopia, 2014

Authors: Habtamu Y.Nega[1], T.H. G/Hiwot[2], M.Aragaw

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Background: Measles is an extremely contagious and remains a common disease and major contributor to child-mortality worldwide and kills approximately 1-3 of every 1000 infected individuals. An estimated 10 million cases and 164,000 deaths from measles occur worldwide each year. On January 17/2014 West Gojam zone, Amhara region reported suspected measles cases from Yilmana Denssa district. As part of it West Gojam zone has been reporting remarkable measles cases started On December 5/2013. An investigation was conducted to identify the cause of the outbreak and to undertake appropriate prevention and control interventions

Method: Descriptive and unmatched Case control study design was used to identify risk factors for the occurrences of the outbreak

Result: A total of 292 suspected cases of measles (incidence of 120 cases per 100,000) and CFR of 2%. The mean ages 13 years and overall attack rate (AR) of the case was 390/100,000 populations. 92.5% of affected cases was unvaccinated. Exposure to a measles cases was significantly associated with illness (OR= 6.3, CI with p-value 0.001)

Conclusion: Unvaccinated children less than 15 years of age were primarily affected by the outbreak Most the cases was unvaccinated. So mass vaccination campaign from 6 months -14 years of age groups should be conducted to stop the transmission.

Key words: Measles, Amhara Region, Vaccination, Outbreak

Word count: 212

Chapter VII – Narrative Summary of Disaster Situation Visited

7.1. Belg Human Health and Nutrition Emergency needs assessment- South Wollo Zones, Amhara, Ethiopia, June 2013

Executive summary

Disaster situation assessment conducts two times a year with collaboration with different sectors from governmental organization and nongovernmental organization together. It leads by Ethiopia disaster risk management and food security sector (EDRMFSS). The assessment was therefore undertaken to assess and identify public health emergency needs of the region following "Belg" season. Briefing and debriefing was conducted at regional, zonal and woreda level and south Wollo Zone and four woredas assessed using checklists and discussion. From total of zonal population of 682,698 (21%) population assessed. Assessed woreda have no functional multi sectorial public health emergency management coordination forum and their leading causes of mortality is diarrhea followed by Pneumonia in under five age and AFI followed by Pneumonia in adult. A total of 6 outbreaks were occurred in assessed woreda last 6 months. The outbreaks were measles in Tenta woreda (74 cases and 4 deaths with CFR of 5.4%), DessieZuria woreda 8 cases. Clustered diarrheal cases in Tenta woreda (50 cases and 4 deaths with CFR of 8%), and typhoid fever in Delanta woreda 54 cases. south Wollo anticipated measles, typhoid, malnutrition and AWD for the coming seasons. Assessed woreda have shortage for AWD (Doxycycline, ORS and R/L), for measles (Vit A, TTC eye Ointment, Amoxicillin Syrup), for Meningitis(Vaccine, LP set, Pateros and oily CAF, ceftriaxone) and for Malaria: Artesunate, Quinine, RDT. A total of 984 SAM (sever acute malnutrition) and 757 moderate malnutrition cases were reported in the assessed woreda from January to May 2013. Tenta woreda takes the higher score for SAM which is (31%). All assessed woreda have OTP (outpatient therapeutic program) and SC (stabilization center) site. Woreda emergency task force members should consider emergency situations than other activities. They should make functional the committee and outbreak affectedworeda should be given priority for preparedness and support.

Introduction

Disaster situation assessment conducts two times a year with collaboration with different sectors from governmental organization and nongovernmental organization together. It leads by Ethiopia disaster risk management and food security sector (EDRMFSS). This multi sectorial seasonal assessment mostly focuses on post-harvest in "Belg" and "Meher". And also the team divides in to two main groups which are food and non-food teams and tried to assess Belg dependent woredas because the season is Belg Food teams tried to assess woredas weather condition, crop production, planted area and timeliness of planting, crop production prospect (both cash and food ,crop stage ,weather impact, crop pest and disease, over all crop production performance, future seed availability) ,livestock condition, market condition, other sources of cash income, coping strategies of community. The non-food team responsible to assess health and nutrition, water and education. This report focus on health and nutrition part of assessed woreda in Amhara region, south Wollo zone (Delanta, Legambo, DessieZuria and Tenta woreda).

Objectives of the assessment

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 likelihood of different RISKS in the most “vulnerable” Woredas; if any
- To assess the existing capacity of the health system and WASH to address those Risks
- To determine gaps in the capacity of the health system ,Education and WASH to address emergencies of anticipated/impending risks and existing threats based on the findings,
- To develop Response plans

Methodology

Briefing was conducted at zonal and each assessed woreda primary and secondary non-food related data were collected using checklists, Formal discussion and interview was made with respective sector offices, Debriefing were made on assessment findings to visited zones.

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Result

Socio- Demographic profile

South Wollo zone population 2,985,964 and assessed woreda total population 682,698 (21%). A total of 682,698 (21%) of population assessed. There were no special population which are pastoralists, refuges, internal displaced population or migrant workers in assessed woredas.

Table 25 Assessed woreda different type of population in South Wollo Zone, Amhara Region, 2014

Zones	Assessed Woredas	Population Assessed	Male	Female	Under five population
South Wollo	Delanta, Legambo, Tenta, Dessie Zuria	682,698	336203	346,495	85,337

Health Profile

Zonal level

Health and Nutrition, WASH, and Education parts of the Belg Assessment 2014 were conducted in South Wollo Zone of Amhara region.

Coordination

Multi-sectorial coordination forum was established in South Wollo zone but it is lacks regularity.

Disease outbreakin the last five months

A total of 1025 suspected measles cases and 14 deaths, 554 Typhoid Fever, 57 suspected Anthrax case and 9 food poising cases were reported in south Wollo from January to May 2014.

Ongoing outbreak

Currently, there is ongoing Measles outbreak in the assessed zones (South Wollo).

Anticipated epidemics

Public Health emergency management

S/Wello Zone has PHEM coordination committee and has secured budget for emergency preparedness &response Activities on their hand

Emergency drugs and supplies for preparedness

S/Wollo Zone reported has no adequate and full drugs and other supplies on hand to manage possible emergency situations.

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Woreda level

Socio-demographic profile

A total 4 woredas were included in the assessment. Total population of 682,698 was covered by the assessment in the both zones.

Table 26Socio-demography of Population included in Meher 2013 Assessment

Name of woreda	Male	Female	Total population	Reproductive age women (15-49) years	Pregnant women	Tot No ofPLW	U5 age group
Delanta	66,111	67,445	133,556	27,111	4273	4273	18030
Tenta	90,905	92,717	183,622		5876		
Legambo	89,622	92355	181,977				22679
DesseZuria	84,539	87,989	172,528	40,682	5590	6901	23,291

Health Profile

According to the assessment findings, pneumonia, Diarrhea, Acute Febrile illness, and Upper respiratory tract infections (URTI) were the leading cause of morbidity in children under five years of age in all the visited Woredas. In adults above the age of five Dyspepsia and Acute Upper respiratory tract infections (AURTI) were reported to be the leading cause of morbidity in the year 2006 (2013/14) in the visited Woredas.

Table 27anticipatedepidemics by beneficiaries in S/Wello Zone, Amhara Region 2014

Anticipated epidemics	Malaria	Measles	Meningitis	Typhoid Fever	Dysentery	Flood/Land slide
at-risk woreda	All woredas	All woredas	All woredas	Delanta and Tenta	Ambasel ,DesseiZuria,Delanta,Tenta and Sayint	Ambasel ,DesseiZuria,Kutaber,Kalu and Legambo
Estimated beneficiary	1,918,967	2,864,130	2,864,130	64,656	198,864	203,573

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Morbidity and Mortality Data

Malaria

A total of 515 malaria cases were reported from the assessed 4 woredas from January to May 2014. From these; the assessed woredas not a hot spot

Mealses

A total of 128 measles cases and no deaths were reported from assessed woreda January to May 2014.

Maningitis

There is no meningitis cases reported.

Other diseases

A total of two Acute Flasid Paralysis (AFP) cases reported with one death from Tenta Woreda and nine food poisinig case were reported from Delanta woreda.

Ongoing outbreak

Currently, there is no ongoing outbreak in the assessed woredas.

Emergency drugs and supplies for preparedness

Most of the assessed woredas of S/Wollo Zone has adequate emergency drugs and supplies for upcoming one month.

Coordination

All visited woredas in South Wollo Zone has multisectorial PHEM coordination forum and PHE preparedness and response plan but they did not conduct regular meeting.

Risk Analysis

Malaria

All the assessed woredas have no Malaria endemic kebeles, breeding sites, interrupting rivers and unprotected irrigations except DessieZuria. All assessed Woredas have LLINs coverage less than 80% which is not replaced after 2002. It was also found that malaria prevention and control activities are depleted in DessieZuria woreda except others.

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AWD

There was no AWD epidemic in the last three years in all assessed woredas. Most are at risk of outbreak due to low(less than 75%) safe and adequate and poor latrine utilization as well as reported diarrhea among the leading cause of morbidity.

Measles

The assessment also identified that there was no SIA in all the assessed woredas in 2014 but measles immunization coverage greater than 90% except DessieZuria.

Nutrition

The nutrition situation as well looks stable till now with slight increasing trend in the assessed Woreda as the time of CHD campaign. However the admissions of children and PLW screened for SAM and MAM during CHD can be considered high. Whenever there is better community mobilization and door to door services, a lot of children malnourished and who could have remained hidden at home without getting the service during the routine service delivery usually come out. The implication is that, the case is already there. It also implies the prevalence or existence of Malnutrition in the community is still considerably high. From monthly trend of admission of acute malnutrition cases at TFP increased in the month of March and April, 2014 due to Community Health day campaign.

Assessment of adequacy of therapeutic supplies in the last five months indicated that there was enough Plumpy Nut, F75 and F100 throughout the months, January to May 2014, in all assessed woredas of zones.

WASH

In all visited Woredas (Legambo, Tenta, Delanta and DessieZuria) currently there have been no unusual WASH related emergency hazards, but serious shortage of water has been reported in DessieZuria Woreda of 039, 028 and 027 kebeles. Most water schemes has been none functional due to different reasons, in most health facilities and school have not WASH facilities. However, there are no school and health facilities closed due to WASH hazards.

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Education

In all visited Woredas (Legambo, Tenta, Delanta and DessieZuria) currently there has been no unusual Education related emergency hazards.

In Delanta Woreda A total of 879 students were drop out from school; 41.3% 0f the drop out number is from Belg producing areas (kebeles), Unusual school absenteeism was recorded and Some youth students also drop out in order to search Opal as a source of family income.

In Tenta woreda a total of 1110 students were droped out and unusual school absenteeism was recorded.

Gaps/ Challenges

There is no full emergency drugs and medical supply stock at Zonal level

Absence of regular multisectoral PHEM coordination forum to manage emergency situations in most visited woredas and zonal health office

Low coverage and shortage of LLINSs for replacement and new distribution in malaria risk woredas and kebeles of the zones.

Discussion

All woreda have responsibility for functional PHEM coordination forum. It is responsible to assess woredas emergency situation some interval days. Unfortunately, none of the woreda PHEM committee is functional.

A total of 6 outbreak has occurred; measles 74 cases and 4 deaths in Tenta woreda, 8 cases DessieZuria and 7 cases Bati woreda. Clustered diarrheal cases in Tenta woreda 50 cases and 4 deaths.

Typhoid 25 cases in February and 29 cases in April in Delanta woreda. So all those woredas exposed for outbreak in last 3 months and anticipated epidemics needs special attention for the coming seasons. The target for Timeliness and completeness report is to be 100% because it is helpful to detect events easily. But sometimes it becomes lower than 80% which is a minimum expected level.

The nutrition situation as well looks stable till now, though admissions of children and PLW screened for SAM and MAM during community health day (CHD) is considered high. The implication is whenever there is better community mobilization and door to door services, a lot of children malnourished still remain hidden at home without getting the service during the routine service delivery, though the case is already there. It also implies the prevalence or existence of Malnutrition in the community is still significantly high. However from the analysis of food security perspective i.e.

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the rain condition was so unfavorable for crop production and the expected production is minimal to zero, the livestock condition is being affected and would be more affected, there was no better crop production as well in the neighboring Maher producing kebeles, i.e. all would need to by crops and sale live stocks, the price of cheap crops has even raised to four fold and live stock price went down by half and the term of trade (TOT) does not favor all households and this aggravates the food security gap. Besides making use of alternative unsafe source of drinking water is already in place, with signs poor immunity the nutritional situation is expected to be in challenge if immediate actions are taken to minimize the household food security gaps ahead and health deliveries and nutritional programs are strengthened further.

Conclusion

There is no functional PHEM coordination forum in assessed woreda.

Some woredas are affected by outbreak in the last 3 months

Report timeliness and completeness is not above 80% for all woredas

CHD program can trace more malnourished cases than before so it shows the case already there

Recommendation

Woreda emergency task force members should assess themselves and consider emergency situations than other activities and they should make functional the committee. Outbreak affected woredas should be given priority for preparedness and support. Report timeliness and completeness should be improved and it should achieve the expected level. CHD program can trace many malnourished cases so it should continue in strong manner.

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Chapter VIII – Protocol/Proposal for Epidemiologic Research Project

8.1. Assessment of immunization status and factors affecting its among children aged 12-23 months old in Mekidela Woreda of South Wollo Zone Amhara Regional State, North West Ethiopia,2015

Introduction

Immunization is a proven tool for controlling and even eradicating communicable diseases. An immunization campaign carried out by the World Health Organization (WHO) from 1967 to 1977 eradicated the natural occurrence of smallpox. When the program began, the disease threatened 60% of the world's population and killed every fourth victim. Also poliomyelitis is going to be eradicated. Since the launch by WHO and its partners of the Global Polio Eradication Initiative in 1988, infections have fallen by 99%, and some five million people have escaped paralysis. Between 1999 and 2003, measles deaths dropped worldwide by almost 40%, and some regions have set a target of eliminating the disease (1).The Ethiopian health policy had given emphasis to the prevention and control of major communicable diseases. Thus in Ethiopia expanded program on immunization (EPI) was initiated in 1980. The objective of the National Immunization Policy was to reduce mortality and morbidity in children from the EPI target diseases through the immunization of all children under the age two in the first five year, but later after 1986 it was revised to focus children under one year of age in order the child exposure time to natural infection. The program had been planned to make immunization services available to 10% of the population in 1980 and to increase immunization access by 10% each year and reach to 100% coverage(3).

Statement of the problem

Vaccination has been shown to be one of the most effective public health interventions worldwide, through which a number of serious childhood diseases have been successfully eradicated. Small pox was eradicated by the immunization campaign carried out by WHO from 1967 to 1977 (4).The WHO recommends vaccination against a number of serious infectious diseases, including diphtheria, tetanus, pertussis, HepB, invasive Hib disease, pcv, Rota and measles for all children, and against yellow fever for children in some areas as part of their EPI. However, many infants and children still die every year from these diseases. It has been shown that in 2007 approximately 27 million infants are not vaccinated against common childhood diseases, such as measles or tetanus. As a result, 2–3 million children are dying annually from easily preventable diseases, and many more fall ill (4). But in the same year, 24 million children are not being reached with vaccines and over 10% of children under one year old in developing countries

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were not receiving even one dose of DTP vaccine, compared with 2% in industrialized countries (2).An estimated 2.1 million people around the world died in 2002 of diseases which can be prevented by widely used vaccines. This toll included 1.4 million children under the age of five years. Among these childhood deaths, over 500 000 were caused by measles; nearly 400, 000 by Hib; nearly 300, 000 by pertussis; and 180, 000 by neonatal tetanus (1). It has been also recognized that vaccine preventable diseases are responsible for 16% of under-five mortality in Ethiopia (5). Although estimated global routine vaccination coverage with the first dose of measles containing vaccine (MCV) reached 82% in 2007, nearly 23.2 million of children missed the vaccine of which 15.3 million (65%) resides in eight countries of Africa and south Asia. From these 1 million of them live in Ethiopia (6).Despite the increased report immunization coverage of measles in Ethiopia, the disease has continued to be the main childhood health problem in the country. It attributed to 4% of child and infant deaths in 2004 which was highest of the world (4). Immunization is one of the national child survival strategies in Ethiopia to reach DPT3/measles vaccination coverage of 90% in 2010, which planned to decrease mortality under five ages of year by 2% (7) and immunization is the key to achieving the millennium development goals (MDG) specially to reduce the child mortality (2) and proportion of children immunized against measles is one of the indicator of health MDG 4 target 4 for decreasing the child mortality and morbidity from measles (8). But in Ethiopia the incidence of measles has increased from 3.19/100,000 (1964 confirmed cases) in 2009 to 7.35/100,000 (3121 confirmed cases) in 2010 (9)

The routine immunization is most critical part of the challenge especially in measles outbreak. In the most recent coverage survey conducted in 2012; significant regional disparities were observed in Amhara region (65%) low utilization as compared to Addis Ababa or Tigray and also Nationally. To address these gaps to assess the risk factors and appropriate prevention strategies in this nomadic community is mandatory

Rational of the study

Routine immunization particular Mekidela Woreda is not functioning as expected. The district 2013/2014 reported that only 67% of children between 12 and 23month are vaccinated for penta3 and 64% for measles in routine EPI, More than 60% of district population is geographically in accessible for give health service. It is one of the high measles outbreak occurred in Amhara region in 2013/2014, this is high-risk zones, primarily hard to reach area. The available traditional network of information sharing mechanism, knowledge and perception of the community will be study and recommend effective intervention and strategies

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Objective

General Objective

To assess immunization status and factors affecting it's among children aged 12-23 months old in Mekidela Woreda of South Wollo Zone Amhara Regional State

Specific objective

- To determine the immunization coverage among children of aged 12-23 months old towards the vaccine preventable disease
- To assess demographic, socio economic and health service factors affecting immunization status among children aged 12-23 months
- To assess the knowledge of the mother/caretakers on immunization and vaccine preventable disease
- To come up with effective and affordable intervention in this woredas

Methods

Study area and population

The study will conduct in 5 kebeles Mekidela Woreda of South Wollo zone, Amhara regional state. Its capital town is 700 km to the East of Bahirdar, the capital city of Amhara Region. The Woreda and town are independent by management of each other and the capital of the woreda is the town itself. According to 2007 Ethiopia national census Mekidela Woreda have population of 159,174 .There are 38 kebeles; 1 urban and 34 rural kebeles. There are different private and public health institutions found in the woreda. According to the health office, all kebeles have their own health post and there are 2 health centers. In Ambo town also there is one zonal hospital, 4 health centers and different private clinics.

Study design

The cross-sectional descriptive study design will conduct. Quantitative data will collect from mother/caretakers who has children aged 12-23 months to assess the immunization status and factors affecting it.

Source population

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All household with children of 12-23 months residing in Mekidela Woreda constitutes the source population of the study.

Study population

The study population of this study is all children in the age group of 12-23 months of age living within eligible household inthe woreda. Mothers'/caretakers are also will study about their knowledge on the perception of child immunization.

Study participants

Children of 12-23 months of age and their mothers/caretakers in the eligible households

Sampling technique:- By using systematic sampling technique the households will be selected from each kebeles to identify the study subjects. Assigning of the households from each kebele will be done by using proportional allocation to the size of the households of each selected kebeles. Sampling interval will be determined by dividing the total number of households in each kebeles by the corresponding number of households to be interviewed in each kebele. The first household will be selected randomly then the next household will be selected systematically based on the sampling intervals.

Sample Size:-The sample size is calculated by using the standard sample size calculation formula using one

Sample proportion :-The following assumption will be considered: the proportion of vaccination 12-23 months of children will be 50 %(p=0.5), because the proportion of proportion of vaccination in the study area is not known, the confidence interval will be 95% (α=0.05), the marginal error of the study will be 5 %(e=.05) and10% non-response rate will be added. Based on the above assumptions the minimum sample size required for the study will be)

$$n = \frac{(z\alpha/2)2 \times p\ q}{e2} \Rightarrow n = \frac{1.96 \times 1.96 \times 0.5 \times 0.5}{0.05 \times 0.05} = 384$$

By adding 10% non-response rate, the final sample size will be 384+ (384x0.1) = 422 house holds

Data collection:

A structure questionnaire will be used for the purpose of data collection. Fifteen health extension worker and 5 supervisors will be recruit for data collection. Training will be given for data collectors and supervisors prior to study period for 1 days. Interviews using structure questionnaires will be

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conduct with household wife from the select households in the study kebeles. The questions focus on various sub-themes like, knowledge of mother/caretaker, movement, kebeles leaders/religious leaders, socioeconomic characteristic, focus group discussion with the community leaders on why children is not immunized or partially immunity . Pre-test will be conduct in a non-study village to identify the potential problems encountering during data collection and interview. Confidentiality of information will maintained during the whole study.

Ethical Consideration:

The ethical approval and clearance will be obtained from Medical Faculty of Addis Ababa University ethical committee. Permission will be also obtained from the concerned bodies of Amhara Regional State Health Bureau and Mekidela District Health Office. The data collectors will be oriented during the training so that they would provide proper advice for the respondents regarding any malpractice they have come across. Interview will be carried out only with full consent of the person being interviewed. Before each interview, clear explanation will be given about the aim of the study will not neither to evaluate the performance of the individual nor to blame anyone for weakness but to gather information and opinions that may lead to eventual enhancement of immunization. Each respondent will assured that the information provided by them would be confidential and used only for the purpose of research.

Dependent variable

Immunization status of children aged between 12-23 months

Independent variable

Knowledge, attitude of mothers/caretakers for vaccination, Socio economic characteristic

Expected out come

To provide suggests the gab and to take public health intervention

To provide suggested factors that contributes the low immunization coverage at the district

Dropout rate will be reduced below 10% Increase coverage of measles vaccination, Decrease morbidity and mortality related to Vaccine preventable disease

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Annexs1 Budget break down

SN.	Item	Unit cost (US$)
	Translation and back retranslation of questionnaire from English to local from local to English language.10pagesX2times translation X70birr/page	100
Sub total		100
	Training of data collectors and supervisor for 2 days	
1	Ten data collectors *9$/day*2 days	180
2	Five supervisors *14$/day*2 days	140
3	One Evaluator *20$/day*2days	40
4	Trainer for two days	40
5	Training hall rent for 2 days	20
6	Seventeen pens*0.25birr/pc	4.25
7	Seventeen pencils*0.015	0.25
8	Data collection from 40 non targeted households to pretest the quality of the questionnaire developed (four days activity) 4(20+(10x5)+(10x5)	480
Sub –total		904.5
	Data Collection for 10 days	
1	10data collectors *10$/day*10 days	1000
2	5 supervisors *16$/day*10 days	800
3	1Evaluator *20$/day*10days	200
4	2 Car rent for 10 days service 40$/day	800
5	Fuel to the car 2x50$/dayX10days	1000
Sub total		3,800

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	Stationeries, printings and photo copies	
1	Flash diskette 1 GB	25
2	Photo copy paper (210 x 297 mm) x 24packet x 5$	120
3	17 pcs of writing pads for data Notes collection 17X0.5$	8.5
4	Printing of translated questionnaires 10pages X 2 X 0.2/page	4
5	Photo copying 10 pages questionnaires for 500 household survey X0.050 birr/page	25
6	Final report Writing and printing	8
7	Photo copying the final report	3
8	Binding the final documents 7copies X12birr/document	2
Sub total		195.5
Grand total		5,000

Annexs2 Implementations Time

Activities	Time			
	February	June	July	August
Proposal writing	X			
Proposal submission	X			
Review of scientific merit point	X			
Arranging training and field work		X		
Data collection (Field)		X	X	
Data entry			X	
Data analysis			X	
Data analysis and interpretation			X	
Writing of report				X
Submitting Final report				X

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Annexes 1Epi Project Consent Form

Title: Assessment of immunization status and factors affecting its among children aged 12-23 months old in Mekidela Woreda of South Wello Zone Amhara Region, North west Ethiopia,2015

Objective: To assess immunization status and factors affecting it's among children aged 12-23 months old.

Procedure: This project will take about 30 minutes of your time. There are two parts. First, we will clearly explain you the purpose, benefits and risks of the study. We will give you a chance to ask questions and gate answers about the study. Second, we will ask you about immunization status and factors affecting among your children. All information collected during this study will be kept private and will only be known by the investigators.

Benefits: This project will help the government of Ethiopia and all level government health sectors to enhance the immunization coverage and maximize the benefits.

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

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

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

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

The purpose of the study and confidentiality procedures has been explained to me and me on my own consent: a) Agree _____ b) Disagree_____

Signature of Interviewer_____

Date of interview _____Time started_____ Time completed_____

Checked by supervisor: Name_____ Signature_____ Date_____

Annexes 2Epi Project Structured questionnaires

Introduction:

Questionnaire ID NO----------

Hello, my name is..... . I am Addis Ababa University (EFETP) Research Team member. Thank you for taking the time to speak with us today. We are conducting an Assessment of immunization status and factors affecting it's among children aged 12-23 months old in Mekidela Woredaand wanted to speak with heads of house hold and/or spouse. Our goal is to figure out factors affecting the immunization status in the 12-23 month children. We are very interested in your experiences and your point of view.

We will start by asking your willingness to participate in the study and clearly explain you the objective, benefit and risks of the study to get your consent. And then we will ask you all a multiple of questions for discussion. Questions are simple and what you are clearly known in your daily activities. Please feel free to speak your mind; your name, position, and anything that could identify you personally will not be used in any official reports or presentations. (Feel consent Form).

Identification code

Name household heads ----------

House numbers ---------- Kebele ----------

Residence 1 Urban 2 Rural

1. Child birth date day / month/ year

Or Age of child in months_____

2. Sex of the child 1= male 2= female

3. Number of children's older siblings_____

4. Family size_____

5. Mother's age _____

6. Mother's marital status

1= single 2= married 3= separated 4= divorced 5= widowed

7. Mothers educational status

1=illiterate 2=read and write 3= grade 1-8 4= grade 9-12 5=college/university

8. Number of children ever born by the mother_____

9. Number of children alive _____

10. What is occupation of the mother?

1= House wife 2=government employee 3=merchant 4= daily laborer 5= others, specify_____

11. What is your family monthly income per month? _____

12. Ethnicity 1=Oromo 2=Amhara 3=Others

13. What is your religion?

1=orthodox 2= protestant 3=catholic4= Muslim 5= other specify_____

14. Have you attended antenatal care during your last pregnancy?

1= Yes 2= No

15. If yes, how many times did you attend? _____

16. Have you received tetanus vaccination during your last pregnancy?

2=Yes 2= No

17. If yes, how many injections did you received? _____

18. Where did you deliver your last baby?

1= at home 2= at health institution 3=other_____

Access to vaccination service

19. Is there any health facility which vaccination service near to you?

1=Yes 2=No

20. If yes to above question which health facility is near to you?

A. health center B. hospital C. health post D. private clinic

21. How does it take you to reach there in minutes?

A. Less than 15 minutes B. 15-30 minutes C. 30-1hour minute D.> 1 hour

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Questions on immunization

22. Do you heard about vaccination and vaccine preventable disease?

2=Yes 3=No

23. If yes to above question, from where do you heard about the vaccination and vaccine

Preventable disease?

1=Radio 2=Television 3= from friends/peers 4=from school 5=Health personnel 6=other, specify _____

24. Do you mention the objective of vaccinating a child?

1=to prevent the disease 2=for specific disease 3=for child health 4=don't know

5=other, specify _____

25. How many vaccine preventable diseases do you know? _____

a. Measles b. Tetanus c. Pertussis d. Tuberculosis e. Diphtheria f. Polio g. Hepatitis b

h. Homophiles influenza b I. Pneumonia J. Rota

26. How many vaccination sessions are needed for a child to be fully protected?

1= one 2= repeated 3= five 4= don't know

27. Do you tell me the age at which the child begins immunization?

1= just after birth 2= one month after a birth 3=any time 4=after one year 5= I don' know

6=other specify_____

28. At what age the child should complete immunization? _____

29. Do you think vaccination will make your child sick?1= Yes 2=No 3= don't know

30. Do you bring a sick child for vaccination? 1=Yes 2=No

31. Does your child take any vaccination? 1=Yes 2=No

32. Do you have a card where vaccinations are written down? 1= Yes 2= No

33. Copy the immunization data from the card.

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Vaccine taken	Day	Month	year
BCG			
OPV0			
OPV1			
OPV2			
OPV3			
Pentavalent1			
Pentavalent2			
Pentavalent3			
PCV			
Rota			
Measles			

34. Has a child had any vaccinations that are not recorded on this card, including vaccinations given in a national immunization day campaign? 1=Yes 2= No

35. If question above question is no, did a child ever have any vaccinations to prevent him/her

From getting diseases, including vaccinations received in a national immunization day

Campaign?

1= Yes 2=No 3= don't know

36. Please tell me if the child had any of the following vaccinations

a. A BCG vaccination against tuberculosis that is, an injection in the arm or shoulder that

Usually causes a scar

Yes____ No_____

b. Polio vaccine, that is, drops in the mouth?

Yes_____ No_____

c. Was the first polio vaccine given in the first two weeks after birth or later?

Yes_____ No_____

How many times was the polio vaccine given _____?

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d. Apentavalent vaccination, that is, an injection given in the thigh or buttocks?

Yes_____ No_____

How many times pentavalent vaccination is given? _____

e. A measles injection that is, a shot in the arm at the age of 9 months or older – to prevent

Him/her from getting measles?

Yes_____ No_____

f. Does the child have a BCG scare on his/her upper left arm? Observe Yes__ No ___

If the child does not receive any vaccination ask the following

37. What are the reasons for the not receiving any vaccine? If the child has not received any

Vaccine yet

a. Absence of health facility in the locality

b. Health workers did not come and give vaccine at our village

c. Vaccination is of no use

d. Vaccination hurts children

e. Religion and culture refute vaccination

f. Lack of awareness about vaccination

g. Fear of side effect

h. Others

38. What are the reasons for defaulting? If child is a defaulter)

a. Vaccination site is far-away

b. Vaccination time is inconvenient

c. Absenteeism of vaccinators

d. Lack of awareness on the importance of vaccination

e. Not knowing vaccination time and site

f. Not knowing whether to come back for second and third vaccination

g. Other

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8.2. Assessment of long-lasting Insecticidal Nets Utilization by under-five children and the factors affecting its utilization among freely supplied in Kallu District, Amhara region, Ethiopia 2015

Introduction

Malaria is a life-threatening parasitic disease caused by plasmodium and transmitted from person to person when malaria parasite infected female anopheles mosquito is biting healthy person in search of blood meal. Over the last decade, the world has made major progress in the fight against malaria. Since 2000, malaria mortality rates have fallen by more than 25%, and 50 of the 99 countries with ongoing transmission are now on track to meet the 2015 World Health Assembly target of reducing incidence rates by more than 75%. A major scale-up of vector control interventions, together with increased access to diagnostic testing and quality-assured treatment, has been key to this progress.1

Malaria still kills an estimated 660 000 people worldwide, mainly children under five years of age in sub-Saharan Africa. Every year, more than 200 million cases occur; most of these cases are never tested or registered. A recent plateauing of international funding has slowed down progress, and emerging drug and insecticide resistance threaten to reverse recent gains.1

Malaria is ranked as the leading communicable disease in Ethiopia, accounting for about 30% of the overall Disability Adjusted Life Years lost. Approximately 57.3 million (68%) of the 84.3 million population of Ethiopia live in areas at risk of malaria. According to the FMOH, malaria was the leading cause of outpatient visits and health facility admissions in 2009/2010, accounting for 14% of reported outpatient visits and nearly 9% of admissions. Malaria also was among the ten leading causes of inpatient deaths among children less than five years of age. Because of a weak malaria disease surveillance system and the inability of the Health Management Information System (HMIS) to capture all necessary malaria related indicators, official estimates of the true burden of malaria in Ethiopia are imprecise2.

The main vector control activities implemented in Ethiopia include IRS, LLINs and mosquito larval source reduction.4 The challenge now is maintaining the existing high LLIN coverage and increasing utilization rates.

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Statement of the problem

Malaria and Other Vector Born Disease Prevention and Control Department of Amhara Regional Health Bureau, malaria is responsible for the significant proportion of fever cases, outpatient consultations and hospital admissions. In addition, it causes a considerable amount of workdays lost by the victim, economic cost, and absenteeism from school, reduction of productivity and days missed by women and men due to malaria episode of their children or other family members. Malaria transmission in Kalu woreda occurs throughout the year. Even if malaria transmission occurs throughout the year the peak malaria transmission season of the area is between March April and June/July-September following rainy season. Kalu woreda is one of identified malarious woreda (Hot spot) by Ministry of health and it has recent malaria epidemic history in 2013. The effectiveness of LLINs for epidemic control depends on whether most at-risk populations have sufficient LLINs and are using available LLINs properly.4 According to carter center Amhara, a total of 10,463 households were assessed in 2012. Household net ownership was high (84%), but not sufficient to cover all sleeping spaces (64%). More critically, only 31% of households reported that all members slept under an LLIN the previous night, and only 38% of households were found to have LLINs hanging at appropriate height. Nets appeared to be in good condition however, as only 38% of households owned nets that were in need of repair. School-based assessments evaluated net ownership and utilization for 38,896 students in 227 (3.2%) schools in Amhara. While 82% of students reported that their household owned at least one LLIN, only 43% of students reported sleeping under a LLIN the previous night.5

Literature Review

Persons living within 1 km of recent malaria cases should be advised to sleep under their long lasting insecticidal nets (LLINs).[4]All mosquito nets act as a physical barrier, preventing access by vector mosquitoes and thus providing personal protection against malaria to the individual(s) using the nets. Pyrethroid insecticides, which are used to treat nets, have an excito-repellent effect that adds a chemical barrier to the physical one, further reducing human–vector contact and increasing the protective efficacy of the mosquito nets. Most commonly, the insecticide kills the malaria vectors that come into contact with the ITN. By

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reducing the vector population in this way, ITNs, when used by a majority of the target population, provide protection for all people in the community, including those who do not themselves sleep under nets.[7, 8] A recent study has shown that relatively modest coverage (around 60%) of all adults and children can achieve equitable community-widebenefits.[9] ITNs thus work in this case as a vector control intervention for reducing malaria transmission. ITNs have been shown to avert around 50% of malaria cases, making protective efficacy significantly higher than that of untreated nets which, under ideal conditions (such as those found in research settings), usually provide about half the protection of nets treated with an effective insecticide.

Ethiopia is also one of the most malaria epidemic-prone countries in Africa. Rates of morbidity and mortality increase dramatically (i.e. 3-5 fold) during epidemics. Since 2005, Ethiopia has scaled-up one of the largest and most ambitious malaria control programs in Africa, designed to support the country's Health Sector Development Plan (HSDP), the national strategic plan (NSP) and the national child survival strategy, in order to reduce under-five mortality rates by two thirds by 2015. Ethiopia is among the few countries with unstable malaria transmission. Consequently, malaria epidemics are serious public health emergencies. While malaria is mostly an endemic disease, it may also occur as outbreaks, for example in areas with low seasonal transmission.[3] All patients, however, should be notified when they are in a malaria "hot zone" (i.e. an area of increased risk of malaria), and should be strongly advised to use available LLINs to the maximum extent possible, especially pregnant women and young children.[4] At least 60% of those at risk, especially pregnant women and children under five, should benefit from the most appropriate combinations of personal and communal protection, including insecticide treated nets (ITNs). Possible precipitating Factors of Malaria epidemics are :-Abnormal weather conditions / Rain fall, Increase of vector capacity, Deterioration of vector control operations, Immigration of non-endemic into an endemic area, Resistance to anti malaria drugs and Constructions / Dams, mining/.

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Objective

General objective

- To assess factors affecting long-lasting Insecticidal Nets utilization by under-five children and factors affecting its utilization amongfreelysuppliedin Kallu District,.Amhara region, Ethiopia 2015

Specific objectives

- To describe ITNs utilization by Insecticide treated mosquito net ownership and use in the woreda
- To assess awareness level towards malaria, mosquitoes and insecticide treated
- To identify factors that influence insecticide treated mosquito net utilization

Methods

Studyarea and Period

The woreda has a total population of 211,371 of whom (106,889 are male and 104,482 female) and 25,745 and 185,626 accounts for under 5 and above 5 age group respectively with a population density of 218.64 square km. The altitude of this woreda ranges from 800to 1,750 meters above sea level in the lowlands. The climate of Kalu varies from dry sub-humid to semi-arid. Important rivers include the Cheleleka and Borkana. It fares around 543 km from Bahir Dar and 383 from Addis Ababa. The woreda divided in to 8 cluster and 34 Kebeles. Concerning health care service, there are 8 health center and 34 health posts.Proposal project from 25 June up to 15 September 2015.

Study Design

A community based cross sectional study will be employed to assess utilization of ITNs by under-five children, and the associated factors affecting its utilization among freely supplied households in Kallu District, Amhara Region Ethiopia

Source Population

All householdsin theKallu District

Study population

Mothers with any children under the age of 5 years in selected Households in Kallu District included in the study

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Inclusion criteria

All under five children who live at least 6 months in theKallu District

Exclusion criteria

People who live less than 6 months in the Kallu District and respondents in the households who have no under five children exclude from this study.

Sampling technique

By using simple random sampling technique the households will be selected from each kebeles to identify the study subjects. Assigning of the households from each kebeles will be done by using proportional allocation to the size of the households of each selected kebeles. Sampling interval will be determined by dividing the total number of households in each kebeles by the corresponding number of households to be interviewed in each kebeles. The first household will be selected randomly then the next household will be selected systematically based on the sampling intervals.

Sample Size

The sample size is calculated by using the standard sample size calculation formula using one. The following assumption will be considered: the proportion of LLIN users will be 50 %(p=0.5), because the proportion of LLIN users in the study area is not known, the confidence interval will be 95% (α=0.05), the marginal error of the study will be 5 %(e=.05) and10% non-response rate will be added. Based on the above assumptions the minimum sample size required for the study will be)

$n = \frac{(z\alpha^2) X p (1-p)}{d^2}$ $n = \frac{1.96^2 \times 0.5 \times 0.5}{0.05^2} = 384$

By adding 10% non-response rate, the final sample size will be 384+ (384x0.1) = 422 house holds

Data collection procedures

For data collection either Nurse, Health Extension workers or above will be recruited. They will be residences of the study area and who know the local culture and belief of the community. Data collectors will be trained by the principal investigator. The training will include discussing about the objective, significance of the study, and how to administer the questionnaires. For supervisor either BSc or diploma graduate health professionals

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will be selected. And they will train on the objective of the study, the relevance of the study and how to supervise the data collectors. The supervisor together with the principal investigator will supervise data collection process. Completed questionnaires will be collected every day after checking for possible inconsistencies, errors and omissions. Questionnaire formats with problems will return back to interviewers for re-interview. The principal investigator will responsible for overall coordination of data collection process

Dependent variables:-ITN ownership, ITN utilization

Independent variables:-Socio demographic characteristics, such as residence, age, religion, education, sex, marital status, occupation ,monthly income, Knowledge about mosquitoes, knowledge about ITN and malaria ,housing condition , attitude towards use of nets ,family size ,condition of nets ,treatment status and sleeping arrangement.

Ethical Consideration

The ethical approval and clearance will be obtained from Medical Faculty of Addis Ababa University ethical committee. Permission will be also obtained from the concerned bodies of Amhara Regional State Health Bureau and Kallu District Health Office. The data collectors will be oriented during the training so that they would provide proper advice for the respondents regarding any malpractice they have come across. Similar information provision will be done by the principal investigator for the participants of the focus group discussions. Interview will be carried out only with full consent of the person being interviewed. Before each interview, clear explanation will be given about the aim of the study will not neither to evaluate the performance of the individual nor to blame anyone for weakness but to gather information and opinions that may lead to eventual improvement in the utilization of ITN. Each respondent will assured that the information provided by them would be confidential and used only for the purpose of research.

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Dissemination of findings

Results will be submitted to AAU Department of Community Health and presented orally. To help in future interventions the result will be communicated to governmental and nongovernmental bodies. These include the Kalu District Health Office, Amhara regional health bureau, Federal Ministry of Health (FMoH), WHO country office, United Nation Children's Fund (UNICEF), The Carter Center (TTC) and others. One day conference will arranged at district level to present the study results. In addition effort will be exerted to publish the paper and disseminate it via presentation on different national and international conferences.

Expected outcomes

Number of households owned ITNs, source of ITNs(Free, subsidized or cash base) Proportion of; households uses ITN, under 5 age children slept under ITN in the previous night and how is the perception of the community towards ITN for malaria prevention

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Annex 1 Budget break down

	Item	Unit cost (US$)	total cost
	Translation and back retranslation of questionnaire from English to local from local to English language.10pagesX2times translation	5	100
	Training of data collectors and supervisor for 2 days		
	Ten data collectors *2days	9	180
	Five supervisors *2 days	14	140
	One Evaluator *2days	20	40
	one trainer *2days	20	40
	Training hall rent * 2 days	10	20
	Seventeen pens	0.25	4.25
	Seventeen pencils	0.015	0.25
	Data collection from 40 non targeted households to pretest the quality of the questionnaire developed (four days activity)	48	480
	Data Collection for 10 days		
	10data collectors *10 days	10	1000
	5 supervisors *10 days	16	800
	1Evaluator **10days	20	200
	2 Car rent for 10 days service	40	800
	Fuel to the car 2 x 10days	50	1000
	Stationeries, printings and photo copies		
	Flash diskette 1 GB	25	25
	Photo copy paper (210 x 297 mm) x 24packet	5	120
	17 pcs of writing pads for data Notes collection 17	0.5	8.5
	Printing of translated questionnaires 10pages X 2	0.2	4
	Photo copying 10 pages questionnaires for 500 household survey	0.05	25
	Final report Writing and printing	8	8
	Photo copying the final report	3	3

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	Binding the final documents 7copies	0.29	2
Grand total			5,000

Annex 2 Implementations Time

Activities	Time			
	February	June	July	August
Proposal writing	X			
Proposal submission	X			
Review of scientific merit point	X			
Arranging training and field work		X		
Data collection (Field)		X	X	
Data entry			X	
Data analysis			X	
Data analysis and interpretation			X	
Writing of report				X
Submitting Final report				X

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Chapter IX – Other Additional Output Reports / Works

9.1. Ebola virus disease outbreak preparedness assessment report in Humera (Tigray Region) and Metema (Amhara Region), September 2014

Executive Summary

Ebola viruses are found in several African countries .The first Ebola virus was discovered in 1976 near the Ebola river in what is now the Democratic republic of Congo .Since then ,outbreaks of Ebola among humans have appeared sporadically in Africa particularly in Sub Saharan Africa. Risk assessment in disease endemic areas is difficult because the natural reservoir host of Ebola viruses is expected to be animal even though transmission of the virus to humans remain unknown

Currently Ebola outbreak affected six countries until September 18, 2014 include: DRC, Guinea, Liberia, Sierra Leon, Senegal & Nigeria.

Ethiopia is one of the countries which are identified to be at risk of EVD. Land ports in the four corners of the country are more likely to be at risk. The preparedness activities are being undertaken by Federal Minster of Health since EVD has been declared to be international Public Health Emergency by WHO.

Conclusion: Despite there was no immigrants other than the local residents in the two countries, the fact that a number of people crossing the land ports especially in market days along with the fact that the Sudanese men frequently visit Ethiopian prostitutes in the area makes the region to be paid special attention

Recommendation: capacity building for health Workers in detecting & managing EVD cases, logistics for EVD preparedness like PPE, thermometer ETC, strengthening Public Health Surveillance, availing reporting formats & standard operating procedures /Screening Algorithms ensure the completeness & timeliness of reporting, Ensure the use of free hotline call /8335 for further information; Every Health worker is Supposed to memorize the hotline line number like his/her own cellphone number.

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Introduction

Back ground (EVD)

Ebola viruses are found in several African countries .The first Ebola virus was discovered in 1976 near the Ebola river in what is now the Democratic republic of Congo .Since then ,outbreaks of Ebola among humans have appeared sporadically in Africa particularly in Sub Saharan Africa .risk assessment in disease endemic areas is difficult because the natural reservoir host of Ebola viruses is expected to be animal even though transmission of the virus to humans remain unknown

Person-to-person transmission of Ebola and Marburg virus occurs through direct contact with the Blood, secretions, organs, or other body fluids of infected persons, putting health-care workers and the community at risk. To date, approximately 9% of Ebola or Marburg victims have been health-care workers.

Currently Ebola outbreak affected six countries until September 18, 2014 include: DRC, Guinea, Liberia, Sierra Leon, Senegal & Nigeria.

Ethiopia is one of the countries which are identified to be at risk of EVD. Land ports in the four corners of the country are more likely to be at risk. The preparedness activities are being undertaken by Federal Minster of Health since EVD has been declared to be international Public Health Emergency by WHO.

Back Ground of the Area

About Metema woreda

Metema is one of the woreda in the Amhara Region of Ethiopia. Part of the Semien Gondar Zone, Metema is bordered on the south by Quara, on the west by Sudan, on the north by MirabArmachiho, on the northeast by TachArmachiho, on the east by Chilga, and on the southeast by Takusa. The administrative center is Shedi; other towns in Metemma include Metemma and Shinfa.

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Demographics

Based on the 2007 national census conducted by the Central Statistical Agency of Ethiopia (CSA), this woreda has a total population of 110,252, an increase of 100.78% over the 1994 census, of whom 58,748 are men and 51,504 women; 29,698 or 26.94% are urban inhabitants. With an area of 6,969.97 square kilometers, Metemma has a population density of 15.82, which exists less than the Zone average of 63.76 persons per square kilometer. A total of 29,378 households were counted in this woreda, resulting in an average of 3.75 persons to a household, and 27,935 housing units. The majority of the inhabitants practiced Ethiopian Orthodox Christianity, with 83.4% reporting that as their religion, while 16.5% of the population said they were Muslim.[6]

The 1994 national census reported a total population for this woreda of 54,913 in 10,546 households, of whom 29,545 were men and 23,368 women; 11,051 or 20.12% of its population were urban dwellers at the time. The five largest ethnic groups reported in Metemma were the Amhara (78.87%), the Qemant (10.27%), the Tigrayan (7.01%), the Gumuz (2.1%), and the AgawAwi (1.25%); all other ethnic groups made up 0.5% of the population.[7] The Amhara are relative newcomers, while Gumuz are the original inhabitants, who are now found in only three kebeles: KumerAftit, Tumet and Shinfa.[1]Amharic was spoken as a first language by 89.48%, 6.76% spoke Tigrinya, 2.11% Gumuz, and 1.25% spoke Awngi; the remaining 0.4% spoke all other primary languages reported. The majority of the inhabitants practiced Ethiopian Orthodox Christianity with 81.27% reporting that belief, while 18.61% of the population said they were Muslim.[7]

About Humera

Humera is a town and separate woreda in northern Ethiopia, near the borders of Sudan and Eritrea. Located in Mi'irabawi Zone of the Tigray Region, this town has a latitude and a longitude of 14°18′N 36°37′E. Humera was part of KaftaHumeraworeda. Based on the 2007 Census conducted by the Central Statistical Agency of Ethiopia (CSA), this town has a total population of 21,653, of whom 11,395 are men and 10,258 women; this is an increase of 14,451 over the 1994 national census. With an area of 153.03 square kilometers, Humera has a population density of 141.50. A total of 49.84% households were counted in this woreda, resulting in an average of 6,360 persons to a household, and 3.40 housing units. The majority

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of the inhabitants said they practiced Ethiopian Orthodox Christianity, with 93.18% reporting that as their religion, while 6.45% of the population were Muslim.[5] The 1994 census reported it had a total population of 14,451 of whom 7,649 were men and 6,802 women. The people speak mainly Tigrinya, although Amharic is also spoken as is Sudanese Arabic.

Objectives

- To identify the gaps /needs on EVD preparedness activities
- To get the community acquainted on emergency hot line number /8335/
- To intensify the public health Surveillancesystem

Methods &materials

Preparation for field work: On September 2,2014 we made informal discussions with EFETP coordinators & resident advisor ; on the next day ,September 3,2014 we departed from Addis Ababa to Amhara Regional states' capital Bahir Dar. We had arrived at Bahir Dar on Thursday at 5:12 pm.

Data collection: We collected data by observation, interviewing the key informants & discussing /debriefing.

Briefing the purpose of visiting: On Friday morning we had made informal discussion with concerned regional health Bureau PHEM process owner, Mr. Belay Bezabih. We informed him the purpose behind our visit &asked him what has been carried out by Regional Health Bureau regarding EVD preparedness.

Prepare Sensitize workshop at Amhara regional state on Saturday September 6/ 2014 in Bahir Dar City

The Amhara Regional Health Bureau in collaboration with the Jica AMRIDS held a sensitize work shop about Ebola preparedness on September 6 2014 in Bahir Dar City at Asinuara Hotel. The workshop was led by Mr. AyelignMulualem, head of the Amhara Regional state Bureau of Health. The participants of the workshop are all stake holders, Bahir Dar University, Gonder University, North Gonder Zone health department, Gonder Town health

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office, Metema woreda health office head, and FMHACA representative, Air Lines, Aviation, Emigration, Tourism and others.

The objectives of the workshop are:

To create awareness on Ebola virus Disease (EVD) for different stakeholders

To establish Regional taskforce and subcommittees

To create discussion forum and put the way forward in preparedness and response for EVD

In the workshop there were presentations about Ebola Outbreak overview, infection prevention, virology, with general discussions by WHO, Amhara Regional Health Bureau and Bahir Dar University. Different questions and concerns were raised by the participants and final consensus was reached. Finally the Regional Emergency Task Force and Technical Working Group will be established from different partners and stakeholders and capacity building will be given for the public and health workers. Emphasis will be given for the border areas of the region. And also

Alert letter for all zones and woreda, strengthen surveillance communication.

The next day on Sunday sept 05, 2014 travel from Bahirdar to Humera, onSeptember 06/2014

Briefing the purpose of visiting: On Monday morning we had made informal discussion with concerned Mr., Yohans the Tigray regional PHEM owner by phone. We informed him the purpose behind our visit &asked him what has been carried out by Regional Health Bureau regarding EVD preparedness we had contact with Mr., Yohans the Tigray regional PHEM owner by phone, then discuss the Mi'irabawi Zone focal person Mr., H/Mariam Alemu, AfitaHumera PHEM officer, Humera hospital director, Head of Humera Immigration department

On Tuesday, Sept 07, 2014 we visit the AfitaHumera land port Lugdy,During our visit we made discussion with ,Gumruk, Immigration and military officials ,why we have made the visit ;we told them about the current status of EVD globally and EVD preparedness in Ethiopia and there are no report from Ethiopia and Sudan's so far. They said many people enter in Ethiopia from different country more than 200. After having discussion different

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questions and concerns were raised and final consensus was reached screening must be started at the land port.

Debriefing: On Wednesday, sept 08, 2014 morning, had provided feedback for Mi'irabawi Zone focal person, Humera hospital director, PHEM officer and Head of immigration department attended the meeting of Tigray region at Humera.

Thursday, sept 9, 2014 was Ethiopian New Year

On Friday sept 10 ,2014 traveled to Metema ,we arrived at 2:30 pm afternoon ,there was any office opened ,woreda health office head`s phone switched off up to Sunday 12,2014;but we communicate with head of the woreda executive,

On Saturday September 11,2014 travel to Metema Yohans ,discuss with Metema Yohans Health center head about EVD preparedness and We informed him the purpose behind our visit &asked him what has been carried out by woreda

Findings &Discussion

Preparedness in Humera: According to the Mi'irabawi Zone of Tigrayregion; we made discussion with Mi'irabawi Zone focal person, AfitaHumera PHEM officer, Woreda Administrator, Municipality Head, Immigration Head. They established the task force organized from different sectors; established the TWG; give community awareness ;EVD orientation for all woreda health office head and health center head ,Screening started at land port of lugidy(more than 3 public bus and 20 auto truck enter to Ethiopia),strengthen the surveillance communication ,alert letter for all woreda and health facility

Preparedness in Humora: According to the Amhara regional state, the task force established regionally, and at Metema Yohans established committee (organized from FMHACA,health center head and PHEM focal person; migration head;customhead(Gumruk);kebeles administration; municipality head ;principal) and assessment was done by FMHACA focal person

They told us they were also concerned of the disease & According to they told us the people of the two nation had strong socioeconomic relations since many years ago. more than 2000 thousands of Ethiopians go to Sudanese every day which are labor market days; The Ethiopians get most of the factory products such as Oil, Sugar, oil, detergents (Omro)

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cosmetics (Specially perfume),etc. In turn The Sudanese enter to Ethiopian territories to buy vegetables like tomatoes, lemon etc. Coming from other countries for example on sept 13, 2014 enter to Ethiopia show in table 1.

Table 28 Daily entry of passengers enter to Ethiopia on the land port of Metema

SN	country	No of passenger
1	American	1
2	Japan	1
3	Rashia	2
4	Sudan	22
5	Ethiopia	15
6	Others from Labor; market place	> 3000

According to the MetemaWoreda; MetemaYohans is not the only land port of entry others in late and out late Farm places.

Strength /Opportunities:-Sanitized work shop prepared at Amhara RHB, Given orientation for all PHEM officers for EVD preparedness in Tigray RHB

Health Development Army: The establishment of HDA has been underway this is a glorious opportunity to implement Community based Surveillance if it has been well established.

Challenges: -- During our visit in Metema town it was a holiday which makes me difficult to get all the people because everyone was celebrating the New Year-Personal protective equipment was not in place for screening and the most of the staff was afraid to acquire the disease -All the staff not taken training on Ebola virus disease

Conclusion :-Despite there was no immigrants other than the local residents in the two countries, the fact that a number of people crossing the land ports especially in market days along with the fact that the Sudanese men frequently visit Ethiopian prostitutes in the area makes the region to be paid special attention .

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Recommendation

Capacity Building: as capacity building is highly instrumental to build confidence in the health Workers in detecting & managing EVD cases hence EPHI /RHB should get the Health workers trained on EVD. It should be commenced as early as possible

Logistics; there was no logistics at land ports for screening hence the EPHI/RHB should fulfill the useful logistic for EVD preparedness like PPE, thermometer ETC

Strengthen public health surveillance: Surveillance is a compass that guides disease prevention & Control program so the surveillance system should be intensified. Availing reporting formats & standard operating procedures /Screening Algorithms

Ensure the completeness & timeliness of reporting

Ensure the use of free hotline call /8335 for further information; Every Health worker is Supposed to memorize the hotline line number like his/her own cellphone number.

Concerns & requests from Regional Health Bureau & Health Center

Support: The process owner highly stressed that incessant support should be given to the Region from central / EPHI/

Sensitization: The RHB wants to be supported in capacitating the health workers so that they develop confidence regarding EVD detection & management

Personal protective equipment: the RHB & the Health center staffs demanded for the availability PPE as soon as possible so that they protect themselves while screening &providing care. From all over the country. Sesame, Teff and sorghum are among the most common crops.

Acknowledgements:- We would like to Acknowledge Amhara Regional Health Bureau, Tigray regional Bureau, Mi'irabawi Zone focal person, Humera hospital Director DrAlaeyi; Metema Yohans EVD committee ,FMHACA, EFETP, Ethiopian Public Health Association /EPHA, Ethiopian Public Health Institute/EPHI. Our gratitude also goes to Sudanese& Ethiopian Military officials, Health Care workers who are currently working at Health center (Ethiopia) for their hospitability & cooperativeness

9.2. Ebola Screening on land port entry in Lare District, Gambella Region, Ethiopia, 15-21/10/2014

Introduction

Ebola hemorrhagic fever (Ebola HF) is one of numerous Viral Hemorrhagic Fevers. It is a severe, often fatal disease in humans and nonhuman primates (such as monkeys, gorillas, and chimpanzees). Ebola is caused by infection with a virus of the family Filoviridae, genus Ebola virus. When infection occurs, symptoms usually begin abruptly (1). The first Ebola virus species was discovered in 1976 in what is now the Democratic Republic of the Congo near the Ebola River. Ebola hemorrhagic fever (Ebola HF) is one of numerous Viral Hemorrhagic Fevers. It is a severe, often fatal disease in humans and nonhuman primates (such as monkeys, gorillas, and chimpanzees).

Ebola is caused by infection with a virus of the family Filoviridae, genus Ebola virus... Ebola is introduced into the human population through close contact with the blood, secretions, organs or other bodily fluids of infected animals. In Africa, infection has been documented through the handling of infected chimpanzees, gorillas, fruit bats, monkeys, forest antelope and porcupines found ill or dead in the rainforest. Ebola then spreads in the community through human-to-human transmission .In the absence of effective treatment and a human vaccine, raising awareness of the risk factors for Ebola infection and taking protective measures are the only way to reduce human infection and death. FMOH has made great efforts to prevent the spread of EVD to our country. Major activities implemented in Ethiopia since the detection of EVD in West Africa are; screening the passengers those coming from Ebola epidemic reported West Africa countries in air ports and Land Ports Raising the awareness of the community through media and hotline call ,Contact tracing

Background

Gambella Region is one of the 9 National Regional State of Ethiopia located 776 kms far from Addis Ababa city. The region divided in to 3 administrative Zones, 13 administrative Woreda and 2 Municipalities. According to 2008 CSA the projected total population of the region January 2014 is 307096. There are 5 indigenous ethnic group in the region, namely; Neuwer, Anyua, Majang, Oppo and Komo. There are international and national neighbor bordering the region; in east and North east by South Sudan, in west and south west by Oromia Region

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In the Gambella region, There are 5 main entry ports in the region; namely; LarePagak, Gog, Accordingly, we assigned in Pagak and Gikao Land ports which are located in the border of Lare District from Gambella region.. Lare Woreda is located in western Ethiopia of Gambelle Regional State. The District has 28 kebeles and 44,465 of the total population. There are 2 main land ports located in the district, namely; Pagak and Mura land port.

Pagak is located 100 kilometers away from Gambella town and is one of the land port selected for establishing screening center in the area and screen those enter to the country regarding Ebola virus.Therefore, this report summarizes 1 month and 3 weeks implementation activities, challenges encountered, recommendation and next Month action plan of Lare District screening site.

Methods and Material

SWOT analysis to identify gaps, Casedefinition, Discussion with Regional Steering Committee and Previous EPHI team to identified gaps and purpose of continuing the current screening, Conduct meeting with Lare Woreda Ebola Prev. and Control technical working group, Developing action planCommunication of the action plan for Woreda, Regional and Federal level Ebola technical committee and task force via email, phone call and or face to face communication ,Implementation and Follow up of the activities

Case definition

Suspected case : Any person that has traveller or/and has stayer, in a country that has reporte atleast one confirmed case of Ebola Virus Disease, with in a period of 21 daysbeforeonset of symptoms, and : - withsuddenonset of highFever and at least three of the following symptômes : He daches, vomiting, anorexia/loss of appetite, diarrhoea, léthargie, stomach pain, acting muscles or joints, difficulté swallowing, breathing difficultés, hic up OR with inexplicable bleeding OR thatdiedsudden and inexplicable

Community case definition: A patient with fever and no response to treatment for anti-malaria in malaria risk area or of usual causes of fever in the area, OR at least one of the following signs: bleeding, bloody diarrhoea, bleeding into urine OR any sudden death

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Major Activities

1. Physical Activities

Expanding the screening site (as its importance)

Construction of quarantine site

Construction of isolation site (site for treating those have shown sign and symptoms of EVD)

2. **Capacity Building and Advocacy**

Conducting Health Education (HE) for all HWs, for Schools, or Militaries and Police, for all Lare Woreda Government Workers, Awareness creation & advocacy for the kebele leaders and cascade to the general Community, Awareness creation for immigrants, Expanding awareness creation activities to adjacent district

3. **Screening Activities**

Equipping Health workers who assigned for isolation & screening site with essential PPE, disinfectants and necessary information, Start to use infrared (overhead) thermometer after calibrating with standard thermometer, demonstrating for those HWs who screen immigrants, Extending the screening time with night and day shift, Establishing & Strengthening Ebola Technical working group and taskforce

4. **Communication**

Conducting weekly meeting with WTWG, Timely Reporting of the implemented activities and its recommendation for the concerned bodies, Feedback for Woreda and Regional Ebola Prevention and Control technical committee and taskforce

Budget

HW training=100 person*3days*200=60,000 birr

Kebele Administration Training=120*3days*200=72,000 birr

Payment for constructers =30,000 birr

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Material needed

Tent for 1 isolation site, 1 quarantine site, 1 screening site and 10 latrines with full construction materials (ties, floor plaster, wall structure, slab and etc.)

Bed and mattress sleeping mat

Plastic sheeting to cover the mattress or sleeping mat

Bedding for each bed -- at least 1 blanket and a bottom sheet

One thermometer, one stethoscope, and one blood-pressure cuff

Covered container for alcohol or bleach solution

Puncture-resistant container

Oral Rehydration Solution (ORS), Paracetamol, Tramadol, Morphine, Promethazine

Metoclopramide, Cimetidine, Diazepam, Oral cefixime or injectable ceftriaxone, Azithromycin, Coartem

VA, VB, VC, Multivitamins, Plump nut

RDT for malaria, Artesunate IV, IV quinine,Ringer lactate etc.

Result

Strengthening and Establishment of EVD taskforce and technical working group

On 3 October 2014 we strengthen and newly established Lare Woreda EVD task force committee (TFC) and Technical Working Group. The TFC decided to meet every Friday at 8:00PM (Morning) to discuss on major activities implemented and identified problems

Major tasks of Technical Working Groups are:-Identifying gaps and developing action plan, Establishing Screening, Quarantine and Isolation center at appropriate place and start to work in the established centers, conducting awareness creation training for HWs, travelers, schools, general community and etc.

Meeting every Thursday to discuss on major activities made and report for EVD TFC

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B. Awareness Creation training on Risk Factors of EVD

On 3 October 2014 awareness creation training was given for Lare Woreda EVD TFC which includes 12 members & Woreda EVD TFC decided to cascade the training for all kebele administrators (7 members from each kebele) on 6 October 2014, Cascade the training for the general community. A total of 91 (46%) took training. The training was given by:-Woreda Administrator, followed by Woreda Political Leader and finally the experts from the EPHI summarizes through the translator (Who translate Amharic to Newer language). Questions were raised from participants and discussed on it, All participants of the meeting informed to aware the general community and report to WorHO

Major topics on which awareness creation training was given includes:-Definition of EVD, TransmissionMechanism, Prevention and Control Measures, Major Sign and Symptoms of EVD

Treatment of EVD case patients

Action which should be taken by the community while they face EVD patients.

Table 29 Awareness given for kebele administrators, HEWs and HWs working in the HCs of Lare District, 2014

Trainer	Plan	Achievement	%	Remarks
Kebele Covered	28	28	100	
Kebele Administrative organs	196	91	46.2	
HEWs	56	23	41	10
HWs from HCs	50	13	26	
HC head	2	2	100	

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Figure 27 When Lare Woreda Administrator and Head of Woreda EPRDF give awareness creation training for Kebele Administrators, Gambella Region, Ethiopia on 6 October 2014.

Figure 28 When Awareness creation training on EVD was given for HEWs, Lare Woreda, Gambella Region, Ethiopia, on 6 October 2014

Training for health works:-On 11 October 2014 Training was given for a total of 20 Health Workers working in Lare HC.

Major topics on which awareness creation training was given includes:-Epidemiology of EVD,Medical Care of EVD,Ebola Infection Prevention and Control ,EVD Surveillance and Communication and Laboratory Confirmation of EVD

D. **Screening Activities**

A total of 4,902 immigrants (peoples) were passed by screening at Pagak Land Ports (entry port) from 1October -16 November 2014. The trend of number of immigrants took screening by week shows a slowdown ward. This may be due to:-

Change in recording of the data starting from 5 October 2014.

There might be over recording of data.

As HWs assigned for screening EVD at Pagak land port informed the number of immigrants become decreasing.

Figure 29the trend of number of immigrants took screening by Week in Lare Woreda Pagak Land Port, Gambella Region, Ethiopia from October 1-November 16, 2014

E. Construction of Temporary Isolation Center

F. Participating in the establishment of Regional TFC and EVD prevention and Control Emergency Plan

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G. Finally we conducted meeting with Lare Woreda TFC and Regional PHEM process team to give general feedback and hand over the work.

Discussion

As many literatures pointed screening at entry port and awareness creation on risk factors of EVD are the only means to prevent and control the spread of EVD cases and deaths. As of 16 November 2014 a total of 9,023 immigrants were took screening at Pagak land port. The trend of those immigrants who entered by screening has been decreasing. Awareness creation which will be cascaded to the general community was given for a total of 91 (46.2%) kebele administrative organs that were participated from all kebeles.

Around 23 (41%) HEWs, 13 HEP supervisors and 2 HC heads took orientation on EVD.

Challenges encountered

Budget scarcity,

In availability of full PPE

Climatic condition (due to rainy season and the land topography holds water to early construction of isolation and quarantine center

The other challenge was the timing of the screening and immigrant entry through the land port. I.e. the land port is opened for 24hrs, whereas the screening was done from 8:30 AM (Morning)-4:00PM (Afternoon).

Solution taken

Discussion with LareWoreda TFC on the prepared action plan

Discussion with Federal Police to arrange entry time

Recommendation

RHB should give due attention in establishing of isolation center in appropriate site

Due to many reasons it is impossible to follow up of suspected case patients who has contacts, not yet started to show any sign and symptoms.

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So, establishing a quarantine site around the screening area and following them for 21 days is recommended.

Therefore, RHB and other concerned organizations should focus and give necessary supports for its establishment.

Concerned organization including EPHI and other partners should focuses on disbursing budget for training, establishment of isolation and quarantine sites.

Provide PPE

Awareness creation for the general community

Conclusion

To make our country free of EVD the participation and integration of; Governmental Organizations, NGOs, Private Sectors and general community is necessary. Therefore, all concerned parties should involve both in financial and technical support to strengthen the current efforts which has been made to prevent and control the spread of EVD.

Reference

WHO recommended Guidelines for Epidemic Preparedness and Response: Ebola Hemorrhagic Fever (EHF), WHO/EMC/ DIS/97.7?

WHO: EBOLA RESPONSE ROADMAP UPDATE 3 October 2014

FILOVIRUS HAEMORRHAGIC FEVER GUIDELINE, Medicines sansFrontiers 2008, Esther Sterk, MD

9.3. Training, Conference and other activities

AFENET 5th conference

I have attended 5th AFENET scientific conference in Addis Ababa starting from 17-21 Nov 2013.

The five day conference provided a platform for hundreds participants including trainees and graduates from various Field Epidemiology and Laboratory Training programs (FELTPs) to benefit from oral and oral poster presentations that were presented.

Presenters, key note speakers, public health professionals and trainees from Field Epidemiology and Laboratory Training Programs (FELTPs) from over 20 African countries attended the conference and exhibition. The program not only involved oral and poster scientific presentations, themed workshops and keynote addresses but also excursions and social events such as the opening cocktail, cultural dinner, and finally the international night.

The conference concluded on a high note with a closing ceremony and international night at the Sheraton Hotel, Addis Ababa, in which representatives from the various countries presented songs and dances reflecting a variety of cultures. Awards and certificates were given to the best oral and poster presenters and different contributor for the success of conference.

Measles Post Epidemic Evaluation

I have attended and presented outbreak investigation on Measles post epidemic evaluation, at Dangila Town from 22 and 23/02/2014.

PHEM National Review Meeting

I have attended PHEM National annual review meeting in Hawassa,August 15-19, 2014

Bulletin Article

I have contributed on the preparation on of weekly Bulletin Article Amhara National Regional State Health Bureau of Public health emergency management (PHEM) core process.

Training for HWs on EVD

In Gambella regional state, on 11 October 2014 Training was given for a total of 20 Health Workers working in Lare HC.

Major topics on which awareness creation training was given includes:-Epidemiology of EVD,Medical Care of EVD,Ebola Infection Prevention and Control,EVD Surveillance and Communication, Laboratory Confirmation of EVD

Figure 30 When Training given for Health Workers of Lare HC Gambella Region, Ethiopia on 11 October 2014.

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Annexes

Annexes 3 Questionnaires for Case control study on Measles outbreak in Community Level In Yilmana Denssa woreda 2014

	Respondent category: Data collector name	**case Active case control**
	Date of data collection	
	Kebele	
	Got	
	Latitude Longitude	
	What is your relation to the person we are asking questions about?	Mother Father Grandparent The case or control Other (please specify) _____
SOCIO-DEMOGRAPHIC		
	What is the respondent's name? How old is the respondent?	_____months ____ years
	What sex is the respondent?	Male Female
	Has the respondent ever attended school? What is the highest level of education the respondent has completed? (read answers):	yes (go to question 15) No (go to question 16) Not Applicable (mark N/A on Q.15, Q.16, then go to question 17) KG Primary Secondary Tertiary Not applicable
	What is the respondent's occupation?	Farmer Merchant Housewife Unemployed Government Pastoralist Student Not applicable Other _____
	What is the respondent's ethnicity? What is the respondent's religion?	Oromo Tigre Amhara Gurage Other (specify) _____ Orthodox Protestant Muslim Catholic Other_____
	What is the respondent's marital status?	Single Married Widowed Divorced Not applicable
	What is the respondent's father's occupation?	Farmer Merchant Unemployed Government Student

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		Pastoralist Other _____
	What is the education level of the FATHER of the respondent?	Illiterate Primary Secondary Tertiary Don't know
	What is the education level of the MOTHER of the respondent?	Illiterate Primary Secondary TertiaryDon't know
	What is the main material of the roof? RECORD OBSERVATION	no roof thatch/leaf/mud rustic mat/plastic sheets reed/bamboo wood planks cardboard corrugated iron /metal wood asbestos/cement fiber cement/concrete roofing shingles other (specify) _____
	Does your household have…	Electricity? Yes No A watch/clock? Yes No A radio? Yes No A television? Yes No A mobile telephone? Yes No A non-mobile telephone? Yes No A refrigerator? Yes No A table? Yes No A chair? Yes No
	KNOWLEDGE	
	How do you think measles is transmitted, or do you not know? You can pick more than one response. Do you think measles is transmitted…. (READ ANSWERS)	Through the air/coughing Fecal/oral routes Food Close contact with an ill person Another way _____ Or, do you not know?
	How do you think measles can be prevented? Do you think..(READ ANSWERS)	Vaccination can prevent measles There is no prevention Local healing can prevent measles Another way _____ Or, do you not know?
	Who do you think can be affected by measles, or are you not sure?	Children less than 5 years old Children between 5-18 years People over 18 years old Any age group Don't know Other (specify):_____
	Do you think vaccination can prevent measles?	Yes No Don't know

What is the routine age for a child to be vaccinated with measles vaccine, or do you not know?	3 months 6 months 9 months Other _____ Don't know
There is a vaccine that can prevent measles. Did you know that this vaccine exists?	Yes No Don't know

RISK FACTORS

Can I see your immunization card?	Yes (go to question 33) No (go to question 32)
Why do you not have an immunization card?	Never went to get vaccinated Got vaccinated but was never given the card Lost the card Other _____
Was the respondent vaccinated again measles, or do you not know? (if have an immunization card, refer to the card to find out if vaccinated)	Yes (go to question 34) No (go to question 37) Don't know (go to question 38)
What is the number of measles vaccine doses received? (refer to card if possible)	One Age of first dose _____ Card validated Two Age of second dose _____ Card validated More than two Age of third dose _____ Card validated
Where did the respondent get these vaccines? Was it… (READ ANSWERS)	Routine in the health center A visit by HEW during routine program A door-to-doorcampaign Did you forget or don't know Or in a other way? _____ **GO TO QUESTION 35**
The recommended age for vaccination is 9 months. What is the main reason the respondent not vaccinated against measles?	Clinic was too far You were absent during vaccination campaign You didn't know it was time for vaccination You think the vaccine will hurt the child The child is not yet 9 months old Other, (specify)_____ _

EXPOSURE

To your knowledge, did you have contact with a person with measles/(CASES: 2-3 weeks before onset of illness?) (CONTROLS: In the last 2-3 weeks?)	Yes No ---------- skip to Q38 Don't know ---------- skip to Q38
If yes, who did you have contact with?	Name: _____

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	Where did you have contact with this person?	_____
	Have you travelled outside of your village (CASES: 2-3 weeks before onset of illness?) (CONTROLS: In the last 2-3 weeks?) Is there anyone else with measles symptoms in your household? How long does it take you to walk to the health center from your house? *How many windows and doors does the house have?*	Yes, (If yes), District _____ Kebele_____ No Don't know Yes: Total number of measles cases in the house _____ No Less than 10 minutes 10-30 minutes 31 minutes – 1 hour More than 1 hour More than 2 hours Don't know two or more windows or doors less than two windows or doors
	How many sleeping rooms are there in your house? How many people slept in your house last night?	
CLINICAL PRESENTATION*(for case ONLY)*		
	Did the case have any of the following symptoms? What is the date the case first saw a rash on their body?	Rash: Yes No Fever: yes No Runny nose: yes No Red eyes: yes No Cough : yes No Tiny white spots or sores inside the mouth yes No ____/_____/_____
	Was the case in your home village when you first noticed you were ill?	yes (skip to question 50) No (go to next question)
	Where were you when the illness started? How long have you had a rash? Do you still have the rash?	District:_____Kebele; _____ Purpose of trip:_____ _____days Yes No
	Did you visit a health facility for this illness? How long were you sick before visiting the health facility?	Yes (date went to facility____/____/____) No (go to Q.55) _____ in days/hours

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	Were you admitted?	Yes --- date admitted:___/___ /_____ No
	Treatment given? Was the respondent given… *Outcome*	Yes (go to question 56) No (go to question 57) ORS Antibiotics Vitamin A Supplementary food TTC ointment Anti-pyretic Other ____ Alive death
	Did you have any of the following complications when you were sick with measles? Did you travel four days prior to or four days after rash onset? Where did you travel to?	Diarrhea: yes No Blindness : yes No Ear infection: yes No Convulsions yes No Change in vision: yes No OTHER _____ Yes (go to question #60) No (FINISHED)

Thank you for you for participating in this study. have a nice day

Interviewer Notes:

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Annexes 4 Proposal of surveillances system evaluation

Background

A functional disease surveillance system is essential for defining problems and taking action. Proper understanding and use of this essential epidemiological tool (public health surveillance) helps health workers at the woreda and health units to set priorities, plan interventions, mobilize and allocate resources, detect epidemics early, initiate prompt response to epidemics, and evaluate and monitor health interventions. It also helps to assess long term disease trends[1].(PHEM guide line page 22).Ethiopia underwent different strategies to have functioning and effective surveillance system. Too often, however, surveillance data for communicable diseases are neither reported nor analyzed on time. As a result, the opportunity to take action with an appropriate public health response and save lives is lost. Even in cases where adequate information is collected, it is often not available for use at the local level. Over the last decade, the world has made major progress in the fight against malaria. Since 2000, malaria mortality rates have fallen by more than 25%, and 50 of the 99 countries with ongoing transmission are now on track to meet the 2015 World Health Assembly target of reducing incidence rates by more than 75%. A major scale-up of vector control interventions, together with increased access to diagnostic testing and quality-assured treatment, has been key to this progress.[2] But we are not there yet. Malaria still kills an estimated 660 000 people worldwide, mainly children under five years of age in sub-Saharan Africa. Every year, more than 200 million cases occur; most of these cases are never tested or registered. A recent plateauing of international funding has slowed down progress, and emerging drug and insecticide resistance threaten to reverse recent gains.[3]Malaria is ranked as the leading communicable disease in Ethiopia, accounting for about 30% of the overall Disability Adjusted Life Years lost. Approximately 57.3 million (68%) of the 84.3 million population of Ethiopia live in areas at risk of malaria. According to the FMOH, malaria was the leading cause of outpatient visits and health facility admissions in 2009/2010, accounting for 14% of reported outpatient visits and nearly 9% of admissions. Malaria also was among the ten leading causes of inpatient deaths among children less than five years of age. Because of a weak malaria disease surveillance system and the inability of the Health Management Information System (HMIS) to capture all necessary malaria related indicators, official estimates of the true burden of malaria in Ethiopia are imprecise[4]. *Presidents of malaria initiative, Malaria operational plan FY 2013(page 5)*

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Rational for Evaluation

The surveillance system of North Gonder zone has not been evaluated before and malaria selected as a tool becauseEthiopia aims to achieve malaria elimination in selected geographical areas with historically low malaria transmission by 2015, where universal coverage of malaria prevention interventions and strengthened surveillance has been well established. There will be an especially aggressive response to malaria case build ups and to epidemics within these areas. And it is one of the main health problems of Amhara Region. Therefore, this study will conduct to evaluate the functionality of the surveillance system, to see effectiveness and efficiency of the system and identify the gap for the better improvement of the surveillance system.

Objectives

General Objective

To evaluate the surveillance system using key attributes of malaria surveillance system

Specific Objectives

- To evaluate the attributes of malaria surveillance system in the selected woredas
- To assess usefulness and utility of surveillance system in early detection of diseases, outbreaks and decreasing morbidity and mortality.
- To describe the surveillance system of Malaria

Materials and Methods

1. Study Area and Population

The evaluation will be carried out in Amhara Regional North Gonder zone; is one of 10 Zones in the Amhara Region of Ethiopia. A total population estimated for 2014 is 3,557,517 and has 24 woredas of which the study will be conducted in two malarious and good and poor performed woreda. Those 2 Woreda will be selected by discussing with zonal officers for their performance for PHEM activity.

2. Study Design and Period

A cross-sectional descriptive study will conduct from December 24-Janury 8, 2014 in North Gonder Zone,

3. Sample Size, Sampling Technique and study unit

The study subjects will be the health facilities, health offices and zonal health department. A total of 7 study units/sites will be included in the study. These will be North Gonder zone health department, two district health offices, two health centers and two health posts. Selection of the districts and the district health facilities will perform as follows:

From the zone, two districts will be select by discussing good and poor performing woredas in PHEM activity and the district health offices will include in the study. From each selected district one health center and one health post will selected on convenience basis.

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4. Data Collection Method :-Data will be collected using semi-structure questionnaire and observation using check-list. Using this tool surveillance officers or focal persons in the selected health facilities and health offices for the study will be interviewed. Secondary data source such as malaria surveillance data, malaria surveillance indicators will also be reviewed

5. **Data analysis** :The data will enter and analyze Epic info 7

Time Table

Table 30Timeline for the activities to be done

Activities	Time			
	December		January	
	3nd week	4th week	1st week	2nd week
Proposal submission	X			
Arranging Administrative Process	X			
Data collection (Field)		X	X	
Data entry				X
Data analysis and interpretation				Data analysis & finalization of document will be done after coming back to residency site.
Writing progress report				
Submitting Final report				

References

1. http://www.who.int/campaigns/malaria-day/2013/event/en/

2. Presidents malaria initiative, 2012 G.C., malaria operational plan FY 2014,Ethiopia

3. EHNRI PHEM center, 2012 G.C, Public health emergency management guide line, Addis Ababa, Ethiopia

Questionnaire

I. REGIONAL /ZONAL LEVEL QUESTIONNAIRE

Identifiers: --------- Date: ----------

Respondent name: ---------- Responsibility: ----------

A. Surveillance system

1. Is there national Malaria guideline?

   1.Yes 2.No 3. Not applicable 4.Unknown
2. Do you have standard case definitions for the Country's priority diseases like malaria?

   1.Yes 2.No 3. Not applicable 4.Unknown
3. Is the central level responsible for providing surveillance reporting forms to the health facilities?

   1.Yes 2.No 3. Not applicable 4.Unknown
4. If yes, have you lacked appropriate surveillance forms (Line list, weekly reporting form, and epidemic reporting form, rumor investigation) at any time during the last 6 months?

   1.Yes 2.No 3. Not applicable 4.Unknown
5. What are the reporting entities for the surveillance system?
   1. Public health facilities
   2. NGO health facilities
   3. Military health facilities Private health facilities
   4. Others(Specify)_____
6. Percent of district reports (either directly or through an intermediate level) received during each reporting period at the central level during the past 3 months:

   6.1. Number of reports in the last 3 months compared to expected number (completeness)

   6.2. Weekly: /12 times the number of districts (timeliness)

   6.3. Immediately: /------ times the number of districts
7. Was there any report of the immediately reportable diseases in the past 1 month?

   1. Yes 2. No
8. If yes, with in what time is the report received after detection of the case/ diseases?
   1. Less than 1 hour
   2. **2-24 hours**
   3. 1- 2 days
   4. 3- 7 days
   5. After 1 week
9. How do you report? (Multiple responses are possible)

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1. Mail
2. Fax
3. Telephone
4. Radio
5. Electronic
6. Other(specify)_____

A. Data analysis

1. Does the Zonal level describes the data by age, sex, time and places:

1. Yes 2. No 3.Unknown 4.Not applicable

2. List disease(s) for which line graph is observed _____ _____

3. If they do not made analysis for Malaria ask the reason why they don't_____ _____

4. Do you have an action threshold defined for, malaria?

1. Yes 2. No 3. Unknown 4. Not applicable

5. Who is responsible for the analysis of the collected data? _____
6. How often do you analyze the collected data?
    1. Daily
    2. Weekly
    3. Every 2 weeks
    4. Monthly
    5. Quarterly
    6. As needed……..

7. Do you have appropriate denominators?

1. Yes 2. No 3.Unknown 4.Not Applicable

8. Do you give feedback for woredas

1. Yes 2. No

9. If the answer is yes for Question 7, how often?

1. Daily 3. Every 5. Weekly
2. Monthly 4 .Quarterly

B. Outbreak Investigation

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1. Percent of suspected outbreaks that were investigated in the past 6 months_____(# of suspected outbreak)_____(# of investigated) _____ (%)
2. List the diseases: _____

C. Epidemic Preparedness (relevant for epidemic prone diseases)

3. Existence of a Regional/Zonal plan for epidemic preparedness and response

1. Yes 2. No 3. Unknown 4. Not applicable

4. Has the zone had emergency stocks of drugs, LLITN, and supplies at all times in past 1 year (2012)?

1.Yes 2. No 3.Unknown 4.Not applicable

5. Has the region experienced shortage of drugs, vaccines or supplies during the most recent epidemic (or outbreak)?

1.Yes 2.No 3.Unknown 4.Not applicable

6. Existence of standard case management protocol for Malaria

1.Yes 2.No 3.Unknown 4.Not applicable

7. Is there budget line for epidemic response?

1.Yes 2.No 3.Unknown 4.Not applicable

8. Does the region have rapid response team for epidemic?

1.Yes 2.No 3.Unknown 4.Not applicable

D. Response to Epidemics

1 Ability of the regional level to respond within 48 hours of notification of most recently reported outbreak

1.Yes 2.No 3.Unknown 4.Not applicable

2. How many feedback bulletins or reports had the regional level produced in the last year? _____
3. How many supervisory visits have you made in the last 6 months? _____
4. The most usual reasons for not making all required supervisory visits:_____
5. Have you been trained in disease surveillance?

1.Yes 2.No 3.Unknown 4.Not applicable

6. If yes, specify when, where, how long, by whom? _____
7. What percent of your subordinate personnel have been trained in surveillance? _____
8. Have you received any post-basic training in epidemic management?

1.Yes 2. No 3.Unknown 4.Not applicable

9. If yes, specify when, where, how long, by whom? _____

Percent of sites that have:

10. Data management
    1. Computer:
    2. Printer:
    3. Photocopier:
    4. Data manager:
    5. Statistical package:
11. Communications
    1. Telephone service:

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2. Fax:
3. Radio call:
4. Satellite phone:
5. Computers that have modems:

12. Budget line _____
13. Logistics _____

Surveillance

14. Do you have computerized surveillance network at this level?
    1. Yes 2.No 3.Unknown 4.Not applicable

F. Budget for surveillance

15. Is there a budget line for surveillance in the Regional Health Bureau budget?

    1. Yes 2.No 3.Unknown 4.Not applicable

16. How could surveillance be improved?

_____

_____

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

G. Questionnaire for Attributes and level of Usefulness:

1. Total population under surveillance_____
2. What is the incidence / Prevalence of Malaria in your area/region
   - Malaria _____cases _____Deaths _____

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

Does the surveillance system help:

1. To detect outbreaks of these selected priority diseases early?
   1. Yes 2.No
2. To estimate the magnitude of morbidity and mortality related to these diseases, including identification of factors associated with these diseases?
   1. Yes 2.No
3. To permit assessment of the effect of prevention and control programs?
   1. Yes 2.No

4. To Observe (confirm): interventions and diseases trends analyzed

   1. Available 2.Not available

II. Describe Each System Attributes:

i. Simplicity:

1. Is the case definition of malaria and case detection known by all level health professionals?
   1. Yes 2. No
2. What are the organizations which need to receive reports of the surveillance data?
3. Do you feel that additional data collected on ~~a~~ case are time consuming?

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1. Yes 2. No

4. How long it takes to fill the format?
   1. <5 minute 2.-10-15minuts 3.- >15 minutes
5. How long does it take to have laboratory confirmation of Malaria?
   1. <5 minute 2.-10-15minuts 3.- >15 minutes

ii. Flexibility:

1. Can the current reporting formats be used for other newly occurring health event (disease) without much difficulty? 1. Yes 2. No
2. Do you think that any change in the existing procedure of case detection, reporting, and formats will be difficult to implement? 1.Yes 2.No

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

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

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

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

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

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

iv. Acceptability:

1. Do you think all the reporting agents accept and well engaged to the surveillance activities? 1. Yes 2.No
2. If yes, how many are active participants (of the expected total)? _____
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 analyzed data back to reporting facilities
   C. Reporting formats are difficult to understand
   D. Report formats are time consuming
   E. Other(specify):_____

v. Representativeness:

1. What is the health service coverage of the district/ zone/ region?
   _____(#) _____%
2. Do you think, the population under surveillance have good health seeking behavior for these diseases?

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1. Yes 2. No

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

---

vi. **Timeliness**: Timeliness of reporting in the past one year (by Zone and Woreda)

1. On time---------- 2. late

vii. **Stability:**

1. Was the new BPR restructuring affect the procedures and activities of the surveillance of these diseases? 1. Yes 2. No
2. Was there lack of resources that interrupt the surveillance system? 1. Yes 2. No

II. DISTRICT (WOREDA LEVEL) QUESTIONNAIRE

Identifiers: ---------- Date: ----------

Province: ---------- Interviewer ----------

Respondent: ---------- Responsibility----------

A. Surveillance system

1. Is there national guideline for Malaria and PHEM at this site?

1. Yes 2. No 3.unknown 4.Not Applicable

. **Case confirmation:**

2. Does the district have the capacity to transport specimens to higher level lab?

1. Yes 2.No 3.Unknown 4.Not applicable

3. Does the district have guidelines for specimen collection, handling and transportation to the next level?

1. Yes 2.No 3.Unknown 4.Not applicable

Data reporting:

1. Have you faced lack of forms recommended for the country at any time during the last 6 months?

1. Yes 2.No 3.Unknown 4.Not applicable

1. Number of reports received in the last 3 months compared to expected number
2. Weekly: _____ /12 times the number of health facilities
3. Immediately: _____/----- times the number of health facilities
4. On time (use national deadlines)
5. Number of weekly reports submitted on time: ____/12 times the number of health facilities
6. Number of immediately reports submitted on time: _____/3 times the number of health facilities

2. How do you report (Multiple answers are possible):

7. Mail 4. Telephone

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8. Fax 5. Electronic
9. Radio 6. Others (specify)……..

3. How can reporting be improved?
_____
_____

Data Analysis:

1. Percent of sites that: Describe data by person, time and place (case based, outbreaks, sentinel)
   1. Yes 2.No 3.Unknown 4.Not applicable
2. Do you have an action threshold for any of the country priority diseases?
   1.Yes 2.No 3.Unknown 4. Not applicable
3. If yes, what is it? _____cases _____% increase _____rate

(Ask for 2 priority diseases)_
_____
_____

4. Do you Have appropriate denominators? Observe presence of demographic data at site (E.g. population <5 yr, population by village,)

   1.Yes 2.No 3.Unknown 4.Not applicable
5. Who is responsible for data analysis? _____

6. How often do you analyze the collected data?

   1. Daily 3. Every 2 weeks
   2. Weekly 4.Monthly
   5. Quarterly 6.As needed

Outbreak investigation:

1. Number of outbreaks suspected in the past 6months:_____
2. Observe: Of those, number investigated (Observe reports and take copies if possible): _____
3. Has your district ever investigated an outbreak?
   1.Yes 2.No 3.Unknown 4.Not applicable
4. Existence of epidemic preparedness and response plan at district level_____
   1.Yes 2.No 3.Unknown 4.Not applicable
5. Do the districts have written plan of epidemic preparedness and response
   1. Yes 2.No 3.Unknown 4.Not applicable
6. Has the district had emergency stocks of drugs and supplies at all times in past 1 year?
   1. Yes 2.No 3.Unknown 4. Not applicable

7. Has the district experienced shortage of drugs, vaccines or supplies during the most recent epidemic (or outbreak)?

   1. Yes 2.No 3.Unknown 4. Not applicable
8. Is there budget line or access to funds for epidemic response?
   1. Yes 2.No 3.Unknown 4.Not applicable

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9. Percent of districts that have an epidemic management committee
10. Observation: Observe minutes (or reports) of meetings of epidemic management committee
    1. Yes 2.No 3.Unknown 4.Not applicable
11. Does the district have rapid response team for epidemics?
    1. Yes 2. No 3.Unknown 4. Not applicable

Responses:

1. Has the district implemented prevention and control measures based on local data for at least one reportable disease or syndrome?
   1.Yes 2.No 3.Unknown 4.Not applicable
2. Does the district responded within 48 hours of notification of most recently reported outbreak (from written reports)
   1.Yes 2.No 3.Unknown 4.Not applicable
3. Has epidemic management committee evaluated their preparedness and response activities during the past year? (observe written report to confirm)
   1.Yes 2.No 3.Unknown 4.Not applicable

Feedback:

1. Is there written feedback reports has the district produced in the last year?
   1.Yes 2.No 3.Unknown 4.Not applicable
2. How many feedback bulletin or reports has the district received in the last year? _____
3. Supervision_____
4. How many times have you been supervised in the last 6 months?
5. How many supervisory visits have you made in the last 6 months? _____

(Obtain required number of visits from central level)_____

6. The most usual reasons for not making all required supervisory visits.

Reason 1_____

Training _____

7. Percent of health personnel (in position of responsibility) trained in disease surveillance

8. Have you been trained in disease surveillance?
   1.Yes 2.No 3.Unknown 4.Not applicable
9. If yes, specify when, where, how long, by whom?
   _____

10 8.What percent of your personnel in the district have been trained in surveillance and epidemic management? _____

Resources:

1. Percent of sites that have:

Logistics

1. Electricity 3.Motor cycles
2. Bicycles 4.Vehicles

2. Data management
   1. Stationary 2. Calculator 3.Computer 4.Printer

3. Communication
   1.Telephone service 3. Fax

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2.Radio 4.Computers that have modems

9. Information Education and Communication materials
   1. Posters
   2. Megaphone
   3. Generator
   4. Screen
   5. Projector (Movie)
   6. Others(specify):_____
10. Hygiene and sanitation materials
    1.Spray pump 2..Disinfectant
11. Surveillance coordination:_____
12. Is there a surveillance co-ordination focal point within the district epidemic management committee?
13. Satisfaction with surveillance system_____
14. Are you satisfied with the surveillance system?
    1.Yes 2.No 3.Unknown 4.Not applicable
15. If no, how can the surveillance system be improved? _____

III. HEALTH FACILITY QUESTIONNAIRE

Identifiers:

Assessment team : Type of health facility:

Date: District:

Interviewer: Region/province:

Respondent : Country:

Name of health facility: Surveillance system:

---

1. Is there national manual for surveillance at this site?
   1. Yes 2.No 3.Unknown 4.Not applicable

I. Case detection and registration

2. Percent of health facilities that have a clinical register
   1. Yes 2.No 3.Unknown 4.Not applicable
3. Percent of health facilities that correctly register cases filling of the clinical register during the previous 30 days
   1. Yes 2.No 3.Unknown 4.Not applicable
4. Do you have a standard case definition for: malaria?
   1. Yes 2.No 3.Unknown 4.Not applicable

II. Case confirmation

5. At this facility are you able to collect

Sputum:	1. Yes	2.No	3.Unknown	4.Not applicable
Stool:	1. Yes	2.No	3.Unknown	4.Not applicable
Blood:	1. Yes	2.No	3.Unknown	4.Not applicable

CSF: 1. Yes 2.No 3.Unknown 4.Not applicable

6. Observation: Observe the presence of materials required to collect
   Sputum: 1. Yes 2.No 3.Unknown 4.Not applicable
   Stool: 1. Yes 2.No 3.Unknown 4.Not applicable
   Blood/serum: 1. Yes 2.No 3.Unknown 4.Not applicable
   CSF: 1. Yes 2.No 3.Unknown 4.Not applicable

7. Do you have the capacity to handle sputum, stool, blood/serum and CSF until shipment at this facility?

   1. Yes 2.No 3.Unknown 4.Not applicable

8. Do you have RDT to test Malaria at this facility?
   1. Yes 2.No 3.Unknown 4.Not applicable

9. Do you have functional microscope to test for Malaria at this facility?
   1. Yes 2.No 3.Unknown 4.Not applicable

10. Observation: Observe presence of functional cold chain at health facility
    1. Yes 2.No 3.Unknown 4.Not applicable

11. Is there transport media for stool at health facility

    1. Yes 2.No 3.Unknown 4.Not applicable

12. Observation: Observe presence of packing materials for shipment of specimens at health facility

    1. Yes 2.No 3.Unknown 4.Not applicable

III. Data reporting

13. Have you faced lack of appropriate surveillance forms at any time during the last 6 months? 1. Yes 2.No 3. Unknown 4.Not applicable

14. Is the last monthly report agreed with the register for malarial diseases; major public health importance

    Observation: Malaria 1. Yes 2.No 3.Unknown 4.Not applicable

15. Percent of sites that reported each reporting period to the next higher level during the past 3 months
    Number of reports in the last 3 months compared to expected number
    Observe Weekly: /12 times the number of sites
    Observe immediately: /-- times the number of sites
16. On time (use national deadlines)

    Observe: Number of weekly reports submitted on time:-_____ /12 times the number of sites

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Observe: Number of immediately reports submitted on time: ___/-- times the number of sites

17. How do you report?
    1. Mail
    2. Fax
    3. Electronic
    4. Telephone
    5. Radio
    6.Other(specify):_____

18. Strengthening reporting

How can reporting be improved?

_____

_____

IV. Data analysis

Percent of sites that:

19. Describe data by person ,place and time

20. Do you have an action threshold for any of the Country priority diseases?

1. Yes 2.No 3.Unknown 4.Not applicable

21. If yes, what is it (Ask for malaria diseases)? _____cases ____ % increase _____rate

22. Who is responsible for data analysis? _____

23. How often do you analyze the collected data?
    1. Daily
    2. Weekly
    3. Every 2 weeks
    4. Monthly
    5. Quarterly
    6 .As needed……..

24. Do you have appropriate denominators? Observe demographic data at site (E.g. population <5 yr., population by village, total population)

1. Yes 2.No 3.Unknown 4.Not applicable

V. Epidemic preparedness

25. Is there written case management protocol for malaria epidemic prone disease

1. Yes 2.No 3.Unknown 4.Not applicable

VI. Epidemic response

26. Has the health facility implemented prevention and control measures based on local data for at least one epidemic prone disease?

1. Yes 2.No 3.Unknown 4.Not applicable

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VII. Feedback

27. How many feedback bulletins or reports has the health facility received in the last year? ___
28. How many meetings has this health facility conducted with the community members in the past six months?

VIII. Supervision:

29. How many times have you been supervised in the last 6 months?

IX. Training

30. Have you been trained in disease surveillance and epidemic management?

1. Yes 2.No 3.Unknown 4.Not applicable

31. If yes, specify when, where, how long, by whom? _____ _____

X. Resources

Percent of sites that have:

32. Logistics

1. Electricity 3. Motor cycles
2. Vehicles 4.Bicycles

33. Data management

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

34. Communications

1. Telephone 3.service Radio call
2. Fax 4.Computers that have modems

35. Information education and communication materials

1. Posters
2. Megaphone
3. Flipcharts or Image box
4. Projector (Movie
5. Screen
6. Generator
7. Other(Specify):_____

36. Hygiene and sanitation materials

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1. Spray pump
2. Disinfectant

37. List Protection materials _____
_____

38. Are you satisfied with the surveillance system?

1. Yes 2.No 3.Unknown 4.Not applicable

39. If no, how can the surveillance system be improved? _____
_____

Health Post Level Questionnaire

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

1. Is there national manual for malaria surveillance at this site?
   1. Yes 2.No 3.Unknown 4.Not applicable

I. Case detection and registration

2. Is there a clinical register book health facility?
   1. Yes 2.No 3.Unknown 4.Not applicable

3. Do you have standard case definition for malaria?
   1. Yes 2.No 3.Unknown 4.Not applicable

II. Data reporting

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

   1. Yes 2.No 3.Unknown 4.Not applicable

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

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

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

   Observe Weekly:

   Observe Immediately:

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7. Percent of HF that have means for reporting to next level by e-mail, telephone, fax or radio?_____
8. How do you report?

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

III. Data analysis

9. Performing trend analysis Observed line graph of cases by time

1. Yes 2.No 3.Unknown 4.Not

IV. Epidemic response

10. Has the health facility implemented prevention and control measures based on local data for at least one epidemic prone disease?

1. Yes 2.No 3.Unknown 4.Not applicable

V. Feedback

11. How many feedback bulletins or reports has the health facility received in the last year? __
12. How many meetings has this health facility conducted with the community members in the past six months? _____
13. How many times have you been supervised in the last 6 months? _____

VI. Training

14. Have you been trained in disease surveillance and epidemic management?

1. Yes 2.No 3.Unknown 4.Not

15. If yes, specify when, where, how long, by whom?_____
_____

VII. Resources

Percent of sites that have:

16. Logistics

1. Electricity 3. Motor cycles
2. Bicycles 4.Vehicles

17. Data management

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

18. Communications

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

19. Information education and communication materials
    1. Posters 4.Screen
    2. Megaphone 5.Projector (Movie)
    3. Flipcharts or Image box 6.Other(specify):_____
20. Hygiene and sanitation materials
    1. Spray pump
    2. Disinfectant
21. List Protection materials _____ _____ _____ _____

VIII. Satisfaction with surveillance system

22. Are you satisfied with the surveillance system?
    1. Yes 2.No 3.Unknown 4.Not
23. If no, how can the surveillance system be improved? _____ _____
24. What opportunities are there for integration of surveillance activities?_____

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Declaration

I, the undersigned, declare that this is my original work and has never been presented by another person in this or any other University and that all the source materials and references used for this thesis have been duly acknowledged.

Name: Habtamu Yimer Nega

Signature: _____

Place: _____

Date of Submission: _____

The thesis has been submitted for examination with my approval as a university advisor.

Name of advisor: _____

Signature: _____

Date: _____

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