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
Etsehiwot Zemelak

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, 2014
Addis Ababa

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Approval by Examining Board

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Examiner

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Table of Contents

Acknowledgments iv
List of Tables vi
List of Figures vi
Executive Summary ix
Chapter I- Outbreak/Epidemic Investigations 1
1.1. Investigation of measles outbreak, Kindo Didaya woreda- SNNPR, Ethiopia, 2013 1
1.2. Yellow fever outbreak investigation in Malle Woreda, Southern Ethiopia, 2013 17
Annex 2: Yellow fever assessment questionnaire, Malle woreda-South Omo zone 25
Chapter II: Surveillance data analysis report 29
The Epidemiology of rubella disease in Ethiopia, 2008-2012 29
Chapter III – Evaluation of surveillance system 40
Evaluation of malaria surveillance system in West Gojam Zone, Amhara Region 40
Chapter VI: Health profile description 54
Efratana Gidem Woreda health profile-Amhara region, 2013 54
Chapter V: Scientific manuscripts for peer reviewed journals 85
5.1. Investigation of measles outbreak in Kindo Didaya district, Southern Ethiopia, October 2013 85
5.2. Yellow fever outbreak in Male district, southern Ethiopia, 2014 91
Chapter VI: Abstract for scientific presentation 96
6.1. The Epidemiology of rubella disease in Ethiopia: 2008-2012 96
Chapter VII. Narrative summary of disaster situation visited 99
Belg health and nutrition needs assessment-Southern Ethiopia, 2013 99
Chapter VIII. Protocol /proposal for epidemiologic research project 120
Knowledge, attitude and practice of notifiable disease surveillance and reporting among health
Chapter IX. Public Health Emergency Public Health Emergency Management Weekly bulletin 139

List of Tables

Table 1: Bivariate analysis for different exposure of measles disease, Kindo Didaya woreda, Wolayeta zone, 2013 7
Table 2: Multivariate analysis of risk factor for Measles, Kindo Didaya Woreda,Wolayeta zone Ethiopia 2013 9
Table 3: Laboratory result for Rubella IgM antibody testing of suspected Measles cases, 2008-2012 34
Table 4: Distribution of Rubella case by age group, 2008-2012 35
Table 5:Efrtana Gidem woreda population by kebele, 2013. 62
Table 6: Immunization coverage of Efrtatana Gidem woreda, 2011-2012. 65
Table 7: Health facility type and number of Efrtatana Gidem woreda, 2013. 66
Table 8: Health professionals to population ratio, Efratana Gidem woreda, 2013. 67
Table 9: Top 10 cause of morbidity in adult, 2012. 67
Table 10: Top 10 cause of morbidity in pediatrics/< 5 years, 2012. 68
Table 11: Tuberculosis result of treatment, Efratana Gidem woreda, 2012. 69
Table 12: Type of risk and population to be affected identified at Zone level, August-December, 2013 103
Table 13:Top five causes of morbidity by age group, 2013 105
Table 14:SC and OTP sites by Zone, From January – May, 2013 108

List of Figures

Figure 1: Measles case reported by date of onset Kindo Didaya woreda, Ethiopia, 2013 6
Figure 2: Measles Attack rate (AR/1000) by Kebeles of Kindo Didaya woreda, Ethiopia, 2013 ..7
Figure 3: Laboratory testing of measles serum specimen 33
Figure 4: The burden of Rubella disease by regions of Ethiopia, 2008-2012 34
Figure 5: Number of rubella positive cases and incidence rate (100,000 populations), 2008-2012 35
Figure 6: Distribution of Rubella cases by month, 2008-2012 36
Figure 7: Flow chart of the surveillance reporting system and feedback of West Gojam zone 46
Figure 8: Population pyramid of Efratana Gidem woreda, 2013. 63
Figure 9: Population pyramid of Efratana Gidem woreda, 2013 63
Figure 10: ANC, Delivery attended by skilled attendants, clean and safe delivery (HEW) and PNC coverage, 2012 65
Figure 11: Trend in immunization coverage from 2011-2013GC up to May. 66

Figure 12: Malaria cases of Efratana Gidem woreda by month and year, 2012/2013.....68
Figure 13: SAM cases reported by woredas, from January-May, 2013.....108

List of Maps

Map 1: Map of Measles affected Woreda, Wolayita zone- SNNP, 2013 4
Map 2: Map of SNNPR, South Omo zone showing Male woreda 2014 20
Map 3: Map of West Gojam zone by woreda, Amhara regional state, Ethiopia, 2013 43
Map 4: Map of Efratana Gidem woreda, West Shoa zone, Amhara regional state, Ethiopia, 2013 58

List of Annexes

Annex 1: Questionnaires for Case - control study on Measles outbreak in Kindo Didaye Woreda-2013.....13
Annex 2: Yellow fever assessment questionnaire, Malle woreda-South Omo zone 25
Annex 3: health profile assessment questionnaire 75
Annex 4: health and nutrition needs assessment questionnaire.....111
Annex 5: Budget beak down 132
Annex 6: Informed consent sheet 135
Annex 7: Questionnaire for assessing Knowledge, Attitude and practice of notifiable disease surveillance.....136

List of Abbreviations

ANC .....Antenatal Care

CRS .....Congenital Rubella Syndrome

EPHI.....Ethiopian Public Health Institute

ELISA.....Enzyme Linked Immuno Sorbent Assay

EDHS .....Ethiopian Demographic and Health Survey

EPI.....Expanded Program of Immunization

EPRP .....Epidemic Preparedness and Response Plan

HEW.....Health Extension Worker

IgM.....Immunoglobulin M

JICA .....Japan International Cooperation Agency

MMR .....Measles, Mumps and Rubella

MOH .....Ministry Of Health

NGO .....Non Governmental Organization

OTP .....Outpatient therapeutic feeding program

PHEM.....Public Health Emergency Management

PNC.....Postnatal Care

RHB.....Regional Health Bureau

RRT .....Rapid Response Team

SNNPR.....Southern Nation and Nationalities People Region

SAM .....Severe Acute Malnutrition

SIA .....Supplemental Immunization Activity

WoHO .....Woreda Health Office

WHO .....World Health Organization

ZHD.....Zonal Health Department

Executive Summary

The Ethiopian Field Epidemiology Training Program is a two year post graduate training program. The training is provided in collaboration with Addis Ababa University, School of Public Health, Ministry of Health and Ethiopian Public Health Association. The program designed to work 75% of the time in service and 25% theory, it is learning by doing. For the partial fulfillment of master's in public health in field epidemiology, this summary compiled two year residency outputs; surveillance data analysis, surveillance system evaluation, health profile, outbreak investigation, manuscript and disaster report.

The document is organized in nine chapters; chapter one deals about outbreak investigation. During the residency period it has been conducted two outbreak investigation; one was measles outbreak investigation which was conducted in Kindo Didaya woreda of Wolayeta zone, SNNP region. On this investigation we conducted a case control study. The second outbreak investigation was a case study conducted in Yellow fever disease in SNNP region, South Omo zone of Malle woreda.

Chapter two explains about surveillance data analysis which was conducted nationally on rubella disease. The analysis was made from the year 2008-2012 and it address the burden of rubella disease in the country by place, person and time moreover trends and seasonality of the disease was discussed on the chapter .Similarly chapter three is about malaria surveillance system evaluation conducted in West Gojam zone, Amhara region. In this chapter purpose and objective of surveillance system, progress towards the objective and also attributes of the surveillance system was discussed.

Chapter four is about health profile of Efratana Gidem woreda, North Shewa zone, Amhara region. In this chapter health and health related data of the woreda presented. Chapter five is manuscript on measles and yellow fever outbreak investigation. Abstract on surveillance data analysis of rubella disease was presented on chapter six. The abstract was presented on 5th AFENET conference and it was selected as best oral poster presentation. The second abstract was on measles outbreak investigation.

Chapter seven presents narrative summary of disaster situation which was conducted in SNNP region; as part of early warning and vulnerability assessment. It was done together with partners

working on health and nutrition. The assessment was conducted to identify potential problems which need humanitarian assistance in the Belg season. Based on the report from the assessment regional humanitarian requirement document was developed and shared with potential partners for response.

Project proposal entitled knowledge, attitude and practice of notifiable disease surveillance and reporting presented on chapter eight. The proposal intended to do descriptive cross-sectional study in Afar regional state. Finally Public Health Emergency weekly bulletin prepared. The bulletin is prepared on weekly basis and in this chapter week twenty three bulletins presented.

Chapter I- Outbreak/Epidemic Investigations

1.1. Investigation of measles outbreak, Kindo Didaya woreda- SNNPR, Ethiopia, 2013

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Abstract

Introduction: Measles is a highly contagious disease and remains the leading cause of childhood morbidity and mortality in the world. In Ethiopia measles accounts four percent of childhood mortality. On October 2, 2013, a suspected outbreak of measles was reported in Kindo Didaya woreda, SNNP region. We investigated to identify risk factors and to institute prevention and control measures.

Methods: A 1:2 unmatched case control study was conducted, with 50 cases and 100 controls. A measles case was defined as illness characterized by fever, rash, and either cough, coryza or conjunctivitis. Controls were individuals who had no clinical signs of measles and were randomly selected from the same communities where cases were identified. Blood samples were collected for laboratory investigation.

Result: The mean age for cases was 8.4 (SD +/- 7.4) years while for controls were 8.6 (+/- 6.7) years old. A total of eight deaths with case fatality rate of 1.4% were attributed to this outbreak. All the collected five samples were measles IgM positive. Not being vaccinated (OR=6.62; CI: 2.29-19.10), having contact with suspected or confirmed cases (OR=12.6; CI: 3.52-39.62) and mothers illiteracy (OR=4.75; CI: 1.51-12.38) was associated with contracting measles.

Conclusion: There was an outbreak of measles in Kindo Didaya woreda. Being un-vaccinated, having contact with suspected or confirmed case and mother‘s illiteracy were associated with contracting measles. Vaccination of children‘s aged six months- 14 years; case management and public health education were instituted as a prevention and control measure.

Keywords: Measles outbreak, kindo Didaya, Southern Ethiopia

Introduction

Measles is a highly contagious respiratory viral disease that is characterized by fever, maculopapular rash, cough, conjunctivitis and runny nose. The incubation period range from 10 to 12 days. Measles is spread through contact with nose and throat secretions of infected people and through airborne droplets released when an infected person sneezes or coughs. A person infected with measles is contagious from four days before to four days after the rash appears (1).

Measles remains the leading cause of childhood morbidity and mortality in the world despite the availability of safe, effective and relatively cost effective vaccine (2).Globally an estimated 122,000 death occurred in 2012. In Ethiopia a total of 16,410 cases were reported in 2013.

Immunization is one of the indicators used to monitor progress towards the achievement of MDG4 and the reduction of childhood mortality. Routine measles vaccination for children combined with mass immunization campaigns in countries with high case and death rates are key public health strategies to reduce measles deaths (2). In Ethiopia measles is one of the vaccine preventable disease causing preventable morbidity and mortality in children. It accounts four percent of childhood mortality in Ethiopia (3).

Ethiopia is adopting strategies to control and ultimately to eliminate measles by 2020. The country is implementing routine immunization of children aged 9 to 11 months, case based measles surveillance and improving case management through the provision of vitamin A (1).

Outbreaks of measles were reported in Kindo Didaya Woreda of Wolayita Zone in October 2, 2013. To investigate the extent of outbreak and to identify possible risk factors responsible for the occurrence of the outbreak and to institute preventive and control measures a team from EPHI and SNNP RHB was organized and deployed to the area.

Objectives

General objective

To investigate the occurrence of the outbreak and control the outbreak and recommend corrective measures for preventing similar outbreak in the future

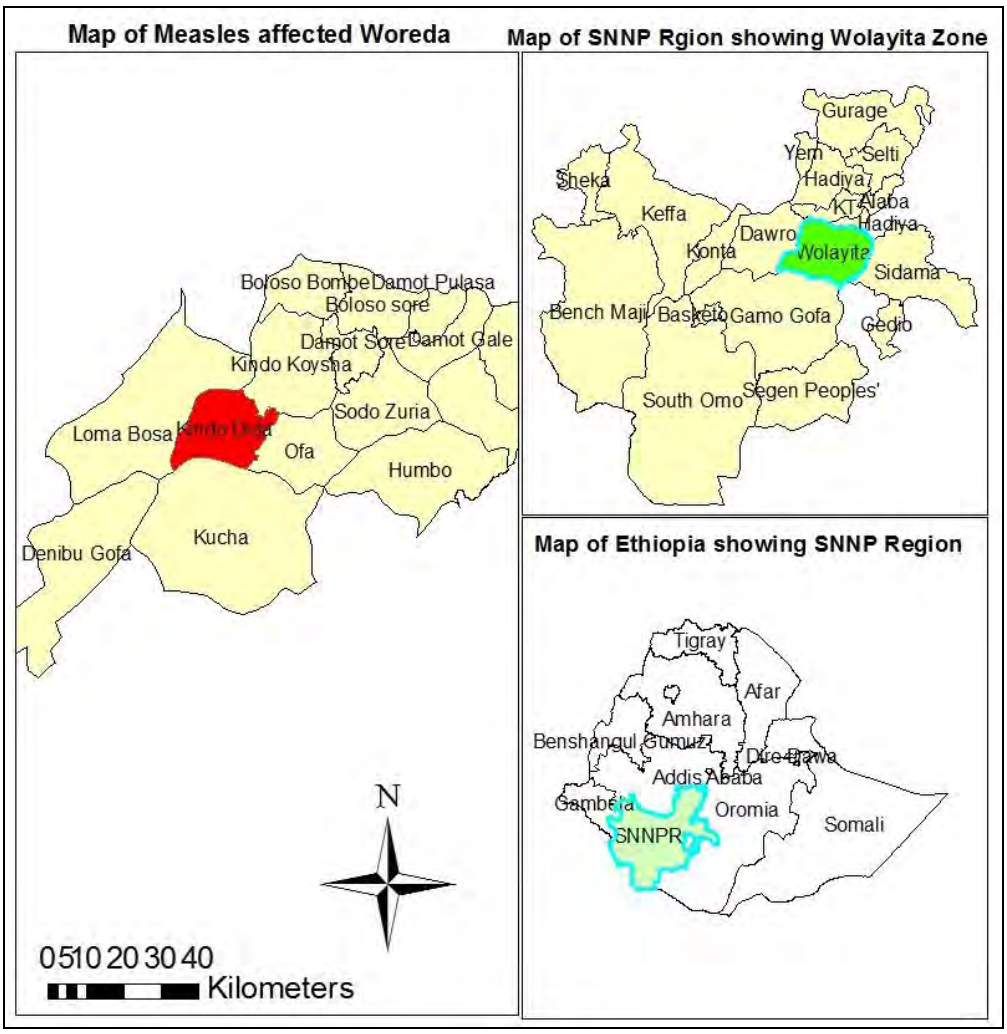
Specific objectives

- To describe the magnitude of the outbreak
- To identify possible risk factors for measles infection
- To undertake prevention and control measures and recommend corrective actions for preventing further epidemics in the area

Materials and methods

study area and study period

Kindo Didaya is one of the Woreda found in Wolayeta Zone. It has a total population of 111,675 of which 54,792 are male and 56,883 are females. The woreda has 21 Kebeles and four health centers and 20 health posts. The woreda is 360 Km far from Addis Ababa (Figure 1). The study was conducted from 10/9/2013 – 10/24/2013.



Map 1: Map of Measles affected Woreda, Wolayita zone- SNNP, 2013

Study design

We conducted a descriptive study followed by unmatched case control study to investigate the outbreak

Sampling

Standard PHEM case definitions were used to detect measles case. Suspected measles case was defined as any person with fever, maculo-papular generalized rash and cough, coryza (runny nose) or conjunctivitis.

A confirmed case was defined as: suspected case with laboratory confirmation (positive IgM antibody).

All cases that fulfilled this case definition were included in the study. Controls were a person without the history of measles and from the same area were cases enrolled.

Data collection method

A structured questionnaire was used to interview the patients and controls. Information was collected regarding age, gender, previous history of measles infection, having contact with suspected or confirmed measles case, immunization status against measles before the illness.

Interview of key informants (HCs medical directors, health care givers and Woreda, Zone and Regional health authorities) were also conducted and availability of refrigerator, vaccine carrier, ice pack and cold chain management were observed.

Data analysis and clearance

The data collected entered into Epi-Info (version7) software and checked for completeness and consistency. The entered data was analyzed by Epi-info (version7) software. Descriptive statistics were used to determine the frequency of different variables. Bivariate and logistic regression analysis was applied for analysis. Results were displayed using tables and graphs and it was interpreted using Odd ratio, P value <0.05 and 95% confidence interval.

Ethical issues

Ethical clearance was obtained from Ethiopian Public Health Institute (EPHI). A letter was written for woreda health offices in order to obtain approval on data collection. Informed verbal consent was obtained from all study participants before conducting interview by explaining the purpose of the study. Privacy and confidentiality was ensured. The name of respondents was not written on the questionnaire, therefore, the information study participants provide was not known to others. The participation of individuals in this study was purely voluntary.

Result

Descriptive

A total of 591 cases and eight deaths with CFR 1.4% were registered from September 13 – November 07/2013. The overall attack rate for the woreda was 5.0 per 1000 population. The attack rate is higher (10.5/1000) among 5-14 years of age groups compared to the other age groups 0-4 years (2.3/1000), 15-24 years (2.0/1000) and 25-59(0.4/1000). Male and female are almost similarly affected by the outbreak (4.9/1000 female and 5.1/1000 male).

The first index case was reported to the woreda on September 13,2013 and subsequently additional cases were being reported September 18, 2013 and progressive cases are increased until it dropped to zero starting from November 4, 2013 (see figure 1).

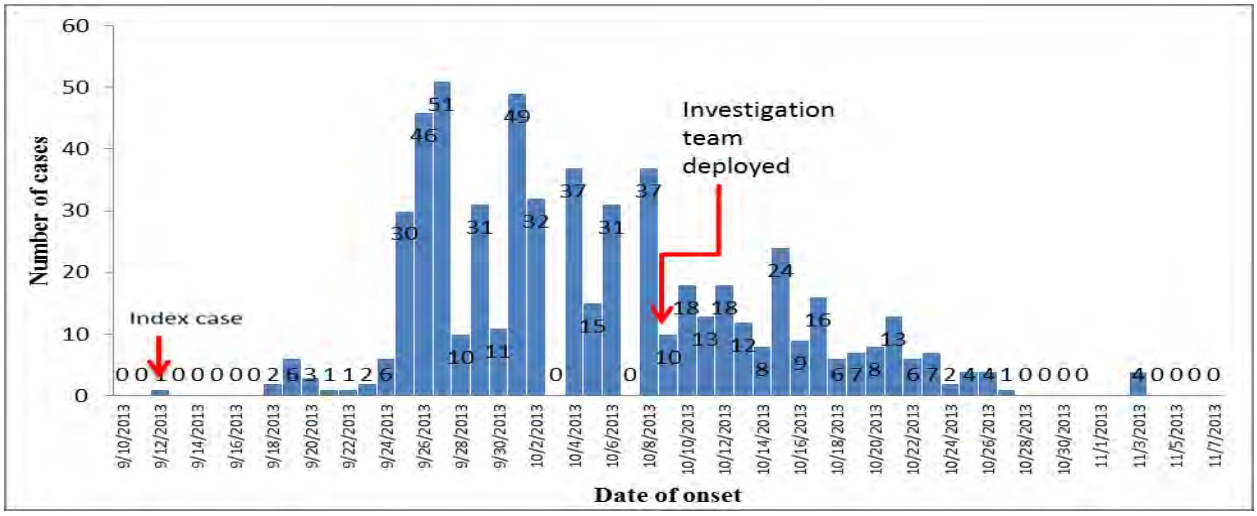


Figure 1: Measles case reported by date of onset Kindo Didaya woreda, Ethiopia, 2013.

Kindo Didaya woreda has 21 kebeles of this 20 kebeles were affected by the outbreak. The most affected kebeles were Wamura 01(AR= 39.7/1000) followed by Halale 01, Mogisa and Patata (AR=26.4/1000, 18.7/1000,12.7/1000 respectively) (see figure 2).

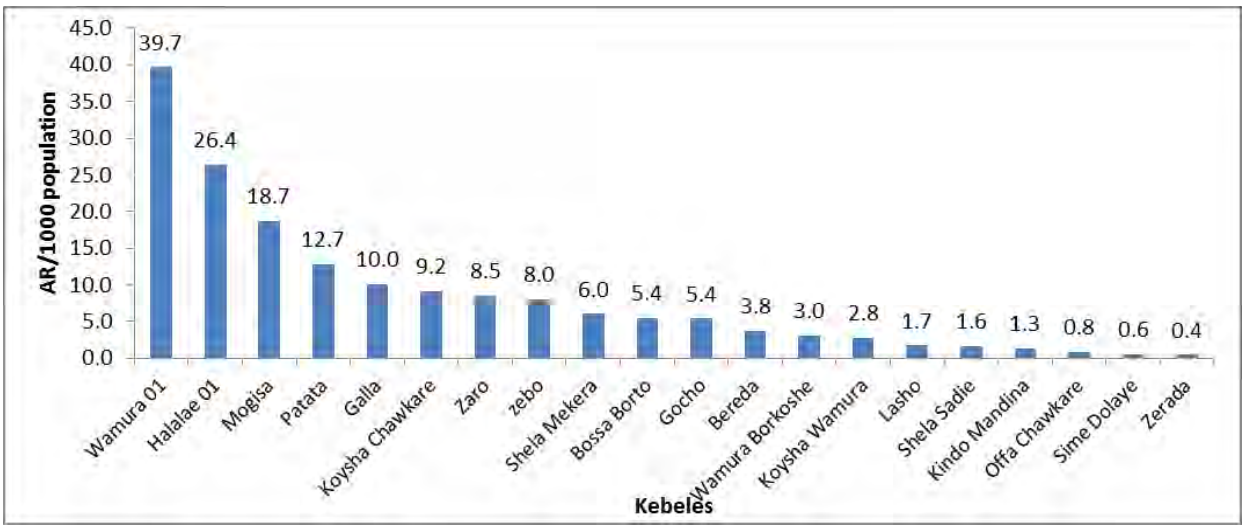


Figure 2: Measles Attack rate (AR/1000) by Kebeles of Kindo Didaya woreda, Ethiopia, 2013

Cases had history of fever 591(100%), rash 591(100%), cough 536 (90.7%) and conjunctivitis 51 (8.6%). Blood specimens were collected from five cases and sent to EPHI/National Polio and measles laboratory for measles antibody detection and the entire collected specimen were positive for measles specific antibody (IgM).

The team observed the cold chain management system and vaccine carrier availability. In all health centers there is available functional refrigerator. However power interruption is very common in the woreda therefore the refrigerators are supplied by kerosene and solar energy but the solar energy does not work when the weather is cold or rainy. In addition, kerosene is not consistently available in all health centers. But particularly in one health center neither solar energy nor kerosene was available to maintain the cold chain system. All the assessed health facilities have enough vaccine carriers and ice packs.

Analytical investigation

We recruited 50 cases and 100 controls (1:2). The mean age for cases were 8.4(SD +/- 7.4) years while for controls were 8.6(+/- 6.7) years. On bivariate analysis 5 variables: being un-vaccinated (OR=4.9; CI 2.32-10.48, P value 0.000032), having sick person in the family (OR=4.7; CI 2.2-10.1, P value 0.000032), having contact with suspected or confirmed case (OR=12.2; CI 4.7-31.6, P value 0.00000), mothers illiteracy (OR=4.7; CI 2.21 -10.18, P value 0.00000) and being unemployed family (OR=10.6; CI 3.44 – 10.18, P value 0.000) was statically associated, however knowledge about mode of transmission of measles, knowledge about measles is a

vaccine preventable disease, Presence of previous history of measles was not statistically associated for contracting measles (Table 1).

Table 1: Bivariate analysis for different exposure of measles disease, Kindo Didaya woreda, Wolayeta zone, 2013

Exposure		Case (%)	Control (%)	OR(95% CI,)	P-Value
Being unvaccinated	No	26(50.9)	18 (40.9)	4.9 (2.32-10.48)	0.00
	Yes	24(22.6)	82 (77.4)		
Sick person in the family	Yes	14 (60.8)	9 (39.3)	4.0 (1.61-10.18)	0.00
	No	35 (27.8)	91 (72.2)		
Having contact with suspected or confirmed case	Yes	24 (77.4)	7 (25.5)	12.3 (4.75-31.63)	0.00
	No	26 (25.6)	93 (78.1)		
Occupation	Yes	48 (92.3)	4 (7.8)	10.6 (3.44-43.04)	0.00
	No	52 (53.0)	46 (49.9)		
Mothers illiteracy	Yes	38 (48.7)	40 (51.3)	4.7 (2.22-10.18)	0.00
	No	12 (16.7)	60 (83.3)		
Knowledge about mode of transmission of measles	Yes	29 (39.2)	45 (60.8)	1.6 (0.83-3.29)	0.20
	No	21 (28.0)	54 (72.0)		
Knowledge about measles is a vaccine preventable disease	Yes	42 (34.1)	81 (65.8)	1.2 (0.49-3.04)	0.82
	No	8 (29.6)	19 (70.3)		
Presence of previous history of measles	Yes	5 (50.0)	5 (50.0)	2.1 (0.58-7.66)	0.41
	No	45 (32.1)	95 (67.8)		

For the multivariate logistic regression analysis, the risk factors that are statistically significantly associated with the illness were Vaccination status, contact with suspected or confirmed cases and Educational status (Table 2).

Table 2: Multivariate analysis of risk factor for Measles, Kindo Didaya Woreda,Wolayeta zone Ethiopia 2013

Exposure	COR	AOR*	P-Value
Being unvaccinated	4.93 (CI:2.32-10.48)	6.618 (CI: 2.29-19.10)	0.00005
Having contact with suspected or confirmed case	12.26 (CI:4.75-31.63)	11.81 (CI: 3.52-39.62)	0.0001
Mothers illiteracy	4.75 (CI:2.21-10.18)	4.33 (CI:1.51-12.38)	0.00063

* Adjustment was made for socio-demographic variables

Response

- Cases were managed with appropriate medication
- Vaccination campaigns were conducted in all kebeles and (98,599) 98 % of targeted children between the age of 6 month- 14 years were vaccinated
- Surveillance: Active case search, contact tracing and line listing of cases were done. Daily reporting of cases was done across the surveillance structure from Health facility up to the national system with the proper format.
- Coordination: Woreda RRTs were reactivated and active case search, daily situation monitoring, assessing risk factors and case management were strengthened

Discussion

Among the total cases 24% were not vaccinated against measles. However, in the woreda the administrative measles coverage in 2012 was 105.2%. Coverage is calculated by percent and if the bordering area of the woreda is accurately demarcated and the number of eligible population is well estimated or if there is no influx of new population to the community it could not be above 100%.The woreda vaccination coverage shows the presence problem in estimating eligible population and this could result false vaccination coverage performance and assists for the accumulation of unvaccinated children in the woreda.

In addition, among all vaccinated children at nine month old only 85% will be protected by the immunization the rest 15% will be susceptible due to the vaccine potency; as a result from 3618 vaccinated children‘s on the year 2013 E.C, 541 were susceptible for the disease. Hence by including all susceptible cases and unvaccinated children 19% of the eligible population is susceptible for measles therefore the transmission of cases are expected.

Our study revealed that children whose mothers have no education are four times more likely to develop illness than those born to literate mother and we got similar finding with case control study conducted in India which showed that children whose mother have no education are more likely to develop illness than those born to educated mother (4). A similar finding had been seen in study conducted in Arisi Zone showed mothers illiteracy were eight times more likely to develop illness (5). Also EDHS 2011 survey indicates children whose mothers have secondary education are more likely to be fully immunized than those born to mothers with no education (6).

Measles is a highly contagious disease transmitted by respiratory droplet or air born spread. Secondary attack rate among susceptible household contact reach 75% - 90%. Our study also showed having contact with suspected or confirmed measles case were risk factor for contracting measles. Our findings were similar with another case control study conducted in Cameroon which revealed that people having contact with suspected measles cases were seven times more likely to contract measles than those who do not have contact (7).

This investigation has limitations: information on vaccination status and mothers illiteracy is obtained by asking mothers and their care givers as well as from adult patients and controls therefore recall bias could have occurred.

Conclusion

An outbreak of measles occurred in Kindo Didaya Woreda affecting 20 Kebeles of the woreda. . Being un-vaccinated, having contact with suspected or confirmed case and mother‘s illiteracy were associated with contracting measles. Vaccination of children‘s aged 6 month- 14 years; case management and public health education were instituted as a prevention and control measure.

Recommendation

- Number of eligible children for vaccination should be estimated appropriately
- Power interruption is very common. As a result cold chain system appeared to be incapable of storing vaccine at appropriate temperature. Therefore kerosene should be available in all health facilities.
- Routine measles immunization should be strengthened

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Annex 1: Questionnaires for Case - control study on Measles outbreak in Kindo Didaye Woreda-2013

Case status = Case _____Control_____

Patient Name_____ date of Data collection_____

Region_____ Zone_____ Woreda_____ Kebele _____ Got _____ Phone_____

Location: Longitude:_____ Latitude:_____

I. Socio-demographic Characteristics

S. No	Questions	Alternatives
1.1	Sex	1.Male 2.Female
1.2	Age	years_____ Months_____
1.3	Occupation	1. Farmer 2. House wife 3. Student 4. Unemployed 5. Daily laborer 6. Merchant 7. Gov't 8. Other (specify)_____
1.4	Educational level of mother or care giver	1. Illiterate 2. Read and write 3. Elementary 4. Secondary 5. Above secondary
1.5	Marital status	1. Single 2. Married 3. Divorced 4. Widowed 5. Separated
1.6	Family size	_____
1.7	Is there any sick person with rash, fever, running nose/conductivities (illness)?	1. Yes 2. No
1.8	If yes, number of sick person	_____

II. Clinical History of Diseases

2.1	What was the symptom?	1.fever 2.Rash 3.cough, 4.coryza (runny nose), 5. conjunctivitis (red eyes) 6.Diarrhea 7.Ear discharge 8. pneumonia 9.Blidness 10. Laringo tracheal infection 11.Vomitting Others_____
2.2	Date of rash on set	__/__/____
2.3	Date seen at health facility	__/__/_____
2.4	Did you (he/she) take treatment?	1.Yes 2.No
2.5	If yes, treatment taken	1.ORS 2.Antibiotics 3.Vitamin A 4.Supplementary food 5. TTC ointment 6.Anti pyretics 7.Others given_____
2.6	Did you recovered after the treatment?	1.cure 2. partially 3. deteriorated/disabled 4.death

III. Risk factor and Knowledge question

3.1	Did you ever vaccinated for measles?	1.Yes 2.No 3.Unknow 4.Not applicable
	If yes last vaccination date	1.patient recall_____ dd/mm/yy 2. vaccination card_____ dd/mm/yy
3.2	Number of vaccine doses received	1.one dose 2. two dose 3.three and above
3.3	Did you have any travel history 7-18 days to areas with active measles cases before onset of symptoms?	1.Yes 2.No If Yes where _____
3.4	Do you have any travel history four days before and after rash onset	1.Yes 2. No If yes where _____
3.5	Do you have any contact history with someone else four days before and after rash onset	1.yes 2.No If yes with whom_____
3.6	If Yes to question 3.5 place of travel	1.School 2.Neighbor 3.Market 4.Other_____
3.7	Do you know modes of transmission for measles?	1.Yes 2.No 3. If yes specify_____
3.8	Did you ever have measles infection?	1.Yes 2.No 3. Don‘t know

3.9	Nutritional status of the cases	1.Normal 2.Moderate 3.Severely malnourished
3.10	How many people are living together in one house with you:	_____
3.11	What is the estimated area of the house?	_____
3.12	Where did you go first when you get ill?	1. Health Facility 2. Traditional Healers 3. Holy Water 4. Stayed at home 5. Other :(Specify)_____
3.13	How do you think people get measles?	1. Contact with a virus from ill person 2. From God 3. Bad attitude of other people 4. Other(Specify)
3.14	Do you Know measles is vaccine preventable?	1. Yes 2. No 3. Don‘t Know
3.15	Who do you think can be affected by measles?	1. Children of aged less than 5 years 2. Children of aged less than 18 years 3. Women of any ages 4. Any age groups of both male and women 5. Other (specify):_____
3.16	How do you think measles can be cured?	1. Using modern medicine 2. Using traditional Medicine 3. Holy water 4. By feeding nutritious foods 5. Keeping the sick person indoor 6. Other(Specify)_____

1.2. Yellow fever outbreak investigation in Malle Woreda, Southern Ethiopia, 2013

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Abstract

Introduction: Yellow fever is an acute viral hemorrhagic disease caused by yellow fever virus. Infection causes a wide spectrum of disease, from mild symptoms to severe illness and death. The disease is untreatable and death rates in severe cases can exceed 50%. Ethiopia is one of the east African countries endemic to the disease though no cases/outbreaks were reported for the last 48 years. In January 15, 2014 outbreak of yellow fever was reported from Malle district. Team deployed to the area to investigate the outbreak and to recommend possible prevention and control measures.

Methods: A case study was conducted along with surveillance reports and medical records review was executed. A yellow fever suspected case was defined as person with acute onset of fever followed by jaundice within two weeks of onset of first symptoms. Blood specimens were collected for laboratory investigation.

Result: A total of three cases with two deaths (CFR 66.6%) were reported. Cases were occurred in two kebeles; Damiker and Gongode. All the reported cases were male farmers working in one area called Erepo. The area is around the pond and the farmers spent the day and night around for farming. Serum specimen was collected from two cases and had positive ELISA test for yellow fever, confirmed by RT PCR at WHO Dakar reference laboratory. Among the cases two were unvaccinated and vaccination history was unknown for one case.

Conclusion: A yellow fever outbreak was occurred in Malle district. All cases were male farmers working in the same farming area. We recommend strengthening surveillance, implementing vaccination of previously unvaccinated population and health education to the community and sensitize health workers to consider yellow fever in their differential diagnosis.

Key word: Yellow fever, outbreak investigation, Malle district, Ethiopia.

Introduction

Yellow fever is an acute viral hemorrhagic disease caused by yellow fever virus, in the genus Flavivirus of the family Flaviviridae (1). The disease is transmitted by mosquitoes and mainly affects humans and monkeys. Infection causes a wide spectrum of disease, from mild symptoms to severe illness and death. The disease is untreatable and death rates in severe cases can exceed 50% (2).

Yellow fever virus is transmitted in three epidemiological cycles; in the sylvatic "jungle" cycle, monkeys act as host and A. Africans and other Aedes species as the vector. In the savanna (intermediate) cycle, only in Africa, monkeys and humans act as hosts with Aedes species as the vector. Finally, in "urban" cycle Aedes aegyptiis is the vector only for human hosts (3).

Effective vaccines against yellow fever have been available for almost 60 years and are responsible for a significant reduction of occurrences of the disease worldwide. However, the virus is still endemic to tropical areas of Africa and South America (4). Worldwide an estimated 200,000 cases of yellow fever and 30,000 deaths occurred annually; 90% of the deaths occurred in Africa. However, yellow fever morbidity and mortality is under estimated because of that number of cases expected to be 10 to 250 times greater than the current estimate (1).

Worldwide there are forty-four endemic countries for yellow fever virus, all are located in Africa and Latin America; over 900 million people are at risk. In Africa, an estimated 508 million people live in 31 countries at risk. The remaining populations at risk are in 13 countries in Latin America. Ethiopia is one of the east African countries that are Endemic to the disease (1).

In Ethiopia, the largest outbreak of yellow fever with an estimated 100,000 cases occurred from the year 1960-1962. Studies also showed reappearance of the outbreak in 1966 in Arba Minch, east of Lake Abaya, in an area not affected by the outbreak of 1960 (5). Then after 48 years the country reported an outbreak in May 2013 in South Omo Zone, SNNP region, which caused 141 cases and 41 deaths. Additional new outbreak of yellow fever was reported on January 2014, in Malle District which was not affected by the May 2013 outbreak. A team comprised from Ethiopian Public Health Institute, Public Health Emergency Management Center (PHEM) and

zonal PHEM offices deployed to the affected district to investigate the outbreak and to recommend possible prevention and control measures.

Objectives

General objective

To describe the magnitude, identify etiological agent and recommend possible prevention and control measures

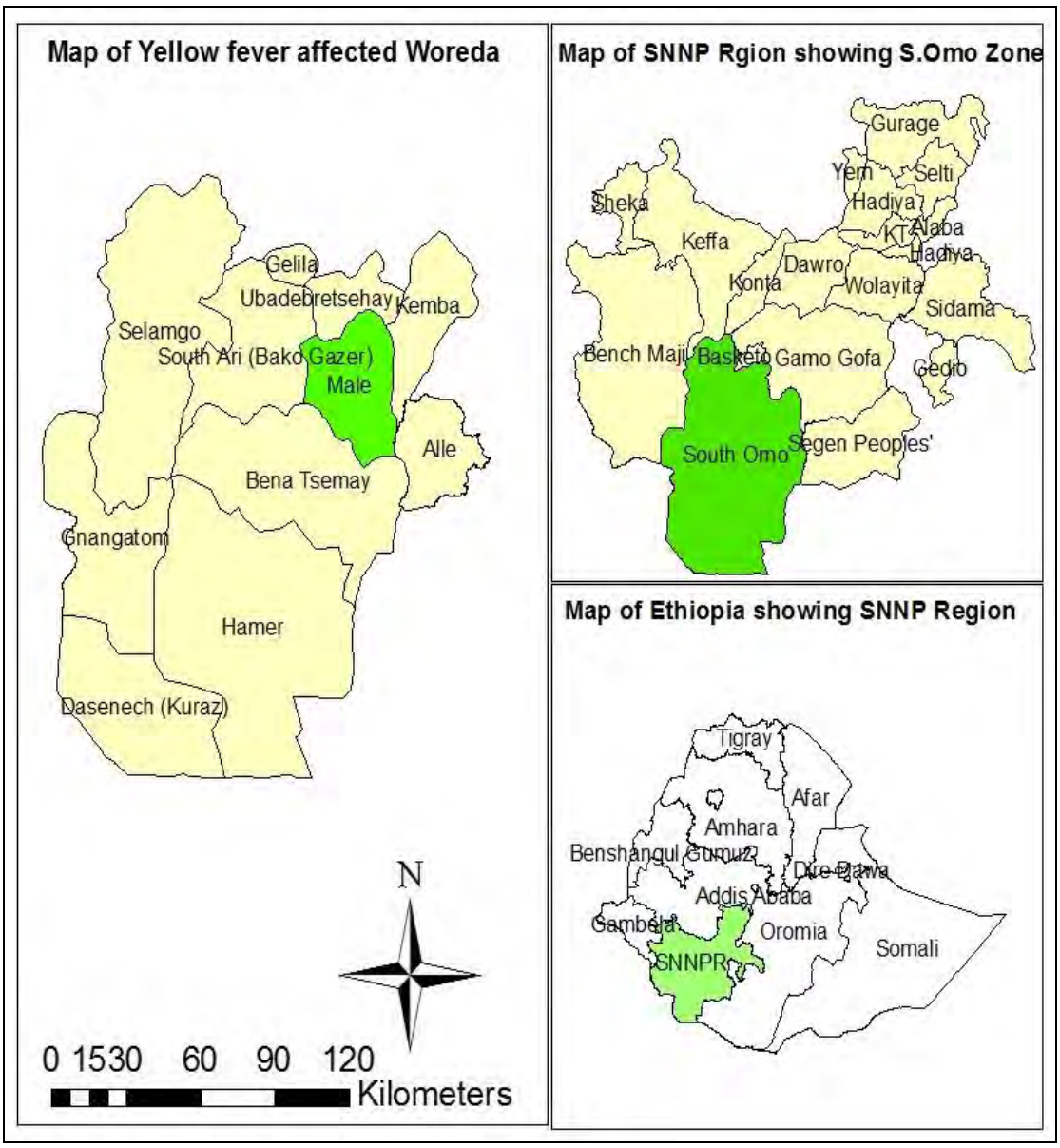
Specific objectives

- To describe the extent and magnitude of the outbreak
- To identify the etiological agent of the outbreak
- To recommend possible prevention and control measures

Materials and methods

Study area and period

Malle District is one of the nine districts of the South Omo Zone of Southern Nation and Nationalities People Region. The district is further divided in to 24 kebeles. Total population of the district is 102,914; of this 52,074 are males and 50,840 are females. The study was conducted from January 16 -30, 2014.



Map 2: Map of SNNPR, South Omo zone showing Male woreda 2014

Data collection method

We conducted case study and reviewed surveillance reports and medical records were reviewed. Yellow fever cases were identified by using PHEM case definition. Suspected cases were defined as any person with fever, bleeding from gum or skin, jaundice within two weeks of onset of first symptoms or any person with fever and jaundice. Hemorrhagic manifestations and renal failure may occur. Immunization coverage and other health related data were collected from Woreda offices and zonal health department. A structured questionnaire was used to interview

the patients. Information was collected regarding age, gender, history of vaccination before illness, travel history, availability of breeding site at home

Laboratory investigation

Blood specimens were collected from two patients who met the working case definition of yellow fever and tested at WHO Dakar reference laboratory.

Data analysis

Data were entered in Excel and descriptive analysis was done by time, person and place. Case fatality rate (CFR), percentage was calculated.

Result

A total of three yellow fever cases were reported of which two resulted death (CFR=66.6%). The outbreak occurred in two different Kebeles; Gongode (two cases) and Damiker (one case). The woreda population was vaccinated in May 2013 due to the occurrence of outbreak in neighboring woreda and the coverage was 85%. Serum specimens were collected from two cases had positive ELISA test for yellow fever, confirmed by RT PCR at WHO Dakar reference laboratory.

First case

The first case was reported from Gongode Kebele on December 28, 2013. The case was 37 years old male; married and with 15 children. The patient was a farmer, and his farming land was far from his home, in an area called –Erepo". He spent both days and night in the farming area. The area has pond and it share a border with Benatsemay woreda where in May 2013, a yellow fever outbreak had been reported.

The patient experienced fever, headache, muscle joint pain on 21/12/2013 and he went to Damiker Health Post 24/12/2013. The clinicians diagnosed him as Acute Febrile Illness (AFI) and treated him with Doxcycycline, Diclofenac, Chloraphinicol (CAF) and Chloroquine drugs. However, the treatment did not cure him. Rather, he developed abdominal pain and had blood in both his vomit and urine, jaundice and kidney failure. As a result he was referred to Jinka Hospital and was admitted 28/12/2013.When admitted, he was diagnosed with upper GI bleeding and received treatment with cimetidine, plasil and mebendazole drugs. The physician suspected

yellow fever and a blood specimen was collected and sent to EPHI's virology laboratory. It was positive for yellow fever virus. The patient was unvaccinated during vaccination campaign on May 2013 due to unknown reason. Finally he died 31/12/2013 at the hospital.

Case 2 and 3

The second case was a 30 year old male from Damiker Kebele. He is farmer and his farming area is similar with the first case. He spent most of the day and night in the farming area.

The patient developed vomiting with blood, diarrhea, jaundice, chest pain and epigastria pain for three days, the date of onset of the illness was 31/12/2013. He went to Damiker Health Post on 2/1/2014. The clinicians diagnosed him with acute febrile illness (AFI) and a peptic ulcer disease (PUD) and treated him with Glucose 40%, Cotrimoxazole, Gentamicin, Mebendazole and Diclofenac drugs. However, the patent could not be cured and he was not referred to next health center and he died 3/1/2014 at home. The patient vaccination history was unknown and blood specimens were not collected.

The third case is a 20 year old male coming from same kebele as the second case (Damiker). He is farmer and his farming area is similar with the first case (Erepo).

He experienced fever, headache, muscle and joint pain, epigastria pain, anorexia, vomiting, reduced amount of urine and diarrhea, on 7/1/2014, then he went to Damiker health post on 9/1/2014 and was diagnosed as AFI and received treatment with Doxycycline, Diclofenac, Chloramphenicol (CAF) and Chloroquine drugs. Because the patient illness becoming severe he referred to Jinka Hospital while admitted at the hospital, the patient develop bleeding from nose. Upon admission he was diagnosed as upper GI bleeding and recivied treatment with Cimetidine, plasil and mebendazole drugs. Blood specimen were also collected and tested at EPHI virology laboratory and it was positive for yellow fever. The patient was unvaccinated previous to the illness. Eventually, the patient was cured and discharged.

Public health response

Following the confirmation of this outbreak, the woreda health office in collaboration with zonal health department sensitized the health workers working in the area about the occurrence of the outbreak remind them to include yellow fever on their differential diagnosis. An active case

search was conducted to identify additional cases; however no new cases were obtained. Cases were managed at health facilities.

The woreda conducted a vaccination campaign on May 2013 after the occurrence of outbreak in other neighboring woredas. The woreda that was targeted for vaccination has a population of 94,542 people; and they vaccinated 80,352 (84.99%). Since 15% of the targeted population is not vaccinated, a follow-up campaign is planned.

Discussion

The cases were reported from two kebeles; Damiker and Gongode. However, both cases share the same environment during farming. Their farming area is called –Erepo", which is near a pond. Yellow fever mosquitoes are container-inhabiting mosquitoes; often breeding in unused flowerpots, spare tires, untreated swimming pools, and drainage ditches. Aedesaegypti are extremely common in areas lacking piped water systems, and depend greatly on stored water for breeding sites (6). The availability of the pond in their farming area facilitates the breeding of mosquito; the cases spend the day also the night at their farming area. Therefore farmers working in the area are more exposed to mosquito bites. In addition, during the May 2013 outbreak, the index case was farmer working in similar farming area where there was yellow fever death around the pond area.

The peak biting times for many mosquito species is dusk to dawn. However, Aedesaegypti, one of the mosquitoes that transmits yellow fever virus, feeds during the daytime (6). The Malle Woreda weather condition is warm and the population wears short sleeves. Therefore, they are often exposed to mosquito bites.

Yellow fever can be prevented through immunization with the 17D yellow fever vaccine. A single dose provides protection against the disease for at least 10 years and possibly life-long (1). From the reported cases two of them (one case and one death) were unvaccinated and one death had unknown vaccination status.

The yellow fever infection has an incubation period of three to six days (2). Early symptom includes myalgia, pyrexia, headache, anorexia, nausea, and vomiting. In many patients there will

be an improvement in symptoms and they will gradual recovery three to four days after the onset of symptoms. As a result there is a possibility that the patient can be cured at home without visiting health facility and this contributes to the disease being under reported. In addition, the disease is difficult to diagnose during early stages because it can be confused with severe malaria, dengue fever, leptospirosis, viral hepatitis, especially the fulminating form of hepatitis B and D and other hemorrogic diseases fevers (Bolivian, Argentine, Venezuelan hemorrhagic fevers and others flavivirus as West Nile, Zika virus etc) (3). Therefore it is difficult for peripheral health workers to recognize the disease.

Conclusion and recommendation

Yellow fever outbreak with a case fatality ratio of (66%) occurred in Malle woreda. The outbreak occurred in two kebeles; Gongode and Damiker. All of the cases were male farmers farming in one area, Erepo, and they were unvaccinated. We recommend strengthening surveillance, implementing vaccination of previously unvaccinated population and health education to the community and sensitize health workers to consider yellow fever in their differential diagnosis.

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Annex 2: Yellow fever assessment questionnaire, Malle woreda-South Omo zone

Name of Interviewer:_____

Date of Interview:_____

Part one: Socio Demography

1.1. Name_____
1.2. Age _____
1.3. Sex _____
1.4. Family size_____
1.5. Woreda _____
1.6. Kebele _____
1.7. Village_____
1.8. GPS coordinates of home: Lat: _____Long_____
1.9. Mobile number_____
1.10. Occupation

A. Farmer
B. House wife
C. Government Employee
D. Private Employee
E. Merchant
F. Student
G. Daily Laborer
H. Other(specify)_____
_____

1.11. Marital Status

A. Single
B. Married
C. Divorced
D. Widowed
E. Not applicable

1.12. Religion

A. orthodox B Muslim C protestant D other

1.13. Level of Education

A. Illiterate
B. Elementary or completed elementary school
C. Secondary or completed Secondary School
D. College and above or Completed

Part two: Knowledge about Yellow Fever

2.1. Have you heard about the disease yellow fever? Yes ___No___ If yes go to the next question

2.2. Where did you heard about it?

A. Friends
B. Family
C. Health extension workers
D. Other Health workers
E. Mass media/radio/TV/Internet
F. Printed materials
G. Others (specify)_____

2.3. What is the way of transmission?

A. By contacting sick person for yellow fever
B. Bite of mosquito
C. Natural or God punishment
D. Others(specify)_____

2.4. What are the

preventions of yellow fever?

A. Using ITN
B. Vaccination
C. Others(specify)

2.5. What are the signs of yellow fever?

A. Fever
B. bleeding from the gums, nose, eyes, and/or stomach
C. Jaundice
D. Others (specify)

2.6. What measure do you take or advice you family or friends if you/your family/friends get sick /shows sign of yellow fever?

A. Go to health facility for treatment
B. Go to traditional healers for treatment
C. Go to holly water/religious places for treatment
D. Others(specify)

Part three: Clinical signs and symptoms

3.1. Date of onset of symptom: _____

3.2. Date of seen at health facility: _____

3.3. Date of admission to the health facility: _____

3.4. Name of health facility admitted to: _____

3.5. Signs and symptoms:

A. Fever: Yes ___No___ Date of Onset of fever_____
B. Chills: Yes ___No___
C. headache: Yes ___No___
D. Anorexia: Yes ___No___
E. Nausea: Yes ___No___
F. Vomiting: Yes ___No___
G. Jaundice: Yes ___No___ Date of Onset of jaundice_____
H. Diarrhea: Yes ___No___
I. Muscle and joint pains: Yes ___No___
J. Abdominal pain: Yes ___No___
K. Bleeding from the gums, nose, and/or eyes: Yes ___No___
L. Blood in the stool (black stool) Yes ___No___
M. Blood in the vomit (black vomit): Yes ___No___
N. Blood in the urine Yes___No____
O. If yes to any bleeding, Date of Onset_____
P. Dark urine Yes____No_____
Q. Reduced amount of urine_____
R. If yes to reduced amount of urine, Date of onset_____
S. Easy bruising of the skin: Yes ___No___
T. kidney failure: Yes ___No___
U. confusion: Yes ___No___
V. seizures: Yes ___No___
W. coma :Yes ___No___
X. Death : Yes ___No___
Y. If yes, date of death:_____
Z. Others(specify):_____
_____

3.6. What type of treatment do you take: _____
3.7. Specimen collected A. yes B. No
3.8. If yes what was the result _____

Part four: Risk factors

4.1. Travel history to other area: Yes ___No___,
4.2. If yes, Where? _____ When? _____
4.3. Contact history with diseased person: Yes ___No___
4.4. Contact history with diseased animal: Yes ___No___
4.5. If yes, what animal?_____
4.6. Anyone with the same disease in the same family: Yes ___No___
4.7. If yes, how many of your family affected with this disease? _____
4.8. Presence of other disease/s: Yes ___No___ and type _____
4.9. History of vaccination for yellow fever: Yes ___No___ and M/MYY: _____
4.10. Anyone who visited you from other area before you get sick? Yes ___No___
4.11. If yes, from where? _____
4.12. Did you attend any mass gathering? Yes___ No_____
4.13. Availability of breeding sites for insects: Yes ___No___
4.14. Presence of container near the home where standing water is found (i.e. old tire or pot)?
A. Yes B. No_____
4.15. LLITNs availability: Yes ___No___
4.16. Utilization of LLINs: Yes ___No___(observation)
4.17. If using LLIN, how many years old is it?_____
4.18. Presence of forest: Yes ___No___
4.19. Work in the forest: Yes ___No___
4.20. Frequent presence in the forest: Yes ___No___,
4.21. Presence of monkeys in the forest: Yes ___No___
4.22. If yes, are the monkeys new to your forest? Yes _____No_____
4.23. If monkeys are new to your forest when did they arrive? _____
4.24. If yes, have the monkeys been dying unexpectedly? Yes ____No_____
4.25. Are you aware of any history of yellow fever occurrence in your locality or nearby area?

A. yes B. no C. do not know

Chapter II: Surveillance data analysis report

The Epidemiology of rubella disease in Ethiopia, 2008-2012

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Abstract

Introduction: Rubella is a mild viral disease. However, rubella infection in pregnancy is major public health importance due to teratogenic effects that can result from congenital rubella syndrome (CRS). In Ethiopia, Rubella surveillance is not established and therefore little is known about the epidemiology of rubella disease. This data analysis was conducted to describe the burden, disease trend and seasonality of rubella disease in the country.

Methodology: Five year data (2008-2012) of Rubella disease which was reported through measles case based surveillance system for laboratory confirmation of Measles and Rubella IgM antibody to EPHI was analyzed to describe the epidemiology of Rubella disease in the country

Results: A total of 11,026 samples were tested for Rubella IgM and 1346(12%) cases were positive for Rubella. The vast majority, 1231(91%) of cases were below the age of 15 years and 53% were females. Among the total Rubella positive cases, 1317(98%) had information on patient area of residence (rural vs. urban); of these, 684 (51%) were from rural area and 633(47%) from urban area. Addis Ababa 275 (2/100,000), Hareri 18 (1.8/100,000) and Dire Dawa 24 (1.3/100,000) contributed higher number of cases. Within the five year period, the annual incidence of Rubella cases increased 67% from 0.3/100,000 in 2008 to 0.9/100000 in 2012. Annually, increments in the number of cases were observed from April to June.

Conclusion: Rubella is common in young children's below the age of 15 years. The disease is widely distributed throughout the country and it is more common in rural areas than urban areas. Peak of rubella cases observed from March to June. To further understand the burden and epidemiology of Rubella and CRS in Ethiopia surveillance system should be established.

Key words: Rubella, surveillance, Ethiopia.

Introduction

The name "rubella" is derived from Latin, meaning little red. Rubella is also known as German measles because the disease was first described by German physicians in the mid-eighteenth century (1). It is caused by an enveloped togavirus, genus Rubivirus. The virus is transmitted by direct contact or droplet spread. Humans are the only known host and children born with congenital Rubella syndrome, who may be infectious for several years, are the only reservoir. The risk of transmission is 10-30% but varies with the immunization rate of the population. The incubation period is 14-21 days (2).

Rubella is a mild and self-limited viral disease with little clinical significance in children and adult males. However, rubella infection in pregnancy is of major public health importance due to the teratogenic effects that can result from congenital rubella infection, which can lead to miscarriage, fetal death or birth of an infant with congenital rubella syndrome (2).

Rubella is a vaccine preventable disease. Vaccine is available as either in combination with Measles, Mumps and Rubella (MMR) vaccine or as a monovalent rubella vaccine (2). The rubella vaccine is a live attenuated strain that has been in use for more than 40 years. A single dose gives more than 95% long-lasting immunity, which is similar to that induced by natural infection (3).

Worldwide, a total of 121,344 case of rubella and 165 CRS were reported to WHO in the year 2009.in the same year, in Africa 17,338 cases with the incidence rate of 2.11 per 100,000 populations were reported (4).However, little known about the epidemiology of rubella disease in Africa.

In Ethiopia there is no rubella surveillance system and also vaccine is not introduced in the EPI program of the country. However, all suspected measles cases which is sent to laboratory confirmation to EHNRI and having negative and indeterminate laboratory result for measles will be tested for Rubella. Even though the presence of confirmatory laboratory result present for Rubella disease in the country and available documentation of Rubella data which is integrated with measles case based surveillance system, Information is limited on the epidemiology of

rubella disease. It is therefore this data analysis is conducted to figure out the burden and distribution of Rubella disease and also display disease trend and seasonality.

Rationale

In Ethiopia Rubella and Congenital Rubella Syndrome (CRS) is not notifiable disease. Moreover, there is no surveillance system designed to capture and report Rubella, However, measles case based laboratory surveillance system and the case definition of Measles supported the diagnosis and the documentation of Rubella cases. Even though the documentation of the disease present at MOH/EPHI, Rubella is not recognized as a public health problem in the country and the epidemiological information about the disease is limited. Therefore this study describes the epidemiology of rubella disease in the country and recommends public health intervention action to be taken.

Statement of the problem

The disease rubella has similar clinical presentation with suspected measles case which is fever and rash. However rubella is milder than measles and also 20-50% of rubella infection do not have rash, as a result, measles case based surveillance system may not detect all rubella cases. The public health importance of rubella is due to the teratogenic effects when rubella infection is acquired in the early months of pregnancy. Rubella infection of the fetus can result in fetal death or in the birth of an infant with serious congenital birth defects.

The congenital rubella syndrome (CRS) is an important cause of blindness, deafness, congenital heart disease, and mental retardation. Rubella is vaccine preventable disease; the vaccine is available since 1969. However rubella vaccine has not yet been introduced in to Ethiopia, the absence of this vaccination in infants and young children helps the continuous circulation of the disease and exposure of pregnant women to the disease. Besides, information regarding Rubella and CRS is limited. Therefore, it is essential to carry out this study to describe the epidemiology of rubella and provide a plat form for policy makers for appropriate action to be taken.

Objectives

General objective

The main objective of this study is to describe the epidemiology of rubella disease in Ethiopia.

Specific Objectives

To describe the burden of Rubella disease in Ethiopia

To assess trend and seasonality of Rubella disease in Ethiopia

To recommend public health action

Methods

Descriptive analysis was made. Suspected measles cases with blood specimen obtained reported from all regions of Ethiopia to the then Ethiopian Public Health institute (EPHI) for laboratory confirmation and tested for measles IgM antibody, specimens having negative measles result will be subsequently tested to Rubella IgM antibody. Specimens tested for rubella IgM antibody was reviewed retrospectively and specimen with rubella positive laboratory test was classified as confirmed rubella case (figure 3).

Laboratory result and individual case investigation forms entered in an electronic data base and reported to Public Health Emergency Management center (PHEM) from the year 2008-2012 was used for analysis. Data cleaning and analysis was made by excel 2007 software.

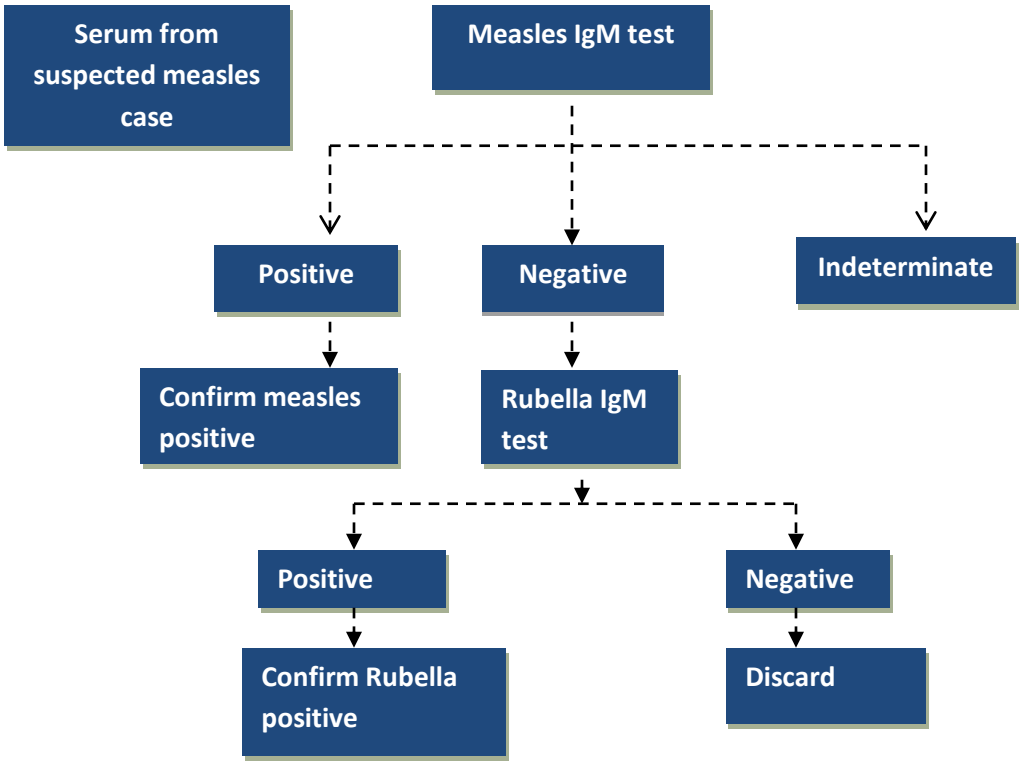

Figure 3: Laboratory testing of measles serum specimen

Result

From the year 2008- 2012 a total of 16,545 suspected measles cases were investigated with blood specimen obtained for confirmatory laboratory testing of measles. Of these, 11, 030 (66.7%) were tested for rubella specific IgM antibody and 1346 (12.2%) were positive, 8690 (78.9%) were negative and 990 (9.0%) were having indeterminate result (Table 3).

Table 3: Laboratory result for Rubella IgM antibody testing of suspected Measles cases, 2008-2012

	Suspected measles cases	Rubella IgM tested		IgM positive	IgM negative		Indeterminate		
Year	N	N	%	N	N	%	N	%	Positivity rate %
2008	5770	2261	78.5	191	1937	85.7	133	5.9	8.4
2009	4584	1984	81.6	83	1813	91.4	88	4.4	4.2
2010	8270	2212	57.3	130	1919	86.8	163	7.4	5.9
2011	6125	1430	48.4	175	1063	74.3	191	13.4	12.2
2012	7814	3143	71.2	767	1958	62.3	415	13.2	24.4
Total	32563	11030	66.7	1346	8690	78.8	990	9.0	12.2

Note: positivity rate = the number of IgM positive /Rubella IgM tested *100

During the year 2008-2012, rubella cases were reported from all regions of Ethiopia and higher number of positive cases occurred in Addis Ababa (9.4/100,000), Hareri (9.1/100,000), Dire Dawa (6.5/100,000) and Benishangul Gumuz (4.5/100,000) regions (Figure 4).

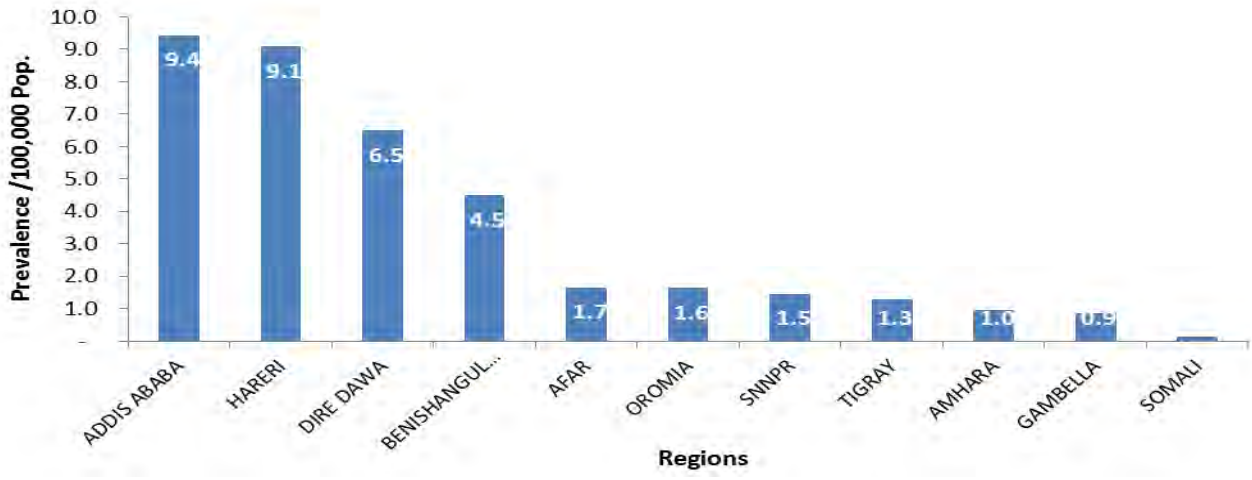

Figure 4: The burden of Rubella disease by regions of Ethiopia, 2008-2012

Annual number of confirmed rubella cases increased from 191 cases in 2008 to 767 cases in 2012 similarly annual incidence rate was also increased from 0.2 /100,000 in 2008 to 0.9/100,000 in 2012 (Figure 5).

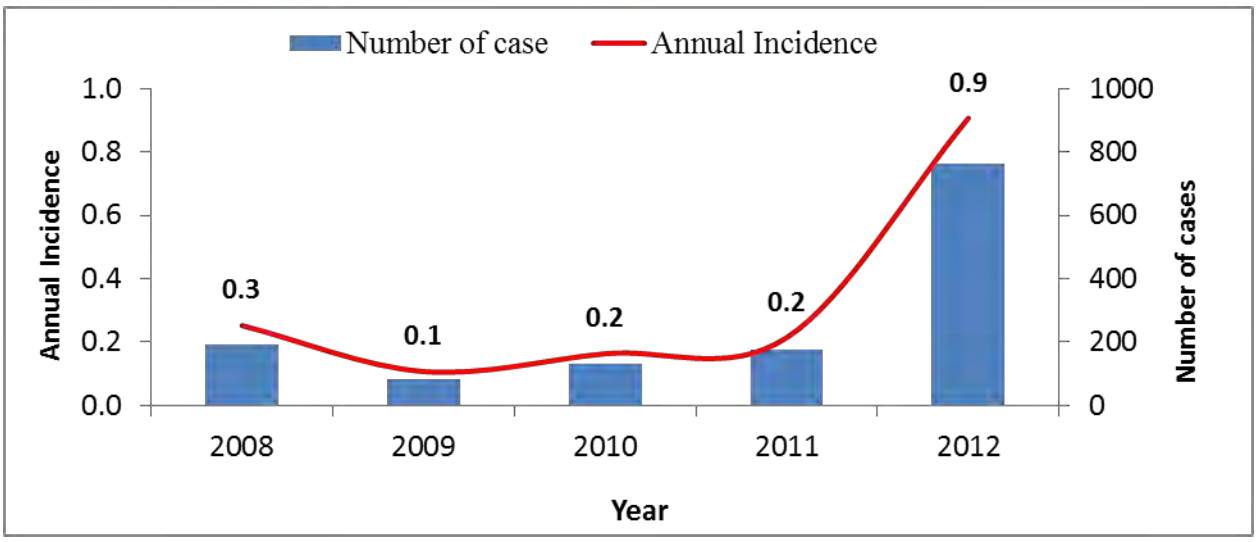

Figure 5: Number of rubella positive cases and incidence rate (100,000 populations), 2008-2012

The age of cases ranges from 4 months to 74 years with a median age of 6 years. Of the total reported 11,030 cases, majority 1258 (93.5%) were below the age of 15 years and 707 (52.5%) of cases were females of this 62 (8.8 %) were between the age of 15-49 years (Table 4).

Table 4: Distribution of Rubella case by age group, 2008-2012

Age group	Total	Female	Male
<1	62	23	39
1-4	408	188	219
5-9	566	309	256
10-14	190	118	71
>15	104	62	42
Age missing	16	7	9
Total	**1346**	**707**	**636**

Information on the patient residence of location classified by urban and rural setting were available for 1317 (98%) of cases; of this 684 (50.5%) of cases were from Rural area and 684 (50.5%) of cases were from rural area.

During 2008-2012 seasonality of rubella observed with peak through April to June (Figure 6).

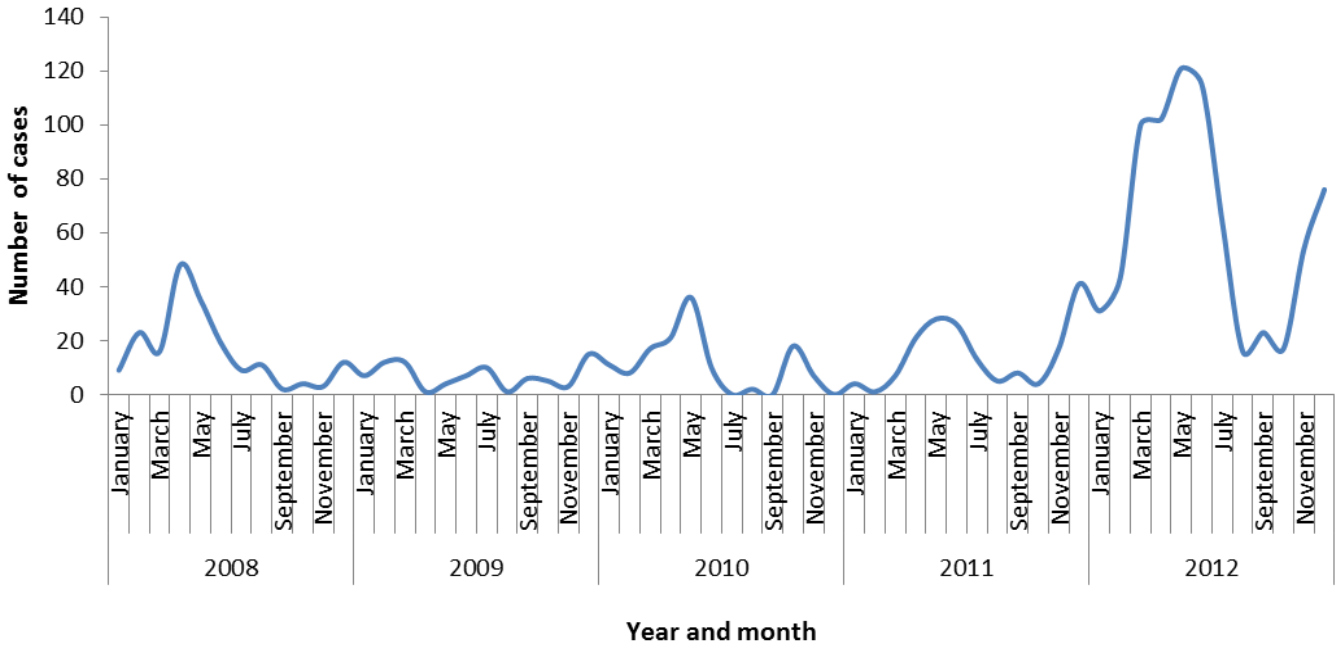

Figure 6: Distribution of Rubella cases by month, 2008-2012

Discussion

From the total 1346 confirmed rubella cases 1258 (93.5%) were below the age of 15 years and of this higher number of cases 563(41.9%) are between the age group of 5-9 this shows rubella more common in young children below the age of 15 years. This finding are similar with the study conducted in Africa in the pre-vaccine era which was found that 91% of rubella confirmed cases are below the age of 15 years and of this 47% are aged 5-9 (9). In addition study conducted in Ethiopia showed similar result that 94% of rubella cases in Ethiopia are below the age of 15years (11).

During the five year period a total of 11,030 cases were tested for rubella specific IgM antibody and 1282 (13%) were positive. Among the positives, 52.5% were females and of this 62 (8.8%) were between the age of 15-49 years. Similar studies conducted in Ethiopia also showed that, from the total reported 992 confirmed cases 52% of the patients were female (11). However this might give an indication for the possible risk of CRS in Ethiopia but there is data limitation to describe the burden of CRS in the country.

Rubella is higher in rural setting than urban setting; this finding is different with the study conducted in Ethiopia which shows rubella is common in urban setting than rural setting however its similar with the study conducted in Africa which included Ethiopia showed that rubella susceptibility is lower in urban setting than rural setting (9, 11).

Yearly seasonality of reported laboratory confirmed rubella cases occurred in the united states during spring time and also in another study conducted in Africa showed that in East Africa biphasic reporting was observed with peak during February and March and in September and October and annual troughs in December to January and May to June (9). According to the epidemiology of rubella conducted in Ethiopia seasonality of rubella was observed and peaked through March to June (11). We found similar seasonality which peaked through April to June.

These result should be considered with several limitations, Rubella cases were detected through a surveillance system designed to detect measles, and the case definition used to detect measles cases which is fever and rash and at least one of the three symptoms and signs (cough, coryza, and conjunctivitis) were used to identify rubella cases but 20- 50 percent of cases with rubella infection do not develop rash therefore this cases might be missed, in addition based on Measles guideline specimen is not collected from all suspected measles case during an outbreak condition serum was collected from only five suspected measles from the health facility or district during a month therefore mixed outbreaks of measles and rubella may be missed if measles disease predominates over Rubella disease.

Conclusion

Rubella is primarily common in young children‘s below the age of 15 years. The disease is widely distributed throughout the country particularly in Addis Ababa, Hareri, Dire Dawa and Benishangul Gumuz regions where there is high burden of the disease. Susceptibility is higher in rural than urban setting. Peak of rubella cases observed April to June.

More than half of rubella cases were below 15 years of age. Rubella in children and adults is almost always a mild disease, and the focus of concern is CRS in pregnant women‘s. Therefore, being ill in early childhood give them lifelong immunity against rubella and protect them from CRS.

Recommendation

Data on the epidemiology of Rubella and CRS in Ethiopia is very scarce due to this the burden of CRS in the country is unknown. Based on our study there is significant rubella disease in Ethiopia, though primarily in individual less than 15 years of age. The burden of CRS should be assessed.

In Ethiopia there is limited information about rubella disease, the surveillance through the measles surveillance system settled to collect measles cases helped us to understand the epidemiology of rubella. The measles case based surveillance system cannot show the burden of Rubella in the country therefore it should have separate surveillance system or system integrated with measles but with more sensitive to catch both measles and rubella cases. Moreover, national strategies and guideline has to be developed to prevent and control the disease.

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Chapter III – Evaluation of surveillance system

Evaluation of malaria surveillance system in West Gojam Zone, Amhara Region

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Abstract

Introduction: Malaria is a leading health problem in Sub-Saharan Africa. In Ethiopia, malaria is one of the leading causes of morbidity and mortality and it is endemic in most parts of the country with an altitude less than 2,000 meter. Amahara region has many malariaious areas which are affected by malaria. Of which Jabi tehnan and Wenberma woreda are among malaria affected woredas; however, the surveillance system had never been evaluated. Therefore, we conducted an evaluation to determine whether the objectives of the surveillance system are being met and its attributes.

Objective: To assess key attributes of malaria surveillance system and to determine whether the objectives of the system are being met so as to generate evidence based information for the better improvement of the surveillance system. The information will helps to draw appropriate conclusions and forward recommendations to concerned bodies.

Methodology: The evaluation was carried out in 11 purposively selected health institutions. We reviewed surveillance data from August 12-27, 2013. Information on system attributes were collected using semi structured questionnaire. The surveillance system was evaluated according to CDC guideline for surveillance system evaluation.

Result: All sites analyzed malaria data and used for epidemic monitoring, detected change in malaria cases and determined malaria morbidity and mortality. Completeness and timeliness was 98% and 97% respectively. The positive predictive value was 52.4%.

Conclusion: The malaria surveillance system is able to detect change in malaria cases and outbreak. It is simple, flexible and acceptable to all operators. However, it is not stable and the positive predictive value should be improved.

Key words: Malaria, Surveillance System, Evaluation, West Gojam Zone.

Introduction

Malaria is a vector born disease caused by mosquito genus plasmodium species. Malaria is one of the top leading causes of morbidity and mortality in the world but more than 70% of the total morbidity is in Africa (1). Worldwide an estimated 219 million malaria cases and 660,000 deaths occur each year. It is the leading health problem is in Africa (2).

Due to growing drug and insecticide resistance and climate change the disease remains one of the most important causes of human morbidity and mortality in the world. Combating malaria is one of the millennium development goals; which is planned to halt the incidence of malaria by halve in 2015 (3).In Ethiopia, malaria is one of the leading causes of morbidity and mortality. It is endemic in most part of the country with an altitude below 2,000 meter. About 75% of the land mass is potentially malarious and about 40 million people are at risk of infection.

In the country from the four Plasmodium species, *Plasmodium Falciparum and Plasmodium Vivax* species are the two species that exist. The risk of disease in Ethiopia is highly variable by location and is affected by rainfall, altitude, and seasonal factors. Overall, malaria is classified as unstable, and host immunity to malaria is thought to be low in most parts of Ethiopia (4).

To reduce the overall burden of morbidity and mortality due to malaria in Ethiopia, a comprehensive approach to vector control, early diagnosis and prompt treatment and surveillance, prevention and rapid management of malaria epidemics when and where it occurs are being implemented by incorporating in the country health sector development program since 1999 (5). Amahara region has many malaria hot spot areas, which are affected repeatedly by malaria episodes. West Gojam Zone is one of malaria hot spot areas and a malaria epidemic occurred by the year 2012, which affected all woredas. Hence, this evaluation was conducted to evaluate the gaps, attributes and purposes of the surveillance system.

Rationale

Malaria is one of the leading causes of morbidity and mortality in Ethiopia. It is one of the main health problems of Amhara Region with recurrent epidemics particularly in 18 malaria hot spot areas. West Gojam Zone is a malaria hot spot area and has highest malaria case load and compared with other Zones of the region. In the Zone high number of malaria cases were reported from Wenberma and Jabi Tehnan; in addition surveillance system had not been evaluated previously. Therefore, this study was conducted to evaluate the functionality of the surveillance system and to identify the gap for the better improvement of the surveillance system.

Objectives

General objective

To assess key attributes of the malaria surveillance system and to evaluate whether the surveillance system is meeting its objective so as to generate evidence-based information for the improvement of the surveillance system..

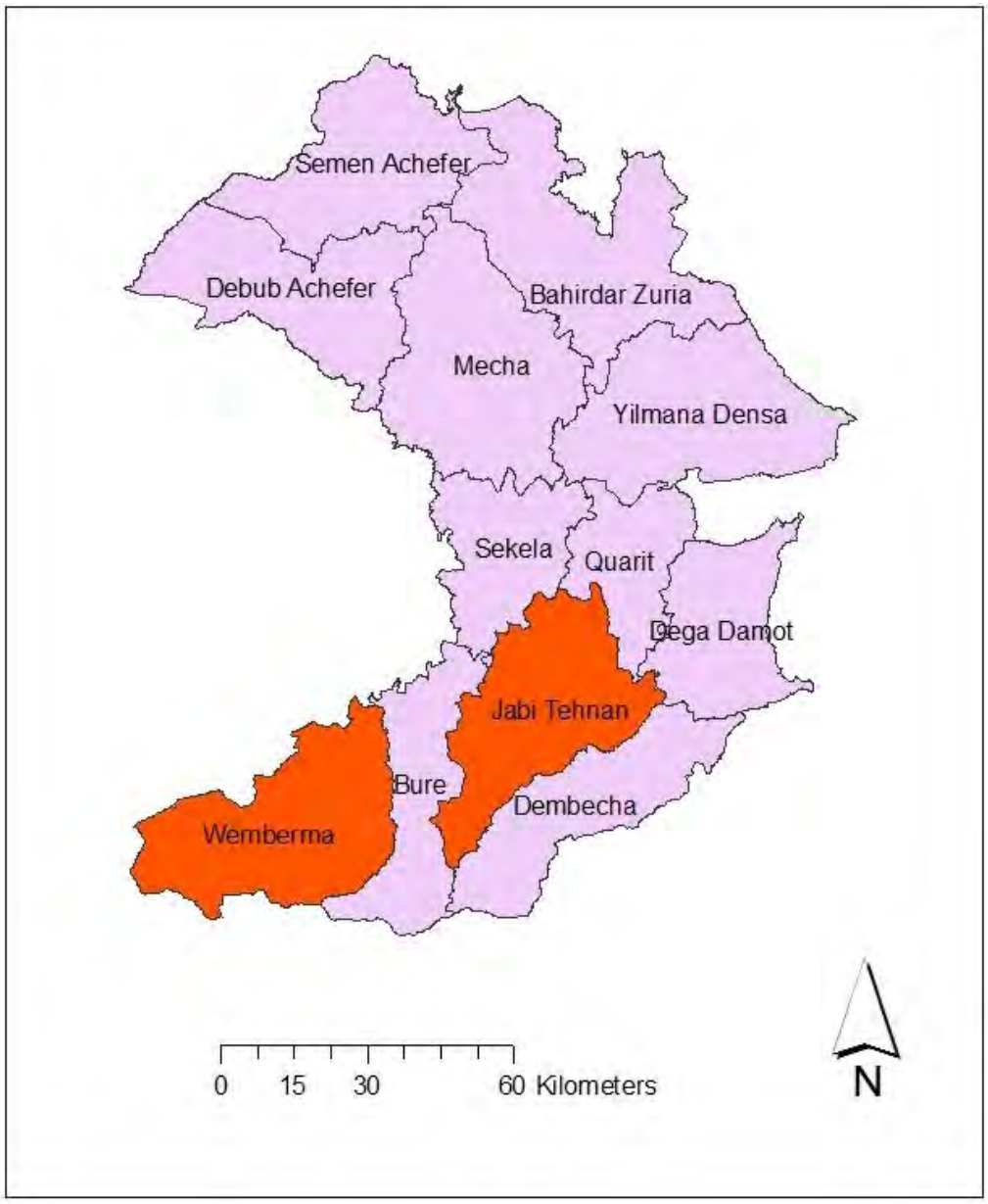
Specific objectives

- To evaluate the attributes of malaria surveillance system in the zone and selected woredas
- To assess the performance of the surveillance system in line with set objective.
- To give possible recommendations based on the findings for the better improvement of the surveillance system

Materials and methods

Study area and population

The evaluation was carried out in Amhara Regional State, West Gojam Zone. The zone is located in west part of Amhara Regional State. The zone has a total population of 2,296,487 and have15 woredas of which the study was conducted in two woredas (Wenberma and Jabi Thenan). These woredas were selected for their accessibility and high burden of malaria cases comparing with other woredas of the zone.



Map 3: Map of West Gojam zone by woreda, Amhara regional state, Ethiopia, 2013

Study design and period

We implemented a descriptive cross-sectional from August 12- 27, 2013.

Sample size and sampling technique

First, purposive sampling was used to select one zone on the basis of its burden of malaria cases compared with other zones of Amhara Region. Then, two woredas were selected based on the burden of malaria cases compared with other woredas of the zone. Of the selected two woredas, two health centers and two health posts were selected presenting with good and poor surveillance

practice as judged by zonal and woreda health offices and based on the accessibility of the health facility.

Study units

The study units were zonal and woreda health offices and health facilities. A total of 11 study sites were included in the study, these include governmental health center (4) and health posts (4) and woreda (2) and zonal health offices (1).

Data collection method

Data was collected using a semi-structure questionnaire and using an observation check-list. We interviewed surveillance officers and health institution staff with these tools. Secondary data sources such as surveillance report completeness and timeliness as well as malaria surveillance data, supervision report, written feedbacks, preparedness plans were also reviewed. Information on system attributes were collected using CDC surveillance system evaluation guideline.

Data analysis

The collected data were entered and analyzed using Microsoft Office Excel 2007.

Ethical clearance

Ethical clearance to conduct the study was obtained from Ethiopian Health and Nutrition Research Institute. A letter of request was provided for the selected health department and health offices for their participation on the study.

Operational definitions

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

Acceptability: Reflects the willingness of individuals and institutions to participate in the surveillance system.

Data quality: Is the completeness and validity of the data recorded in the public health surveillance system.

Representativeness: Is the ability of the system to describe health events accurately in terms of time, place and person.

Sensitivity: Sensitivity is the capacity of the system to detect the highest proportion of true cases

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

Timeliness: Is the ability of the system to trigger appropriate action in time.

Usefulness: Refers to the relevance of the system in terms of feeding information for action.

Positive predictive value: Is the proportion of reported cases that actually have the health-related event under surveillance.

Flexibility: Is the ability of the system to adapt to changing needs such as the addition of a new disease, the collection of additional data, and change in case definition.

Completeness: Proportion of all expected data reports that were submitted to public health surveillance.

Result

Purpose and operation of surveillance system

In Ethiopia there are 20 nationally notifiable diseases, of which, most (13) are reportable immediately and the rest (seven) diseases reported on weekly bases. Malaria is one of the nationally notifiable diseases reported on a weekly basis. However, during epidemics the reporting will be changed to daily form. Public health facilities, private and NGO health facilities are the reporting entities.

The surveillance system capture data on cases of malaria suspected fever case, total malaria cases (confirmed and clinical) for outpatient, inpatient and deaths and confirmed malaria cases by species. The collected data is reported from health center to health post through either a delegated person, telephone, email or mobile texting. From health centers and hospitals to district health office information is transmitted by paper. At district level the data entered into

Excel and is reported to the zonal health office and subsequently to regional health office. Similarly weekly and monthly feedback of the report will be given to each level.

The structure of Amhara Region puts the malaria program and PHEM under one directorate in addition the surveillance system works in coordination and collaboration with other departments and with different administrative offices present in Woredas and kebeles. In every health institution there is at least one surveillance focal person that collects and sends reports to the next reporting level. The purpose of malaria surveillance is intended to detect epidemics and outbreak so that they can be controlled in a timely manner, for planning and to implement intervention measures.

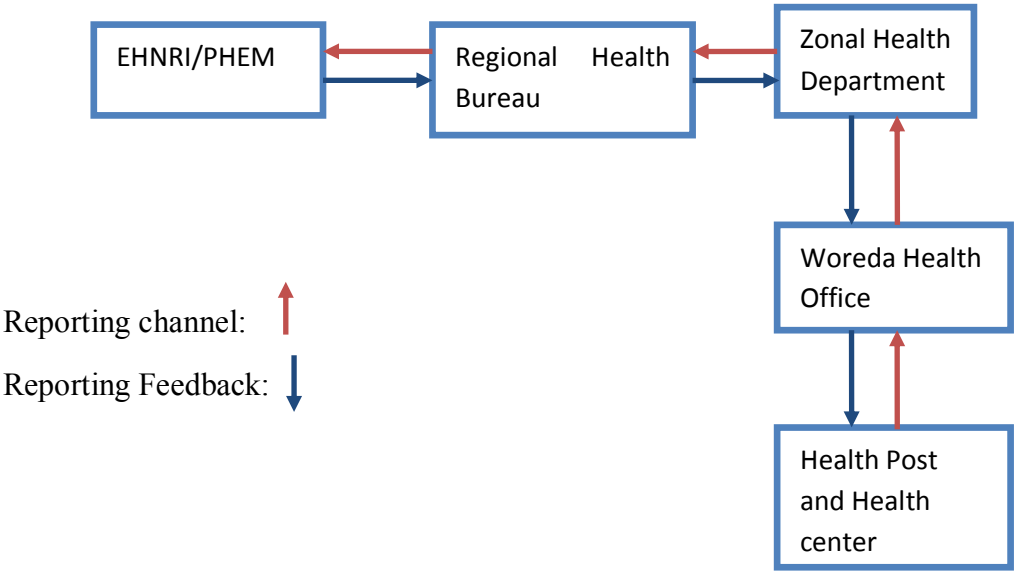


Figure 7: Flow chart of the surveillance reporting system and feedback of West Gojam zone

Population under surveillance

The population in the catchment area of the selected health facilities, including all health posts under the selected health centers was included. The surveillance system encourages community participation to detect and respond to disease epidemics through the health extension program.

Case detection, registration and data reporting

The case definition of malaria was available in all visited health centers and the understanding of the case definition at those visited health facility was good as explained by some of health workers at the time of field visit. However, in all assessed health posts (100%) there was no

available community case definition. Though the case definition is not present the health extension workers used their training module for detection of cases.

Case definition for 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.

All assessed health facilities had clinical case registration log book. Observation of monthly report submitted to higher level was conducted and we found similar number of cases registered in clinical registration log book.

Reporting formats are available and a shortage was not encountered within the past six month period. Public health facilities, private and NGO health facilities are the reporting entities. The reporting rate within the past 12 months for Health center was 90% and for health post 88%. The reporting rate for the zone was 97%. Reports were sent to the next level through delegated person, telephone, mail and mobile texting.

Data quality

Data quality was assessed by completeness of the reporting form. The completeness of some key variables (malaria suspected cases and species type) was assessed to look at the data quality and it was 98 %.The information registered on the weekly reporting form matches with patient record at the health facility.

Data analysis

In the assessed health facilities data analysis made on weekly basis by Malaria or PHEM officers and at health post level by health extension workers. The analysis was done only by time at health center and health posts level by using malaria epidemic monitoring chart. However in the assessed zone and woreda analysis was done by time and place. The collected information is utilized to monitor action threshold which is done by doubling previous year cases or by using the third quartile of the five years morbidity data and for planning interventions.

Feedback and supervision

Feedback was given in all assessed health institutions to their respective health facilities. Feedback is mostly given by phone. Written feedback was given in all assessed health facilities on monthly basis but there is inconsistencies and documentation problems. We observed the written feedback and in all assessed health facilities written feedback was given when there was reporting problem and to notify that problem.

At the zonal level, supervision is conducted once within the past six months for the woredas and facilities. Fifty percent of the woredas had at least one supervisory visit during the past six months. Similarly 60% of health centers made supervision trips twice and 40% at least once to their respective health posts

Epidemic preparedness and response

In all woredas and in the assessed zone there is epidemic preparedness plan. All of the assessed health facilities have epidemic management committee and rapid response team. We observed the presence of epidemic management committee meeting minute. The meeting minute was available in one health facility (1/6) and at zonal health office (1/1) level only and the documentation was poor. Within the past one year, the committee had no experience of evaluating their preparedness and control measure.

There was an outbreak of malaria in 2012. There was no shortage of drugs and supplies encountered during the outbreak time. There were no outbreaks the past six months the system,

In the assessed health facilities there was no available budget used for epidemic response. However, in case of experiencing any emergency, the zone or the woreda mobilized the budget for response activity. Epidemic prevention and control activity is implemented based on the available local data by making analysis or by using clinical registration log book at health post level.

Resources used to operate the surveillance system

The system has supplies and equipment for laboratory diagnostic and data management, including microscopes rapid diagnostic tests (RDT), giemsa stain and slides, immersion oil, gloves, recording books, reporting forms, and computers. The system also has adequate reporting

formats and telephone communication available in all woreda health offices and its common material used to submit surveillance reports.

There is available malaria and PHEM guideline in all assessed health offices and health centers. Similarly there is IRT manual available in the assessed health posts. However, IRT manual is in English. All assessed health offices and facilities received training on disease surveillance given by Amhara Regional Health Bureau, Zonal health office, WHO and JICA. There is at least one trained person at each health institution. However, the training was given over a year ago and there has been high staff turnover meaning the knowledge has dissipated. and the addition there is turnover of trained staffs.

Surveillance system attributes

Usefulness

The Malaria surveillance system presented in all assessed health institutions was able to determine the magnitude of the disease for planning and intervention. In addition, malaria trend analysis was made to detect epidemic which shows weekly count of malaria cases and epidemic threshold and it was posted at every health institution to monitor epidemic.

Simplicity

All respondents in the assessed health institutions agreed the case definition of Malaria is simple and easy to understand. The process starting from data generation at the health facility level and reporting through defined reporting route as set by the guideline was clear and simple. In addition, collection of the data was simple and filling of the collected information on the paper based reports form were easy and took less than10-15 minutes. However, at zonal level, the reports received from woredas are by paper and the report sent from zone to the next level was through electronic system and therefore it took long time to convert data from paper to electronic form.

Flexibility

The current reporting format used is more flexible to accommodate newly occurring health events. A change in the existing procedure of case detection, reporting and formats is difficult to adapt.

Acceptability

The reporting agents accept and engaged with the surveillance activities. The reporting of health posts is 88%, health centers 90% and hospitals 94% within the past 12 months. The case definition and reporting tools were acceptable by all stakeholders.

Representativeness

The representativeness of the surveillance system was assessed by health service coverage and by health seeking behavior for the disease. In West Gojam Zone a total of 100 HC and 370 HP are available so the health service coverage is 97%. Malaria is the common disease in the zone and the population has good health seeking behavior for the disease.

Sensitivity

Sensitivity in surveillance refers to the proportion of actual cases in a population that are detected and notified through the system. But this couldn‘t be measured as the total number of persons with the disease in the community was not ascertained.

Positive predictive value

Positive predictive value is calculated by the proportion of malaria cases identified divided by the systems that actually have the disease. We were able to calculate the positive predictive value of the system by dividing the number of positive malaria cases confirmed by microscope by the total suspected malaria cases identified clinically and it was 52.4%.

Timeliness

Timeliness of the reporting was 97%

Stability

The surveillance system is able to collect, manage and provide data properly without failure. However data from health post and health center are collected by phone communication or in hard copy and will be sent to woreda health office by delegating one health professional. However, when they communicate information by telephone they will not be charged by the system when they do the work by their own cost. When trained surveillance personnel leave the position there will be difficulties in data collection and reporting.

The government does not allocate fund for surveillance activities except for outbreak response only the nongovernmental organizations allocate fund for surveillance, preparedness and response activity.

Discussion

Surveillance is a systematic collection, analysis, and interpretation of health and health related data. The use of this data is to monitor health problems for public health action. The main aim of the surveillance system is to detect outbreaks before causing any damage to the public, according to the set objective the surveillance system in West Gojam Zone was met its objective. Malaria epidemics are usually the result of major changes in the eco-epidemiological system like excess rainfall, premature termination or unplanned interruption of anti-malarial measures and less effective implementation of control measures. Therefore integration of the surveillance system with metrological information is paramount in prediction of epidemic. In addition, the intervention measures made to control or prevent malaria epidemic should be evaluated to improve and prevent failure in prevention and control strategy so that human resource skill should be built in prediction of epidemic and evaluation of intervention measure.

For a surveillance system to be useful, the information that is gathered should be analyzed and reported in a timely manner. Data analysis includes summarizing data into frequency tables, calculating rates, plotting simple graphs and comparing all information with earlier information. In the assessed health center and health posts the data is analyzed by time to monitor epidemic with reference to expected normal level of incidence and to control it in a timely manner. Analyzing data by place shows where the outbreak/case build up occurred and provide information on its geographical extent and help for availing intervention measures on the affected area. In the assessed health facilities the collected information were not interpreted by place particularly at health post and health center level due to lack of awareness, however the health extension will do intervention on the area where most cases are coming from whentreating individual patient. This may limit health extension workers not to institute early prevention and control activity in the areas where case build up occurred.

According to Ethiopia PHEM guideline, there are two kinds of case definition one is prepared for health professionals other than health extension workers. The second one is called community case definition which is prepared by Amharic language. Malaria is the only disease in the

country which can be diagnosed and treated by health extension workers. Availability of case definition at health post level enhances the case detection and reporting. However, case definition is not available at health post level however the area is malarious and by the year 2012 higher malaria cases were observed from those assessed two woredas.

Feedback is the important function of the surveillance system; it helps to improve the quality of the surveillance system as well as motivation for health workers. It is possible to give feedback by supervision, newsletter, bulletin etc. In the assessed zone, woreda and health facilities feedback was given to their respective health institutions through two ways. Through official letter and by phone.We observed the written letter of feedback and it was like letter which was written to improve reporting at different level. Though this is good start, it has to be improved for example by including analyzed data, geographic distribution of the disease and trend over time and assist in early disease prevention and control measures.

Conclusion

The malaria surveillance system in West Gojam Zone is able to detect changes in malaria cases and outbreaks by doubling the previous calendar year surveillance data and comparing with the current number of malaria cases and also by using the third quartile of the last five years morbidity data and plotting every week in each health facility. Generally, the surveillance system is simple, flexible and acceptable to all operators but, it is not stable and the positive predictive value should be improved.

Recommendations

- Human resource skill should be built in for predicting epidemic early and evaluating intervention measure
- Continuous supportive supervision should be in placed using checklist to increase the quality of the surveillance system.
- Training should be given to all health institutions how to analyze and interpret data.
- Case definition should be availed to health posts and posted at their facility.
- Continuous training on PHEM guideline should be given to health workers at least for PHEM focal persons.

- The government should allocate budget for surveillance to ensure sustainability of the system.
- The surveillance system should have capacity in prediction of epidemic and evaluating intervention measures.

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Chapter VI: Health profile description

Efratana Gidem Woreda health profile-Amhara region, 2013

Summary

Introduction: A community health profile is a comprehensive compilation of information about a community. It is a continuous process used to reflect the present state and to monitor progress in the future. In developing country the planning and management of health services often proceeds within an environment of inadequate information about the health status of the population served and the occurrence of important determination of health. In Ethiopia, particularly at the district level an organized health and health related indicator which determine the health status of the community is scarce and these contribute a gap in planning and taking evidence based information for action. Therefore the aim of health profile describes the health and health related information of Efratana Gidem woreda.

Methods: a structured questionnaire was used to collect health and health related data from different woreda administrative offices (Health, water, Culture and tourism, finance, transport, electric power offices). The main mechanism of data collection was record review and interview.

Result: In Efratana Gidem woreda among 109,200 total population 65% (65,426) people have access to safe water. There are 18,588 households among those 17,945 (96.5%) of the households has latrine. In the woreda 60 schools are present and among these 30 % (18) have water supply and 88% have toilet facility however only 51% (27) are functional. A total of 37 health institutions are available in the woreda among those 27 (73%) are owned by government and the other 10 (27%) are private health facilities. In the woreda the proportion of pregnant women who had at least one ANC visit are 74.5% and 22.4% of births were attended by skilled health personnel besides 1.4% of births attended by HEWs. Family planning coverage of the woreda is 80.3%. In the woreda the full immunization coverage was 67.6%. Pneumonia, acute febrile illness and diarrhea (non bloody) are one of the top leading cause of adult morbidity and similarly Pneumonia, diarrhea (non bloody) and acute febrile illness are top leading causes of morbidity in under five children‘s.

Conclusion: In Efratana Gidem woreda communicable disease like Pneumonia, Acute febrile illness and Diarrhea are the most frequently occurring disease both in Adult and pediatric population. In the woreda most (70%) of the schools do not have water supply and 49% of those schools do not have functional toilet There was better health improvement in ANC follow up as well as in family planning coverage. In the woreda more than 70 % of deliveries neither skilled nor safe, in addition the immunization coverage was poor therefore should be improved for the upcoming year 2014.

Introduction

A community health profile is a comprehensive compilation of information about a community. The data in a profile reflects the health of a given community from many different angles. The information may include data already collected and published about a community or information collected by the organizations or individuals (1).

Profiles describe health and its determinants, and these are not static. Profiles are a continuous process that should be used both to reflect the present state and to monitor progress in the future. If profiles are fulfilling their roles as a tool in improving health, a series of profile will be needed both to monitor changes that may prevent the achievement of good health (1).

In Ethiopia communicable disease and nutritional deficiency is the main health problem of the country. Shortage and high turnover of human resource and inadequacy of essential drugs and supplies have also contributed to the burden. Despite major strides to improve the health of the population in the last one and half decades, Ethiopia‘s population still face a high rate of morbidity and mortality and the health status remains poor (2).

To improve the health status of the population Health sector Development Program is formulated and being implemented since 1997/98 currently the country is being implemented HSDP IV (2010/11-2014/15). To monitor progress towards HSDP to improvement in health status of the population, current and reliable information and use of information for making evidence based decision are very crucial.

This health profile describes the health and health related information of Efratana Gidem woreda, of North Shewa zone of Amhara regional state. It encompasses compilation and interpretation of

Demographic, Education and services like: water, Transport, economy, Agricultural information‘s and also health status information of the woreda on the perspective of health. It gives health and health related information to stakeholders and different actors involved in the health system

Rationale

The planning and management of health services in developing countries often proceeds within an environment of inadequate information about the health status of the population served and the occurrence of important determination of health. This is particularly the case at the district level where health service have traditionally underdeveloped and information system lacking (3). In Ethiopia, particularly at the district level an organized health and health related indicator which determine the health status of the community is scarce and these contribute a gap in planning and taking evidence based information for action. In Efratana Gidem woreda health profile was not done before and also there is no organized health and health related information. Therefore this health profile compiled health and health related information of the woreda for planning, prioritizing health and health related problems.

Objectives

General objective

To describe health and health related information of Efratana Gidem woreda and to identify problems for priority setting.

Specific objectives

- To compile health and health related indicators of the Efratana Gidem woreda.
- To convey the local burden of disease
- To describe existing community health problem

Material and method

Study area

Efratana Gidim woreda found in Amhara regional state of Semen Shewa zone. It was founded in 1958 by former Ethiopian emperor Hailesillasie. The woreda name was assigned by combination of two rural districts called Efrata and Gidem. It is located in the north of Addis Ababa at

$10^0 15^0 50^0$ Latitude and $39^0 55^0 00^0$Longitude.The woreda is about 275 Km far from Addis Ababa and have total of 102,900 populations.

Efratana Gidim woreda contains19 kebles of this 18 are rural and 1 urban. The woreda is borderd by Antsokia woreda in the north, Kawot woreda in the south, Jille Temuga worda in East and Menz Gera worda in the west.

The total area of the woreda is 501.13 $Km^2$with urban area of 4.2Km^2 and rural area 496.93 Km^2, the woreda cover 3% of Semen Shewa zone. Out of total area 501.13 Km^2, 158.6 Km2 are cultivated area and 75.31 Km2 are grazing area, the average annual temperature of the area is 22^0c.When we see the climatic zone classification:

- Dega (Highland) covers 16%
- Weyandega (Middle land) covers 62% and
- Kola (Low land) covers 22%

Map 4: Map of Efratana Gidem woreda, West Shoa zone, Amhara regional state, Ethiopia, 2013

Study desighn and period

Amhara regional state, Efratana Gidem woreda was selected based on its convenience and time constraint. The study was conducted from April 22 - May 1/2013.

Data collection techniques and procedure

The health data was collected from Woreda health office and Ataye health center as well as health related information was collected from different woreda administrative offices (water, Culture and tourism, finance, transport, electric power offices) of the year 2012/2013. The main

mechanism of data collection was record review and interview of woreda health workers. The data collection was extracted using structured questionnaire

Ethical clearance

Health and Health related information of Efrana Gidem woreda was collected after obtaining official letter from Ethiopian Public Health Institute (EPHI) as well as permission obtained from Efratana Gidem woreda health office and other concerned bodies in the district during data collection.

Variables

Demography: The study of population and its characteristics, with reference to such factors: size, age structure, density, fertility, mortality, growth and social and economic variables.

Child mortality rate: The number of births occurring in 2004 per 1000 women in the reproductive ages (i.e. women aged 15-49).

Crude birth rate: The number of births in a population during 2004is divided by the number of person-years-lived by the population during the same period. It is frequently expressed as births per 1,000 populations.

Crude Death Rate: The number of deaths in a population during 2004is divided by the number of person-years-lived by the population during the same period. It is expressed as births per 1,000 populations.

Infant Mortality Rate (IMR): The ratio of the number of deaths under one year of age occurring in 2004 to the number of births in the same year

Clean and safe delivery: Proportion of deliveries attended by HEWs

Contraceptive prevalence rate: Proportion of women of reproductive age (15-49 years) who are using (or whose partner is using) a contraceptive method, on the year 2004

Contraceptive acceptance rate: Proportion of women of reproductive age (15-49 years) who are not pregnant who are accepting a modern contraceptive method (new and repeat acceptors).

ANC rate (how many of the total expected pregnancies attended 1st ANC): Proportion of pregnant women attended, at least once during the current pregnancy, by a health professional, for reasons related to pregnancy

Skilled delivery: Proportion of deliveries attended by skilled health attendants; A skilled birth attendants an accredited health professional – such as a midwife, doctor or nurse – who has been trained in the skills needed to manage normal (uncomplicated) pregnancies, child birth and the immediate postnatal period, and in the identification, management and referral of complications in women and newborns.

Clean and safe delivery: Proportion of deliveries attended by HEWs on the year 2004

Tuberculosis (TB) case detection rate: Number of new smear positive TB cases detected, among the new smear-positive TB cases estimated to occur in the woreda.

TB treatment success rate: Percentage of a cohort of new smear positive TB cases registered in a specified period that successfully completed treatment. Successful completion entails clinical success with or without bacteriological evidence of cure.

TB cure rate: Percentage of a cohort of new smear-positive TB cases registered in a specified period that was cured as demonstrated by bacteriologic evidence (a negative sputum smear result recorded during the last month of treatment and on at least on one previous occasion during treatment).

TB defaulter rate: Percentage of a cohort of new smear-positive TB cases registered in 2004 that interrupted treatment for more than 2 consecutive months.

TB death rate: Percentage of a cohort of new smear-positive TB cases registered in a specified period that died during treatment, irrespective of the cause.

Skilled birth attendant: An accredited health professional such as midwife, doctor or nurse who has been trained in the skills needed to manage normal (uncomplicated) pregnancies, child birth and the immediate postnatal period and in the identification, management and referral of complications in women and newborn. (Exclude TTBA and HEWs)

Leading causes of morbidity: The frequently occurring causes of morbidity (10) among patients, of which the greatest number of cases have been reported during the year.

Fully immunized: Surviving infants who receive all doses of infant antigen. The Infant Antigens are: BCG, Pentavalent (DPT-HepB, Hib), doses 1 -3; OPV, doses 1—3; and Measles.

Antenatal coverage: Proportion of pregnant women attended, at least once during the current pregnancy, by a health professional, for reasons related to pregnancy.

Contraceptive accepter's rate: Proportion of women of reproductive age (15-49 years) who are accepting a modern contraceptive method (new and repeat acceptors).

Postnatal care (PNC) coverage: Proportion of women who seek care at least once during postpartum (42 days after delivery) from skilled health attendants including HEWs for reasons relating to post-partum

Leading causes of mortality: The most frequently occurring causes of mortality (10) under which the greatest number of deaths have been reported during a given year.

Maternal mortality rate: The number of maternal death while pregnant or within 42 days after termination of pregnancy from any cause related to pregnancy or its management per 100,000 populations

Result

Demography

Efratana Gidem woreda have a total of 102,900 populations of this 51725 are males and 51175 are females. The woreda has 19 kebeles, of this 18 are rural and one urban kebeles. Of the total 102,900 population95% (98165) of them live in rural kebeles and 5% (4735) live in urban kebeles. In terms of population density the woreda is densely populated 202 person per Kilometer square (202 p/Km^2) and also compared with the national, regional and zonal population density figure 79 p/ Km^2,121.9 p/ $Km^2$and 126.2 p/ Km^2respectively it is much higher.

Table 5: Population of Efrtana Gidem woreda by kebele, 2013.

No.	Kebele	Both sexes	Male	Female
1	Lulaea Gate	4134	2033	2101
2	Dulit Yegelda	4949	2557	2392
3	Maramirselelo	6839	3539	3300
4	Kore Meda	3334	1689	1645
5	HoraDeledey	4453	2232	2221
6	Kara Legoma	4570	2362	2208
7	Meskel Ber	7708	3820	3888
8	Layeganew Sar Amba Yeserdo	4824	2437	2387
9	Layeganew Atayena Tachignaw Sar Amba	2907	1518	1389
10	Bergibi	3872	1929	1943
11	Mehalwenz	5932	3012	2920
12	Ambo Berwetega	6155	3036	3119
13	Yemiliwa	3705	1846	1859
14	Alal	7635	3769	3866
15	Ashiquaye Sherif	11688	5974	5714
16	Arso Ambaena Magna	4089	2006	2083
17	Zembo	6843	3418	3425
18	Gewecha Negeso	4528	2300	2228
19	Karakore	4735	2248	2487
	Total	102900	51725	51175

The sex ratio (Male: female) of the woreda is 101:100. Of the total population 40% (41,087) are below age of 15 years, 47% (47971) are on the age range between15-49 and13, 842 % (13%) are above the age of 50 years and 24% (24268) are female between the ages of 15-49 years. From the total population 80.65% of the total population is dependent (for 100 economically active person, there are 80 economically inactive people).

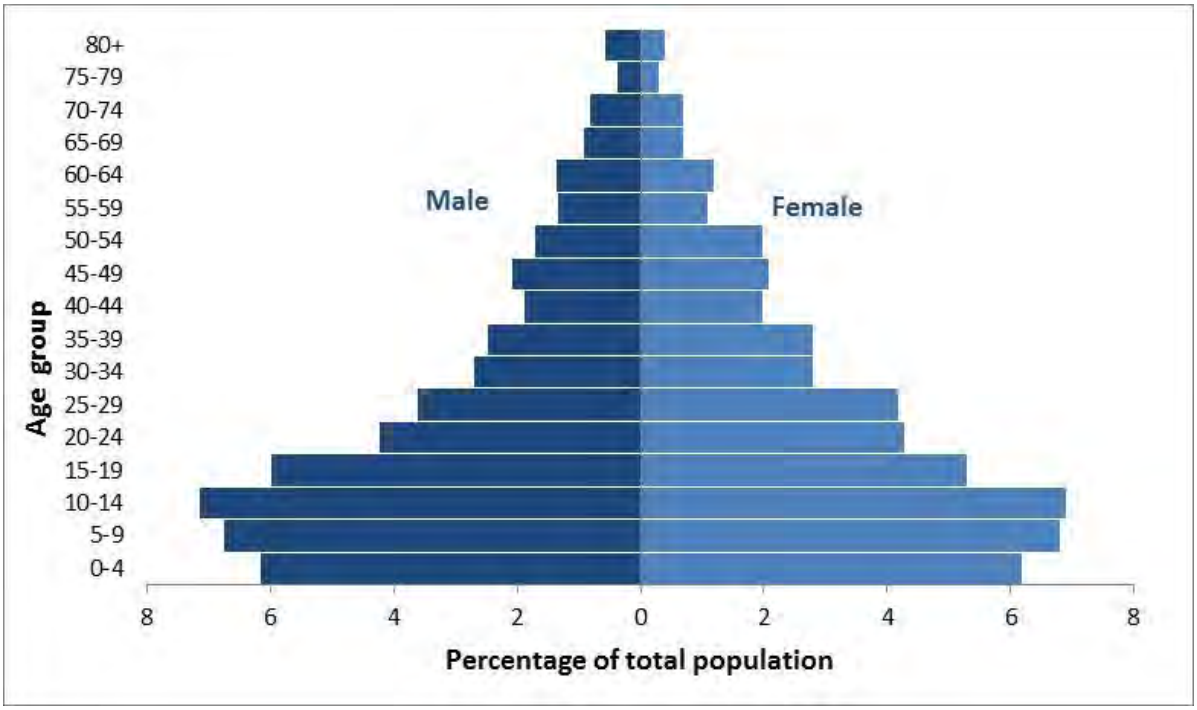

Figure 9: Population pyramid of Efratana Gidem woreda, 2013

Religious and ethnic compositions are the major components of demographic feature of a nation, in Efratana Gidem woreda 98% of the population are Amhara, 0.9% are Oromo, 0.2% are Argoba and 0.4 are other Ethiopian ethnic origin and most 88% of the population is Ethiopian Orthodox religion follower followed by Muslim 10.99% and Protestant 0.53%.

Infrastructure of the woreda

Education

A total of 60 schools (4 kindergartens, 54 primary, 1 secondary and 1 technical and vocational school) are available in the woreda and 25548 students are learning in these schools among those 50.5% (12908) are males and 49.5% (12640) are females.

From the total 25548 enrolled student 7% (1680) are dropped out due to economic and health problems of this 759 (45.2%). Among 60 schools 30 % (18) have water supply and 88% have toilet facility however only 51% (27) are functional.

Water

In the woreda among 109,200 total population 65% (65,426) people have access to safe water from this 60% of rural kebeles and 90% of urban kebeles have access to safe water. The main water sources of the woreda are spring development, Hand dug well, shall well and deep well. The daily water consumption per day per person is 15L.

Electric power supply and telephone communication

A total of 1,083 (5.8%) household have access to electric power supply and 688 have access to fixed telephone communication.

Transportation

In Efratana Gidem woreda there is one main road called Ataye-Meskel road, the road is 6 m width and form the total 19 Kebeles only 7 kebeles have access to transportation

Health

Vital statistics and health indicator

In Efratana Gidem woreda the crude birth rate is 33 per 1000 population this is almost similar compared with the national crude birth rate (34.5/1000 population).the total fertility rate is one of the most useful indicator of fertility, its measured as the average number of children that a women would be born throughout her child bearing age (15-49), the woreda total fertility rate (4.3 per 1000 women of reproductive age) is similar with the national TFR (4.8 per1000 women of reproductive age).Data on other measures of fertility like crude death rate, child and infant mortality rate are not available in the woreda.

The proportion of pregnant women in Efratana Gidem woreda had at least one ANC visit increased from 52.4% in (2011) to 74.5% in (2012) however only 4.7% of pregnant women attended 4^{th} ANC visit. Over the year 2012, 22.4% of births attended by skilled health personnel and 1.4% of births attended by HEWs of the woreda.

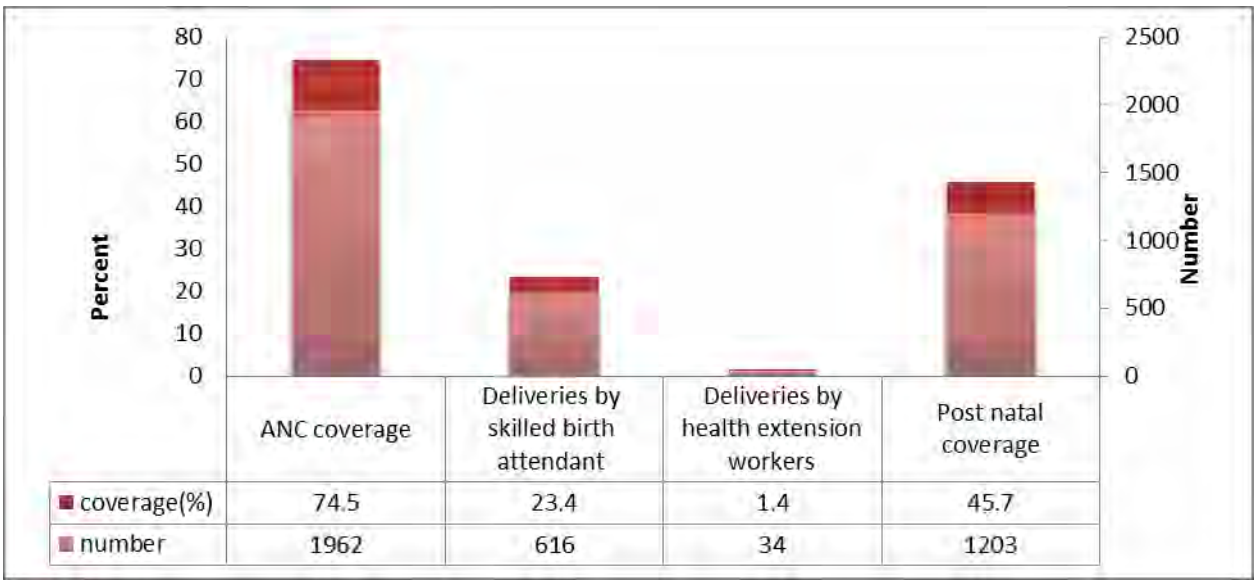

Figure 10: ANC, Delivery attended by skilled attendants, clean and safe delivery (HEW) and PNC coverage, 2012.

In the woreda proportion of women of reproductive age (15-49 years) who are not pregnant who are accepting a modern contraceptive method (contraceptive acceptance rate) is 22.4%,this is very low compared with the Amhara reigon contraceptive acceptance rate (88.6%).the proportion of women who are using contraceptive method (the contraceptive prevalence rate) of the woreda is 74.5%. Family planning coverage of the woreda is 80.3% and the most commonly used family planning methods in the woreda is Pill and Depo-Provera.

Immunization

Immunization is one of the medical technologies used to protect the life of infants and children's against disease. In Efratana Gidem woreda the full immunization coverage is increased from 56% on the year 2011 to 67.6% in 2012.However, OPV 0 was not administered for infants at birth. In the woreda 56.4 % (1884) children's are protected from Neonatal tetanus at birth.

Table 6: Efrtatana Gidem woreda immunization coverage, 2011-2012.

		Vaccination coverage (%)										
Year	Target popn<1	BCG	OPV 0	OPV 1	OPV 3	Penta1	Penta2	Penta3	Measles	PCV1	PCV3	Full immunization
2011	4408	2950(66.9%)	-	-	-	2807 (71.4%)	-	2821 (71.7%)	2403 (61.1%)	-	-	2199 (55.9%)
2012	3025	2203 (65.9%)	-	-	-	2339 (77.3%)	-	2388 (78.9%)	2123 (70.2%)	1646 (93.3%)	1105 (62.6%)	2044 (67.6%)

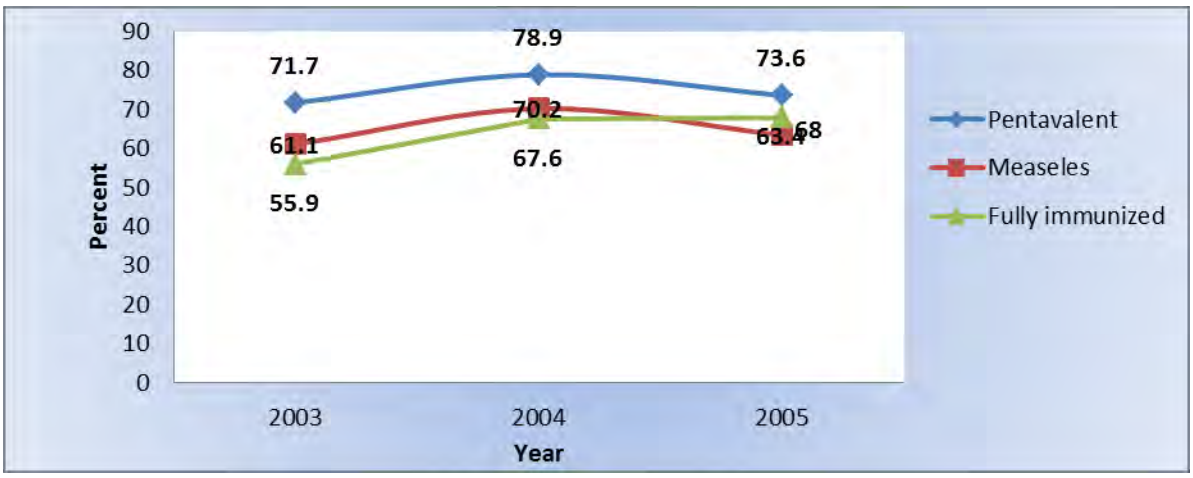

Figure 11: Trend in immunization coverage from 2011-2013GC up to May.

Health services

In the woreda there are 37 health institutions among those 27 (73%) are owned by government and the other 10 (27%) are Private health facilities. The health service coverage of the woreda is 51.3%.

Table 7: Number and type of health facility- Efrtatana Gidem woreda, 2013.

Type of health facility		**Number**	**Total no. of beds**
Government Hospital		1	0
Government Health center	Type A	1	5
	Type B	5	0
Private health facilities (clinics/disg.lab/drug)	Clinic (all type)	5	0
	Diag.Lab.	1	0
	Drug store	4	0
Government health posts		20	0

A total of 115 health worker found in the woreda, among those majority 71 (61%) are Health extension workers and nurses. In the woreda there is one hospital but there is neither Gp nor specialist. In addition there are 3835 Health Development Army (HDA) in the woreda which are appointed from the community to work with the health extension workers on worda community health service program.

Table 8: Health professional type, Efratana Gidem woreda, 2013.

Type	No.	Professional to popn. ratio
Specialist	0	
G.P	0	
HO	5	1:24,697
Nurses (Deg. and Dip.)	35	1:3,528
Mid wife (Deg. and Dip.)	7	1:17,640
Lab. (Deg. and Dip.)	12	-
Pharmacy (Deg. and Dip.)	13	-
Env. Health (Deg. and Dip.)	0	-
HIT	5	-
Health education	0	-
HEWs	36	1:3,430
Others	2	-
Total health workers	115	

Causes of Morbidity and Mortality

In Efratana Gidem woreda pneumonia, acute febrile illness and diarrhea (non bloody) are one of the top leading cause of adult morbidity and similarly Pneumonia, diarrhea (non bloody) and acute febrile illness are top leading causes of morbidity in under five children's.

Table 9: Top 10 cause of morbidity in adult, 2012.

S.no	Disease	Number of case	Percent
1	Pneumonia	2402	19
2	Acute febrile illness	2049	16
3	Diarrhea (non bloody)	1523	12
4	Helminthiasis	1441	11
5	Acute upper respiratory infection	1387	11
6	Malaria (Clinical without lab confirmation)	920	7
7	Urinary tract infection	818	6
8	Trauma	776	6
9	Dyspepsia	757	6
10	other unspecified infections and parasitic diseases	766	6

Table 10: Top 10 cause of morbidity in pediatrics/< 5 years, 2012.

S.no	Disease	Number of case	Percent
1	Pneumonia	994	35
2	Diarrhea (non bloody)	648	23
3	Acute Febrile illness (AFI)	336	12
4	Acute upper respiratory infection	311	11
5	Malaria	155	5
6	Helmethiasis	151	5
7	Diarrhea with dehydration	101	4
8	Other unspecified diseases of respiratory	82	3
9	Other unspecified infectious and parasitic disease	80	3
10	Conjunctivitis	59	2

Environmental health and sanitation

In the wored there are 18,588 household among those 17,945 (96.5%) of the households have latrine, moreover 17,349 (93.3%) have solid waste management disposal system in their household and 17,248(92.8%) have liquid waste management disposal system.

Endemic diseases

Malaria

In the woreda there are 19 kebeles form this 12 are malarious and 74339 populations are at risk. All malarious Kebeles (17288 household) are treated with Insecticide Residual Spray (IRS) and the ITN coverage is 100%. On the year 2012 a total of 1003 malaria cases reported with peak November and December from this 262 (26%) cases are children below five years of age.

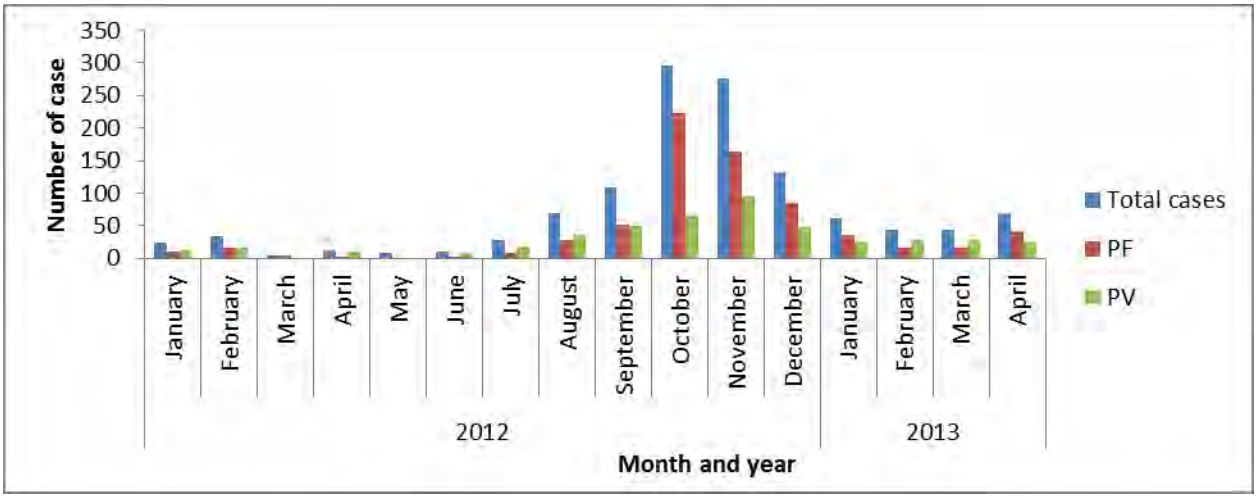

Figure 12: Malaria cases of Efratana Gidem woreda by month and year, 2012/2013.

TB/leprosy

A total of 146 new TB cases were reported in the woreda of this 37 % (54) Pulmonary TB negative, 30 %(44) are pulmonary TB positive 33 % (48) are extra pulmonary TB cases. Number of new smear TB positive cases detected, among the new smear–positive TB cases estimated in the woreda (TB detection rate) is 57.8%. In the woreda from the total 146 TB cases 74% (108) were screened for HIV.

In Efratana Gidem woreda a total of 5 leprosy cases were reported and all of the cases are on treatment.

Table 11: Tuberculosis treatment result, Efratana Gidem woreda, 2012.

Pulmonary TB positive case	Cure rate		Treatment completed	Treatment success rate		Death rate	Defaulted
	Case	Percent	Number	Case	Percent	Number	case
44	23	53	25	24	54.2	1	0

HIV/AIDS

A total of 15320 people screened for HIV/AIDS among those 224(1.5%) were positive. In the woreda 1690 people live with HIV/AIDS and the prevalence is 0.18%. From the total 1690 positive cases 601(36%) are enrolled in anti-retroviral therapy (ART) and 1089 are on pre ART stage.

A total of 1826 (60.7%) pregnant attend health facility that provide PMTCT service for at least one ANC visit pregnant women and 29 (2%) were positive for HIV/AIDS.

Nutrition

In the woreda a total of 20 outreach therapeutic program are present on this site 33 cases are admitted per year.

Essential drugs

In Efratana Gidem woreda essential drugs used for most frequently occurring diseases like Amoxicillin, ORS, Arthemesin/ lumefatrine (COARTAM), Mebendazole is on hand and no drug shortage encountered during the year 2012 and 2013 -May.

Discussion

In Efratana Gidem woreda most (70%) of the schools do not have water supply and 49% of those schools do not have functional toilet. Due to the absence of water at their school the students take water to the schools for their daily consumption or they do not take. As the result of absence of toilet, the students are forced to use open space to urination and/or defecation around the school or wait until they get home. Hand hygiene is the most important measure of prevention and control of infection and can reduce the burden of diseases. But, the practice of hand washing is unacceptably poor particularly in developing countries. A study conducted in kersa woreda, Eastern Ethiopia revealed that from those households participated in the study with latrine the habit of hand washing after defecation was reported to be about 5.1% (4). The existence of proper hand washing facilities affects the hand washing practice. When there is no water in the school, children cannot wash their hands.

Inadequate sanitation is mostly responsible for diseases which are transmitted through the fecal – oral route. Unimproved hygiene, inadequate sanitation, and insufficient and unsafe drinking water account for 7% of the total disease burden and 19% of child mortality worldwide. In Ethiopia about 75% of causes of OPD visits are largely due to the lack basic sanitation provisions (5). Similarly in Efratana Gidem woreda from top 10 cause‘s morbidity both in Adults and children, the top four are communicable diseases which can be prevented by improved hygiene and sanitation.

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

In Efrantana Gidem woreda the proportion of pregnant women who had at least one ANC visit increased from 52.4% in (2003) to 74.5% in (2004).However, 70% of delivery attended at home. Combination of contraceptive use, improved transport, education and birth in a health facility can reduce 75% of maternal deaths (6). A study conducted in Ethiopia showed that majority of delivery (78%) attended at home assisted by traditional birth attendants. The study revealed that

the reasons for not preferring health institution delivery were traditional birth attendants are seen as culturally acceptable and competent health worker, women's reported poor quality of care and previous negative experience with health facilities in addition to having low awareness on the advantage of skilled attendance at delivery, having little role for making decision and also economic constraints during referral were reported as main reasons (7). Another case control study conducted in Bahirdar, Ethiopia showed that the likelihood of delivering at home was greater among mothers with inadequate knowledge of pregnancy related services, those who started attending ANC after 24 weeks of gestation, mothers having no formal education and rural residents (8).

Family planning reduces mortality and morbidity due to pregnancy and child birth. Family planning saves lives of women and children as well as improves the quality of life for all. It is one of the best investments that can be made to ensure the health and well-being of women, children, and communities. Family planning has great role in significant reduction of maternal mortality by reducing exposure to unintended pregnancy and unsafe abortion in developing countries where the majority of maternal deaths occur. The use of modern family planning methods has potential to reduce about 25%-40% of all maternal deaths in developing countries (9).In Efratana Gidem woreda the contraceptive acceptance rate is very low; this means the populations are not willing to use modern contraceptive methods. According to EDHS 2011, use of modern contraceptive methods among currently married women has increased from 6 percent in the 2000 EDHS to 27 percent in the 2011 EDHS this is largely due to the sharp increase in the use of injectable (10). Study conducted in Jimma revealed that knowledge and practice of modern contraception methods is low. Most women's contraceptive knowledge and practice was influenced by socio-cultural norms such as male/husband dominance and opposition to contraception, and low social status of women. A lack of formal education for women was identified as a key factor in preventing change in the patterns of contraceptive knowledge and use by women (11). Moreover, another study conducted in Ethiopia showed that inclusion of husband in family planning program will increase the use of modern contraceptive methods. Therefore, advocacy work has to be done for the community to improve the community acceptance of modern contraceptive method (13).

The contraceptive acceptance rate of the woreda is about 22.4 % which is lower as compared with the Amhara region contraceptive acceptance rate (88.6%) (12). the contraceptive acceptance considers the number of persons who accept for the first time in their lives any method of contraception to be reported for a defined reference period. Whereas, the contraceptive prevalence rate of the woreda is higher this is about 74.5% even to that of national figure from the EDHS 2011 which was about 29% (13). As the contraceptive prevalence rate reaches a high level the number of new acceptors is likely to decrease because of the fact that most of the eligible persons have been recruited as users. Two studies conducted in developing countries revealed that religion, education status, age at marriage and perceived side effects of family planning methods were significantly associated with contraceptive usage. These studies further recommended the need for more intense awareness creation campaigns for promoting contraceptive usage (14, 15).

The absence of registered data on top 10 cause of mortality in adult and pediatric population in the woreda health office and at the health facility brought difficulty to determine the main causes of mortality.

Conclusion and recommendation

In Efratana Gidem woreda communicable disease like Pneumonia, Acute febrile illness and diarrhea are the most frequently occurring disease both in adult and pediatric population. In addition in the woreda (70%) of the schools do not have water supply and 49% of those schools do not have functional toilet therefore the woreda have to promote hygiene and sanitation for the community in addition the woreda have to work with other sectors which work in hygiene and sanitation to improve availability of water and toilet facility at schools.

There was better health improvement in ANC follow up as well as in immunization coverage. Moreover there was good achievement in family planning coverage, contraceptive prevalence rate. The woreda should continue on this progress.

In the woreda more than 70 % of deliveries neither skilled nor safe in addition there was low contraceptive acceptance rate this should be improved by giving health education for the community and by social mobilization.

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Annex 3: health profile assessment questionnaire

1. Historical aspects of the woreda

- Woreda Name_____
- How & why the name given_____
- How and when the woreda was formed_____
- Any other historical aspect about the worda_____

  _____

2. Geography and Climate

Woreda map_____

Location(distance) _____Direction _____

Altitude _____

Surface Area _____(_____% from the zone)

Town _____rural _____(land)

Geographical coordinate

- Latitude _____
- Longitude _____
- Annual rain fall(average)_____
- Annual temp(average)_____
- Climatic zones_____ (%) _____ (%) _____ (%)

Woreda boundaries

North _____South_____

East_____Weast_____

3. Political and Administrative Organization

- Total no. of kebeles: _____
- rural_____
- Urban_____

4. Population and Population structures

Demographic data

1. Total Population_____Male_____Female_____ sex ratio_____
2. Urban Total _____ Male_____Female_____
3. Rural Total _____ Male_____ Female_____
4. Population under 1yrs_____
5. Population under five yrs_____
6. Population < 15 years_____
7. Population >64 years_____
8. Women 15_49 years of age_____
9. Total population by kebele(each kebele pop)_____
10. Population enumerated by H.E.Ws_____

Population pyramid

Population data by age and sex								
Male	<1	1-5	6-14	15-24	25-34	35-49	50-64	>65
Female	<1	1-5	6-14	15-24	25-34	35-49	50-64	>65

Ethnic/language

1. Oromo_____ (_____ %), Amhara_____ (_____ %),
2. Afar_____ (_____ %), Tigre_____ (_____ %),
3. Others_____ (_____ %)

Religion

1. Orthodox _____ (_____ %), Muslim _____ (_____ %),
2. Protestant_____(_____%), Other _____ (_____ %)

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

Main income sources

- Agriculture
  - Cultivated area_____
  - Grazing area_____
  - Cropping seasons_____
  - Land density_____
- Livestock
- Truism
- Trade
- Other business

House hold income source

1. Agriculture_____ (#)
2. Government Employer_____(#)
3. Private Employer_____(#)
4. Daily Laborer_____(#)
5. Different business_____ (#)
6. Jobless _____ (#)

➢ **Average Income**_____

6. Education and school Health

Number of educational institution

1. K.G._____
2. Primarily School_____
3. Secondary_____
4. Preparatory_____
5. College/ University_____
6. TVET_____
7. Total School Age Children (target) _____
8. Total Enrolment _____Male_____Female_____
9. School dropout in 6 months or year 2004 _____

10. If there is school dropout why _____

Educational status of the community

1. Total Educated people_____
   - Male _____
   - Female _____
2. School health activities:
   - Number of schools with water supply_____
   - Toilets:
     - Schools with functional latrines (male & female)_____
     - Schools with HIV/other Health clubs_____

7. Facilities

Transport

1. Accessibility (main roads)_____
2. Type of road _____
3. How many kebeles have access to transportation _____
4. Flow of transportation per day_____

Telecommunication

1. How many people have access to fixed telephone?_____
2. How many people have access to mobile phone? (coverage)_____

Post Office_____

Bank_____

Power supply

1. How many house hold get power supply_____?

Water

1. Total safe water coverage _____ (___%)
2. Safe water supply coverage by kebele _____
3. Main source of water supply _____
4. Kebeles getting safe water____ (__ %)
5. Population getting safe water_____ (__ %)

6. Daily water consumption per day per person_____

8. Disaster situation in the woreda

1. Was there any disaster (natural or manmade) in the woreda in the last one year? _____
2. Any recent disease outbreak/other public health emergency_____
3. If yes cases_____ and deaths_____

9. Vital Statics and Health Indicators

1. Infant Mortality Rate (IMR) _____(total <1 yr deaths this 2004yr_____)
2. Child Mortality Rate_____(this year's total <15 yr deaths_____)
3. Crude Birth Rate_____
4. Crude Death Rate_____ (total deaths 2004yr____)
5. Maternal Mortality Rate_____(2004 total maternal deaths_____)
6. Contraceptive prevalence rate_____
7. Contraceptive acceptance rate _____
8. ANC rate (how many of the total expected pregnancies attended 1st ANC) _____
9. ANC rate (how many of the total expected pregnancies attended 4th ANC) _____
10. Percentage of deliveries attended by skilled birth attendants_____
11. Percentage of deliveries attended by HEWs_____
12. Percentage of deliveries attended by TBA _____
13. Average family size_____

10. Immunization Coverage (for children and Women)

1. BCG _____ (__ %).
2. OPV0____ (____ %), OPV1_____ (___ %), OPV3_____ (___ %)
3. Penta1_____ (___ %), penta2 _____ (___ %) penta3_____ (___ %)
4. Measles_____ (___ %).
5. PCV-10-1_____(__%), PCV-10-3_____(___%)
6. TT2+P.W_____(__%),TT2+ N.P.W_____(___%)

11. Health Service

Type and Number of Health Institution

Type		umber	Total No. of beds
Gov. Hospital			
Gov. Health center	Type A		
	Type B		
Private H.Fs (clinics/diag. lab/drug stores)	Clinics (all type)		
	Diag. Lab.		
	Drug store		
Gov. Health posts			
NGOs	H.Ps		
	H.Cs		
	Hospitals		
	Clinics		

Health institution to pop ratio:

- Hospital: Pop----------.
- HC: Pop----------
- HP: Pop----------
- Health service coverage----------

Type and Number of health professionals

Type	No.	Remark
Specialist		
G.P		
HO		
Nurses (Deg. and Dip.)		
Mid wife (Deg. and Dip.)		
Lab. (Deg. and Dip.)		
Pharmacy (Deg. and Dip.)		
Env. Health (Deg. and Dip.)		
HIT		
Health education		
HEWs		
Others		

❖ Health professional to population ratio

- Doctor: pop. Ratio_____
- Nurse: pop. Ratio____
- Mid. Wife: pop. Ratio ____
- HEW: pop. ratio_____

12. Top causes of morbidity and mortality

Top ten leading causes of OPD visit (morbidity)

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

Top ten causes of admissions

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

- **Top ten causes of deaths (mortality).**

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

13. Health budget allocation

Government

1. Total budget allocated for the woreda _____
2. Total budget allocated for health _____(____%)

Funds from NGO

1. Total _____ (purpose/programs)_____

14. Community Health Services

Status of services provided by community health workers namely:

1. No. of TBAs/TTBA_____ and their responsibility _____
2. No. of CHWs/CHPs_____ and their responsibility _____
3. Responsibility of HEWs_____
4. Others_____

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

1. MCH (Delivery, ANC, PNC) _____
2. FP(Methods) _____
3. EPI(outreach service, cold chain, vaccine) : _____

- Environmental Health & sanitation.
  1. Latrine coverage_____ & utilization rate_____
  2. Solid waste management_____
  3. Liquid waste management _____
  4. others_____
- Health Education (what, when, where, how and who conducted health education) _____

16. Endemic diseases

Malaria:

1. Total malariouskebeles_____& Pop at risk_____
2. ITNs coverage (including current dist)_____
3. Is there IRS this year(No of kebeles)_____
4. Total cases/yr_____ deaths/yr_____,<5yr cases_____ deaths_____
5. Malaria supplies (Coartem, RDT, etc) shortage _____
6. Other issues_____

TB/Leprosy:

1. Total TB cases_____
2. PTB negative_____
3. PTB positive_____
4. Extra PTB _____
5. TB detection rate _____
6. TB Rx completion rate _____
7. TB cure rate _____
8. TB Rx success rate _____
9. TB defaulter_____
10. Death on TB Rx_____
11. Total TB patients screened for HIV_____
12. Total Leprosy cases_____on Rx_____

HIV/AIDS

1. Total people screened for HIV (last one year)_____
2. VCT_____ PITC_____PMTCT_____
3. HIV prevalence_____
4. HIV Incidence (new cases/yr)_____
5. Total PLWHA_____
6. On ART_____on Pre-ART_____
7. Other HIV prevention activities_____

Nutrition

1. Total OTP sites_____, total admissions to OTP/yr_____
2. Total SC sites,_____, Newly opened/yr_____, total admissions to SC/yr_____
3. Is there TSF (targeted supplementary feeding) program in the woreda_____
4. CBN program_____ PSNP_____other_____

17. Essential drugs (shortage)

_____

_____

Chapter V: Scientific manuscripts for peer reviewed journals

5.1. Investigation of measles outbreak in Kindo Didaya district, Southern Ethiopia, October 2013

Etsehiwot Zemelak[1], Haftom T.[1], Yeshitela M.[2], Alemayehu B.[3], Alemayehu W.[4]

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Abstract

Introduction: Measles remains the leading cause of childhood morbidity and mortality in the world. In Ethiopia, measles account 4% of childhood mortality. On October 2, 2013, a suspected outbreak of measles was reported in Kindo Didaya district. We investigated to identify risk factors and to institute prevention and control measures.

Methods: Unmatched case control study was conducted. A measles case was defined as a person with fever, maculopapular rash, and either cough, coryza or conjunctivitis. Controls were individuals who had no Clinical signs of measles and residing in the same communities where cases were identified. Five blood samples were collected for laboratory confirmation. Logistic regression was used assessing factors associated with contracting measles.

Results: A total of 50 cases and 100 controls were recruited. The mean age for cases were 8.4(SD +/- 7.4) years while for controls were 8.6(+/- 6.7) years. A total of 8 deaths with case fatality rate of 1.4% were attributed to measles. All the collected five samples were measles IgM positive. Being unvaccinated (OR=6.62; CI: 2.29-19.10), having contact with suspected or confirmed cases (OR=12.6; CI: 3.52-39.62) and mothers illiteracy (OR=4.75; CI: 1.51-12.38) was associated with contracting measles.

Conclusion: There was an outbreak of measles in Kindo Didaya district. Being un-vaccinated, having contact with suspected or confirmed case and mother‘s illiteracy were contributed to the occurrence of outbreak. Vaccination, case management and public health education were instituted as a prevention and control measure.

Key words: Measles outbreak, kindo Didaya, Southern Ethiopia.

Introduction

Measles is a highly contagious respiratory viral disease. Characterized by fever, macula popular rash, cough conjunctivitis and runny nose. Measles spread through contact with nose and throat secretions of infected people and through air borne droplets released when an infected person sneezes or coughs (1).

Measles remains the leading cause of childhood morbidity and mortality in the world particularly in developing countries where more than 95% of measles-associated deaths occur (2,3). Globally an estimated 122,000 death occurred on the year 2012.In Ethiopia a total of 16,410 cases were reported on the year 2013.

Measles is one of the vaccine preventable diseases causing preventable morbidity and mortality in children in Ethiopia. It accounts 4% of childhood mortality (3). Southern regional state of Ethiopia faced outbreak of measles in different district on the year 2012 and 2013.

In October 2, 2013 outbreaks of measles were reported from Kindo Didaya district of Wolayeta zone. Teams deployed to the area with the objective of identifying possible risk factors for the occurrence of the outbreak and to institute prevention and control measure.

Methods

Study setting

The study area was in Kido Didaya district, it is located in Southern regional state of Ethiopia. The district has a population of 111,675 with 54,792 male and 56,883 females. There are 21 Kebeles (lowest administrative level) and 4 health center and 20 health posts.

Study design

A 1:2 unmatched case control study was conducted

Data on cases and controls

A structured questionnaire was used to interview cases and controls. A case status was determined as any person with fever, maculopapular generalized rash and cough, coryza (runny nose) or conjunctivitis. Controls were enrolled in the study from the area were cases enrolled

without the history of measles. Blood samples were collected from five cases for laboratory investigation.

Observational data

Interview of key informants (Health center medical directors, health care givers and district, Zone health authorities) were also conducted and availability of refrigerator, vaccine carrier, ice pack and cold chain management were observed.

Data entry and Statistical analysis

Data collected was entered and analyzed using Epi info version 7 software. Bivariate analysis was performed by converting all continuous and categorical variables to dichotomous variable and logistic regression analysis was performed to identify risk factors associated with contracting measles.

Ethical clearance

Ethical clearance was obtained from Ethiopian Public Health Institute (EPHI). Letter was written for district health office to obtain approval on data collection. Informed verbal consent was obtained from all study participants before conducting interview by explaining the purpose of the study.

Result

The outbreak stayed from September 13 -November 07/2013 and within this period a total of 591 cases and 8 deaths with case fatality rate of 1.4% were occurred (Figure 13). The crude attack rate of the district was 5.0/1000 population. The attack rate is higher (10.5/1000) among 5-14 years of age compared to the other age group 0-4 years (2.3/1000), 15-24 years (2.0/1000) and 25-59(0.4/1000). Male and female are almost similarly affected by the outbreak (4.9/1000 female and 5.1/1000 male).

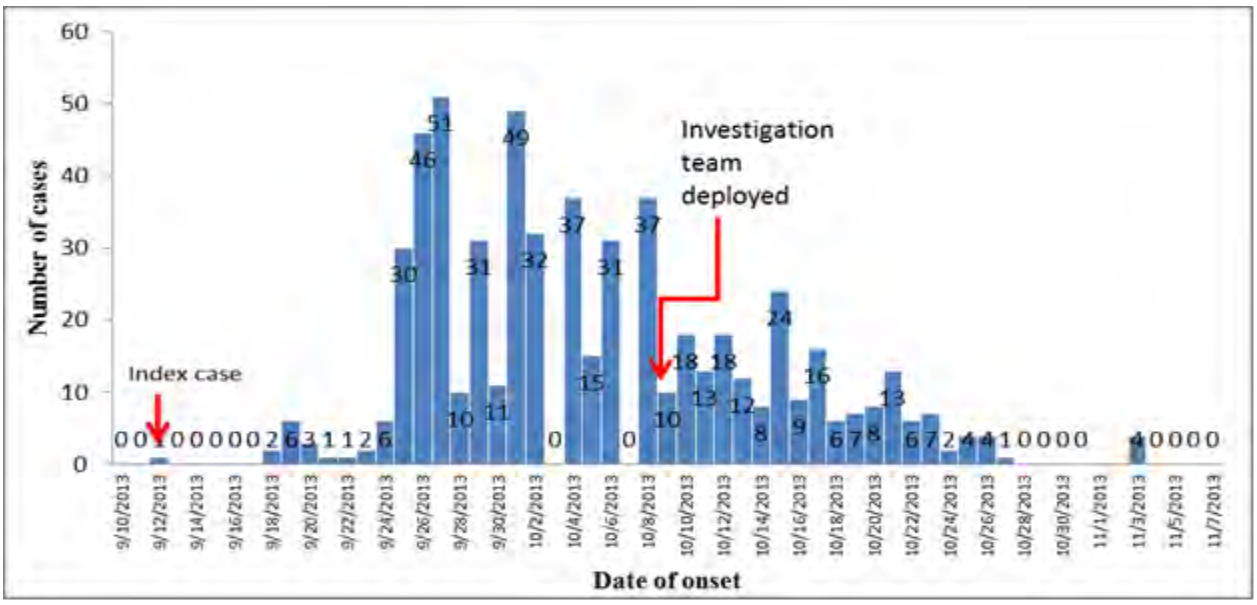

Figure 13: Measles case reported by date of onset Kindo Didaya woreda, Ethiopia, 2013

Observation was made on the cold chain management and on the availability of functional refrigerator; vaccine carrier; ice pack in the available four health centers of the district. It was found that there was functional refrigerator in all health centers however power interruption is very common in the district as a result the refrigerators is settled to work in Kerosene and solar energy but the solar energy does not work when the weather is cold or rainy in addition, kerosene is not sustainably available in all health centers. But particularly in one health center neither solar energy nor kerosene available to maintain the cold chain system.

Blood specimen were collected from five cases and sent to EHNRI/National Polio and measles laboratory for Measles antibody detection and the entire collected specimen were positive for measles specific antibody (IgM); the remaining cases are epidemiologically linked.

For identifying risk factors for the occurrence of the outbreak a total of 50 cases and 100 controls were enrolled in the study. The mean age for cases were 8.4(SD +/- 7.4) years while for controls were 8.6(+/- 6.7) years. On bivariate analysis 5 variables: being un-vaccinated (OR=4.9; CI 2.32-10.48, P value 0.000032), sick person in the family (OR= 4.7; CI 2.2-10.1, P value 0.000032), contact with suspected or confirmed case (OR 12.2, CI 4.7-31.6, P value 0.00000), mothers illiteracy (OR= 4.7; CI 2.21 -10.18, P value 0.00000) and being unemployed (OR= 10.6; CI 3.44 – 10.18, P value 0.000) was statically associated. Having knowledge about mode of transmission of measles (OR= 1.65; CI 0.8-3.2, P value 1.48), having knowledge about measles is a vaccine preventable disease (OR= 1.23; CI 0.49-3.04, P value 0.82), Presence of previous history of

measles infection (OR= 2.11; CI 0.58-7.66, P value 0.41) was not statistically associated for contracting measles.

On multivariate logistic regression analysis, the risk factors that are significantly associated with the illness were being unvaccinated (OR= 6.61; CI 2.29-19.10, P value 0.00), having contact with suspected or Confirmed cases (OR= 11.81; CI 3.52-39.62, P value 0.001) and Mothers illiteracy (OR= 4.33; CI 1.51-12.38, P value 0.001)

Response conducted: Cases were managed with appropriate medication, Vaccination campaign was conducted and (98,599) 98 % of targeted children between the ages of 6 month- 14 years were vaccinated. Surveillance was enhanced.

Discussion

Among the total cases 24% were not vaccinated against measles. However, in the district the administrative measles coverage on the year 2012 were 105%. Coverage is calculated by percent and if the bordering area of the district is accurately demarcated and the number of eligible population is well estimated or if there is no influx of new population to the community it could not be above 100%.The district vaccination coverage shows the presence problem in estimating eligible population and this could result false vaccination coverage performance and assists for the accumulation of unvaccinated children in the district.

Our study revealed that children whose mothers have no education are 4 times more likely to develop illness than those born to literate mother and we got similar finding with case control study conducted in India which showed that children whose mother have no education are more likely to develop illness than those born to educated mother (4). A similar finding had been seen in study conducted in Arisi zone showed mothers illiteracy 8 times more likely to develop illness (5). Also EDHS 2011 survey indicates children whose mothers have secondary education are more likely to be fully immunized than those born to mothers with no education (6).

Measles is a highly contagious disease transmitted by respiratory droplet or air born spread. Secondary attack rate among susceptible household contact reach 75% - 90%. Our study also showed having contact with suspected or confirmed measles case were risk factor for contracting measles which is similar with the natural mode of transmission of measles. In addition we found similar finding with another case control study conducted in Cameroon which revealed having

contact with suspected measles cases were 7 times more likely to contract measles than those who do not have contact (7).

This investigation has some limitations: information on vaccination status is obtained by asking mothers and their care givers as well as from adult patients and controls therefore recall bias could have occurred.

Results of this outbreak is assures the occurrence of measles outbreak in Kindo Didaya district. Being un-vaccinated, having contact with suspected or confirmed case and mother‘s illiteracy were the contributing factor for the occurrence of the outbreak. To prevent and control the further spread of the outbreak vaccination, case management and public health education were instituted.

Acknowledgment

The investigation team would like to thank Kindo Didaya woreda health office, Wolayeta zone health department and SNNPR health bureau for their active participation and kind assistance in conducting this investigation. We also want to express our deep gratitude for volunteers who participated in this study. Finally we thank Ethiopian Public Health Institute and Ethiopian Public Health Association for the field work arrangement.

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5.2. Yellow fever outbreak in Male district, southern Ethiopia, 2014

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Abstract

Introduction: Ethiopia is one of the East African countries endemic to yellow fever disease though zero surveillance reporting for 48 years. On January 15/2014 outbreak of yellow fever was reported from Male district, Southern Ethiopia. Team deployed to the area to investigate the outbreak and recommend possible prevention and control measures.

Method: Case study was conducted along with surveillance reports and medical records review was executed. Serum samples were collected for laboratory investigation.

Result: A total of 3 cases with 2 deaths (CFR 66.6%) were occurred. All the reported cases were male farmers working in one area called Erepo; the area have pond and it share border with Benatsemay district where previous outbreak of yellow fever reported. Serum specimen was collected from 2 cases and had positive ELISA test for yellow fever, confirmed by RT PCR at WHO Dakar reference laboratory. Among the cases 2 were unvaccinated and vaccination history was unknown for one case.

Conclusion: Yellow fever outbreak was occurred in Male district. All cases were male farmers working in one area and unvaccinated. We recommend strengthening surveillance, implementing vaccination of previously unvaccinated population and health education to the community and sensitize health workers to consider yellow fever in their differential diagnosis.

Key word: Yellow fever, outbreak investigation, Male district, Ethiopia

Introduction

Yellow fever is an acute viral hemorrhagic disease caused by yellow fever virus; the virus is transmitted by vector mosquito primarily by Aedes species (1). It is transmitted by the bite of an infected female mosquito, and mainly affects humans and monkeys. Infection causes a wide spectrum of disease, from mild symptoms to severe illness and death. The disease is untreatable and death rates in severe cases can exceed 50% (1, 2).

Worldwide an estimated 200,000 cases of yellow fever and 30,000 deaths occurred annually; 90% of the deaths occurred in Africa. However, yellow fever morbidity and mortality is under estimated because of that number of cases expected to be 10 to 250 times greater than the current estimate (1). Effective vaccines against yellow fever have been available for almost 60 years.

Ethiopia is one of the east African countries that are endemic to the disease. Largest outbreak of yellow fever with an estimated 300,000 cases was occurred from the year 1960-1962. Studies also showed reappearance of the outbreak in 1966 in Arba Minch, east of Lake Abaya, in area not affected by the outbreak of 1960 (5). Then after 48 years, starting from May 2013 the country is being reported an outbreak from Southern Nation and Nationalities People Region. On January 2014, outbreak of yellow fever reported from Male district which is not previously affected by the May 2013 outbreak. The team deployed to the area to investigate the outbreak and to recommend possible prevention and control measures.

Methods

Case study was conducted and surveillance reports and medical records were reviewed. Yellow fever cases were defined as any person with fever, bleeding from gum or skin, jaundice within two weeks of onset of first symptoms or any person with fever and jaundice. A structured questionnaire was used to interview the patients and informed verbal consent was obtained from the study participants. Information was collected regarding age, gender, history of vaccination before illness, travel history. Serum samples were collected from patients who met the working case definition for laboratory investigation.

Result

A total of 3 yellow fever cases were reported among this 2 were death (CFR=66.6%). The outbreak was occurred in two different Kebeles (lowest administrative level); Gongode (2 case) and Damiker (1 case). Serology test were conducted for 2 cases and had positive ELISA test for yellow fever, confirmed by RT PCR at WHO Dakar reference laboratory.

First case

The first case were reported on the day 28/12/2013 from Gongode Kebele, the case is 37 years old male patient. He was farmer called –Erepo" for farming in the area the farmers will spend the day and night in their farming land. The area has pond also it share border with Benatsemay woreda where May 2013 outbreak had been reported.

The patient experienced fever, headache and muscle and joint pain on the day 21/12/2013 and he went to Damiker health post 24/12/2013. He was diagnosed as Acute Febrile Illness (AFI) and was managed by antipyretic and malaria drugs. However, the treatment could not cured him rather he developed abdominal pain, blood vomit, blood in urine, Jaundice and Kidney failure as a result he referred to Jinka hospital and admitted on 28/12/2013.While admission he was diagnosed as upper GI bleeding and recivied treatment also the physician suspected him as yellow fever and serum specimen were collected and it was positive for Yellow fever virus.. Finally he died on the day 31/12/2013 at the hospital. The patient was unvaccinated during vaccination campaign conducted on May 2013 due to unknown reason

Case 2 and 3

The second case was a 30 years old male coming from Damiker Kebele. He is farmer and his farming area is similar with the first case and also similarly he spent most of the day and night in the farming area.

The patient developed vomiting with blood, diarrhea, jaundice, chest pain and epigastria pain for 3 days, the date of onset of the illness was 31/12/2013 then he went to Damiker health post on the day 2/1/2014 and diagnosed as acute febrile illness (AFI) and peptic ulcer disease and he was managed with Glucose 40%, Cotrimoxazole, Gentamicin, Mebendazole and Diclofenac drugs. However the patient died by 3/1/2014 at home. The patient vaccination history was unknown and serum specimen was not collected.

The third case is 20 years old male coming from same kebele with second case (Damiker). He is farmer and his farming area is similar with the first and second case.

He experienced fever, headache, muscle and joint pain, epigastria pain, anorexia, vomiting, reduced amount of urine and diarrhea, on the day 7/1/2014, then he went to Damiker health post on the date 9/1/2014 and diagnosed as AFI and received treatment with antipyretics and malaria drugs. Because the patient illness becoming severe he referred to Jinka hospital, upon admission at the hospital, he was diagnosed as upper GI bleeding and serum specimen were also collected for yellow fever laboratory investigation and was positive test. The patient was un-vaccinated previous to the illness. Finally the patient becomes cured.

Discussion

The cases were reported from two kebeles that was Damiker and Gongode and both cases share the same environment during farming. Their farming area is called –Erepo" on the area there is available pond. Yellow fever mosquitoes (Aedes aegypti) are extremely common in areas lacking piped water systems, and depend greatly on stored water for breeding sites (4). The availability of the pond in their farming area facilitates the breeding of mosquito; the cases spend the day and night at their farming area therefore farmers working in the area are more exposed to mosquito bite. In addition on May 2013 outbreak, the index case was farmer working in similar farming area where in the border of Benatsemay district.

The peak biting times for many mosquito species is dusk to dawn. (4). The Malle woreda weather condition is warm and the population wearing style is short sleeve and pants therefore they are more exposed for biting of mosquito.

The yellow fever infection has an incubation period of three to six days (2). Early symptom includes myalgia, pyrexia, headache, anorexia, nausea, and vomiting. In many patients there will be improvement in symptoms and gradual recovery three to four days after the onset of symptoms; as a result there is a possibility that the patient can be cured at home without visiting health facility and this contribute the disease to become under reported. In addition, the disease is difficult to diagnose during early stage it can be confused with sever malaria, dengue fever, leptospirosis, viral hepatitis specially the fulminating form of hepatitis B and D and other

hemorrhagic diseases fevers (3). Therefore it will be difficult to recognize the disease clinically by peripheral health workers.

Yellow fever can be prevented through immunization with 17D yellow fever vaccine. A single dose provides protection for at least 10 years and possibly life-long (1). Among the total reported 3 cases 2 were unvaccinated and one had unknown vaccination history however the district conducted vaccination campaign on May 2013 after the occurrence of outbreak in neighboring district and they vaccinated 80,352 (84.99%).

In conclusion Yellow fever outbreak was occurred in Male district. All cases were male farmers working in one area and unvaccinated. Therefore strengthening surveillance, implementing vaccination of previously unvaccinated population and community health education is recommended to prevent the occurrence of future outbreak in the area

Acknowledgment

Our sincere thank go to South Omo zonal health department and Malle woreda health office for their active participation and assistance in conducting this investigation. The team also would like to thank Ethiopian Public Health Institute and Ethiopian Public Health Association for availing per diem and vehicle.

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Chapter VI: Abstract for scientific presentation

6.1. The Epidemiology of rubella disease in Ethiopia: 2008-2012

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Abstract

Introduction: Rubella is a mild viral disease. However, rubella infection in pregnancy is major public health importance due to teratogenic effects that can result from congenital rubella syndrome (CRS). In Ethiopia, Rubella surveillance is not established and therefore little is known about the epidemiology of rubella disease. This data analysis was conducted to describe the burden, disease trend and seasonality of rubella disease in the country.

Methodology: Five year data of Rubella disease which was reported through measles case based surveillance system for laboratory confirmation of Measles and Rubella IgM antibody to EPHI was analyzed to describe the epidemiology of Rubella disease in the country

Results: A total of 11,026 samples were tested for Rubella IgM and 1346(12%) cases were positive for Rubella. The vast majority, 1231(91%) of cases were below the age of 15 years and 53% were females. Among the total Rubella positive cases, 1317(98%) had information on patient area of residence (rural vs. urban); of these, 684 (51%) were from rural area and 633(47%) from urban area. Addis Ababa 275 (2/100,000), Hareri 18 (1.8/100,000) and Dire Dawa 24 (1.3/100,000) contributed higher number of cases. Within the five year period, the annual incidence of Rubella cases increased 67% from 0.3/100,000 in 2008 to 0.9/100000 in 2012. Annually, increments in the number of cases were observed from March to June.

Conclusion: Rubella is common in young children‘s below the age of 15 years. The disease is widely distributed throughout the country and it is more common in rural areas than urban areas. It occurred seasonally with peak from March to June. To further understand the burden and epidemiology of Rubella and CRS in Ethiopia surveillance system should be established.

Key words: Rubella, Ethiopia.

6.2. Investigation of measles outbreak in Kindo Didaya district, Southern Ethiopia, October 2013

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Abstract

Introduction: Measles remains the leading cause of childhood morbidity and mortality in the world. In Ethiopia measles account 4% of childhood mortality. On October 2, 2013, a suspected outbreak of measles was reported in Kindo Didaya district. We investigated to identify risk factors and to institute prevention and control measures.

Methods: Unmatched case control study was conducted. A measles case was defined as a person with fever, maculopapular rash, and either cough, coryza or conjunctivitis. Controls were individuals who had no Clinical signs of measles and residing in the same communities where cases were identified. Five blood samples were collected for laboratory confirmation. Logistic regression was used for analysis.

Result: A total of 50 cases and 100 controls were recruited. The mean age for cases was 8.4years while for controls were 8.6 years. A total of 8 deaths with case fatality rate of 1.4% were attributed to measles. All the collected five samples were measles IgM positive. Being unvaccinated (OR= 6.62; CI: 2.29-19.10), having contact with suspected or confirmed cases (OR= 12.6; CI: 3.52-39.62) and mothers illiteracy (OR =4.75; CI: 1.51-12.38) was associated with contracting measles.

Conclusion: There was an outbreak of measles in Kindo Didaya district. Being un-vaccinated**,** having contact with suspected or confirmed case and mother‘s illiteracy were contributed to the occurrence of outbreak. Vaccination, case management and public health education were instituted as a prevention and control measure.

Key words: Measles outbreak, kindo Didaya, Southern Ethiopia

6.3. Investigation of yellow fever outbreak- Malle District, Southern Ethiopia, 2014

Etsehiwot Zemelak[1], Debritu M.[1], Abreham L.[1], Alemayehu B.[2], Alemayehu W.[3]

1. Ethiopian Public Health Institute, 2.Ethiopian Public Health Association, 3.Addis Ababa University

Abstract

Introduction: Ethiopia is one of the east African countries endemic to yellow fever disease though zero surveillance reporting for 48 years. On January 15/2014 outbreak of yellow fever was reported from Male district, Southern Ethiopia. Team deployed to the area to investigate the outbreak and to recommend possible prevention and control measures.

Method: Case study was conducted along with surveillance reports and medical records review was executed. Serum samples were collected for laboratory investigation.

Result: A total of 3 cases with 2 deaths (CFR 66.6%) were occurred. All the reported cases were male farmers working in one area called Erepo; the area have pond and it share border with Benatsemay district where previous outbreak of yellow fever reported. Serum specimen was collected from 2 cases and had positive ELISA test for yellow fever, confirmed by RT PCR at WHO Dakar reference laboratory. Among the cases 2 were unvaccinated and vaccination history was unknown for one case.

Conclusion: Yellow fever outbreak was occurred in Male district. All cases were male farmers working in one area and unvaccinated. We recommend strengthening surveillance, implementing vaccination of previously unvaccinated population and health education to the community and sensitize health workers to consider yellow fever in their differential diagnosis.

Key word: Yellow fever, outbreak investigation, Male district, Ethiopia

Chapter VII. Narrative summary of disaster situation visited

Belg health and nutrition needs assessment-Southern Ethiopia, 2013

Executive summary

The government of Ethiopia has been conducting emergency health and nutrition assessment in the past years to address the emergency health and nutrition need of the country. The assessment is conducted twice in a year following post harvesting season, Belg and Meher. The assessment is led by the Federal Disaster Response Management and Food Security Coordination office in collaboration with MOH, MOW, NMA and NGOS (MSF-S,SC) and UN Agencies (WHO,UNICEF and WFP).

The year 2013 Belg assessment was conducted from June 16-30, the main objective of the assessment was to identify areas where emergency health and nutrition assistance needed for the upcoming six months and to determent the gap in the capacity of the health system in addressing anticipated risks so as to develop response plan. To address this objective, standard checklists classified by Region/Zone and woreda level were used to collect health and nutrition information. The assessment was conducted in 5 Zones and 1 Special woreda. From each Zone, two woredas were selected based on emergency health and nutrition problems in consultation with the SNNP RHB and ZHDs.

Multi-sectorial PHEM coordination forum at all Zonal and Woreda level aveliable and different governmental and nongovernmental organizations are involved in the forum. At Zonal level the forum meets monthly.

From March to May, no outbreak reported from all woredas and Zones. Epidemic preparedness and response plan is available in all visited zones and woredas. However, the plan is not supported by budget.

Malaria in Hadiya Zone; Malnutrition and Malaria in Gedeo Zone; Measles, meningitis and Malaria in Silte Zone; and Malaria & meningitis in Kembata Tembaro zone are the anticipated risk. As well as, population at risk are identified and a total of 651,973, 375,150, 590,621, 763,416 are estimated to be the identified at risk population to be affected by the disease.

Background

Southern Nations, Nationalities and People Region is one of the big and diversified region of the country with a total of 15 zones and 136 woredas with 4 special woredas. The region is located Southern and South-Western part of Ethiopia. The total area of the region estimated to be 110,931.9 Sq. Km which is 10% of the country and inhabited by a population size of about 17, 857,192 in 2013 G.C, and 20% of the total population of the country. The population density of the region became 142 persons per sq.km, which makes the region one of the most populous parts of the country. In the region, there are 8 Zonal Hospitals, 12 District Hospitals, 165 Health Centers, 237 developing health centers & 2,720 health posts, a total of 3,142 health facilities are available in the region. The potential health service coverage of the region reaches 80% (1).

In the region, the causes of mortalities and morbidities are mostly attributed to lack of clean drinking water, poor sanitation, and low public awareness of environmental health and personal hygiene practices. Therefore, this factor exacerbates the vulnerability of the population to disease outbreaks.

The government of Ethiopia has been conducting multi agency emergency health and nutrition assessment in the past years to address the emergency health and nutrition need of the country, the assessment is conducted twice in a year following post harvesting season Belg and Meher. The assessment is led by the Federal Disaster Response Management and Food Security Coordination office in collaboration with the Ethiopian Ministry of Health, SNNP regional health bureau, National Metrology Agency and respective bureaus, WHO, UNICEF, OCHA, MSF-S.

The assessment was conducted from June 16-30/2013. Team was comprised from FMOH/EPHI, SNNPR RHB, WHO, UNICEF, MSF-S and SC was involved in the assessment. The assessment conducted in five zones and 1 special woredas of SNNP region. The aim of this assessment is to identify areas where emergency health and nutrition assistance needed for the upcoming six months and to determine the gap in the capacity of the health system in addressing anticipated risks so as to develop response plan.

Objective

- To assess the extent, types, magnitude, and severity of different risks in the most –vulnerable" woredas
- To assess the existing capacity and gaps of the health system to address those risks
- To identify areas where emergency health assistance might be needed during the upcoming months of 2013.

Methodology

Study Area and period

The assessment was conducted in Gurage, Silte, Kemabata Tembaro, Hadya, Gedo Zones and Halaba special Woreda of SNNP region. From all Zones two woredas were selected and visited. The Zones and woredas were selected based on their disease trend. The assessment was conducted from June 16 - 30/2013.

The assessed Zones were selected by the SNNP regional health bureau based on their disease trend such as ongoing disease outbreak and poor surveillance system. Similarly two woredas from each Zones were selected by Zonal health departments and Regional health bureau.

Assessment Team

Twelve experts from federal DRMFSS, EHNRI, NMA, SNNP RHB, WHO, UNICEF, MSF – S and SIC were participated in the assessment. Half day orientation was given for all assessment team at federal DRMFSS before deployed to regions.

Assessment Tools

Structured questioner was used for data collection. Two different questioners were used to collect health and nutrition related data at district and zonal levels. The questioners addresses socio-demographic profile, health profile, status of epidemic prevention and control multi sectoral coordination committee at all levels and go through asking ongoing epidemic situation and check availability of emergency drug at zonal and district levels. (Annex 2 & 3)

Source of Data

Data were collected through discussion and interview from Zonal Health department and woreda health offices. Head of Zonal and woreda health offices, PHEM officers, Health promotion and Disease Prevention officers, Pharmacists were interviewed in the data collection.

Findings

Zonal Level findings

Coordination

In all assessed zones multisectoral coordination forum are available. In the forum all relevant government, nongovernmental organizations and UN agencies are represented, the forum is led by Zonal administrator having zonal health office as a secretariat. The forum meets on monthly and quarterly basis except in Silte Zone in which the forum does not meet regularly, while only during outbreak.

Outbreak

During the last three month (March-April, 2013) except in Silte Zones, no outbreak reported from all zones. In Silte Zone, Sankura woreda there was measles outbreak, a total of 21 cases and zero death was reported. The outbreak started on 10/6/2005 and ended 13/07/2005.

Anticipated epidemic

In all assessed Zones, Malaria is the anticipated risk. In addition, AWD (Kembata Tembaro, Hadyia, Alaba and Gurage Zones), Flood (Alaba, Hadiya and Silte Zones), Measles (Hadiya and Silte Zones) and Meningitis (Hadiya, Gurage, Silte, Gedeo zones) are the major anticipated risk.

Public Health Emergency Management

Public health emergency preparedness and response plan is available in all assessed Zones. The plan is not supported by budgeted but during emergency or if an outbreak occurred resources will be mobilized from governmental and nongovernmental organizations. In all assessed Zones there is a trained staff on Public Health Emergency Management. However, high staff turnover is the challenge in most of the zones. Rapid Response Team is only available in all visited Zones and the team will only be activated if outbreak or emergency situation occurred.

Stock

In all assessed Zones there are no sufficient emergency drugs and medical supplies used to treat Malaria, Measles, Meningitis, AWD and supplies used for delivery and its complication at their store (annex 4).

Requirements /Needs/

Due to the presence of malaria breeding site, unprotected irrigation and low ITN utilization, Malaria is identified as risk factor for epidemic to occur in the upcoming months. In addition, though national measles vaccination campaign was conducted before one month of the assessment, Measles is identified as a risk for the reason that from all vaccinated children at nine month; only 85% will be protected against measles disease the other 15 % vulnerable due to the vaccine potency. More on that meningitis identified as a risk, due to the presence of meningitis in the neighboring zones and the presence of unimmunized population. Moreover, due to shortage of water for drinking, poor personal hygiene and low sanitation coverage AWD is the anticipated risk for the upcoming six month (Table 1).

Table 12: Type of risk and population to be affected identified at Zone level, August-December, 2013

Zone	Woreda at Risk	Type of risk	At risk population
Hadiya	Soro	Malaria	225,334
	Shshego	Malaria	123,602
	East Badawocho	Malaria	204,256
	West Badawocho	Malaria	98,781
	Total		**651,973**
Gedeo	Dilla Town	Malaria	96,000
	Dilla Zuria	Malaria	62,998
	Wonago	Malaria	101,405
	Kochore	Malaria	1,525
	Wonago	SAM	113,222
	Total		**375,150**

Silte	Silte	Measles, meningitis and Malaria	194372
	Lanfro		94081
	Sankura		238881
	Dallocha		104204
	Hulbasa		99045
	Allich Wurriro		75038
	Total		**805,621**
Kembata Tembaro	HTZ	Malaria	690,577
	Kacha bira	Malaria	
	Kedida Gamila	Meningitis	72,839
	Kacha bira	Meningitis	
	HTZ	Meningitis	
	Total		**763,416**
Gurage	Mareko	Malaria	100,677
	Meskan	Malaria	75,306
	Total		**175,983**

Woreda level findings

Coordination

In all visited woredas there is functional multisectoral PHEM coordination forum lead by the chief Woreda administrator and rapid response team composed of mix of health professionals. There is PHE preparedness and response plan in all assessed woredas. However, the plan is not supported by budget but, if there is outbreak or any emergency resources will be mobilized.

Top five causes of morbidity

Malaria is one of the top leading causes of morbidity in both below five years of age and above five years of age (table 13)

Table 13: Top five causes of morbidity by age group, 2013

Zone	Woreda	Rank	Top five causes of morbidity	
			Below five	**Above five**
Kembata Tembaro	**Kedida Gamila**	1	Malaria	Malaria
		2	Typhoid fever	Typhoid fever
		3	AFI	AFI
		4	Helementhiasis	Helementhiasis
		5	Trauma	Trauma
Kembata Temabro	**Kacha Bira**	1	URTI	Malaria
		2	Malaria	AFI
		3	Pneumonia	Pneumonia
		4	Skin infection	Typhoid fever
		5	Diarrheal disease	URTI
Hadiya	**Shashego**	1	Malaria	Malaria
		2	Pneumonia	Typhoid fever
		3	Diarrhea	Pneumonia
		4	AURTI	Trauma
		5	Other unspecified infection and parasite	Other unspecified infection and parasite
	Misrak Bedawocho	1	Malaria	Malaria
		2	URTI	Typhoid fever
		3	Pneumonia	Pneumonia
		4	AGE	AFI
		5	Conjuctivitis	PUD
Silte	**Lanfuro**	1	Malaria	Malaria
		2	Pneumonia	Intesitinal parasite
		3	Diarrhea	URTI
		4	Conjuctivitis	Pneumonia
		5	Tosilitis	Accidental cases
	Sankura	1	Malaria	Malaria
		2	Pneumonia	Pneumonia
		3	Diarrheal disease	Intesitinal parasite
		4	Malnutrition	Typhoid fever
		5	Otitis Media	Urinary Tract Infection
Gurage	**Meskan**	1	Pneumonia	Malaria
		2	Malaria	Pneumonia
		3	Diarrheal disease	Acute Febrile Illness
		4	All respiratory diseases	Urinary Tract Infection
		5	AFI	Disease of musculoskeletal system and connective tissue
	Mareko	1	Malaria	Malaria
		2	Pneumonia	Pneumonia
		3	Diarrhoea (non bloody)	Trauma
		4	URTI	Helmenthiasis
		5	Diarrhea with dehydration	URTI

Gedeo	**Wonago**	1	Diarrheal disease	Helementhiasis
		2	Pneumonia	Malaria
		3	Malaria	Typhoid fever
		4	Helementhiasis	Acute Febril Illness
		5	Upper Respiratory Infection	Trauma
	Dilla Zuriya	1	Pneumonia	AFI
		2	Diarrhea	Malaria
		3	Malaria	Helmenthiasis
		4	Helmenthiasis	Typhoid fever
		5	Otitis media	Trauma

Outbreak

During three month period (August – October) no outbreak occurred in all assessed woredas. Moreover, there is no ongoing outbreak.

Preparedness

In all assessed woredas, emergency drugs and supplies do not stored at their store. However, any drugs and supplies received from Zonal health department will be distributed to health facilities but, in case of emergency or outbreaks, they will mobilize necessary drugs and supplies from health facilities and dispatch to the affected area.

Except in Shashego woreda of Hadiya zone, PHEM guideline was available and distributed to all health facilities. There is trained RRT in all visited woreda and there is trained staffs on emergency reproductive health.

Risk Factors

Malaria

All assessed woredas are malaria endemic.12 kebeles (96,605 populations) in Wenago woreda and 7 Kebeles (56,611 populations) in Dilla Zuria woreda of Gedeo Zone, 27 kebeles (137,813 populations) in Lanfuro and 30 kebeles (100,925 populations) in Sankura woredas of Silte Zone. Shashego 36 kebeles and East Bedawecho 39 Kebeles of Hadiya Zone, 18 kebeles (98,911 population) in Kacha Birra and 10 Kebeles (52,733 population) in Kedida Gamella of Kembata Tembaro Zone, 26 kebeles (100,677 population) in Meskan , and 26 Kebeles (75,306 population)

in Mareko woredas of Gurage Zone are identified as Malarious. In all assessed woreda malaria prevention and control activity is going on.

The following risk factors were identified for malaria:

- Malaria endemic area
- Presence of malaria breeding site
- Interrupted or potentially interrupting rivers except for Lanfuro

The new malaria guideline had been distributed to all health institutions, and health professionals were also trained on it.

Meningitis

Meningitis outbreak was occurred in Kacha Birra wored Tembaro Zone from March till May in 2012 with a total of 67 cases in 14 kebeles of the woreda. All cases were treated and discharged as cured without any death report. As a result of the outbreak, 49,699 people were vaccinated (2 yrs- 30 yrs old). In other assessed woredas there was no meningitis epidemic, and vaccination in the last three years.

There is no meningitis outbreak control guideline in the health institutions except in East Bedawocho woreda of Hadiya Zone and Halaba special woreda. However, selected health professionals from all assessed woredas were trained on it.

AWD

There was no AWD epidemic in the last three years in all woredas. Cholera outbreak control guideline was not distributed to all health institutions in Lanfuro and Sankura wordas of Silte Zone, Wenago woreda of Ggedeo zone and in Halaba special woreda.

Measles

There was no ongoing measles outbreak in all assessed woredas, national measles vaccination campaign (SIA) was conducted on May 2013, the SIA was conducted for children in the age groups of 9-59 month. All assessed woredas conducted the vaccination campaign.

The new measles guideline had been distributed to health institutions in all woredas and health professionals were also trained on the newer guideline.

Nutrition

The number of Malnourished children admitted in TFP was high in March 2013 in Kacha Birra and Kedida Gamela, Shashego, East Bedawocho, Sankura, Lanfuro, Meskan woredas and started to decrease starting from April as shown in the below graph (figure 1). In contrary, the number of TFP admission is increased in Wenago worda of Gedeo zone and in Mareko woreda of Gurage Zone.

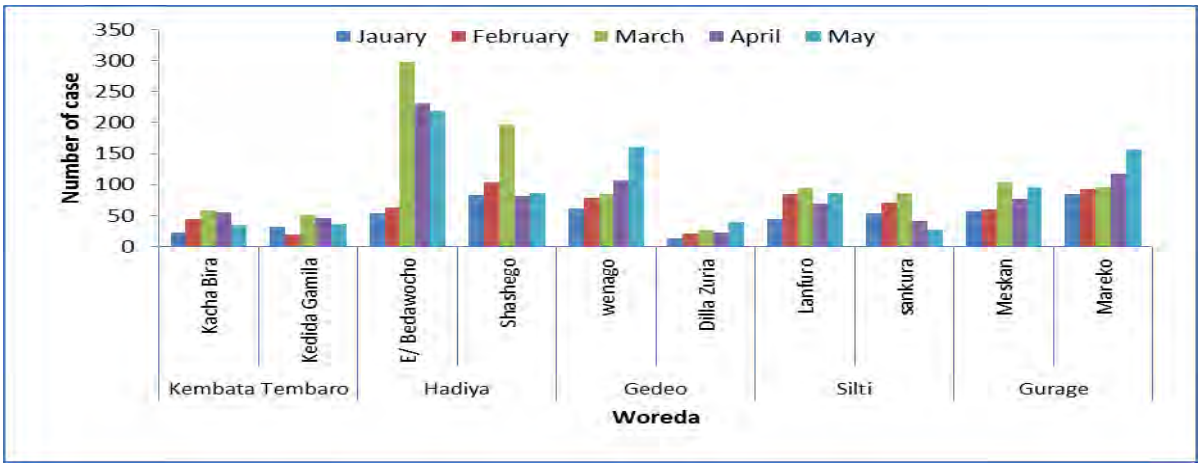


Figure 14: SAM cases reported by woredas, from January-May, 2013

Table 14:SC and OTP sites by Zone, From January – May, 2013

Zone	Woreda	SC	OTP
Kembata Tembaro	Kacha Bira	1	28
	Kedida Gamila	1	22
Hadiya	E/ Bedawocho	3	39
	Shashego	5	41
Gedeo	Wenago	3	21
	Dilla Zuria	2	27
Silte	Lanfuro	5	27
	Sankura	3	29
Gurage	Meskan	3	22
	Mareko	5	21

Except Kacha Biraa woreda and Kedida Gamila woreda of Kembata Tembaro Zone, there is an adequate therapeutic supply of F-100, F-75, RUTF enough for one month in all assessed woredas. There were no SFP in Lanfuro and Sankuro woredas of Silte Zone and Kedida Gamila

and Kacha Birra woredas of Kembata Tembaro Zone hence all children discharged from TFP were not referred supplementary feeding program (SFP).

Conclusion

There was a functional multi-sectoral coordination forum, the forum meets regularly except in Silte Zone. From March to April there was an outbreak of measles in Sankura woreda of Silte zone, the outbreak started February 10-March 7/2013 and a total of 21 cases with zero death were occurred. In other zones and woredas there no outbreak occurred. Malaria in all assessed zones, Sever Acute Malnutrition (SAM) in Gedeo zone, measles and meningitis in Silite zone, Malaria and meningitis in Kembata Tembaro were anticipated risk. As well as atotal of 651,973 populations in Hadya zone, 375,150 in Gedeo zone, 905,621 in Siliti zone and 175,983 in Gurage zone were the identified as risk population.

There is Emergency preparedness and response plan. However, budget is not allocated at all assessed zone and woredas except in Lanfuro and Sankura woredas of Silte Zone There is flexible system which is used to mobilize drugs and medical supplies from any health facility in the zone during an outbreak situation but emergency drugs and medical supplies do not stockpiled at zonal and woreda level store.

Absence of adequate therapeutic supplies (F75 and F100) in Kedida Gamila woreda of Kembata Temabro, Lanfuro and Sankura woredas of Silte Zone. Moreover, children discharged from the OTP are being sent home without enrolling them into supplementary feeding program because of lack of TSF supplies in all woreds of Silte zone and Kembata Tembaro zones

Recommendations

- Strengthening the control and prevention of measles, malaria, AWD and meningitis.
- The woredas EPRP should be supported by budget
- Capacity building, training on PHEM to cope up with the high turnover of staffs by the RHB/PHEM and WoHOs
- Planning should be made at Zonal and Woreda level to allocate budge for purchasing emergency drugs and supplies and stockpiling them at zonal and woreda level store

- Adequate therapeutic drugs and medical supplies should be availed.

Reference

1. Belg Season Rapid Emergency Needs Assessment Report, Health Sector. Southern Nations and Nationalities People‘s Region, June 2012

Annex 4: health and nutrition needs assessment questionnaire

Woreda level Questionnaire

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

Region:_____ Zone:_____Woreda_____

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

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

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

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

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

2.3. List number of cases/deaths from Tir 2005 to Ginbot 2005 (Jan–May 2013)

Month	AWD		Malaria		Measles		Meningitis		Other(specify)	
	Cases	Deaths	Cases	Deaths	Cases	Deaths	Cases	Deaths	Cases	Deaths
Jan 2013										
Feb 2013										
Mar 2013										
April 2013										
May 2013										

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

2.4. Outbreak?

Was there any outbreak in the last 3 months? (August- October)	Yes□ No□

If yes, specify the disease:

Disease outbreak _____# of cases : _____ ___Deaths _____(time period DD/MM/YY))_____

Disease outbreak _____# of cases : _____Deaths _____(time period DD/MM/YY)_____

Is there any ongoing outbreak of any disease?	**Yes□ No□**

Disease outbreak _____# of cases : _____Deaths _____(Start date)_____

Disease outbreak _____# of cases : _____Deaths _____(Start date)_____

Disease outbreak _____# of cases : _____Deaths _____(Start date)_____

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

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

Artesunate (Injection) for Malaria	Yes□ No□
Artemether IM for Malaria	Yes□ No□
Quinine (PO) for Malaria	Yes□ No□
Quinine (IV) for Malaria	Yes□ No□
Chloroquine for Malaria	Yes□ No□
Ceftriaxione (Meningitis)	Yes□ No□
Lab supply: RDT for Malaria	Yes□ No□
Lab supply: RDT (pastorex) for M eningitis LP set	Yes□ No□ Yes□ No□
Number of CTC kit available: (for AWD)	Yes□ No□
Clinical Delivery Assistance kit PART A: Reusable Equipment	Yes□ No□
Clinical Delivery Assistance kit PART B: Drugs & Disposable Equip.	Yes□ No□
Mgt. of Complications of Abortion kit (Manual Vaccum Asp. Set)	Yes□ No□
Main shortage (if any): Specify	
Is budget allocated for emergency Rapid response by the woreda Health office?	Yes□ No□
Is PHEM guideline distributed to all Health institutions	Yes□ No□
Is there a trained woreda Rapid Response Team?	Yes□ No□
Are there staffs trained on Minimum Initial Service Package for Reproductive Health?	Yes□ No□
If " Yes" please state the number of trained personnel : Male : _____ Female : _____ Total : _____	

Weekly Timeliness and Completeness (%) of Surveillance report for August – October

Month	T/C (%)	T/C (%)	T/C (%)	T/C (%)
August 2012				
September 2012				
October -2012				

SECTION III: RISK FACTORS

Diseases	**Risk factors for epidemics to occur**	
Malaria	Malaria endemic area	Yes□ No□
	Presence of malaria breeding site	Yes□ No□

Malaria	Interrupted or potentially interrupting rivers	Yes□ No□
	Unprotected irrigation in the area	Yes□ No□
	LLINs coverage <80%	Yes□ No□
	Indicate the coverage of IRS 2005_____	
	Depleted prevention and control activities	Yes□ No□
	Malaria Guideline (new)distributed to all Health facilities	Yes□ No□
	Health workers trained on the new Malaria guideline	Yes□ No□
	Number of malarious kebeles and total population in these Kebeles	Keb _____ Pop(F)_____(M)_____
Meningitis	Was there Meningitis epidemic in the last 3 years (If yes specify year)_____	
	Has vaccination been conducted in the past 3 years	Yes□ No□
	If yes : Indicate the date and number of people vaccinated	Date____ No_____
	Is there Meningitis outbreak control Guideline	Yes□ No□
	Are health workers trained on Meningitis outbreak management	Yes□ No□
AWD	Was there AWD epidemic in the last three years (If yes specify date)_____	Yes□ No□
	Latrine coverage	
	Latrine utilization	
	Safe water coverage	
	Is Cholera outbreak control Guideline distributed to all HFs	Yes□ No□
Measles	Is there ongoing measles outbreak	Yes□ No□
	What is the measles vaccination coverage of 2004, less than one year (Hamle 2003-Sene 2004)	
	Is Measles Guideline distributed to all Health facilities?	Yes□ No□
	Are health workers trained on Measles	Yes□ No□
	Has SIA been conducted in 2004 EFY	Yes□ No□
	If yes, Indicate the month and number of children vaccinated including the age group	Month_____ No. Vaccinated_____

		Age group_____

Any other observations you made or any risks of epidemics?

_____

_____

_____

_____

_____

What were the major challenges in your Epidemic response experience?

_____

_____

_____

_____

Section IV: Nutrition - TFP admissions at woreda level January to May 2013

Month	Total new SAM Cases	Total Number of TFP (OTP/SC) in the woreda	Number of SC.	Number of OTP.	Total Number of OTP/SC reported.	Therapeutic Supplies Y/N			Children Discharged from TFP referred to SFP Y/N
						RUTF	F100	F75	
Jan									
Feb									
Mar									
April									
May									

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

Any comment

_____

_____

_____

_____

_____

_____

_____

_____

_____

Region/Zone questionnaire

Interviewer name_____		Institution:_____	
Interview Date: (dd) ____/(mm)_____/2013		Region:_____Zone:_____	
Main contact at this location:	Name:_____	Position:_____	Tel:_____

1. COORDINATION			
A.	Is there a functional multisectoral coordination forum for the health sector?	Yes□	No□
B.	Are all relevant government, NGOs and UN agencies represented?	Yes□	No□
C.	Frequency of regular meeting? (Weekly, Every 2 weeks, monthly…..)_____		

2. Outbreak?		
Was there any outbreak in the last 3 months?	Yes□	No□
If yes, specify the name of disease outbreak		
Disease outbreak _____# of cases : _____Deaths _____(time period)_____		
Disease outbreak _____# of cases : _____Deaths _____(time period)_____		
Disease outbreak _____# of cases : _____Deaths _____(time period)_____		
3. Mention anticipated epidemics_____,_____,_____		
If yes please indicate Zone/Woreda at risk and risk population per anticipated risk: *(Use the back side)*		
4. Public Health emergency Management		

A.	Is there a Public Health Emergency Preparedness and Response plan?			Yes□	No□
If yes, is the plan budgeted/ funded?				Yes□	No□
B.	Is there a trained staff on PHEM (Regional/Zonal/Woreda/HFs)			Yes□	No□
If yes specify number of trained personnel per level: **Region:** Female _____Male_____**Zone:** Female_____Male_____**Woreda**: Female_____Male_____					
C.	Is there a Regional trained Rapid Response team (RRT)?			Yes□	No□
D.	Are there trained staff on Minimum Initial Service Package for RH			Yes□	No□
If yes specify number of trained personnel per level: **Region:** Female _____Male_____**Zone:** Female_____Male_____**Woreda**: Female_____Male_____					

	Drugs and medical supplies		Total requirement	Available	Gap
	i. Meningitis vaccine				
	ii. Drugs:	Coartem			
		Artesunate (rectal)			
		Artesunate (Inj)			
		Artemether IM			
		Quinine (PO)			
		Quinine (IV)			
		Chloroquine			
		Ceftriaxione			
		Oily CAF			
		Doxcycline			
		Ringer lactate			
		ORS			
		Vit A.			

	iii. Lab supplies	RDT (Malaria)			
		Pastorex (Meningitis)			
		LP set			
		TI bottle			
	CTC Kit (AWD)				
	Medical Supplies	Gloves,			
		Syringe			
		PPE			
	Clinical Delivery Assistance kit PART A: Reusable Equipment				
	Clinical Delivery Assistance kit PART B: Drugs & Disposable Equip.				
	Mgt. of Complications of Abortion kit (Manual Vacuum Asp. Set)				

Summary: Requirements/Needs/ 2013

Region	Zone	Woreda at Risk	Type of Risk	At risk Population

Region/Zone	Type of Health emergency	Total estimated Beneficiaries	Required finance
	Emergency Reproductive Health needs	Please refer the footnote	Please refer the attached matrix

Comments:_____
_____
_____
_____
_____

Chapter VIII. Protocol /proposal for epidemiologic research project

8.1. Knowledge, attitude and practice of notifiable disease surveillance and reporting among health workers

Abstract

Background: Public health surveillance is the continuous, systematic collection, analysis and interpretation of health-related data needed for the planning, implementation, and evaluation of public health practice. In Ethiopia there are 20 nationally notifiable diseases. The surveillance system in the country relies on health care providers to report notifiable diseases, outbreak or any unusual occurrence of illness to the respective health department based on the reporting periodicity. Though the surveillance system relies on health care providers, literature on knowledge, attitudes and practices of health care workers on notifiable disease surveillance is very poor. Therefore this study aimed to assess knowledge, attitude and practice of notifiable disease surveillance and reporting among health workers in Afar regional state.

Method: A descriptive cross sectional study will be employed .Government health workers who are involved in disease surveillance and reporting will be studied. A multi stage cluster sampling technique will be used to select study participants. The total number of study subjects which will be included in the study is 411.The data will be collected using self-administered questionnaire. Summary measures will be presented.

Time schedule: The study will be conducted from May to June 2014.

Cost required: The total cost required to implement this project is ETB 96, 248.25

Introduction

Public health surveillance is the continuous, systematic collection, analysis and interpretation of health and health related data needed for the planning, implementation, and evaluation of public health practice. Such surveillance can serve as an early warning system for impending public health emergencies, document the impact of an intervention, or track progress towards specified goals and monitor and clarify the epidemiology of health problems, to allow priorities to be set and to inform public health policy and strategies (1).

Surveillance forms the backbone of the health care system and is an essential indicator of the performance of service provision. Today, communicable disease surveillance attains importance more than ever due to stark reductions in travel time and improved communication systems that essentially catalyze the rapid spread of pathogens. The International Health Regulations (IHR) is a legally binding regulation to the renewed initiative of countries to collaboratively reduce the burden of communicable diseases (2). IHR enforced all member countries including Ethiopia to notify: Smallpox, poliomyelitis due to wild type polio virus, human influenza caused by a new sub type, and SARS and also events of potential international public health concern like cholera, plague, yellow fever, VHF and other diseases that have special national concern and diseases which have unknown cause and source (3).

In Ethiopia there are 20 nationally notifiable diseases. The disease are selected based on their high epidemic potential such as anthrax, avian human influenza, cholera, measles, meningococcal meningitis, pandemic influenza, smallpox, SARS, viral hemorrhagic fever, and yellow fever required internationally under IHR like smallpox, poliomyelitis, human influenza caused by a new subtype, SARS, diseases targeted for eradication or elimination it includes poliomyelitis, dracunculiasis, neonatal tetanus (NNT) and diseases which have a significant public health importance such as rabies, dysentery, malaria, relapsing fever, typhoid fever, typhus and severe malnutrition.

In the country notifiable disease are reported on weekly and immediately (within 30 minutes of identification) basis. Weekly reportable diseases are reported to the respective health department through weekly reporting forms and immediately reportable diseases are reported through case

based reporting forms. The compiled reports are reported to the respective health department through telephone communication, mail and reporting formats.

Disease surveillance and reporting in Ethiopia starts from community level in this regard health posts are the main source of surveillance information. The health post compile surveillance information in standard forms, analyzed and then forwarded to the next district health office, then the district level compile, aggregate and send the data to zone/regional state health offices, from which central level (Ethiopian Public Health Institute) receives. At all level data analysis, interpretation and dissemination of this data for those who needs it is expected to be done. For identification and detection of cases standard and community case definition is used.

Statement of the problem

Effective communicable disease control relies on effective response systems and effective response systems rely on effective disease surveillance, a notifiable disease surveillance is one for which regular, frequent, and timely information regarding individual cases requires for the prevention and control of the disease (4). The collected information is used for monitoring trends, program planning, evaluation, policy development, research, and monitoring the effectiveness of prevention and control activities. It also serve to protect the public‘s health by ensuring the proper identification and follow-up of cases and helping to improve health department distribution of limited resources for targeted investigations and interventions.

Completeness and timeliness of reporting is one measure of surveillance performance. Afar regional state is one of the regions in Ethiopia which have poor surveillance performance. Despite different effort made by Ethiopian Public Health Institute to increase their performance the completeness and timeliness of the region is below the minimum requirement 80% for the consecutive six years 2009-2014. The purpose of surveillance is to deliver information for action. Poor reporting completeness indicate the presence of under reporting of disease in the region. Therefore, in this reporting completeness, it is difficult to detect outbreaks early, trends cannot be accurately monitored and prevention and control measure cannot be taken on time.

Healthcare providers are the main source of surveillance information regarding outbreak detection and reporting, for the reason of that standard and community case definition is designed for them to report disease and condition to respective health departments (i.e; woreda,

zone, region and federal).Though the surveillance system relies on health care providers, literature on knowledge, attitudes and practices of health care workers on notifiable disease surveillance is very poor in Ethiopia. Hence this study aimed to assess knowledge, attitude and practice of notifiable disease surveillance among health workers in Afar regional state which have poor reporting completeness.

Literature review

Factors associated with knowledge

Study conducted in Nigeria among health care workers in Bennie state revealed that from the participated health care workers 98.8% of the respondents were aware of disease surveillance and notification system (5). Similarly a descriptive cross-sectional study conducted in Anambra state, Nigeria revealed 89.9% of health care workers were aware of the disease surveillance and notification system and Knowledge of use of the various forms at the facility and local government facility levels were generally low (6).

Evaluation of the notifiable disease surveillance system in Guateng province South Africa assessed awareness of notifiable disease among health care workers and the study found that 59.5% of respondents are correctly identified condition as notifiable or not (7). Another qualitative study conducted in Georgia indicate health care providers do not have accurate knowledge of list of notifiable disease and the majority of practioner do not have adequate understanding of who will use the information and for what purpose (8). On the study conducted in Germany on physicians indicate the existence of case definitions was unknown to 86.5% of the respondents; 75.2% expressed their desire to have Case definitions available (9).

A survey conducted in South Africa in King Edward VIII Hospital, Durban revealed that knowledge of notifiable disease among hospital doctors is poor and list of notifiable disease is not well known by physicians (10). Moreover study conducted in north Eastern Nigeria Yobe state showed that lack of knowledge of reporting requirement was identified as a major factor affecting disease surveillance (11).

Study conducted in Washington which examined notifiable infectious disease reporting awareness among physicians and registered nurses in primary care and emergency department settings indicated only 55% of the physicians and 63% of the registered nurses were aware of reporting procedures within their institution. Awareness was higher when employer-provided training had been provided (13).

Factors associated with attitude

A national survey conducted in Taiwan among doctors indicate the most common reasons for not reporting were "do not want to violate the patient's privacy", "reporting procedure is troublesome", and "not sure whether the diagnosed disease is reportable". Significantly higher proportions of the non-reporting doctors considered the reporting system inconvenient or were not familiar with the system. The highest percentage (65.2%) of the non-reporting doctors considered that a simplified reporting procedure, among all measures, would increase their willingness to report. In addition, a significantly higher proportion of the non-reporting doctors would increase their willingness to report if there has been a good reward for reporting or a penalty for not reporting (14).

Study conducted by Paul M.et al in New York physicians revealed attitude toward reporting: "reporting was too time consuming," "reportable disease list was too extensive," and "health department was too inefficient." reporting violated doctor-patient confidentiality," "patient refused permission to report," "patient already began treatment," and "no treatment existed for certain diseases. Besides it was indicated as reason for under reporting of notifiable disease (15).

A quantitative and qualitative study which examined general practitioners' knowledge and practices concerning reporting of notifiable conditions showed most general practioners felt uncomfortable notifying an unconfirmed case, many preferred to leave notification to the laboratory because of concerns about damaging the doctor-patient relationship, and that there is need for financial or other incentives (16).

Factors associated with practice

A study made on 400 Iranian general physicians showed 88% of the participants stated that they had never reported a notifiable disease. The study mentioned the requirement of extra time for

reporting and poor knowledge of the list of reportable diseases as a barrier for not reporting and they suggest simplifying the reporting process and shifting the responsibility for notification to another person, such as a secretary or a nurse for improve physician compliance of reporting (17).

The experimental study conducted in Nigeria studied the effect of training on notifiable disease surveillance and reporting and compared a study and control group "before and after" training program conducted. The study showed an increment on the percentage completeness and timeliness after training provided for health workers (completeness: was 2.3% before training and 52.0% after. Timeliness: was 0.0% before and 42.9% after). The study mentioned training as a positive effect on health personnel knowledge, reporting requirement and the timeliness and completeness of the disease surveillance and notification system (18).

A literature review conducted in Africa including Ethiopia on challenges with the implementation of an Integrated Disease Surveillance and Response (IDSR) system indicate mmaintaining adequate reporting forms at all levels was a major challenge for case notification in addition the study showed limited means of communication repeatedly compromised data transmission and processing at all levels in Ethiopia. As well as the study identified lack of skilled personnel, poor understanding of the use of surveillance data and shortages of basic equipment such as calculators, computers and respective software was the reason for limited data analysis. The literature review showed appropriate analysis was significantly associated with the in-service training of surveillance staff in Mozambique. Trend analysis varied depending on the disease but was more frequently available for malaria in Ghana amongst other countries (2).

Significance

This study will identify knowledge and attitude of health workers in notifiable disease and assess their practice in the region. The finding from this study will be used to improve the notifiable disease surveillance and reporting in Afar regional state. In addition, it will have an impact on improving detection of unusual occurrence of disease, monitoring trends and generally on utilizing information for action in the region.

Objective

General objective

The aim of this study is to determine knowledge, attitude and practice of health workers in notifiable disease surveillance and reporting.

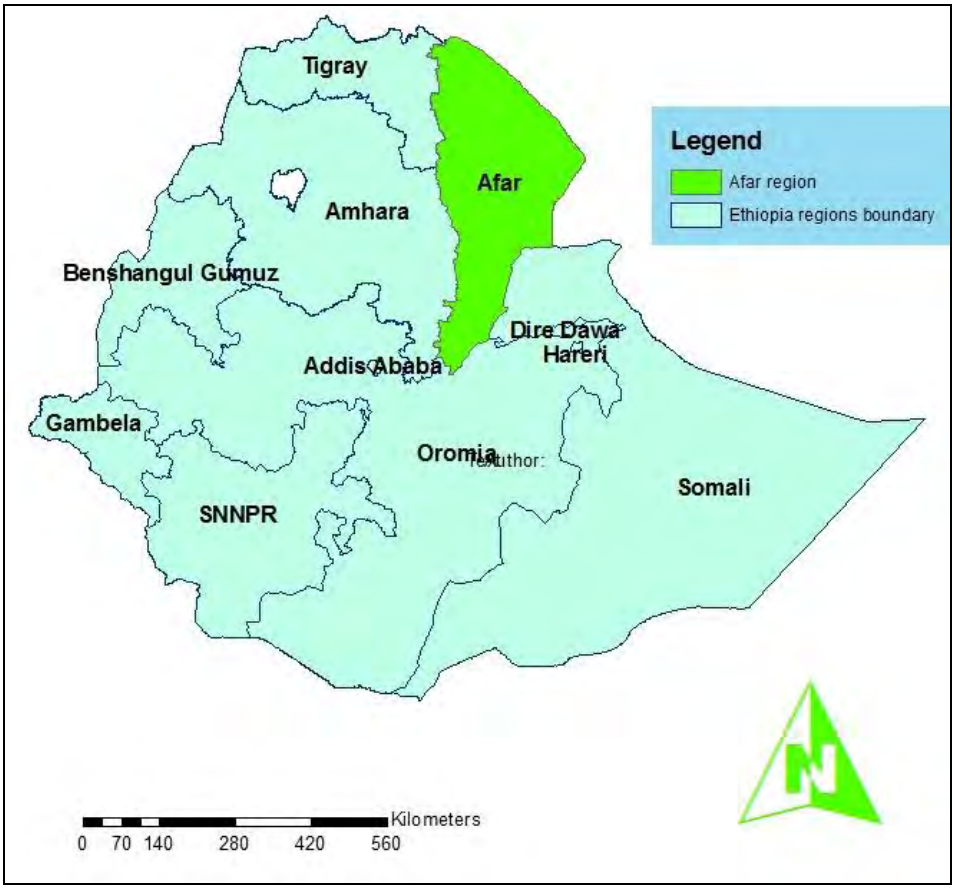
Specific objective

- To determine knowledge of health workers in notifiable disease surveillance and reporting
- To identify health workers attitude about disease surveillance and reporting
- To describe the reporting practice

Method

Study design: Descriptive cross-sectional study will be conducted

Study Area and period: Based on the 2007 Census conducted by the Central Statistical Agency of Ethiopia (CSA), Afar Regional State has 32 woredas and total population of 1,390,273 among these 775,117 men and 615,156 women. Of the total population 185,135 (13.32%) are urban inhabitant‘s and 409,123 or 29.43% are pastoralists. The region is located in Eastern part of the Ethiopia. It has 268 health posts, 69 health centers.



Source Population: All health professionals working in government health facilities in Afar regional state

Study population: All health workers working in the 22 selected woredas government health facilities in Afar regional state

Sample population: All health workers working in the 22 selected woredas government health facilities in Afar region will be included in the study

Inclusion criteria: Health workers who are involved in disease surveillance and reporting (e.g. Medical directors, physicians, health officer, nurses) working at the selected health facilities and surveillance officers working at the selected woredas will be included in the study

Exclusion criteria: health professionals who are not working at the government health facility and health worker who are not available in the study area/health facility during the study period will be excluded in the study.

Sample size

The sample size for this study was determined using the formula, $n=z^2pq/d^2$ where n = calculated as sample size, z=standard normal deviate at 95% confidence interval=1.96, p= proportion of respondents that have knowledge on disease surveillance and notification 89.8%, q = 1-pproportion and d = precision level 3%=0.03. Therefore, P=0.898. In a study conducted in Anambra state Nigeria 89.8% of the respondent were found to have knowledge on disease surveillance and notification , while $q=1-0.898=0.102$ we got a sample size of 384. With a 5% of non-response rate the sample size will be 411. Depending on the total number of health workers who are involved in disease surveillance and reporting, the final sample size required for the study will be adjusted using finite population correction.

Data variables:

Dependent variable: Knowledge, attitude and practice on disease surveillance and reporting

Sampling method:

Multi stage cluster sampling will be conducted. At first stage, Afar region has 32 woreda of this 22 woredas will be selected randomly and at the second sampling stage 5 health facilities will be selected from each woreda purposively based on health facility type. List of health facilities at the woreda level will be obtained from Woreda Health office and at third and final sampling stage a total of 6 or 2 health workers depending on the type of health facility will be selected purposively. Generally a total of 19 health workers will be selected from each woreda purposively. List of health professionals will be obtained from each health facility.

Data collections

The data will be collected using semi structured questionnaire. The questionnaire will be pretested on a sample of respondents who are comparable to the sample of the correspondents but not part of it before applying to the study populations. Participants of the study will be questioned on socio demographic questions that will be included: age, sex, work experience, level of education, employment as well as on knowledge on the purpose of disease surveillance, disease under notification, reporting route, reporting periodicity, reporting formats and they will be asked for timeliness and completeness of their data. In addition observation data on the availability of facility record and to check timeliness and completeness will be collected. The data collection will use a self-administered method.

One supervisor will be recruited for supervising data collection process and 16 data collectors will be recruited for data collection.

Validity/Reliability

The data collection method is self-administered method. Data collectors will be trained on the objective of the study and about the questionnaire. To keep the reliability and accuracy of data collection regular supervision will be made during data collection process. Data will be cleaned and checked for inconsistencies and missing values.

Data Analysis

All the collected data will be once checked for inconsistence, missing value and completeness will be coded and analyzed using the epi-info software. Proportion along with the corresponding confidence interval and frequency will be done for analysis. Composite knowledge indicator will be constructed from all the knowledge questions. A total knowledge score will be computed by coding correct responses by 1 and wrong response by 0. Depending on the symmetric distribution of the total score the mean or the median will be considered as a cut of point. Health workers score below the mean/median will be classified as having poor knowledge and those score above the mean/median will be classified as having good knowledge. Observational data will be analyzed manually.

Ethical consideration

Ethical clearance will be obtained from review board of Addis Ababa University, College of Health Sciences and the School of Public Health. . Permission will be sought from Afar regional state and from district health offices. An informed verbal consent will be obtained from every study participants before inclusion into the study by explaining the objective of the research. Privacy and confidentiality will be ensured by not writing the name of respondents on the questionnaire.

Dissemination of results

The findings of the study will be forwarded to Afar regional health office, district health offices EPHI and for those governmental organizations and non-governmental organizations interested in the subject matter. An attempt will be made to present the findings in different conferences and workshops and will be sent to publication on scientific journal.

Operational definition

Use of disease surveillance and reporting: may defined as if surveillance and reporting is used for data analysis, detect outbreak/epidemic, monitor disease trend, detect change in health care practice, detect rare but significance cause of disease, for planning, setting priorities, inform evaluation of control and prevention measure, describe trend and the natural history of diseases and conditions.

Disease selected for notification: Nationally 20 diseases are under notifiable disease surveillance and they are reported on weekly and immediately basis

The diseases are

Immediately reportable disease: AFP, Anthrax, AHI, Cholera, Dracunculiasis, Measles, NNT, Pandemic influenza A, Rabies, Small pox, SARS, VHF, Yellow fever

Weekly reportable disease: Dysentery, Malaria, Meningitis, Relapsing fever, Sever malnutrition, Typhoid fever, typhus

Reporting forms: meaning weekly reporting form, immediately reporting form (case based reporting form), line list, and epidemic reporting form.

Reporting route: defined as exchanging surveillance reports or information within health facility, woreda, regional health bureau and federal level.

Reporting periodicity: defined as immediately and weekly:

Immediately: 13 diseases are identified to be reported immediately to next reporting level. (i.e. health facility to woreda within 30 minute, woreda to region within 30 minute of and region to federal within 30 minute)

Weekly: Reporting of the total number of cases and deaths seen within aweek (Monday to Sunday) and reported to the next level (i.e. health facilities to woreda reported every Monday, woreda to region every Wednesday and region to EPHI/PHEM every Thursday)

Timeliness of reporting: meaning if the report sent from health facility, woreda, and region to the respective health department on time (depending on reporting periodicity)

Completeness of reporting: number of reported health facility during the week divided by expected health facility who should report

Annex 5: Budget beak down

Stationary and consumables

No	Items	Unit	Quantity	Unit price	Total price
1.	Notebooks	Pcs	25	9.00	225.00
2.	Eraser	Pcs	25	3.00	75.00
3.	Pen	pack	1	200.00	200.00
4.	Pencil	Pcs	25	3.00	75.00
5.	Sharpener	Pcs	12	10.00	120.00
6.	Staples	pack	10	20.00	200.00
7.	Stapler	Pcs	2	50	100.00
8.	Photocopy paper	pack	5	200.00	1200.00
	Sub total				2,195.00

Personnel and Transport cost

Work type		No	Duration	Per diem	Total cost
1	Principal investigator	1	15	208	3,120.00
2	Supervisor	1	15	208	3,120.00
2	Data collector	24	15	208	74,880.00
3	Printing and binding research report				350.00
	Sub total				81,470.00

Training cost

No	Types of expenses	Cost per items	Number of days	Total cost
1	Hall rent	500.00	1	500.00
2	Refreshment	300.00	1	7,500.00
	Sub total			8,000.00

Grand total

No	Description	Total cost(ETB)
1	Stationeries and consumables	**2,195.00**
2	Personal and transportation cost	**81,470.00**
4	Training cost	**8,000.00**
3	Contingency (10%)	**4,583.25**
4	Grand total	**96,248.25**

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Annex 6: Informed consent sheet

I. consent form

Good morning /afternoon, my name is_____ and I_m here on behalf of study team carrying out –Knowledge attitude and practice of health workers on notifiable disease surveillance and reporting in Afar regional state". The research finding will benefit on improving surveillance and reporting and this will help to improving detection of unusual occurrence of disease or outbreaks, monitoring trends and generally on utilizing information for action in the region.

We have received permission from Afar Region Health Bureau, District Health Office and from this health facility to conduct this study.

The objective of the study is to determine knowledge, attitude and practice of notifiable disease surveillance and reporting among health workers. You are selected for the study because you are in the study group with the hope that you will cooperate with us. We assure all information gathered during the course of the study will be kept completely confidential. All the information that you are going to deliver to us will be coded for anonymity. Only the principal investigators will have access to the data.

We are kindly requesting you to answer the questions that we have prepared for you.

Would you be willing to participate? Yes …….1 No …….2

Having been well explained and informed of the intentions and benefits of the study, I voluntarily consent to participate in the study.

Signature of respondent: ---------- Date: ----------

Interviewer name: ---------- Signature: ---------- Date: ----------

Annex 7: Questionnaire for assessing Knowledge, Attitude and practice of notifiable disease surveillance

Part I, Questionnaire related to socio demographic characteristics

Worda:_____ Code no:____		
Name of health facility:_____		
S.No	**Questions**	**Choice of answer**
1	Age	___ Years
2	Sex	1.Male 2.Female
4	What is your educational status?	1. Diploma 2. Degree 3. Above mention_____
5	What type of work you are currently engaged in?	1. Nurse 2. Lab. Technician 3. Physician 4. medical director 5. others mention_____
6	What is your work experience as a health worker	1.less than 1 year 2.1-5 year 3.5-10 years 3.above 10 year
7	Employment status	1.Working full time 2.Working part time 3.Free service (unemployed)

Part II: Questioners Related to Knowledge

S.No	Questions	Choice of answer
1.	Do you know the number of notifiable disease in the country	1. Yes, if yes how many are they? _____ 2.No
2.	If yes what are they (Multiple responses are allowed)	1.Malaria 2.Pandemic Influenza A 3.Measles 4.Polio 5.Anthrax 6.SARS 7.TB 8.HIV 9.VHF 10.Typhoid 11.Cholera 12.Guinea worm 13.Avian Human Influenza 14.Rabies 15.Small pox 16.NNT 17.Sever malnutrion 18.Meningitis 19.Relapsing fever 20.Hepatitis B 21.Yellow fever 22.Typhus 23.Dysentry
3	Do you know the reporting periodicity of this diseases	1.Yes 2.No
4	If yes what is the periodicity	1.Monthly 2.Daily 3.Weekly 4.Quarterly
5	What is the purpose of notifiable disease surveillance and reporting	1. to know change in trend of disease 2.for planning 3.to detect disease outbreak 4.for program planning and evaluation 5. Research purpose 7.For health education 8.for recoding case and death 9. others mention_____
6	Do you know notifiable disease reporting formats	1.Yes 2.No
7	What are they (Multiple responses are allowed)	1.Weekly reporting form 2.case based reporting forms 3.line list 4.Epidemic reporting forms 5.Rumor log book 6.HMIS reporting forms 7.Others mention_____

Part III. Questionnaire related to attitudes

S.No	Questions	Choice of answer	Skip to / code
1	Surveillance is useful to detect epidemic	1.Yes 2.No 3. Don‘t know	
2	Reporting notifiable disease or unusual occurrence of diseases important	1.Yes 2.No 3. Don‘t know	
3	Reporting communicable disease is one of the public health responsibility of health workers	1.Yes 2.No 3.Dont know	
4	How do you feel the surveillance and reporting system in general	1.Convinient 2. Not convenient 3.Not familiar with the system	
5	Reporting communicable diseases is time consuming and should not be done by health care workers	1.Yes 2.No 3.Dont know	
6	A patient is less likely to be reported if his/her diagnosis is difficult to be confirmed	1.Yes 2.No 3.Dont know	
7	If you are too busy to report or if you are engaged in another work like training would you report notifiable diseases	1.Yes 2.No 3.Dont know	
8	reporting method that you would like to use the most	1.Reporting through telephone at the facility, 2.Reporting through fax 3..Reporting through internet 4.Reporting through mobile 5.Others _____	
9	What kind of measures will increase your willingness to report	1.Simplified reporting procedure 2.Feedback of disease epidemic information from government through fax or telephone 3.recharging mobile card for reporting or reimbursement of fees of mobile card 4.Commendation by Ministry of health 5.Others _____	

IV. Factors associated with practice

1	Have you ever diagnose a reportable disease	1.Yes 2.No 3.Dont know
	Ever reported reportable communicable diseases (Among those who have ever diagnosed) surveillance and reporting	1.Yes 2.No
3	Number of times of reporting	1.one time 2.two times 3.Three times 4. Four times 5. More than 4 times
4	For whom you report	1.Medical director 2.Surveillance officer 3.Woreda health office 4.Regional Health bureau 5. for EPHI
5	What was methods of reporting	1.Fax 2.Internt 3.Reporting sheet 4.Telephone 5.Others mention_____
6	When do you report the weekly reportable disease to the next reporting level	1.Monday 2.Tuesday 3.Wedensday 4.Friday 5.Other_____
7	Do you have reporting formats (Observe)	1.Yes 2.No

8	Which reporting formats are available (Observe)	1.Weekly reporting form 2.Case based forms 3.Line list 4.Epidemic reporting form 5.Other_____
9	What is the timeliness of your report within the past six month (Check from the record)	1.Above 80% 2.Below 80%
10	If the answer for Question no.---- is Below 80% mention the exact reporting Timeliness no.	_____
11	What is the completeness of your report within the past six month (Check from the record)	1.Above 80% 2.Below 80%
12	If the answer for Question no.11 is Below 80% mention the exact reporting completeness no.	_____
13	Have you ever gave feedback information to the reporting health facilities	1.Yes 2.No
14	If yes Observe the feedback records (2 month)	
15	Do you analyze surveillance data (Observe)	1.Yes if yes, Observe 2 month analysis 2.No
16	If the answer for Question no.14 is no what is the reason	1.Unaveliablity of computer 2.Skill gap 3.Because it is not valuable to analyze data 4.Other_____

Chapter IX. Public Health Emergency Public Health Emergency Management Weekly bulletin

Public Health Emergency Management Week 23 (June 3-9/2013) Bulletin

Highlights of the week

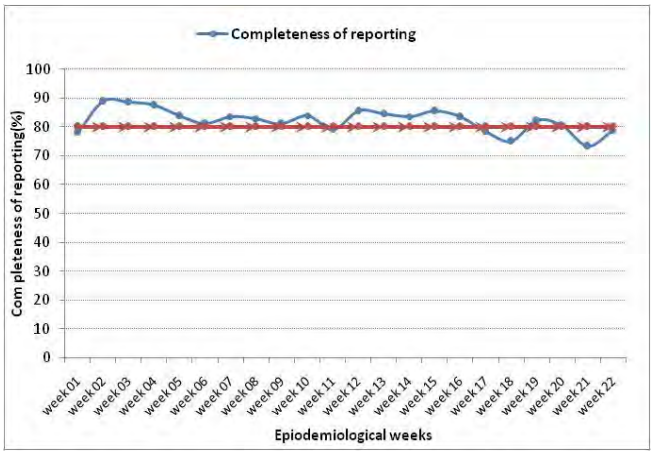
- The national PHEM report completeness and timeliness was 86.6%
- National malaria trend decreased by 3.7%
- Measles epidemic continued in Amhara, Oromia, SNNPR and Tigray regions
- A total of 575 AFI cases are reported from One woreda in Afar region

I. Introduction

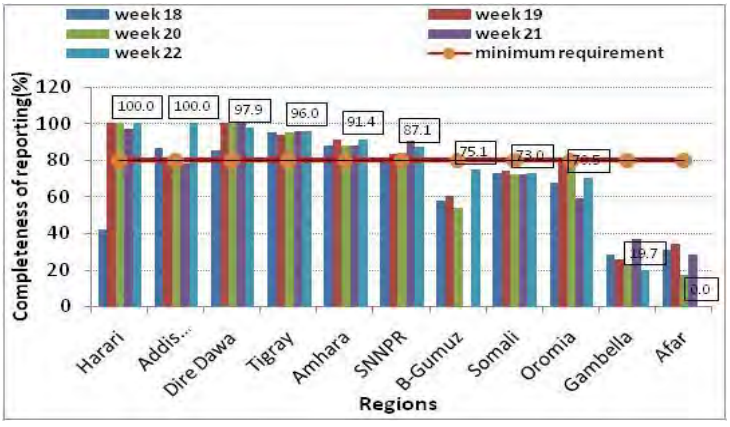
This bulletin serves to provide information on public health emergency management activities, and summarizes surveillance data and performance on epidemic prone diseases and other public health emergencies. It includes surveillance data of week 7-14 and daily phone communication, line list reports of outbreaks for week 15 of 2014. It highlights the surveillance completeness and timeliness across the regions, trends of diseases under surveillance, cluster of cases and events, ongoing outbreaks and responses undertaken at all levels.

II. Completeness of reporting

On week 22, the national surveillance report completeness rate was 78.9% which is below expected minimum standard (80%). However, six regions (Addis Ababa, Harari, Tigray, SNNPR, Dire Dawa and Amhara) met the minimum requirement. By this week, the completeness rate increased by 5% compared with week 21.



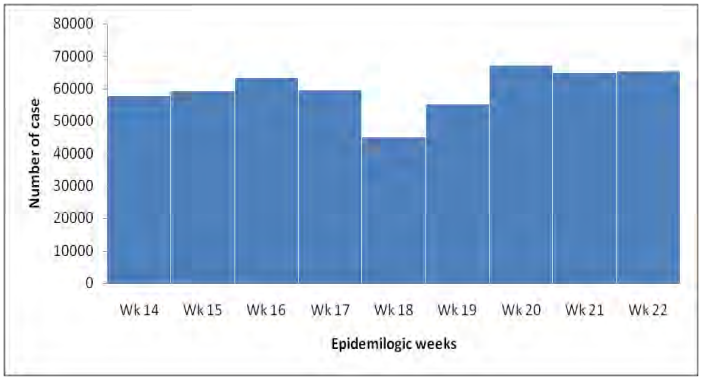
The best performing regions in week 22 were Addis Ababa (100%), Harari (100%), Dire Dawa (97.9%), Tigray (96.0%), Amahara (91.4%) and SNNP (87.1%)



III. Diseases and conditions

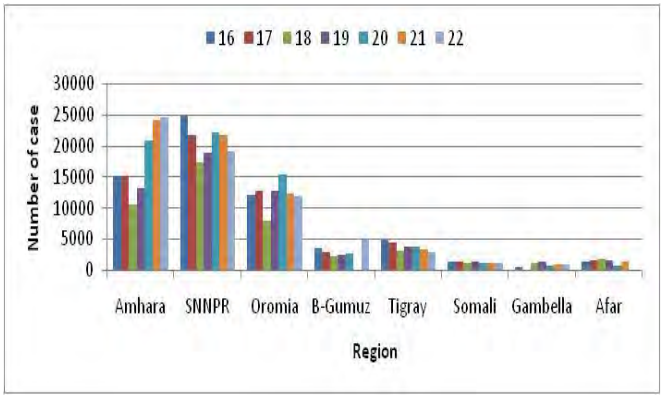
1. Malaria

In this week, a total of 65,618 confirmed and clinical malaria cases and four (4) deaths were reported. National malaria trend showed increment during week 18-20. The four deaths were reported from Benishangul Gumuz region (Assosa 1 and Metekel 1 Zones), Oromia region (Nekemte Town 1), SNNP (Sidama Zone 1).



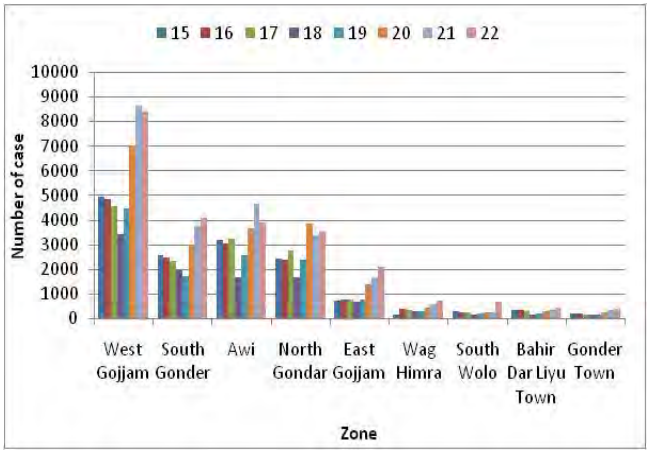
Of the total cases reported in week 22, the highest cases were reported by Amhara 24,628 (37.5%), SNNP 19,011 (29.0%), Oromia 11,885 (18.1%), Benishangul 1813 (7.4%) and Tigray 2825 (4.3%). The rest, 2426 (3.7%) were reported from Somali, Gambella, Harari, Addis Ababa and Dire Dawa.

On this week malaria cases increased by 6.4% in Amhara region, this might have attributed to increment in the reporting completeness as comparing to week 21. In contrary, weekly cases decreased in Oromia and SNNP regions shows decrement in this week (Figure 4) that might have also attributed to low reporting by two regions as noted above.

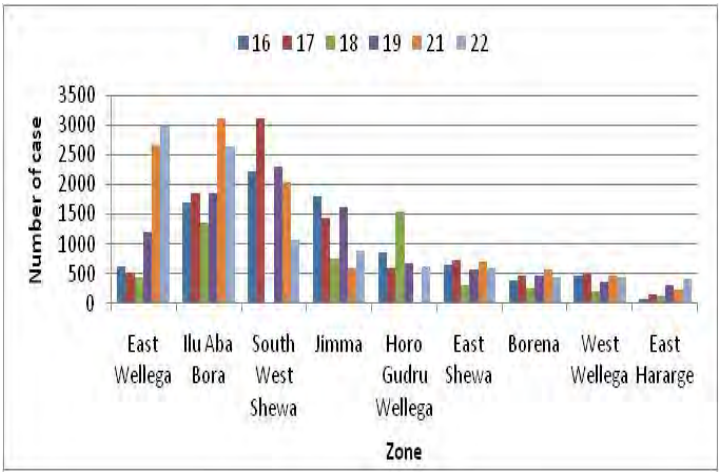


Amhara Region: In week 22, the total 24,628 malaria cases reported from Amhara Region, most cases were from: West Gojjam 8,410 (34%), South Gonder 4,086(16.6%),Awi 3,889 (15.8%) and North Gonder 3,485 (14.2%). Compared with week 21, malaria cases increased in south Gonder, North Gonder, East Gojjam, Waghimira and South wollo.

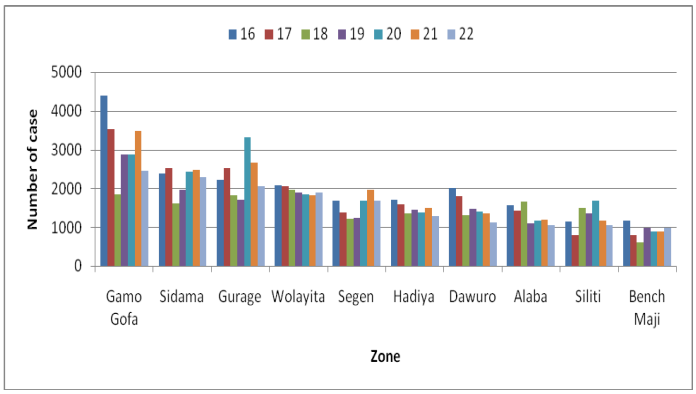
Disaggregating the cases to woreda level, the number of cases increased in Gonji Kolela, Jebitenan,Yilmana Densa and Quarit woredas of West Gojjam Zone, Woreta, Fogera and Estea woredas of South Gondor, Akasha Gugusha, Chagni, Dangila zuria and Fatiga Lekoma of Awi Zone and Wegera, Quara and Alefa woredas of North Gonder Zone.



Oromia Region: In week 22, East Wollega Zone 2978(25.1%) and Ilu Aba Bora Zone 2631(22.1%) reported the highest number of cases compared with other zones of the region, followed by South West Shewa 1072(9.0%) and Jimma 889(7.5%). In East Wollega zone the trend showed increment of cases for the last three weeks. Similarly, the number of malaria cases increased in Jimma by 5%.

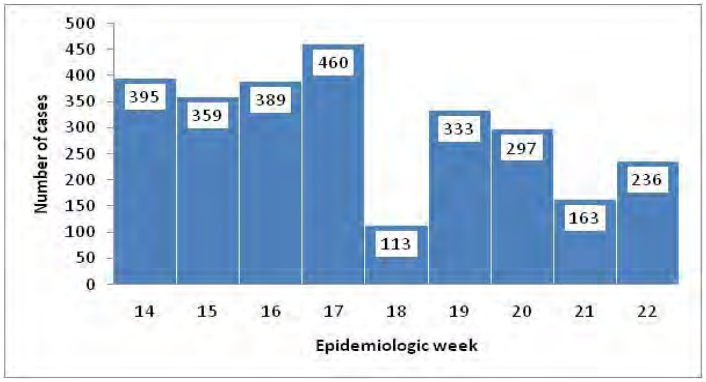


SNNP Region: Of the total 19,011 cases reported from SNNP Region, majority of the cases were reported from Gamo Gofa 2,452 (12.9%), Sidama 2,279(12.0%), Gurage 2,053 (10.8%), Wolayeta 1,902 (10.0%) zones. Compared with week 21, the malaria trend showed increment in Wolayita and Bench Maji Zones.



2. Measles

In week 22, a total of 236 suspected measles cases with no deaths were reported. Of the total cases reported, Oromia 91 (38.6%), SNNP 64 (27.1 %) and Amhara 57 (24.2%) reported the highest cases. In this week, the trend of measles cases was increased compared with week 21



Of the total 91 cases reported from Oromia Region, the highest number of cases was

reported from Kelem Wollega 33(36.3%) and West Harerge 13 (14.3%) and Bale 13(14.3%) Zones. The rest cases were reported from Arsi, Bishoftu Town, Borena, East Harege, East Shewa, Finfine Zuria, Guji, Illu Ababora, Jimma, North Shewa, Shashemene Town, West Harege and West Wellega.

Gamo Gofa 40(62.5%) and Bench Maji Zones 11(17.2%) reported the highest number of cases from the zones of SNNP Region. The rest cases were reported from Sidama 6(9.4%),Segen 2 (3.1%),Gedeo 2 (3.1%) and the rest Gurage, Sheka and Silti reported one case each.

Amhara region reported 57 cases, of which, Oromia 17(29.8%), Waghimira 13(22.8%) and East Gojam 7(12.3%) Zones reported the highest case.

3. Meningitis

In week 22, a total of 42 suspected meningitis cases with no deaths were reported. Of which Oromia 20(47.6%) (Horogudru Wellega 17 ,Guji 1,Illu Aba Bora 2), SNNP Region 14 (33.3%) (Sidama ,Siliti ,Wolayeta ,Gamogofa each reported 2 cases and Alaba,Bench Maji ,Gurage ,Kefa Kembata Temabro and Konta each reported one case), Amhara 6(14.3%) (South Gonder 4, North Shewa 1 and South Wello 1).

4. Polio

Zero reports of polio were received from all regions

5. Dracunculiasis

No report of dracunculiasis received from all regions

6. Yellow Fever

A total of 9 cases were reported from South Omo Zone in SNNPR, of which South Ari Woreda, 7 and Jinka Town, 2. In week 23, additional, 2 cases were reported from South Ari and Jinka Town one case each (received through phone).

IV. Response Activities

- Vaccination of Yellow fever are being undertaken in South Ari woreda of South Omo Zone
- Surveillance data analyzed and feedback was given to the regions.