Addis Ababa University, College of Health Sciences,

School of Public Health

Ethiopia Field Epidemiology Training Program (EFETP)

Compiled Body of Works in Field Epidemiology

By

Elsabetee Megrssa

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

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Advisors

Dr.Ayele Belachew

Dr. John Fogarty

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Approval by Examining Board

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Examiner

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List of Abbreviations

AAU .....Addis Ababa University

ACF .....Action Contre La Faim

AFI .....Acute Febrile Illness

AFP .....Acute Flaccid Paralysis

AHRI.....Armauer Hansen Research Institute

AID .....Acquire Immunodeficiency Syndrome

ANC .....Antenatal Care

AR .....Attack Rate

ART.....Anti Retroviral Therapy

AURTI .....Acute Upper Respiratory Tract Infection

AWD .....Acute Watery Diarrhea

BCG .....Bacille Calmette Guerin

BSC .....Bachelor of Science

CBR.....Crude Birth Rate

CDC .....Center for Disease Control and Prevention

CDR .....Crude Death Rate

CFR .....Case Fatality Ratio

CI.....Confidence Interval

CMR.....Child Mortality Rate

CSF .....Cerebrospinal Fluid

CTL .....Co-team Leader

DRMFSS .....Disaster Risk Management and Food Security Sector

EC .....Ethiopian Calendar

EFETP .....Ethiopia Field Epidemiology Training Program

EFY .....Ethiopian Fiscal Year

EHNRI .....Ethiopian Health and Nutrition Research Institute

EPI .....Expanded Program on Immunization

EPRP .....Epidemic Preparedness and Response Plan

FMOH .....Federal Ministry of Health

FP .....Family Planning

GC .....Gregorian Calendar

GIS .....Geographic Information System

GO .....Governmental Organization

GP .....General Practitioner

HC .....Health Center

HIV .....Human Immunodeficiency Virus

HP .....Health Post

IDP .....Inter Displaced Population

IMR .....Infant Mortality Rate

IRS .....Indoor residual spraying

ITN .....Insecticide Treated Net

ITNs .....Insecticide Treated Net

LLINS .....Long Lasting Insecticidal Impregnated bed Nets

MCH .....Maternal and Child Health

MSF.....Médicos Sin Fronteras

NFTL.....Non Food Team Leader

NGO.....Nongovernmental Organization

NMA .....National Metrology Agency

NNT .....Neonatal Tetanus

OCHA .....Office for the Coordination of Humanitarian Affairs

OPV.....Oral Polio Vaccine

OR.....Odds Ratio

OTP .....Outpatient Therapeutic Feeding Program

PCR.....Polymer Chain Reaction

PHEM .....Public Health Emergency Management

PITC.....Provider Initiated Testing and Counseling

PMTCT .....Preventing Mather to Child Transmission

PTB .....Pulmonary Tuberculosis

REW.....Regional Early Warning

RF.....Relapsing Fever

RHB .....Regional Health Bureau

RRT.....Rapid Response Team

RUTF .....Ready Used Therapeutic Feeding

SAM.....Severe acute malnutrition

SARS.....Sever Acute Respiratory Syndrome

SC.....Stabilizing Center

SIA .....Supplementary Immunization Activity

SNNPR.....Southern Nations and Nationality Peoples Region

SPH .....School of Public Health

TB .....Tuberculosis

TL.....Team Leader

UN.....United Nation

UNICEF .....United Nations Children's Fund

UTI.....Urinary Tract Infection

VCT.....Voluntary Counseling and Testing

VHF.....Viral Hemorrhagic Fever

WFP .....World Food Program

WHO.....World Health Organization

WoHO.....Woreda Health Office

WVE .....World Vision Ethiopia

YF .....Yellow Fever

ZHD .....Zonal Health Department

Executive Summary

The Ethiopia Field Epidemiology and Training program (EFETP) is a two year in-service training program in field epidemiology adapted from the United States Centers for Disease Control and Prevention (CDC) Epidemic Intelligence Service (EIS) program. The program is designed to assist the Ministry of Health in building or strengthening health systems by recruiting promising health workers and building their competencies through on-the-job mentorship and training. The program has two main components: a classroom-teaching component (25%) and practical attachment or field placement component (75%). Completion of the above mentioned two components of the residency culminates in a final output of works, which is equivalent to a thesis for the graduate school of public health for partial fulfillment of a master degree in Field Epidemiology.

These out puts of work have nine chapters, which includes report of outbreak investigations, surveillance data analysis, evaluation of a surveillance system, description of a health profile, scientific manuscripts for a peer review journal, abstracts for scientific presentation, a narrative summary of disaster situation, a proposal for epidemiological research project and another additional output report. In an attempt to complete these outputs of work different methods were used.

In chapter one a total of three outbreaks were investigated. These included a meningitis outbreak in Oromia Region, Horo Guduru Wellega Zone, Hababu Guduru Woreda in May 2013; a measles outbreak in Addis Ababa City administration, Gullelle Sub City, Kechene Medhanialem Orphanage in January 2014 and dengue fever outbreak in Afar Region, Adaar Woreda in April 2014.

In chapter two, three, four and five; a surveillance data analysis of meningococcal meningitis in Ethiopia from 2005 to 2012, measles surveillance system evaluation in Afar Region, Gewane and Buremuditu Woreda from 1 to 12 July 2013, a health profile description in Afar Region of Awash Fentale Woreda from 22 April to 2 May 2013 and two scientific manuscripts for peer reviewed journals were done respectively.

In chapter six abstracts of outbreak investigation, surveillance data analysis and surveillance system evaluation were presented. The abstract was a “surveillance data analysis on

meningococcal meningitis in Ethiopia, 2005-2012", and it was accepted for oral presentation and presented at the 5th AFENET conference held in Addis Ababa from 17-22 November 2013. Another abstract "Meningococcal Meningitis Outbreak, Hababo Guduru District-Oromia Region, Ethiopia-2013", was accepted for oral presentation and presented at the 50th annual conference of the Ethiopian medical association held in Addis Ababa Helton hotel from 27-28 February 2014.

In chapter seven a narrative summary of disaster situation during Meher season in Gedio, Kenbata Tenbaro and Sidam Zone of Southern Nation and Nationality Peoples Region on November 2013 was done. In chapter eight a proposal on Knowledge, attitude and practice of bed net use to prevent malaria infection among rural community of Humbo and Sodo Zuria Woredas of Wolyita Zone, Southern parts of Ethiopia is presented. Finally, in chapter nine other outputs of from public health bulletins presented.

Chapter I – Outbreak Investigation

1.1. Meningitis Outbreak, Hababo Guduru Woreda-Oromia Region, Ethiopia-2013

Authors: Elsabetee M.Sorassa [1], K.Birhanu[1], A.Abushet [1], B.Ayele [2], F.John [3], B.Lucy [1]

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Abstract

Background: Ethiopia is within the meningitis belt and experiences local meningitis epidemics almost yearly. Most of the causes of meningococcal meningitis outbreak in the country is due to serogroup A. On 01 May 2013 Hababu Guduru District of Oromia region reported a suspected meningitis outbreak to the Federal Public Health Emergency Management Center. Investigated was launched to identify the etiological agent, risk factors and to implement control measures.

Methods: A suspected case was defined as any person with a history of sudden onset of fever and one of the following signs neck stiffness, altered consciousness or other meningeal signs. A descriptive study was done than followed by an unmatched case-control study from 01-28 May 2013. A structured questionnaire was used to collect data from 57 cases and 57 controls. Controls were any person in the village without sign or symptoms of meningitis.

Results: The descriptive study reviled a total of 244 suspected meningitis cases and two deaths (CFR= 0.8%). One hundred forty nine (61.1%) were female. The overall attack rate was 46/10,000 and the highest rate was among children aged 5-14 years (AOR=79/10,000). In the case control study, a multivariate analysis showed attendance in a public gathering area (AOR=3.3; 95% CI= 1.3-8.2), sharing a bedroom with more than two people (AOR=10.5; 95%CI=3.2-33.9) and living with a sick family member (AOR= 26.7; 95%CI=4.0-175.5) were associated with meningitis. There was no history of vaccination in the community for *N. meningitidis*. Eleven cerebro spinal fluid specimens(CSF) were collected, and nine were positive for *Neisseria meningitidis* W135 in a rapid latex agglutination test at district level. Of these seven CSF specimens were sent to National laboratory which were negative by culture.

Conclusion: A suspected meningococcal meningitis outbreak in Hababu Guduru district mainly affects females and age group 5-14 years. Overcrowding was significantly associated with the outbreak. Health education and increasing laboratory capacity for RT-PCR for better diagnostic capacity is recommended in the future.

Key words: Meningitis, outbreak, Ethiopia

Introduction

Meningococcal meningitis is a bacterial form of meningitis, a serious infection of the meninges that affects the brain membrane [1]. The most common symptoms are a stiff neck, high fever, sensitivity to light, confusion, headaches and vomiting. It transmitted by person-to-person contact through respiratory droplets of infected person. Human is the only reservoir of *Neisseria meningitidis*. The average incubation period is 4 days, but can range between 2-10 days. Even when the disease is diagnosed early and adequate treatment is started, 5% to 10% of patients die, typically within 24 to 48 hours after the onset of symptoms. Moreover its complication can cause brain damage, hearing loss or a learning disability in 10% to 20% of survivors [2].

Several different bacteria can cause meningitis. *Neisseria meningitidis* is the one with the potential to cause large epidemics. Five serogroups of *Neisseria meningitidis* A, B, C, W135 and X are found in the African "meningitis belt". However, the common strains that cause epidemics in the “Meningitis Belt” regions are serogroup A followed by C. But in 2002 Burkina Faso experienced the largest meningitis epidemic due to W135[2, 3].

Worldwide an estimated 500,000 cases and 50,000 deaths of meningococcal meningitis occur annually. Of these figure majority of cases are reported from countries in the African "meningitis belt", an area that extends from Senegal to Ethiopia with an estimated total population of 500 million[4, 5]. In this region, during epidemic time the attack rate exceeding 500 per 100,000 populations with 1000 of deaths. In addition the disease is more common during the dry and hot season from December to Jun, and epidemics are common in every 8-12 years interval [6-8]. In Ethiopia, meningococcal meningitis epidemic reported for the first time in 1901[9]. The epidemics of 1981-1983 and 1988-1989 was recorded the largest numbers of cases and deaths. Nearly 50,000 cases and 990 deaths reported during in 1981-1983 epidemic and 45,000 cases and 1,685 deaths in 1988-89 [10]. Since the 1989 epidemic, localized outbreaks have occurred

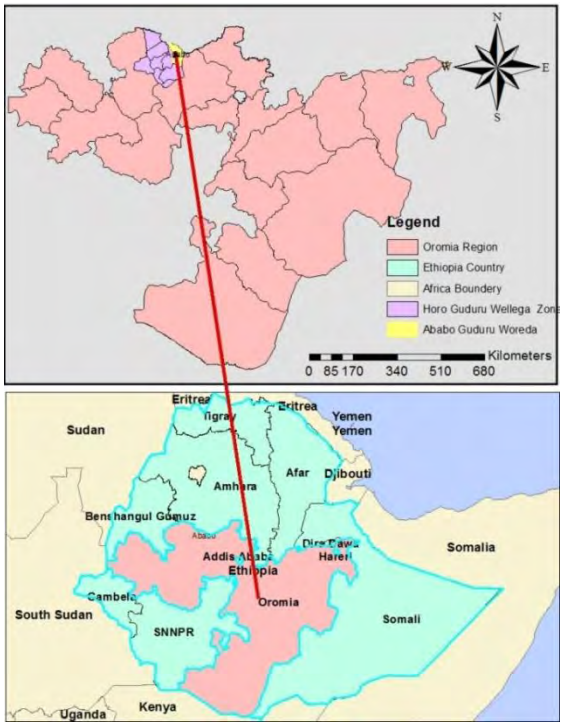
almost yearly indifferent parts of the country and as many literature indicated the common serogroup cause outbreak in Ethiopia was serogroup A[11-13].

Hababu Guduru district of Oromia region reported suspected meningitis outbreak on 01 May 2013. The Regional Health Bureau requested the Federal Public Health Emergency Management (PHEM) center to support the district health authority in the investigation. Accordingly, the PHEM deployed a team on 18 May 2013 to identify etiological agent, risk factors and to assist in the control and prevention measures.

Methods and Material

Investigation Site

Hababu Guduru Woreda is one of the 10 woredas located in Horo Guduru Wellega Zone of Oromia Regional State, Western Ethiopia. It is 431 km far from Addis Ababa. It is made up of 13 kebeles (one urban and 12 rural) with a population of 53,367 (projection from the 2007 census). It belongs to a sub humid climate zone with a dry season from October to February and a long rainy season occurring from June to September with short spell of showers between mid February and April. The mean annual rainfall of the woreda is about 1350 mm and the mean daily temperature from 18^0C to 28^0C.



Map 1: Map of Oromia Region Showing Ababo Guduru Woreda

Study design

Descriptive study followed by case control was employed to investigate the outbreak.

Sample size

Unmatched 1:1 ratio of 57 cases and 57 controls was used for the case control study

Definition

Case: Any person with history of sudden onset of fever and any one of the following signs: neck stiffness, altered consciousness, or other meningeal signs, observed from 01-28 May-2013, in Hababu Guduru Woreda.

Control: Any person in the village without sign and symptoms of meningitis at the time of the study

Data collection method

Surveillance data of the Woreda Health Office was reviewed retrospectively to observe similar outbreak from the district and to set background status of the disease. Structured questionnaire was used to interview cases and controls. Active search was conducted using line listing of cases. In addition to this we conducted informal discussions with different stakeholders about the overall outbreak situation and the control and prevention efforts undertaken in the Woreda.

Data Quality assurance

The collected data was checked daily during the investigation period. Data cleaning was done by running frequency of variables using EpiInfo version 7.1.

Laboratory investigation

Samples of cerebrospinal fluid (CSF) were collected from 11 patients with suspected meningococcal meningitis. Rapid latex agglutination test was done for all collected specimens at the district level laboratory. CSF sample from 7 of the 11 patients were sent to National and AHRI Laboratory for culture and PCR test during the outbreak time.

Environmental investigation

We observed the general housing condition of the cases and controls.

Data analysis

Data was analyzed by using Microsoft office excel and Epi.Info version 7.1.

Epidemic threshold definition

As per the WHO guideline, the epidemic threshold of the outbreak was defined as in a population of more than 30,000 is an incident of 15 case per 100,000 inhabitants per week. However, when the epidemic risk is high, the recommended epidemic threshold is 10 cases per 100,000 inhabitants per week. On the other hand, populations less than 30,000; an epidemic threshold is 5 cases in 1 week or doubling of the number of cases over a three week period. Moreover, when an epidemic is confirmed in a neighboring area, the alert threshold also serves as the epidemic threshold.

Ethical Consideration

Human beings are respected and should take their volunteer participation on the study. Accordingly informal verbal consent was taken from all respondents before interviews and all agreed to take part.

Results

Descriptive analysis

We identified 254 suspected meningitis cases with 2 deaths from five woredas (Hababu Guduru, Horo, Shambu Town, Jima Ganati and Abay Choman) of Horo Guduru Wellega Zone of Oromia Region. Majority of 244(96%) suspected meningitis cases and two deaths were reported from Hababu Guduru Woreda. Out of 13 kebeles of Hababu Guduru Woreda, 11 kebeles were affected by outbreak. Of the cases 149(61.1%) were female while the rest 95(38.9%) were male. Crude attack rate was 46/10,000 and case fatality rate (CFR) was 0.8%. The sex specific attack rate for females was 56/10,000 and males 35/10,000.

The younger age group 5-14 years was more affected by the disease with an age specific attack rate (ASAR) of 79/10,000 followed by children age group 0-4 years 43/10,000. The age groups above 44 years were less affected with an ASAR of 11/10,000.

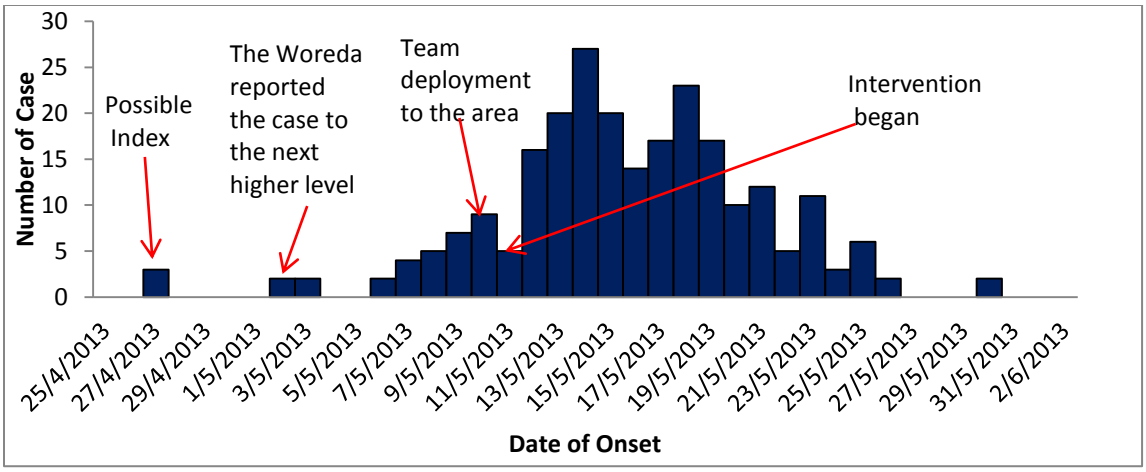


Figure 1: Meningitis Cases by Date of Onset of Symptom, Hababu Guduru Woreda, Oromia Region, 2013

We reviewed the surveillance data of the woreda retrospectively and we didn't observe any similar outbreak before. The date of onset of the probable index cases was April 27, 2013.

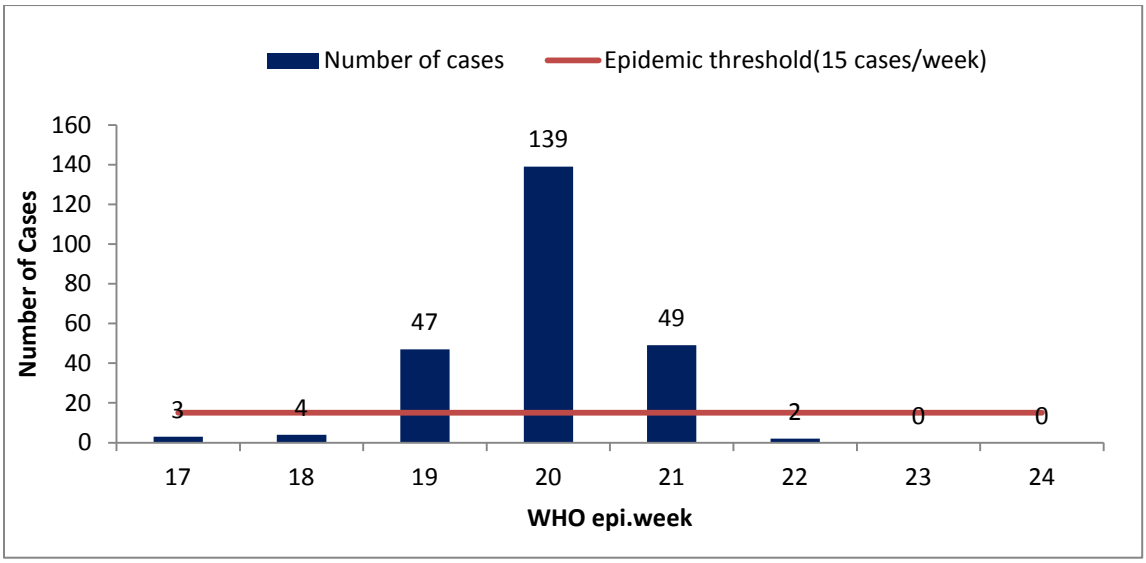


Figure 2: Meningitis Cases by WHO Epidemiological Week and Epidemic Threshold, Oromia Region, 2013

When we analyzed cases by epidemiological weeks, Hababu Guduru woreda started reporting cases in the 17th epidemiological week of April 2013 as figure 2 showing above. The WHO recommended epidemic threshold crossed in the beginning of week 19 and also the 2 deaths were reported during this time. The epidemic continued until week 22 with peak on week 20 and cases were not reported after week 22.

Table 1: Clinical Presentation of Meningitis, Hababu Guduru Woreda, Oromia Region, 2013

Clinical Presentation	Frequency n(%), N=57
Fever	57(100%)
Neck Stiffness	55(96.5%)
Headache	50(87.7%)
Myalage	36(63.2%)
Vomiting	32(56.1%)
Light Sensitivity	26(45.6%)
Nausea	18(31.6%)
Confusion	8(14%)
Cough	8(14%)
Irritability	2(3.5%)
Running Nose	1(1.75%)
Bulging Fontanel	0(0%)

Laboratory investigation

Out of 11 CSF specimen collected nine of them were positive for *N.Meningitidis* W135 in a rapid latex agglutination test at district level. The seven CSF specimens sent to national laboratory were negative for culture and PCR.

Environmental Investigation

In visual inspection we observed over crowding in the assessed houses of cases and control.

Analytical Analysis

We obtained 57 suspected meningitis case (median age of 16 years) and 57 control (median age of 17 years). On bivariate analysis illness was statistically significantly associated with attendance in public gathering area (OR: 3.0; 95% CI: 1.3-6.5), sharing bedroom with more than two people (OR: 6.3; 95% CI: 2.5-15.7), living in one house with more than five peoples (OR: 5.2; 95% CI: 1.7-15), having contact with a case patient (OR: 2.6; 95% CI: 1.2-5.6) and living with a sick family member in the household (OR: 9.8; 95% CI: 2.2-45).

Table 2: Bivariate Analysis of Different Exposures, Hababu Guduru Woreda, Oromia Region, 2013

Exposure	Cases N (%)	Control N (%)	OR	95% CI	P-value
Having case in the household	15(26.3)	2(3.5%)	9.8	2.1-45	0.0016
Attendance in public gathering area	32(56.1)	17(29.8)	3.0	1.3-6.5	0.0081
Having no ventilation	19(33.3)	30(52.6)	0.4	0.2-1.0	0.0685
Sharing bedroom with more than two people	49(85.9)	28(49.1)	6.3	2.5-15	0.0001
Living in one house with more than five peoples	52(91.2)	38(66.6)	5.2	1.7-15	0.0028
Having kitchen in the living room	4(7.14)	3(5.26)	1.3	0.2-6.4	0.9807
Contact history with case-patient	40(70.2)	27(47.3)	2.6	1.2-5.6	0.0224
Sharing house with animals	17(29.8)	13(22.8)	1.4	0.6-3.3	0.5234
Travel history	18(31.6)	12(21.1)	1.7	0.7-4.0	0.2876

However, on multivariate analysis the factors that remained statistically significantly associated with illness were attendance in public gathering area (AOR=3.3; 95% CI= 1.3-8.2), sharing bedroom with more than two peoples (AOR=10.5; 95% CI=3.2-33.9) and living with a sick family member (AOR= 26.7; 95% CI=4.0-175.5)

Discussion

This investigation revealed that the typical clinical picture of meningococcal meningitis supported by confirmation with the rapid latex agglutination test which indicated that *Neisseria meningitidis* serogroup W135 was the presumptive cause of the outbreak. This is related with the recent outbreak that occurred in different parts of the country which were also associated with the W135 serogroup of *Neisseria meningitidis*. This is the first year that *Neisseria meningitidis* serotype W135 has been reported from Ethiopia. Additionally, the woreda is located in the meningitis belt (Western part of Ethiopia) and had a previous experience of a meningitis outbreak eight years ago. As per the explanation by leadership in the Woreda the district was facing a shortage of the major rain in the last four months of 2012, and late onset of minor rain in May 2013. This prolonged the dry season and was associated with the occurrence of the meningitis outbreak in the community. In related publications, climatic factors play an important

role in the seasonal upsurge of meningococcal disease, occurring more often during hot and dry seasons from December-Jun within 8-12 years interval [8].

During epidemics the disease most frequently affects older children, teenagers and young adults [6]. Likewise the investigation results also indicated that more than 50% of the cases occurred in persons below 15 years of age. Of these, the age group between 5-14 years and females were more affected than others. Similarly a study conducted in Angola on epidemiology of meningitis in 2001 indicated that age groups 15-29 years and 5-14 years were more affected than others; there was no difference in incidence between sexes in the Angola study [14]. In contrast a study conducted in Nigeria indicated that males were more affected than females [13]. Lastly, the majority (84%) of cases in this outbreak were in the age group 5-44 years, which is similar with meningitis epidemic, occurred in 1989 in Ethiopia 70% were age group 5-44 years[9].

On biviarant and multivariate analysis, the risk factors that were statically significantly associated with illness were attending a public gathering area, overcrowding such as sharing a bed with more than two people and living in one house more than five people, and having contact history in the house and outside the house. Those are also the major risk factors of meningococcal diseases throughout area of Sub-Saharan Africa known as the meningitis belt, which stretches from Senegal in the west to Ethiopia in the east [15].

Laboratory results of the rapid latex agglutination test at the district level were positive for *Neisseria meningitidis* serogroup W135. The culture and PCR result at national laboratory and AHRI tested negative for meningitis respectively, this might be technical error during specimen collection, Trans Isolate media utilization, or handling and transportation to the reference laboratory.

Limitations

Recall bias might be one factor in controls more than cases. Recall bias was further reduced by interviewing cases and controls during the onset of illness in the case. Inability to perform simple Gram stain technique at local level was also the second limitations of the study.

Conclusion

We confirmed a meningococcal meningitis outbreak in Hababu Guduru District which mainly affected the age group 5-14 years and females. The presumptive cause of the outbreak was serotype W135. This documents the emergence of *Neisseria meningitidis* serotype W135 in Ethiopia in 2013. Overcrowding was a significant risk factor for contracting meningococcal meningitis in this outbreak. We recommended health education, further laboratory capacity to confirm and monitor bacterial agents and serotypes of meningitis and mass vaccination to minimize the risk of meningitis in the community.

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Annex 1: Meningitis Outbreak Investigation Questionnaire

I. Investigator Information

Name of Investigator: ---------- Organization: ----------

Telephone: ---------- Date of Investigation (MM-DD-YYYY): ----------

Case Status: 1. Case 2.Control

II. Socio-Demography

1. What is your Name? ----------
2. What is your Age? ---------
3. Sex: 1.Male 2.Female
4. Address:

   Region: ---------- Zone: ---------- Woreda: ---------- Kebelle: ----------
5. Occupation
   1. Student 2. Farmer 3. Government Employee 4. Private 5.Daily Laborer
6. Religion:
   1. Orthodox 2. Muslim 3.Protestant 4.Catholic 5.Other (specify): --
7. Education:
   1. Illiterate 2. Primary (1-8) 3.Secondary (9-12) 4. Diploma/Degree

III. Clinical Information

1. Date of Onset of Illness (MM-DD-YYYY): -- /-- /----
2. Date seen at health facility (MM-DD-YYYY): -- /-- /----
3. Sign and Symptoms
   i. Fever
   ii. Neck stiffness
   iii. Myalgia
   iv. Confusion
   v. Headache
   vi. Cough
   vii. Vomiting
   viii. Light sensitivity
   ix. Nausea

x. Running Nose

xi. Other (Specify): --------

xii. Bulging fontanel

xiii. Irritability

4. Did you take antibiotics? 1. Yes 2.No

If Q4 is yes, which antibiotics did you take?

1. Ampicilin 2. Penciline 3. Ceftraxon 4.Oily Chloramphenicol 5.Other (Specify)---

4.1 If Q4 is yes, did antibiotics given prior to specimen collection? 1. Yes 2. No

4.2 If Q4 is yes, what name of antibiotics given? ----------

IV. Risk factor

1. Did you vaccinated within the last three years? 1. Yes 2. NO

If Q1 is yes, when (MM-DD-YYYY): -----/-----/----

2. Do you have chronic Disease? Yes NO

If Q2 is Yes, What?

3. Do you have risky behavior? Yes No

If Q3 is yes, check all that apply

1. Current Smoker 2. Alcohol Abuse 3.Intravenous drug User 4. Other (Specify):

4. Did you have contact with suspected or confirmed case within the last 2 weeks?

1. Yes 2. No

5. If Q4 is yes what type of contact did you have?

1. Kissing 2. Sharing Food 3. Work Place 4. Class Room 5.shaking hand

6. Have you travelled to meningitis epidemic areas within the last 2 weeks? 1. Yes 2. No

7. Have you attended mass gathering/Market places within the last 2 weeks? 1. Yes 2. No

If Q7 is yes, complete the following

Name of Event: ----------Location of the event: ----------

Number of People Present: ---------- Date of the Event (MM-DD-YYYY):----/----/-

8. How many people are living with you/ in your house? ----------

9. How many people share your bed?

10. Did you have kitchen? 1. Yes 2.No

If Q10 is yes, where ----------?

1. Inside the living room 2. Outside the living room

11. Did you share house with animal? 1. Yes 2. No

12. Is there any household member who has similar illness? 1. Yes 2. No

If Q12 is yes, Name of person: ----------

If Q12 is yes, Date of onset of illness (MM-DD-YYYY): -- /-- /----

13. Is there a household member that attends school? 1. Yes 2. No

If Q13 is yes, what is his/her name and address? ----------

14. Is there a house hold member that is in the military or police?

1. Yes 2. No If yes what is his/here name and Address? -------

15. Did you visit nursing homes, school or child care facilities within the last 2 weeks?

1. Yes 2. No If Q16 is Yes, Location:----------

16. Case Classification:

1. Suspected 2. Probable 3. Confirmed

17. The status of the case 1. Alive 2. Dead

18. Is your house having windows 1. Yes 2.No

19. Is your windows ventilated every day? 1.Yes 2.No

V. Laboratory Data

20. Was sample collected? 1. Yes 2. No

If Q20 is yes, Type of sample taken:

1. CSF 2. Blood 3.Other (Specify): ----------

21. Type of test made, Check all that apply:

1. Gram stains 2. Culture 3. PCR

22. What is lab result----------

23. What is the Sero-Groups----------

1.2. Measles Outbreak in Kechene Medhanialem Orphanage, Addis Ababa, Ethiopia-2014

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Abstract

Background: Measles is a highly contagious vaccine preventable disease, and has been targeted for elimination in all six World Health Organization (WHO) regions. In Ethiopia, recurrent outbreaks have continued. On 25 January 2014, a suspected measles outbreak was reported from Gullelle sub city-Kechene Medhanialem Orphanage, Addis Ababa to Federal Public Health Emergency Center. Investigated was made to confirm the outbreak, identify risk factors and implement control measures.

Methods: A case was defined as any person with fever and maculopapular rash and cough, coryza, or conjunctivitis or any person in whom a clinician had suspected measles. Matched case-control study by sex was conducted. Structured questioner used to collect data from 14 cases and 42 controls. Controls defined as any person in the orphanage without sign and symptom of the disease. Nine blood specimens collected for laboratory confirmation.

Results: A total of 14 measles cases were identified and no death was documented. Seven of nine blood samples tested positive for measles IgM antibodies. All cases were female aged 7 to 14 years and overall attack rate 4.3%. Median age of case was 10 years and control 13 years. The subsequent analytic study determined factor associated with illness were being unvaccinated (OR=7.1; 95% CI=1.6-31.2) and having contact with measles patient (OR=15; 95% CI=2.9-77.3). Knowledge about measles and previous measles infection were not statistically significant.

Conclusion: Confirmed measles outbreak occurred in Kechene Medhanialem Orphanage, and cases were associated with low vaccination rate. A vaccination campaign, case management and health education program were implemented. Supplementary immunization activity should be enhanced and surveillance should be strengthened.

Key words: Measles, outbreak, Orphanage, Ethiopia

Introduction

Measles is a highly contagious vaccine preventable disease, caused by the genus Morbillivirus and is characterized by fever, runny nose, cough, red and watery eyes; and a generalized, maculopapular erythematous rash. Transmission is through respiration via aerosolized droplets or by direct contact with the nasal and throat secretions of infected persons [1]. Incubation period is approximately 10–12 days from exposure to the onset of fever and other nonspecific symptoms and 14 days (a range of 7–18 days) from exposure to the onset of rash [2].

In certain high-risk populations, the disease case-fatality rates as high as 30% have been reported in infants aged less than one year of age. Malnutrition (including vitamin A deficiency), underlying immunodeficiency and lack of access to medical care are all factors leading to the high case fatality rates observed in many parts of the world. In Ethiopia context, the expected case-fatality rate is between 3% and 6%; the highest case-fatality rate occurs in infants 6 to 11 months of age, with malnourished infants at greatest risk. These rates may underestimate the true lethality of measles because of incomplete reporting of outcomes of measles illness[2].

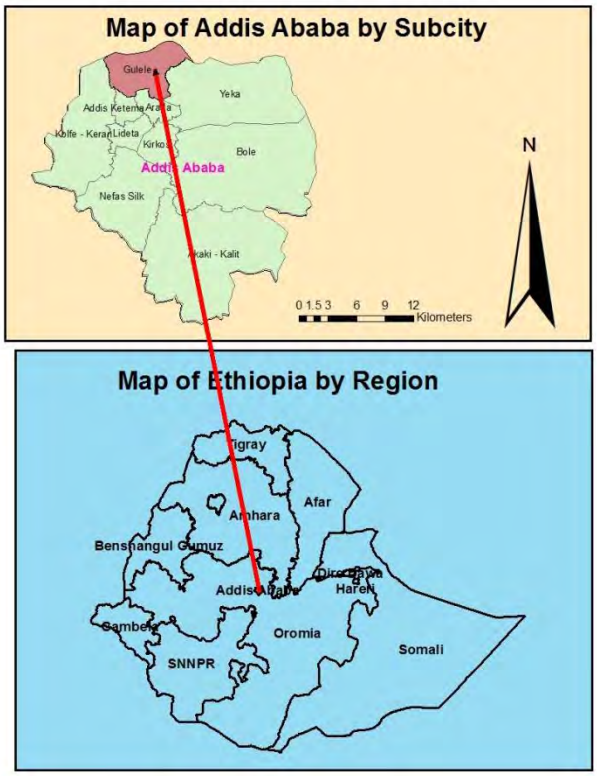
Worldwide, the disease causes an estimated 20 million cases and 164,000 deaths each year [3]. It is one of the leading causes of death among young children even though a safe and cost-effective vaccine is available [4]. All six World Health Organization (WHO) regions have targeted measles for elimination by 2020. In 2001 the WHO launched a number of immunization strategies to reduce mortality from measles, and global measles mortality rates dropped by an estimated 74% between 2000 and 2010. Strategies have included providing a second opportunity for measles vaccination using supplementary immunization activities (SIAs), improving measles-case management, and establishing case-based measles surveillance [2]. However, measles remains endemic in Ethiopia.

On 25 January 2014, a suspected measles outbreak was reported from Gullelle sub city-Kechene Medhanialem Orphanage. Accordingly team deployed to the area to confirm the outbreak, identify risk factors and implement control and prevention measures.

Methods

Investigation area

The study conducted in Kechene Medhanialem Orphanage, which is located in Woreda four Gullelle sub city under Addis Ababa city administration. The orphanage is supported by the government and established 1959. Since establishment up to now it grows up many children that joined the center because of different reason from whole parts of the country. Currently the center has 324 female children age group between 7-18 years. In the Orphanage there are three different living rooms which categorized based on orphans age. The first living room for age group 7-12 years and called "Tach Bet", the second room for age group 13-15 years and they called it "Wello Bet" and the third one for age group above 15 years they called "Foke Bet".



Map 2: Map of Addis Ababa Showing Gullelle Sub City

Study design

We conduct a descriptive study followed by an analytical study of case control.

Sample Size

Unmatched case control study in the ratio of 1:3(14 cases-42 controls) was conducted

Definition

Suspected Case: - defined as any person with fever and maculopapular (nonvesicular) generalized rash and cough, coryza or conjunctivitis (red eyes) OR any person in whom a clinician suspects measles.

Confirmed Case: - defined as a suspected case with laboratory confirmation (positive IgM antibody) or epidemiological link to confirmed cases in an epidemic.

Controls: - a child in the orphanage without sign and symptom of the disease

Data collection method

Registration book of the center clinic was reviewed retrospectively to evaluate for previous outbreak and determine the baseline rate of disease. A Structured questioner was used to interview both the case and controls group. An active search was conducted using line listing of cases. Discussion were made with sub city health promotion and disease prevention case team, head of the center, health worker at the center clinic and care givers about the disease.

Laboratory Investigation

Blood specimens were collected from nine suspected measles patient and sent to National polio and measles laboratory for confirmation.

Environmental Investigation

General housing condition sleeping room, housing ventilation and hygienic condition of the cases and controls were visual inspected.

Data analysis

Collected quantitative data was checked and entered on a computer and analyzed using Microsoft office Excel and Epiinfo 7.1

Ethical issue

The objective of the study fully explained for care givers and other responsible person in the orphans and volunteer participation were requested. Consequently informed verbal consent was taken informally from all respondents before interviews and all agreed to take part.

Result

Descriptive analysis

We identified 7 laboratory confirmed and 7 epidemiologically linked measles cases in the Kechena Medhanialem Orphanage of Gullele Sub City between 25 January to 2 February 2014. There were no deaths. Seven of nine blood specimens tested positive for measles specific IgM antibodies. All cases were female aged 7 to 14 years.

The overall attack rate 4.3% and the attack rate in the Tach bet room was 9.6% and the Wello bet room was 2.2%. We observed overcrowding in their living room (two to three children were sleep together in one bed up to 50 children live in one class).

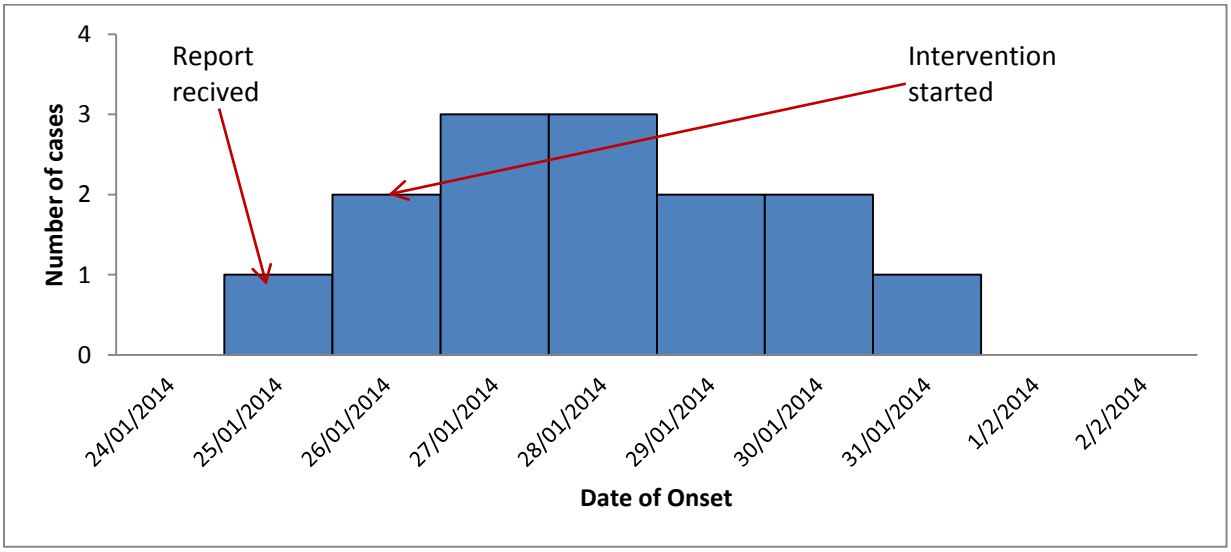


Figure 3: Measles Cases by Date of Onset in Kechene Medhanialem Orphanage, Addis Ababa, 2014

As per the explanation made by leadership and health workers in the Orphan; the health status of children was unknown and also the vaccination rate of the orphan. They also explained that they had problem in referral linkage of the orphan with the nearby health facilities. In addition to this we observed no surveillance system and delegated focal person in the orphanage and we also made discussion with care givers about the disease no one of the care giver respond about how transmitted and prevent the disease.

Table 3: Clinical Presentation of Measles in Kechena Medhanialem Orphanage, Addis Ababa, 2014

Clinical Presentation	Frequency n(%), N=14
Fever	14(100%)
Cough	13(92.8%)
Rash	14(100%)
Coryza (running nose)	9(64.3%)
Red/Watery eye	9(64.3%)
Small white spots inside the cheeks	1(7.1%)
Malaise	4(28.6%)

Analytical analysis

We obtained 1:3 ratios of 14 cases (median age of 10 years) and 42 control (median age of 13 years). On bivarate analysis the factor associated with illness were vaccination status (OR: 7.1; 95% CI: 1.6-31.2) and having contact with sick with measles patient (OR: 15; 95% CI: 3.0-77.3).

Table 4: Socio-Demographic Information of Cases and Controls, Kechena Medhanialem Orphanage, Addis Ababa, 2014

Descriptive Variable		Case	Percent	Control	Percent
Sex	Female	14	100%	42	100%
	Male	0	0%	0	0%
Room	Tach Bet	12	85.7%	8	19%
	Wello Bet	2	14.3%	34	81%
Religion	Orthodox	13	92.8%	39	92.8%
	Muslim	1	7.1%	1	2.3%
	Other	0	0%	2	4.7%
Age group	5-9	3	21.3%	0	0%
	10-14	11	78.5%	41	97.6%
	15 and above	0	0%	1	2.4%
Occupation	Student	13	92.8%	41	97.6%
	Not Student	1	7.2%	1	2.4%

Table 5: Bivarate Analysis for Different Exposures, Kechene Medhanialem Orphanage, Addis Ababa, 2014

Exposure		Case (%)	Control (%)	OR(95% CI)	P-Value
Being Unvaccinated	Yes	6(60%)	4(40%)	7.1(1.6-31.2)	0.01
	No	8(17.4%)	38(82.6%)		
Is there any person with measles	Yes	12(50%)	12(50%)	15(2.9-77.3)	0.00
visited your dormitory or class	No	2(6.2%)	30(93.7%)		
Do you have measles infection	Yes	2(13.3%)	13(86.6%)	0.3(0.07-1.90)	0.30
before	No	12(29.3%)	29(70.7%)		
Knowledge on Measles					
Is measles is vaccine preventable	Yes	7(18.9%)	30(81.1%)	0.4(0.11-1.38)	0.25
disease	No	7(36.8%)	12(63.2%)		
Do you know mode of	Yes	5(17.2%)	24(82.7%)	0.4(0.11-1.4)	0.27
transmission of measles	No	9(33.3%)	18(66.6%)		
Do you think medical treatment	Yes	11(23.4%)	36(76.6%)	0.6(0.13-2.8)	0.39
can cure measles	No	3(33.3%)	6(66.6%)		

Public health Intervention

Patients were received supportive care including oral antibiotics for bacterial infections, tetracycline ointment, oral rehydration solution, anti-pyrtics, and vitamin A as needed by per individual patient. Measles vaccination was provided for all children found in the Orphanage.

Discussion

Our investigation confirmed a measles outbreak in the Medhanialem Orphanage in the Gullele Sub City, Addis Ababa City Administration. The outbreak primarily affected children age group between 7-12 years they where live in "Tach Bet". The overall living and hygienic condition of this room was very poor comparing with the other two rooms of orphans.

Several factor may increased the chance of developing measles disease. Being unvaccinated is one of the factors to develop the disease. In this investigation we identified that the vaccination status of many of children in the Orphanage was unknown. So it might be one of the factors that increased susceptibility of the disease among children found in the orphanage. On the other hand

living in crowded and/or unsanitary conditions could be another risk factor which associated with the occurrence of measles in an area. In related we observed in our visual inspection very crowded living condition in the Orphanage which is two to three children sleeping together in one bed and more than 50 children live in one class. This is also another factor could aggravated the transmission of the disease in the area. [5]. In addition to these care givers in the orphanage they did not have enough knowledge about the disease and also how to manage and protect one uninfected child from contact.

There was no well organized health service and surveillance system in the orphanage and also no clear referral linkage with the surrounding facility. In addition to this, no one of the care givers knows about the orphan health status. When they join the orphanage, they simply join the group based on their socioeconomic and related problems. So, this factor might be contributed to the occurrence of the disease in the area.

On bivaraite analysis the risk factor statically associated with illness were being unvaccinated and having contact with measles patient. These are associated with an outbreak investigation done in two Nigeria states of (Kaduna and Sokoto) in 2013 [6, 7]. Information bias (recall bias) was one of the limitations of the study.

Conclusion

A confirmed measles outbreak occurred in Kechene Medhanialem Orphanage, in Addis Ababa. It primarily affected children aged 7-12 years. We recommend enhancing supplementary immunization activities and surveillance for disease to reduce the risk of future outbreak in the orphanage.

Recommendation

- Health status (vaccination status) of the child should be known
- Supplementary immunization activity should be enhanced
- Surveillance system should be strengthened
- The service of the clinics or their referral linkage should be expand and strengthen

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ANNEX 2: MEASLES OUTBREAK INVESTIGATION QUESTIONER

Case status: 1. Case 2. Control

Name_____

Date of Data collection_____

Address_____

Dormitory number_____

Birth place: _____

I. Socio-demographic Characteristics

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

II. Clinical presentations

2.1	What were the sign and symptoms	1.Fever 2.Rash 3.Cough 4.Coryza(runny nose) 5. Red /watery eyes 6. Small white spots inside the cheeks 7. Malaise

		8. Sore throat
2.2	Date of onset of fever	_____/____/_____
2.3	Date of onset of rash	_____/____/_____
2.4	Duration of rash_____	
2.5	Location when rash started?	
2.6	Date seen at health facility	_____/____/_____
2.7	Did you/he/she take treatment	1. Yes 2. No
2.8	If Yes, treatment taken	1.ORS 2.Antibiotics 3.Vitamin A 4.TTC ointment 5. Anti pyretic
2.9	Admitted	1. Yes 2. No
2.10	If admitted to the hospital	Date of admission:___/___2014
2.11	Complications	1.Pneumonia 2.Ear infection 3. Diarrhea 4. Encephalitis Others_____
2.12	Outcome of the patient	1. Alive 2. death

III. Risk factor

3.1	Did You ever vaccinated for measles?	1.Yes 2.No
3.2	If yes last vaccination date	1._____/_____/___ by card 2._____/_____/____ by history
3.3	Number of vaccine doses received	1. One dose 2. Two dose 3. Above 3
3.4	Did you ever have measles infection?	1. Yes 2. No 3. Unknown
3.5	Is there any sick person with rash, Fever, running nose or conjunctivitis visited you or in the dormitory/class within last 3 weeks	1. Yes 2.No
3.6	If Yes , number of sick person	_____
3.7	Do you have any travel history 10 days	1. Yes 2. No

	before rash onset?	3. If yes, where_____
3.8	Do you have any contact history with sick person before 10 days of onset of rash	1.Yes 2.No If yes, when?
3.9	If yes for Qe.3.8 with whom	1. school friends 2.Ward with same case 3. Market 4.other specify
3.10	Do you know modes of transmission for measles?	1.Yes 2.No
3.11	How many people sleeping together? In dorm	_____
3.12	Where do you go first if you get ill for measles?	1. Health facility 2. Traditional Healer 3. Holy water 4. Stayed at home 5. other specify
3.13	If answer for Q 3.12 other than health facility,	Why?
3.14	How do you think people get measles?	1. Contact sick person 2. Wrath of God 3. Curse of other people 4. Other specify
3.15	Do you know measles is vaccine preventable?	1.Yes 2.No
3.16	Who do you think that 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 age 4. Any age group
3.17	Do you think medical treatment can cure measles?	1.Yes 2.No
3.18	When do you go to health facility if get ill for measles	1. Immediately 2. After a week

1.3 Dengue Fever Outbreak Investigation in Adaar Woreda, Afar Region, Ethiopia-2014

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Abstract

Introduction: Dengue fever is a rapidly spreading mosquito borne viral disease in the world. Globally, an estimated 50 to 200 million cases and 20, 000 deaths occurred annually. In Ethiopia dengue has become a new emerging public health problem. On 03 April 2014 unusual increment of acute febrile illness negative for malaria were reported from Afar region-Adaar Woreda. Team deployed to the area to confirm the existence of the outbreak, identify the etiology, source, risk factors and finally to implement intervention measures.

Method: We conducted a descriptive study of the outbreak for which a suspected case was defined as any person with an acute febrile illness (fever, severe headache and/or diarrhea) with a negative malaria test from 19 March to 30 April, 2014. We also conducted unmatched case-control study. A structured questioner was used to collect data from 60 cases and 120 controls. Thirteen nine (28 serum and 11 whole blood) specimens collected for laboratory confirmation.

Result: We identified a total of 708 acute febrile illness cases without deaths from Ehelliwa town, Adaar district of Afar region. Of which 387(55%) were male and 316(45%) were female. The crude attack rate was 12,048/100,000 population (male=12,298/100,000 and female=11,756/100,000). The age group 15-44 years was more affected by the disease AR of 17,472/100,000. Median ages of cases were 25 years and controls were 26 years. On bivariate analysis the factors associated with illness were having dengue fever patient in the household (OR: 2.3: 95% CI: 1.2-4.4) and wearing short pants and T-shirt (OR: 3.6: 95% CI: 1.2-11.1). Out of 28 serum sample collected 14 specimens were tested ELISA test at national laboratory and 9 were positive for dengue fever. Eleven whole blood specimens were cultured and there was no growth for any bacteria.

Conclusion: We confirmed a dengue fever outbreak in Adaar district of Afar region. This was the third dengue fever outbreak detected in Eastern Ethiopia since September 2013. However, it is the first reported dengue fever from the Afar Region. The age group 15-44 years and people

live in urban were more affected. Supportive case management, health education and vector control activities controlled the outbreak from the district.

Key Word: Dengue fever, Afar, Ethiopia

Introduction

Dengue fever is the most common and rapidly spreading mosquito borne viral disease in the world [1]. It is caused by an arthropod-borne flavivirus. The main vector is the mosquito Aedes aegypti. There are four distinct serotypes of dengue virus (DEN-1, DEN-2, DEN-3 and DEN-4). The dengue virus is transmitted by day time bites of Aedes aegypti and Aedes albopictus mosquito[1, 2]. There are two main forms of dengue disease, dengue fever and the more severe dengue hemorrhagic fever (DHF). Infection with dengue virus present with severe headache, pain in the eyes, muscle and joint pain as well as rash and the more severe hemorrhagic fever presents with dengue-like symptoms and hemorrhagic manifestations. In severe cases, patients may suddenly deteriorate, develop hypothermia and go into circulatory shock we called dengue shock syndrome [3].

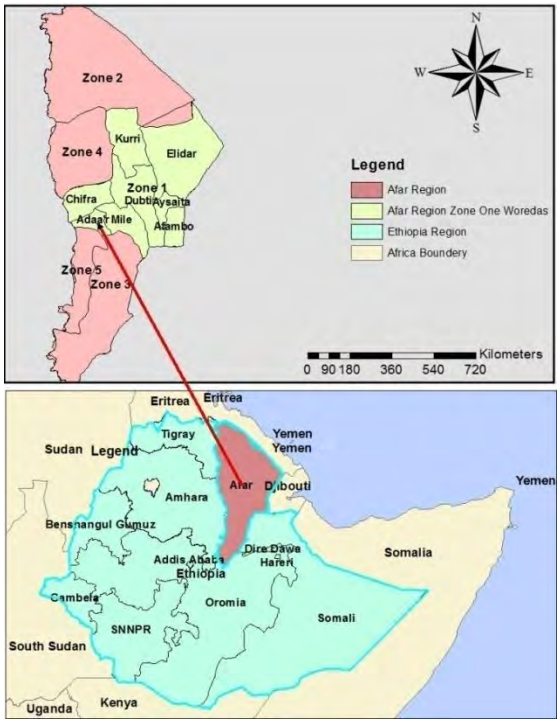
The dengue virus infection is prevalent across the tropical belt in over 100 countries and 2.5 billion people at risk of acquiring the infection. Globally, an estimated 50 to 200 million cases of dengue fever and 500,000 cases of dengue hemorrhagic fever, resulting in around 20, 000 dengue related deaths occur annually[4, 5]. Urbanization, substandard housing, intentional or unintentional water storage patterns, and population growth have created environments that favor transmission of dengue fever [6].

In Ethiopia dengue has become a new emerging public health problem. An outbreak of dengue fever was reported for the first time in Dire Dawa in September 2013 and in Somali Region in January 2014. On 03 April 2014 an unusual increment of malaria negative cases with symptoms of fever, severe headache, back and joint pain suspected for dengue fever were reported from Afar Region- Adaar Woreda. A team from the Ethiopian Public Health Institute deployed to the area to confirm the existence of the outbreak, identify the etiology and risk factors and finally to implement control and prevention measures.

Methods

Investigation area

The study conducted in Adaar Woreda, Zone One of Afar Region. The Woreda is 455Km far from the capital city Addis Ababa to the north east. The woreda has 13 kebeles (one urban and 12 rural) with a total population of 63,630 (male 34,360 and female 29,270). The population of urban (Ehelliwa was 5843 and male population were 3155 and female 2688)



Map 3: Map of Afar Region Showing Addar Woreda, 2014

Study design

We conducted a descriptive study followed by case-control.

Sample Size

Unmatched case control study in the ratio of 1:2 (60 cases-120 controls) was conducted.

Definition

Suspected Case of Acute Febrile Illness

Any person with an acute febrile illness (fever, severe headache and/or diarrhea) with a negative malaria test.

Probable Case of Dengue Fever

Any person infected with an acute febrile illness with 2 or more of the following: headache, retro-orbital pain, arthralgia, rash, hemorhagic manifestations, leukopenia; and Supportive serology (a reciprocal HI antibody titer > 1280, a comparable IgG assay ELISA titer or (+) IgM antibody test on a late or acute convalescent phase serum specimen

Confirmed Case of Dengue Fever

A case confirmed by laboratory

Controls

Any person in the area without signs or symptom of the disease

Data collection method

Registration book of the health center was reviewed retrospectively to observe if similar outbreak had recently occurred and to set background status of the disease. Active case search was conducted using line listing of suspected cases. A structured questionnaire was used to interview both the case and controls group. In addition discussions were made with Woreda Health Office, Regional Health Bureau, health workers at the health facility and some community members.

Laboratory Investigation

A total of 28 serums and 11whole blood samples were collected from malaria negative patients and transported to the national reference laboratory for viral and bacterial investigation.

Environmental Investigation

We assessed the general living environment of cases and controls. In addition to this we assessed the possible mosquito breeding sites within the community and nearby rivers.

Data analysis

We analyzed the collected quantitative data using Microsoft Excel and Epi info 7.1

Ethical issue

Before data collected from each cases and controls objective of the study were explained accordingly and volunteer participation on the study were requested. Then informed verbal consent was taken informally from all respondents before interviews and all agreed to take part.

Result

Descriptive

A total of 704 acute febrile illness cases without deaths were identified from 19 March to 30 April 2014. Of which 388(55%) were male and 316(45%) were female. The crude attack rate was 12,048/100,000 population. Of which male were 12,298/100,000 and female 11,756/100,000. All cases were outpatient and reported from the town Ehelliwa. The age group 15-44 years was more affected by the disease with an attack rate of 439(17,472/100,000) population followed by age group 5-14 years AR 159(8,951/100,000) population. Since 30/4/2014 no case were reported.

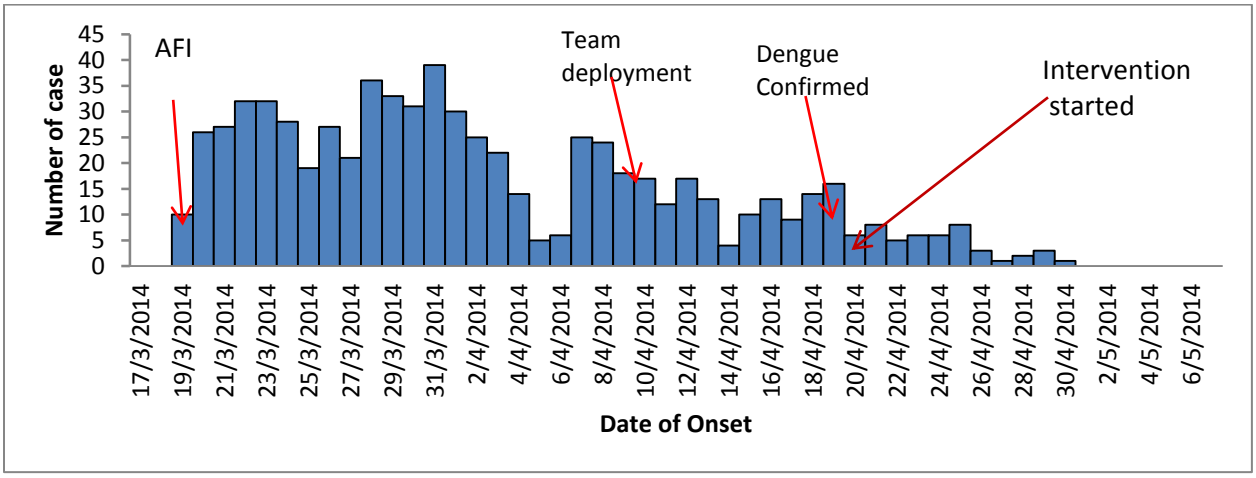


Figure 4: Dengue Fever Outbreak by Date of Onset, Adaar Woreda, Afar Region-2014

Laboratory Investigation

Of the total collected 39 sample (28 serum and 11 whole blood), 14 serum sampleswere tested by ELISA at the national laboratory and 9 (64%) were postive for dengue fever. All the 14 serum specimens were checked for other arbovirus and negative for yellow fever, west nile fever, crimean-congo, rift vally fever and chikugunya virus. The 11 whole blood samples were sent for culture and no growth for streptococcus pneumonia, E.coli, Salmonella species, Klebsiella Pneumonia or brucella species was documented.

Environmental Investigation

The source of drinking water of the community is piped water. However, we observed every household using man made containers like jars and pots to store their water. We also observed mosquitoes in the area and people seated and sleeping outside their homes wearing short pants and t-shirts during day time.

Analytical

We interviewed 60 cases and 120 controls (median ages of cases were 25 years and controls were 26 years.). On bivariate analysis the factors associated with illness were having a dengue fever patient in the household (OR: 2.3: 95% CI: 1.2-4.4) and mostly wearing short pants and T-shirts (OR: 3.6: 95% CI: 1.2-11.1).

Table 6: Socio-Demographic Information of Cases& Controls, Adaar Woreda, Afar Region-2014

Descriptive Variable		Case (%)	Control (%)
Sex	Male	36(60%)	42(35%)
	Female	24(40%)	78(65%)
Age	<1 year	0(0%)	0(0%)
	1-4 year	0(0%)	0(0%)
	5-14 year	7(11.7%)	13(10.8%)
	15-44 year	50(83.3%)	89(74.8%)
	44 and above	3(5%)	18(15%)
Level of Education	Illiterate	12(20%)	33(27.5%)
	Read/Write Only	1(1.6%)	13(10.8%)
	Elementary	23(38.3%)	42(35%)
	Secondary and Above	24(40%)	32(26.6%)
Religion	Muslim	55(91%)	111(92.5%)
	Orthodox	4(6.6%)	8(6.6%)
	Others	1(1.6%)	1(0.8%)
Occupation	Student	13(21.6%)	21(17.5%)
	Daily Laborer	2(3.3%)	7(5%)
	House Wife	14(23.3%)	39(32.5%)

	Merchant	15(25%)	17(14.1%)
	Private Workers	9(15%)	18(15%)
	Civil Servant	7(11.6%)	18(15%)

Table 7: Bivarate Analysis for Different Exposure Adaar Woreda, Afar Region-2014

Exposure		Case (%)	Control (%)	OR (95% CI)	P-Value
Having close contact with	Yes	51(36%)	90(63.8%)	1.8(0.8-4.2)	0.17
case the last one to two week	No	9(23%)	30(77%)		
Having bed net	Yes	25(29.7%)	59(70.2%)	0.7(0.3-1.3)	0.62
	No	35(36.4%)	61(63.5%)		
Having travel history the last	Yes	8(23.5%)	26(76.4%)	0.5(0.2-1.3)	0.25
two weeks	No	52(35.6%)	94(64.4%)		
Using air conditioning or	Yes	27(38.5%)	43(61.4%)	1.4(0.7-2.7)	0.30
window and door screening	No	33(30%)	77(70%)		
Using mosquito repellent	Yes	2(28.5%)	5(71.4%)	0.7(0.1-4.2)	0.89
	No	58(33.5%)	115(66.4%)		
Presence of dengue fever	Yes	39(42.4%)	53(57.6%)	2.3(1.2-4.4)	0.01
patient in the home	No	21(23.8%)	67(76%)		
Presence of river around the	Yes	48(31.2%)	106(68.8%)	0.5(0.2-1.2)	0.20
village	No	12(46.1%)	14(53.8%)		
Presence of any stagnant	yes	4(50%)	4(50%)	2.0(0.4-8.5)	0.30
water around your village	No	56(32.5%)	116(67.4%)		
Is your house sprayed	Yes	35(31.2%)	77(68.7%)	0.7(0.4-1.4)	0.54
	No	25(36.7%)	43(63.2%)		
Type of clothing mostly	Shorts/T-	56(37%)	95(63%)	3.6(1.2-11.1)	0.01
using	Shirts				
	Trousers/	4(13.7%)	25(86.2%)		
	full dress				

Public Health Intervention

Supportive case management, health education and vector control activities (screening different kind of man made containers at home and emptying/changing the water frequently to interrupt breading sites) were undertaken.

Discussion

The investigation confirmed a dengue fever outbreak of 704 cases with common symptoms of fever, headache, back pain and joint pain in Adaar Woreda, Afar Region. This was the third dengue fever outbreak detected in Eastern Ethiopia since September 2013. However, it is the first reported dengue fever from the Afar Region. The first outbreak in September 2013 was reported from Dire Dawa (11,400 cases), the second in January 2014from Gode Town Somali Region (<200 cases) and the third and the current outbreak occurred in Addar Woreda of Afar Region. The disease rapidly spreading to eastern and north eastern parts of Ethiopia[7].

Mostly dengue mosquito born infections are found in tropical and sub-tropical regions around the world. Transmissions predominantly increased in urban and semi urban areas for the reason that Aedes aegypti mosquito lives in urban habitats and breeds mostly in man-made containers [8, 9]. Similarly in this outbreak all most all cases were reported from the Town of Ehelliwa and the community uses man made water containers like jars and pots which are favorable breading sites for mosquitoes.

The disease affects both sexes nearly equally. But, age group 15-44 years were more affected by the disease than others age groups with an attack rate of 439(17.4%). During our investigation time we observed that those age groups prefer to sit outside the home during daytime hours chewing "chatt" when the Aedes mosquito prefers to bite. This may attribute to the increased incidence of the disease among this age group.

On bivariate analysis having dengue fever patient in the household was significantly associated with illness. This may be due to infected humans being the main carriers and multipliers of the virus, serving as a source of the virus for uninfected mosquitoes. Patients who are already infected with the dengue virus can transmit the infection (for 4–5 days; maximum 12) via Aedes mosquitoes after their first symptoms appear[8]. In addition wearing short pants and T-shirts was

significantly associated with illness likely because this may increase exposure to mosquito bites and the disease infection.

The investigation had some limitations. First was the absence of an entomologist from the team. Because of that we were unable to identify the mosquitoes and larva breading sites in the field beyond visual inspection. Recall based was also another limitation of the study.

Conclusion

We confirmed a dengue fever outbreak in Ehelliwa Town of Afar Region. The disease was detected in Ethiopia for the third time since 2013; however, it is the new for Afar Region. The outbreak mainly affects the age group 15-44 years and people living in an urban environment. Supportive case management, health education and vector controlled the dengue fever outbreak from Ehelliwa Town of Adaar District.

Recommendation

The surveillance system should be strengthened within the PHEM system in the region down to the woreda level. Health education in the community should be strengthened; vector control activity should focus in and outside the homes particularly with manmade containers at homes in the community. Cases should managed appropriately in order to prevent further complication and death.

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ANNEX 3: DENGUE FEVER OUTBREAK INVESTIGATION QUESTIONER

No.	Question	Coding Classification
1. Demographic Information		
1.1	Respondent classification	1.Case 2.Control
1.2	Sex	1.Male 2.Female
1.3	Age	_____Years, _____ Months
1.4	Kebele	
1.5	Religion	1. Muslim 2. Orthodox 3. Others
1.6	Marital Status	1. Single 2. Married 3. Divorced 4. Widowed
1.7	Occupation	1. Student 3. House wife 2. Daily laborer 4. Merchant
1.8	Level of education	1.Illitrate 2.Read and write only 3. Elementary 4. Secondary and above
1.9	Number of family members?	_____
2. Clinical Information		
2.1	Date of Onset	dd/mm/yyyy _____
2.2	Sign and symptoms	1. Fever 9. Gum bleeding 2. Headache 10. Sore throat 3. Joint Pain 11. Cough 4. Chill 12. Loss of appetite 5. Nasal Bleeding 13. Nausea 6. Severe muscle and joint pain 14. Vomiting 7. Back pain 15. Diarrhea 8. Rash 16. sweating
2.3	Date seen at health Facility	dd/mm/yyyy _____
2.4	What type of treatment	Antibiotics ___Antiviral ____Antipyretics __
2.5	Did you re-infected again by the disease?	1.Yes 2.No
3. Exposure		
3.1	Do you have bed net?	1.Yes 2.No

No.	Question	Coding Classification
3.2	If Yes, do you use bed net while sleeping?	1.Yes 2.No
3.3	When did you get the last bed net?	_____ Year
3.4	Who use bed net always?	1. Children 2.Women 3. All use equally
3.5	Is there any stagnant water around your village?	1.Yes 2.No
3.6	If Yes, approximately distance of stagnant water from your house?	1.less than 100m 2.more than 100m
3.7	Is your house sprayed?	1.Yes 2.No
3.8	When was the last time that your house sprayed?	1.One month ago 2.Two months ago 3. Three months ago 4. Before 3 months ago
3.9	Is there any river around your village?	1.Yes 2.No
3.10	If Yes what is the name of the river?	_____
3.11	Distance of the river from your house?	1.less than 100m 2.more than 100m
3.12	Is there other person diseased in your family?	1.Yes 2.No
3.13	If Yes, how many family members become ill?	_____
3.14	Did you have close contact with person with same complaint within the last one to two weeks?	1.Yes 2.No
3.15	Travel history within the last 2 weeks?	1. Yes 2. No
3.16	If, yes to where?	_____
3.17	Do you use air conditioning/window/door screens?	1.Yes 2.No
3.18	Do you use mosquito repellents on your skin?	1.Yes 2.No
3.19	What kind of clothes you usually wear	1. Short and T-shirts 2. Trousers/ body full dress
3.20	What is the source of drinking water?	1. Pipe 2. Spring 3. deep well 4. Hand dug well 5. shallow well 6. river

Chapter II – Surveillance Data Analysis

Epidemiology of Meningococcal Meningitis-Ethiopia, 2005-2012

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Abstract

Background: Globally an estimated 500,000 cases and 50,000 deaths of meningococcal disease occur each year. The highest rates of meningococcal disease are found in the "meningitis belt," which extends from Senegal to western Ethiopia. A new meningococcal vaccine program for serogroup A was introduced in 2010 in three countries within the meningitis belt and produced a dramatic decline in meningitis cases. We analyzed surveillance data to describe the epidemiology of meningococcal meningitis in Ethiopia in anticipation of the implementation of a national meningococcal vaccination program.

Method: We analyzed routine weekly surveillance data reported to the national Public Health Emergency Management (PHEM) center from 2005-2012. We defined a suspected case of meningitis any person with sudden onset of fever and one of the following signs: neck stiffness, altered consciousness or other meningeal sign.

Results: We identified 8,866 suspected meningitis cases between 2005-2012. The annual incidence of meningococcal meningitis was 1.4/100,000 and there were 174 deaths (case fatality rate of 2%). The highest incidence (13.3/100,000) was from Harari Region, which is located in eastern Ethiopia outside the meningitis belt. Thirty-five percent (3146) of suspected cases and 72 % (126) of the deaths were reported during epidemics. During epidemics 1444 suspected cases (46%) were aged 15-44 years old (age adjusted attack rate 4.3/100,000).

Conclusion: We determined that the highest rates of meningococcal meningitis in Ethiopia occurred outside of the traditional borders of the meningitis belt. In anticipation of widespread meningococcal vaccination campaigns, epidemiological and laboratory surveillance should be strengthened throughout Ethiopia to more clearly delineate high risk areas for meningococcal meningitis in Ethiopia.

Key Word: Meningococcal Meningitis; African Meningitis Belt; Ethiopia

Introduction

Meningococcal Meningitis is a contagious disease caused by gram negative bacteria known as *Neisseria meningitidis*. The most common symptoms of the disease are high fever, headaches, neck stiffness, vomiting, confusion and hypersensitivity to light [1]. It transmitted by person-to-person contact through respiratory droplets of infected person. Human is the only reservoir of *Neisseria meningitidis*. The average incubation period is 4 days, but can range 2-10 days [2, 3].

Five serogroups of *Neisseria meningitidis* A, B, C, W135 and X are found in the African "meningitis belt". Most common strains that cause epidemics in the “Meningitis Belt” regions are serogroup A followed by C. However, in 2002 Burkina Faso experienced the largest meningitis epidemic due to W135, and in 2003 another outbreak with mixed etiology serogroup (A and W135) occurred in the country. In 2006 *Neisseria meningitidis* serogroup X was isolated as the cause of the outbreak in the western part of Niger, and bringing in new threats for meningitis belt regions [3].

Worldwide an estimated 500,000 cases and 50,000 deaths of meningococcal meningitis occur annually. Of these figure majority of cases are reported from countries in the African "meningitis belt", an area that extends from Senegal to Ethiopia with an estimated total population of 500 million [4,5]. In this region, during epidemic time a peak incidence as high as 100-800 per 100,000 populations per year. Moreover 13 countries in Africa, under enhanced surveillance of meningitis more than 271, 275 cases and 24, 901 deaths reported to WHO in between 2003 and 2009 [6,7].

In Ethiopia, meningococcal meningitis was reported for the first time in 1901[8]. The epidemics of 1981-1983 and 1988-1989 was recorded the largest numbers of cases and deaths. Nearly 50,000 cases and 990 deaths reported during in 1981-1983 epidemic and 45,000 cases and 1,685 deaths in 1988-89. Since the 1989 epidemic, localized outbreaks have occurred almost yearly; in 1996 and 1997 in the southern region, in 1999 in Amhara and Tigray regions, and in 2000 in Addis Ababa city. During the 2000 and 2001 epidemics, 6964 cases and 330 deaths were reported. In the 2003-2004 epidemics, 3326 cases and 160 deaths reported from all regions were not limited to the traditional meningitis belt areas of North West and South Western part of the country [9, 10].

Currently the disease remains a major threat to global health, particularly country located in the meningitis belt such as Ethiopia [4]. This is therefore; these surveillance data analyses carry out to describe the epidemiology of meningococcal meningitis in Ethiopia in order to improve public health action against the disease in the country.

Rationale of the study

Ethiopia, as one of the countries with high burden of the disease experienced recurrent epidemic of meningitis for many years. A new meningococcal vaccine program for serogroup A was introduced in 2010 in three countries (Burkina Faso, Mali and Nigeria) within the meningitis belt and produced a dramatic decline in meningitis cases [11]. Thus, this surveillance data analysis will carry out to describe the disease burden and trend retrospectively from 2005 to 2012, to improve public health actions against the disease in Ethiopia.

Objectives

General Objective

- To describe the epidemiology of Meningococcal Meningitis in Ethiopia, 2005-2012.

Specific Objectives

- To determine the burden of Meningococcal Meningitis in Ethiopia
- To describe the disease (time, place and person)
- To recommend public health action

Methods

We conducted a descriptive surveillance data analysis of meningococcal meningitis using a routine weekly surveillance data of Public Health Emergency Management Centre for eight year (2005-2012). We cleaned and analysed the data using Microsoft Office Excel 2007 and Epi-info version 7.1.

Case definition: Suspected case was defined as any person with sudden onset of fever (>38.5^{0}C rectal or 38^{0}C axillary) and one of the following signs: neck stiffness, altered consciousness or other meningeal sign and confirmed case is a suspected case confirmed by isolation of N. meningitis from cerebrospinal fluid or blood.

Result

From January 2005 to December 2012, a total of 8,866 suspected cases and 174 deaths of meningococcal meningitis reported throughout the country with a CFR of 2%. Mean number of cases per year was 1108 and range of 1805 to 452.The national annual incidence rate was 1.4 per 100,000 population and the highest incidence rate was reported from Harari Region, 13.3 per 100,000 population, which is located out of the meningitis belt.

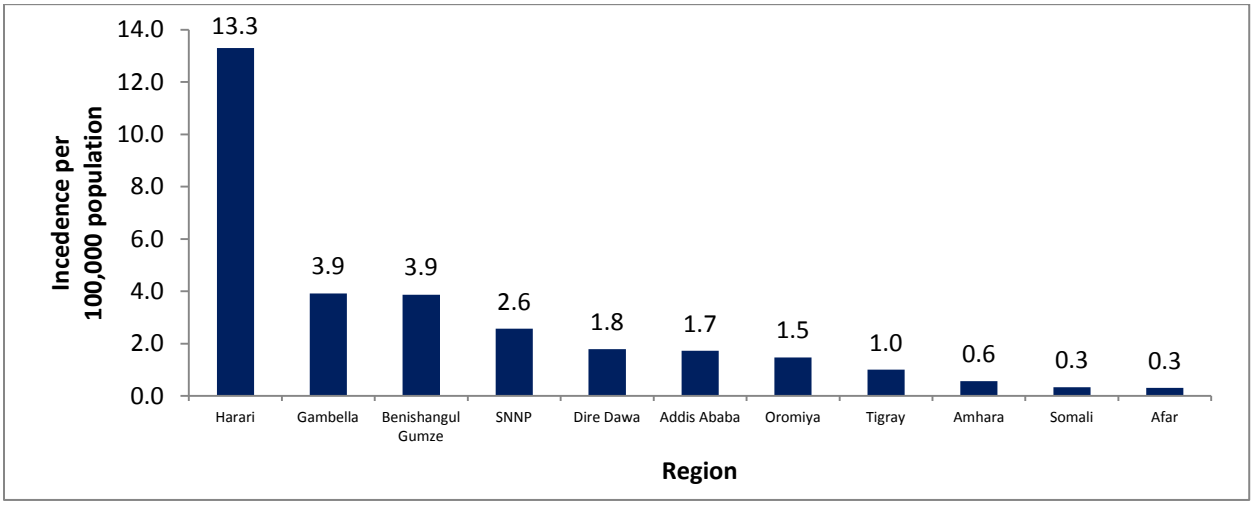

Figure 5: Trend of Meningitis Incidence Rate by Region-Ethiopia, 2005-2012.

Table 8: Cases and Deaths of Meningitis by Region-Ethiopia, 2005-2012.

Region	Case	Death	CFR (%)
Oromia	3349(37.8%)	47(27%)	1.4
SNNPR	3232(36.5%)	64(36.7%)	2.0
Amhara	803(10%)	33(20%)	4.1
Addis Ababa	390(4.4%)	6(3.4%)	1.5
Tigray	359(4%)	15(8.6%)	4.2
Harari	203(2.3%)	2(1%)	1.0
B-Gumuz	218(2.5%)	2(1.1%)	0.9
Somali	122(1%)	2(1%)	1.6
Gambela	103(1.2%)	2(1%)	2
Dire Dawa	51(0.6%)	0	0
Afar	36(0.4%)	1(0.5%)	2.8
National	8866	174	2

Of the total 6210 (70%) cases and 117 (67.2%) deaths were reported during hot and dry season from December to June and reaching its peaks in March for 5 of the 8 years. But, we also found increases in cases and deaths unusual to the meningitis season between August and November, 2006 in account of local outbreak in SNNP region, Gamo Gofa zone, Kucha woreda and Wolayta zone, Damotawoyda Woreda (Figure 7).

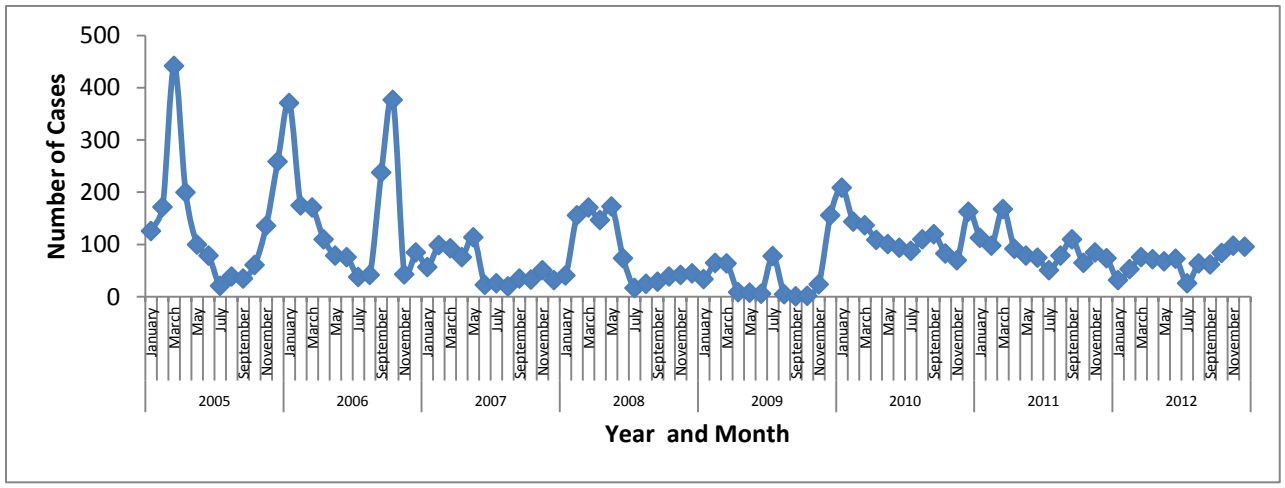

Figure 6: Trend of Meningitis Cases by Time-Ethiopia, 2005-2012.

Of the total 3,146(35.4%) cases and 126(72.4%) deaths were reported during outbreaks. Of the cases associated with outbreak reports, 1,636(4.2 per 100,000 population) were male and 1,510(4 per 100,000 population) were female. More cases occurred among age group 15-44 years 1444(4.4 per 100,000 population) followed by 5-14 years 960(4.1 per 100,000population). The CFR was highest in the 5-14 year age group followed by the under 5 year age group (Table 9).

Table 9: Incidence and CFR of Meningitis by Age Group-Ethiopia, 2005-2012

Age group (Year)	#Case (proportion)	Incidence per 100,000 population	#Death (Proportion)	CFR (%)
<5	412(13%)	3.7	20(16%)	5
5-14	960(31%)	4.1	54(43%)	6
15-44	1444(46%)	4.4	43(34%)	3
45+	330(10%)	3.6	9(7%)	3
Total	3146	-	126	4

NB: Data source from line list and daily epidemic reports.

Discussion

The highest incidences of meningococcal meninigitis form 2005-2012 in Ethiopia were reported from Harari Region followed by Gambella and Benishangul Gumze Regions, but these regions contributed a small number of cases. The majority 7384(83%) cases and 144(82%) deaths were from Oromia, SNNP and Amhara regions. These may be attributed to parts of those regions being located in the African "Meningitis belt", where the magnitude of the disease is high [2].

As per the WHO guideline epidemic threshold of the disease in a population of more than 30,000 is an incident of 15 case per 100, 000 inhabitants per week. However, when the epidemic risk is high, the recommended epidemic threshold is 10 cases per 100,000 inhabitants per week. On the other hand, populations less than 30,000; an epidemic threshold is 5 cases in 1 week or doubling of the number of cases over a three week period. Moreover, when an epidemic is confirmed in a neighboring area, the alert threshold also serves as the epidemic threshold [12]. Based on this, data from line list and daily epidemic report indicated that 35.4% cases and 72% deaths were associated with outbreak reports, in the years 2005, 2006, 2008, 2009 and 2012, in Oromia, SNNP and Amhara Regions. This recurrent occurrence of outbreaks indicates that the epidemic cycle is possibly becoming irregular, shorter and a yearly phenomenon, which is unusual to the expected epidemic interval of 8-12 years [13].

In addition to this, most of the time epidemics of meningococcal meningitis begin during the dry and hot season, from December to June and decrease with the start of the rainy season [14]. Similarly, in this surveillance data analysis 70% of cases and 78% deaths were reported within the same season from December to June and reached peaks in March most years. But, we also observed a slight case and death increment unusual to these meningitis seasons between August and November in 2006, in account of local outbreak in SNNP region of Gamo Gofa and Walayta Zone. Close to this finding, the 2000 meningitis outbreak in Addis Ababa occurred between June and August during the wet and rainy season of Ethiopia, which is the season where it is expected to be declining instead of occurring in outbreaks. Thus we need to carry out further surveillance studies if determine whether there is any epidemiological shift of the disease present or not [15,16].

Meningococcal disease commonly affects young children, but during epidemics older children, teenagers and young adults are also highly affected [13]. Previous outbreak reports in Ethiopia indicated that during the epidemic period of 1988 and 1989 about 70% of cases were among age group 5-44 years and males were more affected than females [10]. Another study conducted in Nigeria also shows that cases were more common among males than females [17]. Our findings show 86% of cases were among the age group 5-44 years and the sexes were affected nearly equally. Moreover the highest cases were among the age group 15-44 years followed by the age group 5-14 years. A study conducted on the epidemiology of meningococcal meningitis in Angola in 2001 reveled that age groups 15-29 and 5-14 years were most affected. This may be that during epidemics there may be a peak in incidence in older children, teenagers and young adults [18].

Conclusion and Recommendation

We determined that the highest rates of meningococcal meningitis occurred outside of the traditional borders of the meningitis belt. The age group 15-44 years was most affected. A seasonal trend was indentified where more cases occurred in March most years and the lowest number of cases occurred in June, July and August most years. In anticipation of widespread meningococcal vaccination campaigns, epidemiological and laboratory surveillance should be strengthened throughout Ethiopia to more clearly delineate high risk areas and to accurately identify the major serotypes of meningococcal meningitis causing disease in the country.

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+Chapter III – Evaluation of Surveillance System

Evaluation of Measles Surveillance System in Afar Region, Ethiopia, 2013

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Background: Measles is an acute, highly contagious vaccine preventable disease caused by Morbillivirus. It is among the top causes of death in children less than 5 years of age in many African countries including Ethiopia. We evaluated the measles surveillance system in Afar region to determine whether the system meeting set objectives and to assess its attributes.

Method: A cross sectional descriptive study design was conducted from 1-12 July 2013. A total of 9 study units, two woreda health office Gewane and Buremuditu (one health center and two health post from each woreda) and regional health bureau were selected. We used Center for Disease Control updated guidelines for public health surveillance system evaluation.

Result: We found the regional reporting rate for the last six month were 27.7%, Zone 39.2%, Woredas (Gewane =64.4% and Buremuditu =20%). We observed poorly acceptable and analyzing of surveillance data for action, and donor dependent surveillance system. But, it was useful, simple and flexible at all level.

Conclusion: The surveillance system of measles is useful to detect outbreaks and to estimate the magnitude of morbidity and mortality of the disease in the area. The system is simple and flexible but poorly accepted. We recommend the reporting rate, feedback system, government funding for sustainability, data analysis and quality should be improved.

Key words: Surveillance, System Evaluation, Measles, Afar, Ethiopia, 2013

Introduction

Measles is an acute, highly contagious viral disease caused by Morbillivirus. The disease is one of the vaccine preventable diseases and its transmission is primarily person-to-person via aerosolized droplets or by direct contact with the nasal and throat secretions of infected persons. The incubation period is approximately 10–12 days with a range of 7–18 days from exposure to the onset of fever and other nonspecific symptoms [1]. Human is the only reservoir of the disease. The case fatality rate of the disease estimated to be 3–5% in developing countries but may reach more than 10% in epidemics situation [2, 3].

In 2000, globally measles causes an estimated number of 853,500 cases and 542,000 deaths. In 2011 new measles cases and deaths decreased by 71% and 58% respectively comparing to 2000[4]. Measles is among the top causes of death in children less than 5 years of age in many African countries [2]. In 2001, countries in the World Health Organization (WHO) African Region began accelerated measles control activities to reduce measles deaths by half in 2005 compared to the estimated number of measles deaths in 1999. Based on the seated strategy 75% of measles death reduced in Africa region by 2005. Following this progress, in 2006 the African Region adopted a goal to achieve 90% measles mortality reduction by 2010 compared with the estimate for 2000. By 2008 in the African Region, reported measles cases and deaths decreased 93% and 92% respectively compared with 2000. The strategies include improving routine vaccination coverage, providing a second opportunity for measles vaccination through supplementary immunization activities (SIAs), improving measles-case management, and establishing case-based measles surveillance [1].

Since 2002, Ethiopia adopted these regional goals and strategies and has been taking important steps to control measles. Moreover measles is one of the 20 notifiable diseases under surveillance system of PHEM (immediately reportable disease) [5]. In addition the national measles vaccination coverage also increased from 37% in 2000 to 81.5% in 2011. However, when we see the coverage at regional level, some of the regions like Afar perform below 80% coverage [6]. This therefore, we evaluate the surveillance system of measles in Afar region to know the system meet its objective and to promote the use of public health resources through the development of effective and efficient surveillance system in the region.

Rationale

As of 2011 health and health related indicator report showing that the afar region measles coverage was 40%. Because of this low herd immunity among the community, sporadic measles cases were reported from different Woredas of the region. For instant in 2013, Gewane and Buremuditu Woreda reported localized outbreak of measles. In addition to this surveillance system evaluation was not done in the area before.

Objective

General Objective

To describe the surveillance system of measles and evaluate the key system attribute of Zone Three, Afar Regional State, Ethiopia from 1-12 July 2013.

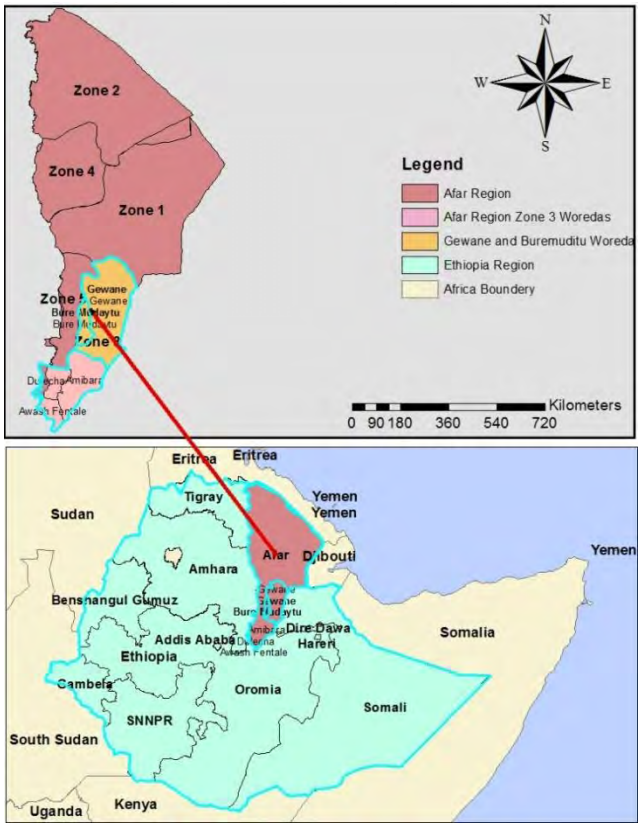
Specific Objectives

- To describe the surveillance system of measles
- Evaluate the key system attribute
- Determine whether the system is meeting its 'objective

Methods and Materials

Study area and population

The evaluation was carried out in Zone three (Gabi Rasu) zone of Afar Regional State. Zone three (Gabi Rasu) is one of the 5 zones of Afar region located in the North East of Ethiopia with a total population of 228,566 (projection from the 2007 census). It has 6 woredas, of which the studies were conducted in two Woredas (Gewane and Buremuditu).



Map 4: Map of Afar Showing Gewane and Buremuditu Woreda

Study design and period

A cross sectional descriptive study design was employed, from 1-12 July 2013.

Sample size and sampling technique

Convenience sampling was used to select one Administrative Zone from the region then Woredas were selected based on measles outbreak reported in 2013.

Study unit

The study subjects were been health facilities, health offices and the Regional Health Bureau. A total of 9 study units, one health center and two health posts from each Woreda were selected conveniently. Moreover the Woreda health offices and the regional health bureau were included in the study.

Data collection Method

The data were collected using Center for Disease Control updated guidelines for public health surveillance system evaluation. We were interviewed PHEM officers and other responsible

persons in the selected study areas and were observed the overall system. Secondary data source such as registration books, minute of meeting, and plan of action, result of data analysis and surveillance indicators were also reviewed.

Data Analysis

Data were entered and analyzed using the Microsoft Excel.

Data quality assurance

Questionnaires were developed after thorough reviewed of CDC Surveillance evaluation guideline and interviews with the key informants were conducted in the same manner using a questionnaire and all questionnaires were administered by a single interviewer to keep the consistency of administering the questions.

Result

Case definition

As per PHEM guideline there are two types of case definitions as presented below

Standard case definition

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

Community case definition

Any person with fever and rash starts from face

Case Detection, Registration and Confirmation

The cases definition of measles was available in all visited health facilities of Gewane woreda but not in Buremuditu Woreda. Understanding of the available cases definitions by the health care providers was satisfactory at the time of visit. Measles clinical registration was found in the registration books at health facilities. However, in Meteka Health post registration books lacks some important variables example chief complain or sign and symptom of patient. All visited sites have a capacity to collect, handle and transport specimen to the next level. But, many of professionals complaining they were not received result timely from EHNRI.

Reporting

There was no shortage of reporting form in the past 6 months in all visited health facilities and health offices. All the visited health facilities used the same reporting formats. The weekly reporting rate of the past six month for the region was 27.7%, Buremuditu woreda 20% and Gewane Woreda 64.4%. Woredas and health facilities used telephone to send report the next higher level while the regional health bureau used email.

Data Analysis

There were responsible PHEM focal person in all visited health offices and health facilities, except Geferem health post in Buremuditu Woreda. Regarding of analyzing data by person, place and time no one of the sampled health facility exercising it except the regional health bureau.

Epidemic preparedness and Response

The region has epidemic preparedness and response plan which is prepared together with partners. Mostly epidemic management committee and rapid response team activated during an event. Even though there was an adequate drug at the regional level, shortages of drugs and supplies occurred at health facility level. Moreover there were no allocated budgets at all level. In addition both visited Woredas were experienced measles outbreak in 2005EC (2013GC). During the outbreak time the Woreda tried to respond the outbreak within 48 hours in collaborated with partner and active case search were done from house to house and used the finding for intervention.

Feedback and Supervision

There was no written feedback system from the region to the Woreda and Woreda to the health facility. But there were verbal feedback at all level. WHO surveillance officers made regular supportive supervision of Woredas. However, the region and Woreda were not conducted this supervision to the next lower level.

Training

All visited health facility and offices were trained on EPI and PHEM system except Debel and Geferem health posts of Buremuditu Woreda. The training was more focused on vaccine preventable disease of Measles, Polio and Neonatal tetanus.

Resource

In all visited site there were enough reporting formats to collect surveillance data except Geferem health post of Buremuditu Woreda. At regional and Woreda level there is computer to create their own surveillance database. Health facilities have mobile access, wireless and land line telephone service. As well region has communication material like fax and internet. There is shortage of transportation (vehicle) at Woreda level to conduct supportive supervision regularly.

Laboratory

Woradas and health facilities have a capacity to collect and transport specimen to the national laboratory (Ethiopian Health and Nutrition Research Institute) accompanied with case based reporting form for further analysis and investigation. EHNRI responsible to test the specimen and inform the result based on the seated time on the measles guideline to the national PHEM.

Attribute of the surveillance system

Usefulness

The surveillance system is useful to detect outbreaks, to estimate the magnitude of morbidity and mortality and to assess the effect of prevention and control programs.

Simplicity

All visited health facilities, health office and regional health bureau agreed that the case definitions of measles for identification of suspected cases are easy to understand and possible to apply by all level health professional. The flow of measles data is clear and simple as it was set in the surveillance guideline and reporting forms. There was no lack of reporting format at all level except Buremuditu Woreda of Gefrem health post. Moreover to fill a single measles case based reporting format took less than 5 minutes. At the health post level there were lacks of means of reporting to report cases to the next higher bodies especially from the health post to health center. Most visited site has a constraint of logistics like internet and fax.

Flexibility

The system accommodated itself in to the new reform undertaken in the health system because previously measles were reported in monthly IDSR system but now changed to immediately and weekly aggregated form of PHEM system. Moreover health professionals explained that the

newly formats is more flexible to report and can incorporated other newly occurring health event without much difficulty.

Data Quality

We assessed the quality of data in terms of completeness and validity of the recorded data on the registry and formats. Based on this when we look the internal completeness of the data some of the measles case based formats in the health facilities missed to fill variables like sex, age, date seen at health facility and address of the patient. In addition to this, number of cases recorded on the registry had difference with reported case to the next higher.

Timeliness and completeness

When we assessed the timeliness and completeness report of the region and Woredas, mostly reports came from the health facility to Woreda on Monday midday, Woreda to region on Tuesday midday and region compile the data Wednesday and send to national PHEM up to Thursday midday. However, the data sent to EHNRI-PHEM always not complete, which indicates below the expected 80%. The completeness and timeliness of the report of the region 27.7%, Buremuditu Woreda 20%, Gewane Woreda 64.4%.

Acceptability

The acceptability of the surveillance system assessed based on their active participation in surveillance system. When we looked the commitment of the reporting agents was not as expected and the reporting rate of the region and Woredas was below 80% as seen over 12 reporting weeks, this may be due to high turnover, workload, poor means of communication, lack of feedback and response, lack of understanding of the relevance of the data collected, and the health care providers are not interested to participate on surveillance because it is not have high resources like other program.

Stability

The surveillance system is donor based, and sometimes reforms changed its stability.

Sensitivity

Sensitivity in surveillance refers to the proportion of actual cases in a population that are detected and notified through the system. During the evaluation, we described sensitivity in to three ways:

- Sensitivity of case definition: - refers to the ability of the case definition to identify all possible cases in the community. This is the case definition of measles well established, easy and can identify all measles cases.
- Sensitivity of the system: - This refers to the proportion of the cases meeting the case definition (regardless of the sensitivity of the case definition itself) that are detected and notified as they should. Accordingly, all the cases reported to the higher levels fulfilled the case definition of measles as seated on the guideline.
- Sensitivity of the detection of events for public health response: - This refers to the proportion of cases detected and reported through the system. But this couldn't be measured as the total number of persons with the disease in the community was not ascertained.

Predictive value positive

We were not able to calculate the PVP, because the total number of persons actually with disease was not determined.

Discussion

The main goal of conducting public health surveillance is to assess the health status of a population, establish public health priorities, and reduce the burden of disease in a population by making appropriate public health actions.

Measles is one of vaccine preventable disease which has a plan to eliminate by 2015 or 2020 [4]. To eliminate measles; the strategy includes improving routine vaccination coverage, providing a second opportunity vaccination through supplementary immunization activities (SIAs), improving case management, and establishing measles case-based surveillance [1]. When we look the implementation of this strategy in the visited Woredas and health facility, they lag from it concerning of measles immunization coverage and surveillance. On top of this when we assessed the first six month (2013) measles coverage of the visited Woredas, Gewane (61%) and Buremuditu (26%) which indicated very low performance.

On the other hand, understanding of measles case definition by all health professional was found good, which helps for early detection and identification of cases for timely response and prevent

further dissemination. However, their reporting habit to higher level was very poor particularly in Buremuditu Woreda.

When we look the regional and zonal reporting rate it was below expected which is 27.7% and 39.2% respectively. Moreover no one of the visited site were analyzed the collected data by time place and person. This may be they don't have continuous training how to analyze and interpreted their surveillance data for action, high turnover, lack of computer at health facility level and poor understanding of surveillance system might be the reasons for not exercising the collected data for analysis, interpretation and to take public health actions.

Conclusion

The surveillance system of measles is useful to detect outbreaks, to estimate the magnitude of morbidity and mortality of the disease in the area. In addition professionals working in the system are satisfied. The measles surveillance system is simple and flexible but it was poorly accepted.

Recommendation

Continuous supportive supervision should be in placed using checklist to increase the quality of data. Data should be analyzed each level and feedback should be given regularly to the reporter. Laboratory result should be communicated to the Woreda and health facility on time. The government should allocate budget for surveillance to ensure sustainability of the system. The region should distributed case definition and reporting formats to the Woreda and health facility.

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Chapter IV – Health Profile Description Report

Health Profile of Awash Fentale Woreda, Afar Region-2013

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 profile includes a narrative description of the given community health status in align with historical, geographical, demographical and economical background of the area.

Assessing the health profile of a community is very important to understand the health status of the community and clearly present their needs and issues. Based on that, possible to plan, prioritize public health action and interventions accordingly. Moreover it can give baseline information to other sectors of the community. However, in Ethiopia particularly regions like afar, such important information is not available in a complete, organized and updated form.

Therefore, this document describe about the comprehensive health and health related profile of Awash Fentale Woreda of Afar region as of 2004 EFY in comparison with the previous year.

Rationale of the study

Health description is important for prioritizing health and health related problems of the community at any level. In related to this there is no organized, completed and well documented profile data in Awash Fentale Woreda of Afar region. Therefore describing the health profile of the Woreda is helpful to give evidence based information for prioritizing and instituting appropriate public health interventions in the Woreda.

Objectives

General Objective

- To describe the health and health related profile of Awash Fentale Woreda.

Specific Objectives

- To assess the health and health related condition of the Woreda
- To identify problems and set priorities
- To recommend public health actions

Method

Study area: - Awash fentale Woreda, Afar region

Study Period:-April 22-May 2, 2013

Study design: - Cross-sectional descriptive

Study Units: - Woreda health office and facilities, and other responsible sectors in the Woreda

Data Collection Method: - Structured questioners were developed and used to collect primary and secondary data. Interviews were conducted with relevant officers of the Woreda health, education, water, Agriculture, administrative and others offices based on need data

Data Analysis: - Using Microsoft Excel

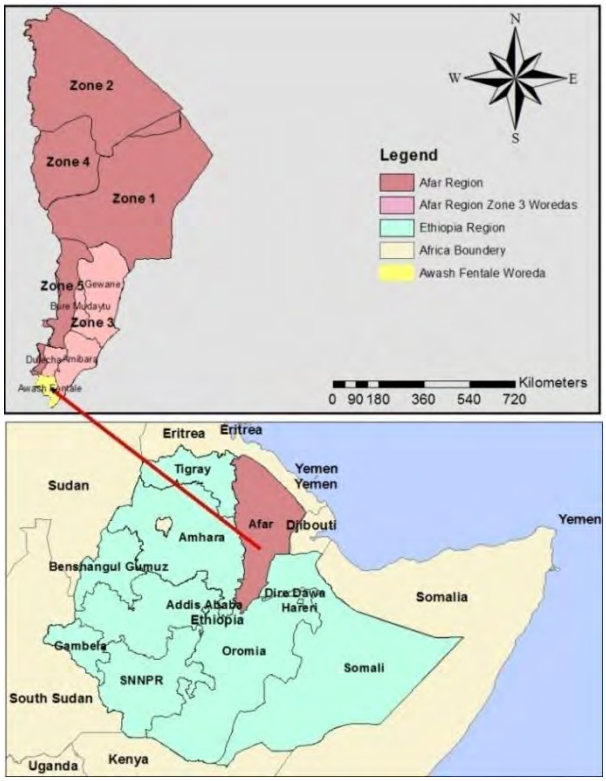
Result

Historical Background

Awash Fentale (Awash Sebat) is located in the north east part of the country in the Great Rift Valley. As the Woreda advertisement office mentioned verbally, it was established before 130 years ago (1875EC). The name of the Woreda derived from the river Awash and the mountain Fental because the woreda located above a gorge on Awash River and Mount Fentale caldera. It is situated between 8 degree latitude to the north and 39 degree longitude to the east. The altitude of the woreda is 750-1050 meter above sea level and its size 1089 square kilometer. The large portion of the woreda is occupied by Awash National Park. The Woreda 100% Kola with annuls minimum temperature 21^0c and maximum 42^0c and the mean temperature 30-32^0c and annual rainfall of 400-500 mm.

Government and Administration

Awash Fentale woreda is one of the 32 woredas in the Afar region and its part of the administrative of zone three. It composed of 5 rural kebele (Dudub, Doho, Sabura, Boloyta and Kebena) and one urban administrative (Awash Town). The main town of the woreda is called Awash town, is 230 km far from Addis Ababa to the North West and 365 km far from the South from the capital city of the region Semera. It is bordered on the south by Oromia and Amhara region, on the West by Dulecha and Argoba Woreda, on the North by Amibara Woreda and on the East by Oromia region.



Map 5: Map of Afar Showing Awash Fentale Woreda

Demography and vital statics

According to the 1999 projections, in the year 2005 Awash Fentale woreda population was 33,542 of which 17,154(51%) are male and 16, 388(49%) are female. Besides this, 18,593(55.4%) were living in urban area while 14949(44.6%) live in rural area. In addition the population distribution of the woreda by kebele is presented on table 10.

Table 10: Population by sex and Kebele, Awash Fentale Woreda, Afar region, 2005 EFY

kebele	Male	Female	Total
Awash	9326	9267	18593
Dudub	619	520	1139
Doho	2067	1866	3933
Sabura	2790	2797	5587
Boloyta	1328	1023	2351
Kebena	1024	915	1939
Total	17154	16388	33542

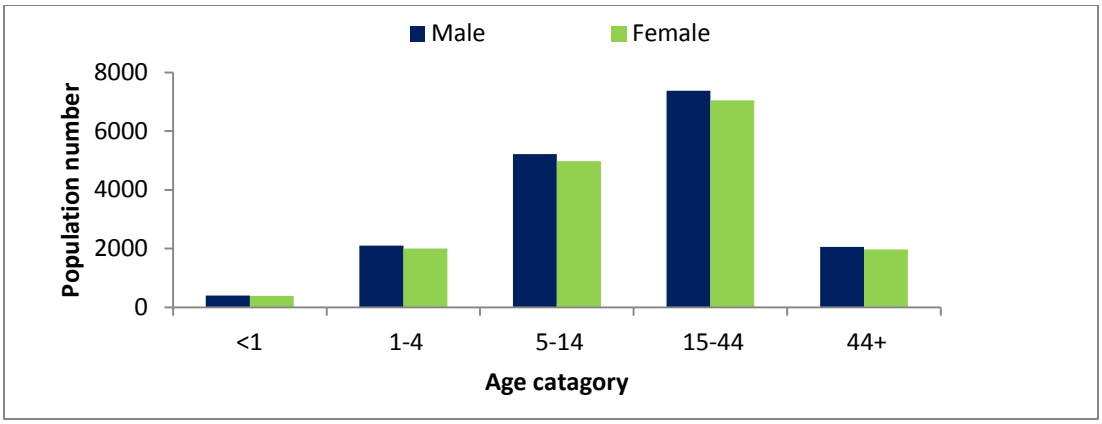


Figure 7: Population distribution by age and sex, Awash Fentale woreda, Afar region, 2005 EFY.

Table 11: Population in different groups, Awash Fentale woreda, Afar region, 2005 EFY

S/N	Description	Percentage	Population	Remark
1	Total Population	100.0%	33542	
2	Male	51.0%	17106	
3	Female	49.0%	16436	
4	Urban	55.4%	18582	16% Nationally
5	Rural	44.6%	14960	84% >>
6	Population growth rate	2.2%		2.6%>>
7	6-59 months age group	9.5%	3176	13.2% >>
8	24-59 month age group	10.4%	3492	10.72% >>
9	Under one years	1.3%	446	2.82% >>
10	Under three years	4.8%	1610	8% >>
11	Under five years	10.1%	3388	14.6% >>
12	Women 15-49 years	22.8%	7648	23.4% >>
13	< 15 years	43.2%	14490	44.98% >>
14	15-24 age group	23.0%	7715	21% >>
15	15-59 age group	52.8%	17710	50.2% >>
16	Pregnant women	2.9%	973	3.3% >>
17	Non pregnant women in reproductive age	22.3%	7480	20.1% >>

Table 12: Vital stastic of Awash Fentale Woreda, Afar region, 2004 EFY

Indicator	Number	Percentage
IMR	No data	No data
CMR	No data	No data
MMR	No data	No data
CBR	No data	No data
CDR	No data	No data

Health Infrastructure

The woreda have a total of two health center and six health posts. This make the woreda health service coverage above 100% which means health center established to provide both the preventive and curative services and it comprises five satellite health posts and is expected to serve for 25,000 people while health posts serve for 5000 people. When we look the woreda HP to population ratio 1:5,590 and HC to population ratio 1:16,771 while the national figure indicating on 2003 health and health related indicator HP: Pop 1:5,426 and HC: pop 1:30,794. This indicating the Woreda had good performance in order to expand primarily health care service to the community comparing with the national figure. Moreover the woreda have private clinics, animal health institutions, drug venders and drug stores as mentioned in detail on table 13 below.

Table 13: Health facility list by Kebele, Awash Fentale Woreda, Afar Region, 2005 EFY

		Human Health Facility		Animal Health Facility		Private clinic			Drug	Drug
Kebele	Population	HC	HP	Lower Clinic	HP	Higher	Medium	Lower	Vender	store
Awash	18593	1	0	0	0	1	5	0	3	4
Dudub	1139	0	1	1	0	0	0	0	0	0
Doho	3933	0	2	1	0	0	0	0	0	0
Sabura	5587	0	2	0	2	0	2	1	2	0
Boloyta	2351	1	0	1	0	0	0	0	0	0
Kebena	1939	0	1	0	0	0	0	0	0	0
Total	33542	2	6	3	2	1	7	1	5	4

Human Resource

Based on 2005 data health workers found in the Woreda were 2 Doctor (1 GP and 1 Dentist), 5 Health officers, 17 Nurse (3 BSC and 14 diploma), 4 Midwifery (2 BSC and 2 diploma), 4 Pharmacist (2 BSC and 2 diploma), 5 Laboratory technician (2 BSC and 3 diploma), 1 BSC holder Environmental health and 6 HEW. A total of 31 TBA found in the woreda(7 in each Doho and Dudub kebele, 6 in each Boloyta and Kebena and 3 in Sabura Kebele). When we compare professional to population ratio the woreda with the national figure the woreda have better number of professional comparing with the national except HEW to population ratio.

Table 14: Professional to Population Ratio, Awash Fentale Woreda, Afar region, 2005 EFY

Profession	Profession to population ratio Awash Fentale Woreda	Profession to population ratio National 2004 EFY health Indicator
Doctor	1: 16,771	1:28,847
Health Officer	1: 6,708	1:17,128
Nurse	1:1,973	1:2,299
Midwifery Nurse	1: 8,386	1:21811
HEW	1: 5,590	1:2807

Woreda Health System

Under the woreda health office there are three main case team which is Health Promotion Disease Prevention, Health and Health Related Service Quality and Competency Assurance (not functional currently) and Medical and Health Care Service case team. Moreover under the supervision of the woreda a total of 2 health center and 6 health posts were found. But now (starting from 2005 EFY) the woreda divide in to two which is city and Rural woreda administration. Based on that, the health system also divided in to two which is city and rural administration. As a result under the former woreda health office there were 6 health post and one B type health center while under the city administration one A type health center which is Awash health center located in the city and responsible for the City administration. Additionally three NGO working in health and related activities in the woreda they are AMRAF, Red in the generation and CARE Ethiopia.

Maternal Health Service

As of 2004 EFY, there were 951 eligible pregnant women in the Woreda. Of this, 634(66.7%) received antenatal care service at least once during their pregnancy and 301(31.7%) attended their delivery by skilled health professional, 21(2.3%) by health extension worker and 577(60.7%) by traditional birth attendant at home and 25(7.76%) receive postnatal care service. Comparing this figure with regional figure based on 2003 health and health related indicator; antenatal coverage of the region was 12,785(26.4%), delivery by skilled health professional 3586(7.4%), delivery attended by health extension worker 121(0.3%) and postnatal coverage 1489(3.1%). In general this indicated that maternal health service delivery relatively better in Awash fentale woreda in comparison with the regional figure. Moreover among pregnant women attended for ANC follow up at health center, 609(91%) were tested for HIV and 30(5%) positive for the test and 23 of them received ARV prophylaxis at the health center.

Expanded program of Immunization

The full immunization coverage of the woreda slightly increases from 44% in 2004 to 47% in 2005. When we look the full immunization coverage in the same year for zone three (51%) while the regional coverage (30.8%). This makes the Woreda performed less comparing with its Zone, but relatively better than the regional coverage. On the other way the national coverage indicating 74.5% in 2003 EFY, thus the region, the zone and the woreda itself performed less below the national coverage (Table 15).

Table 15: Description of EPI coverage, Awash Fentale woreda, Afar region, 2004 EFY

Awash Fentale	2004 Coverage	2005 Coverage of 6 Month
BCG	82%	79%
Polio 1	70%	72%
Polio 3	64%	66%
Penta 1	70%	72%
Penta 3	64%	66%
Measles	53%	57%
Fully Immunized	44%	47%
TT2+		
Pregnant	59%	73%
Non Pregnant	65%	68%

Family Planning

The woreda contraceptive prevalence rate was 1421(19%) and contraceptive acceptance rate 1389(19%) while the regional and national contraceptive acceptance rate, 20.1% and 60.4% respectively which indicate the woreda and region performing low.

Disease prevention and control

The main indicator of disease prevention and controls includes top ten cause of morbidity and mortality particularly disease like malaria, HIV, TB and Leprosy. Based on this the detailed listed below.

Top Ten Leading Causes of Morbidity in the Woreda

Table 16: Top Ten Leading Causes of OPD visit, Awash Fentale Woreda, Afar Region, 2003 EFY

Rank	Diagnosis	Cases	Percent
1	Malaria	6978	46
2	Disease of the respiratory	1863	12
3	Acute Febrile Illness(AFI)	1545	10
4	Diarrhea	1270	8
5	Helminthiasis	1051	7
6	Pneumonia	735	5
7	Disease of digestive system	601	4
8	Disease of the genitor urinary system	508	3
9	Typhoid Fever	383	3
10	Other Unspecified Infectious and Parasitic disease	374	2
Total Leading causes of Morbidity		15308	100

Table 17: Top Ten Leading Cause of Outpatient Visit in the Health Center of Awash, Afar Region, 2004 EFY

Rank	Diagnosis	Cases	Percent
1	Acute febrile illness (AFI)	1886	21
2	Acute upper respiratory infections	1317	15
3	Helminthiasis	1178	13
4	Typhoid fever	997	11
5	Malaria	900	10
6	Diarrhea (non-bloody)	634	7
7	Other or unspecified infectious and parasitic diseases	614	7
8	Urinary tract infection	510	6
9	Pneumonia	503	6
10	Diseases of the musculoskeletal system and connective tissue	434	5
Total Leading cause of morbidity		8973	100

Malaria

Malaria is one of the leading causes of morbidity in the woreda. Moreover all five rural kebele of the woreda are malarious and the populations also at risk for the disease and the woreda ITN coverage in 2004 EFY was 65%.

Table 18: Malaria Case by Parasitic Specious Awash Fentale Woreda, Afar Region, 2004 EFY

Indicator	2004	2005
Total Malaria confirmed and clinical	2867	103
Malaria outpatient confirmed case	2864	103
Total malaria inpatient case	3	0
Total malaria death	0	0
Total malaria suspected fever examined by RDT and Microscopy	761	49
PF	613	40
PV	123	30
PF rate	83%	57%

HIV/AIDS and STI

In Awash fentale woreda the prevalence of HIV among adult was 2.1%, children less than 15 years 0.2% and pregnant women's 2.7%. In addition, Awash health center is the only health center in the woreda provides VCT, integrated MCH, PMTCT and ART service to the public. As of 2004, 74 STI cases syndromically treated in the health center. Of which 56(75.6%) STI cases tested for HIV and 9(16%) were positive. On the other way, the health center provides PITC and VCT service for 8608 people in the same year. Of which 179(2%) were tested HIV positive.

TB and Leprosy

Indicators of TB and Leprosy includes TB case detection rate, TB treatment success rate, TB cure rate, TB defaulter rate, TB death rate, and new case of leprosy, grade II disability rate among new cases of leprosy and leprosy treatment completion rate (Table 19).

Table 19: Tb/Leprosy Indicator, Awash Fentale Woreda, Afar Region, 2004 EFY

TB and Leprosy Indicator	Number	Percentage (%)
Total TB case	54	
PTB Negative case	5	9.2%
PTB Positive case	49	90.7%
Extra PTB case	5	9.2%
TB detection rate	54	98.1%
TB treatment completion rate	42	77.7%
TB cure rate	38	70.3%
TB treatment success rate	38	90.4%
TB defaulter rate	12	22.2%
Death on TB Rx	8	14.8%
Total TB case screened for HIV	54	100.0%
New case of leprosy	No data	No data
Grade II disability rate among new cases of leprosy	No data	No data
Leprosy treatment completion rate	No data	No data

Nutrition

There was no data regarding on nutrition in the woreda. However, 157 children's admitted for OTP in 2004 EFY.

Essential Drug

In regarding of essential drug, difficult to say there was or there was no essential drug shortage in the woreda without knowing the woreda required, available and gaps on essential drugs at least a year.

The Woreda Integrated disease surveillance and Report

Table 20: Public Health Emergency Management Immediately and Weekly Reportable Diseases, Awash Fentale Woreda, Afar Region, 2004 EFY

PHEM reportable disease	Case	Death
AWD	0	0
Measles	0	0
NNT	0	0
AFP	0	0
Anthrax	0	0
Dracunculiasis/Guinea worm	0	0
SARS	0	0
Small pox	0	0
VHF	0	0
YF	0	0
Pandemic Influenza	0	0
Rabies	0	0
Malaria	2867	0
Meningitis	0	0
Dysentery	251	0
RF	0	0
Typhoid Fever	498	0
Epidemic Typhus	13	0
SAM	15	0

Hygiene and environmental health

Based on 2003 health and health related indicator, to measure the hygiene and environmental health of the community there are two basic indicators; these are safe water supply and household access to any type of latrine. In order to achieve the woreda environmental health and hygiene there were two types of water providing institute in Awash Fentale woreda (urban and rural). In the urban around 2300 households use water pipe and make the town safe water coverage 50%; moreover the town annual water utilization increase from year to year. In 1996 annual water utilization of the town was 131,058m^3 while in 2004 become to increase 252,081m^3. Thirty water schemes providing drinking water for the rural 5 kebeles peoples. Of which 25(83.3%) are hand dug well, 3(10%) are deep well, one shallow well and one spring water. The rural safe water coverage was 70%. However, health institution with water supply only two (one health center and health post) in 2004 EFY.

In 2003 the latrine coverage of Awash town 68.4% while the rural (5 kebeles) coverage was 6.1%, this makes the woreda latrine coverage 38.1%. In 2004 the latrine coverage of the woreda showing increments comparing with 2003 which is 46.2% while latrine utilization rate of the woreda reached 39.4%. Moreover the woreda solid and liquid waste management is 13.7% and 6.8% respectively.

Budget allocation for health

The woreda budget for all sector in 2004 EFY was 18,815,165 birr while in 2005 EFY is 21,773,558 birr. Of which budget allocation for health mentioned below in table 21.

Table 21: Budget allocation for health, Awash Fentale Woreda, Afar region, 2005 EFY

Institutes	Budget allocation in Birr	
	2004 EFY	2005 EFY
Woreda Administrative budget	18,815,165	21,773,558
Health sector budget	2,833,005	3,918,112
Percentage of Health	15%	17%

Economy

The main economy of the woreda is livestock and 85% of the rural people are pastoralist, 5% were semi-pastoralist and others constitute 10%. Moreover the woreda had a total of 397 farmers and 1,728 hectare cultivates land. Up on it various sort of cereals, vegetable and fruits are being produced; example maize, cottons, onion, tomato, sugar potato ,cabbage, mango, orange, lemon, papaya, banana, sugarcanes etc are some of the agricultural products and also economy sources of the woreda.

Education

In 2004/2005 the woreda have a total of seven KG, 17 primarily, two secondary and one preparatory school. The coverage of children joins first time school when their age reach to education (7 years) was 55.5%. Primary education coverage of the woreda was 70.8%. Of which female participation from grade 1-4 (95.6%) and grade 5-8 (87.37%).

Transport, Communication and electric power

The woreda located in the main road of Addis Ababa - Djibouti highway. Moreover there is railway from Addis Ababa to Djibouti. Within the woreda there are rural roads which connect all five kebeles with the town Awash but mostly this road functional during the dry season. In the rainy season unable to access two kebele (Boloyta and Kebena) because of the Bulga River bursting over. On the other way the woreda have communication facility like telephone(680 landline , more than 24,000 mobile phone customers and also all health facilities accessible through phone), Bank, post offices and electric power (but not adequate). In 2004 only two health facilities (one health center and one health post) have electric supply in the woreda.

Identified Problem

Lack of electricity, and water supplies observed in the health institutions. There were no registered report of death and birth, top ten causes OPD visit in pediatrics and adult age groups and top ten cause of admission in the woreda. Moreover there was limited data on nutrition, HIV/AIDS and malaria at woreda health office level. In addition unable to find required essential drug in the woreda per year in order to know if there any essential drug shortage in comparative to what they have now.

Conclusion and Recommendation

Priority should give to maternal and child health. Although, we were not able to access data on (infant, child and maternal health) and top ten cause of OPD visit in different age groups in the Woreda. These data are very important data to measure the health service quality and the magnitude of the problem in the Woreda. Thus, we recommend health facilities should register and report this important data appropriately.

Reference

1. Health and Health Related Indicator, 2003 EFY/2011 GC
2. NEW MEXICO DEPARTMENT OF HEALTH Community Health Assessment and Planning Guidebook
3. The 2007 Population and Housing Census of Ethiopia

Annex 4: Data Collection Tool

1. **Historical Aspects of the area (Culture & tourism office).**
   - Woreda Name_____
   - When was the woreda established_____
   - How & why the name given_____
   - Any other historical aspect_____
2. Geography and Climate (including map, altitudes, agro ecological zones etc)
   - Woreda map_____
   - Location(distance from AA) _____Direction _____
   - Altitude _____
   - Surface Area _____(_____%) from the zone
   - Town _____rural _____(land)
   - Geographical coordinate
     - ✓ Latitude _____Longitude _____
     - ✓ Annual rain fall_____ 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**

   A. Demographic data

   - Total Population_____ Male_____ Female_____ sex ratio_____
   - Urban Total _____ Male_____ Female_____
   - Rural Total _____ Male_____ Female_____
   - Population under 1yrs_____
   - Population under five yrs_____
   - Population < 15 years_____
   - Population >64 years_____
   - Women 15_49 years of age_____
   - Total population by kebele(each kebele pop)_____
   - Average household size
   - Annual population growth rate (%)
   - Population pyramid by age and sex

   B. Ethnic/language

   - Afar_____ (____ %), Tigre_____ (____ %),
   - Oromo_____ (_____ %), Amhara_____ (____ %),
   - Others_____ (_____ %)

   C. Religion

   - Muslim _____ (_____ %), Orthodox _____ (_____ %),
   - 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

6. Education and school Health

- **Number of educational institution**
  - ✓ K.G._____
  - ✓ Primarily School_____
  - ✓ Secondary_____
  - ✓ Preparatory_____
  - ✓ College/ University_____
  - ✓ TVET_____
- Total School Age Children (target) _____
  - ✓ Total Enrolment _____Male_____ Female_____
  - ✓ School dropout in 6 months or year 2004 _____
  - ✓ If there is school dropout why _____
- Educational status of the community
  - ✓ Total Educated people_____
    - Male _____
    - Female _____
- Number of teacher in the district_____ Male_____ Female_____

7. Facilities

A. Transport

- Road network with respect to health facility_____
- How many kebeles have access to transportation _____

B. Telecommunication

- How many people have access to fixed telephone? _____
- How many people have access to mobile phone? (coverage)_____

C. Post Office_____

D. Bank_____

E. Power supply

- How many house hold get power supply_____?

F. Water

- Total safe water coverage _____ (___ %)
- Safe water supply coverage by kebele _____
- Main source of water supply _____
- Kebeles getting safe water____ (__ %)
- Population getting safe water_____ (__ %)
- Daily water consumption per day per person_____

8. District Health system

- The general health system structure of the woreda(flow chart)

  _____

- Is there health management team (HMT) at woreda level? Yes/No

  _____

- If yes , describe the HMT in detail (composition and function)

  _____

- Do you have NGOs working on health and health related issues? Yes/No
- List the NGOs and their work in related to health

  _____

9. Vital Stastics and Health Indicators

- Infant Mortality Rate (IMR) _____(total <1 yr deaths this 2004/05 yr____)
- Child Mortality Rate_____(this year's total <15 yr deaths_____)
- Crude Birth Rate_____
- Crude Death Rate_____ (total deaths 2004/05 yr____)
- Maternal Mortality Rate_____(2004/05 total maternal deaths_____)
- ANC rate (how many of the total expected pregnancies attended 1st ANC) _____

- ANC rate (how many of the total expected pregnancies attended 4th ANC) _____
- Percentage of deliveries attended by skilled birth attendants_____
- Percentage of deliveries attended by HEWs_____
- Percentage of deliveries attended by TBA _____
- **Immunization Coverage (for children and Women);**
  - ✓ BCG _____ (__ %).
  - ✓ OPV0____ (____ %), OPV1_____ (___ %), OPV3_____ (___ %)
  - ✓ Penta1_____ (___ %), penta2 _____ (___ %), penta3_____ (___ %)
  - ✓ Measles_____ (___ %).
  - ✓ TT2+P.W_____ (__ %), TT2+ N.P.W_____ (___ %), TT coverage

10. Health Service

A. Type and Number of Health Institution

Type		Number	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		
Facilities under constrictions	HP		
	HC		
	Hospital		

- Health institution to pop ratio: Hospital: Pop----------.HC: Pop----------
- HP: Pop----------Health service coverage----------

B. 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		

- Doctor: pop. Ratio____Nurse: pop. Ratio____
- Mid. Wife: pop. Ratio ___HEW: pop. Ratio_____

C. **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		

D. Health budget allocation:

- **Government**

- ✓ Annual budget allocated for the woreda(birr) _____
- ✓ Annual budget allocated for health or health institutions _____
- ✓ Annual budget allocation increment percent comparing to the previous year___%

- **Funds from NGO**
  - ✓ Total _____ (purpose/programs)_____

11. Community Health Services;

- Status of services provided by community health workers namely
  - ✓ No. of TBAs/TTBA_____ and their responsibility
  - ✓ No. of CHWs/CHPs_____ and their responsibility
  - ✓ Responsibility of HEWs_____
  - ✓ Others_____

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

- MCH (Delivery, ANC, PNC) _____
- FP(Methods, Contraceptive prevalence rate, Contraceptive acceptance rate
- EPI(outreach service, cold chain, vaccine) _____

- Environmental Health & sanitation.
  - ✓ Latrine coverage_____ & utilization rate_____
  - ✓ Solid waste management_____
  - ✓ Liquid waste management _____
- **Endemic diseases;**
  - **Malaria:**
    - ✓ Total malarious kebeles_____ & Pop at risk_____
    - ✓ ITNs coverage (including current dist)_____
    - ✓ Is there IRS this year(No of kebeles)_____
    - ✓ Total cases/yr____ deaths/yr_____,<5yr cases_____ deaths___
    - ✓ Malaria supplies (Coartem, RDT, etc) shortage _____
    - ✓ Other issues_____
  - **TB/Leprosy**
    - ✓ Total TB cases_____

- ✓ PTB negative_____
- ✓ PTB positive_____
- ✓ Extra PTB _____
- ✓ TB detection rate _____
- ✓ TB Rx completion rate _____
- ✓ TB cure rate _____
- ✓ TB Rx success rate _____
- ✓ TB defaulter_____
- ✓ Death on TB Rx_____
- ✓ Total TB patients screened for HIV_____
- ✓ Total Leprosy cases _____on Rx_____

- **HIV/AIDS;**
  - ✓ Total people screened for HIV (last one year)_____
  - ✓ VCT_____PITC_____PMTCT_____
  - ✓ HIV prevalence_____
  - ✓ HIV Incidence (new cases/yr)_____
  - ✓ Total PLWHA_____
  - ✓ ON ART_____ on Pre-ART_____
  - ✓ Other HIV prevention activities_____
- **Nutrition (malnutrition related OTPs,SC,TSF,CBN and PSNP activities)/HO & Early warning**
  - ✓ Total OTP sites_____, total admissions to OTP/yr_____
  - ✓ Total SC sites,_____, Newly opened/yr_____, total admissions to SC/yr_____
  - ✓ Is there TSF (targeted supplementary feeding) program in the woreda
  - ✓ CBN program_____ PSNP_____ other_____
  - ✓ General food security condition_____
- **Essential drugs (shortage):-_____**

13. Disaster situation in the woreda

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

- Any recent disease outbreak/other public health emergency_____
- If yes cases_____ and deaths_____

14. Discussion of the highlights and the main findings of the health profile assessment and description

_____

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

_____

16. **Conclusions made about the health status of the Woreda based on the findings**

_____

17. R**ecommendations- on how to address the problems identified clearly depicting responsibilities, required resource and timeline**

_____

Chapter V – Scientific Manuscript for Peer Reviewed Journal

5.1 Measles Outbreak in Kechene Medhanialem Orphanage, Addis Ababa, Ethiopia-2014

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Abstract

Background: Measles is a highly contagious vaccine preventable disease, and has been targeted for elimination in all six World Health Organization (WHO) regions. In Ethiopia, recurrent outbreaks have continued. On 25 January 2014, a suspected measles outbreak was reported from Gullelle sub city-Kechene Medhanialem Orphanage, Addis Ababa to Federal Public Health Emergency Center. Investigated was made to confirm the outbreak, identify risk factors and implement control measures.

Methods: A case was defined as any person with fever and maculopapular rash and cough, coryza, or conjunctivitis or any person in whom a clinician had suspected measles. Matched case-control study by sex was conducted. Structured questioner used to collect data from 14 cases and 42 controls. Controls defined as any person in the orphanage without sign and symptom of the disease. Nine blood specimens collected for laboratory confirmation.

Results: A total of 14 measles cases were identified and no death was documented. Seven of nine blood samples tested positive for measles IgM antibodies. All cases were female aged 7 to 14 years and overall attack rate 4.3%. Median age of case was 10 years and control 13 years. The subsequent analytic study determined factor associated with illness were being unvaccinated (OR=7.1; 95% CI=1.6-31.2) and having contact with measles patient (OR=15; 95% CI=2.9-77.3). Knowledge about measles and previous measles infection were not statistically significant.

Conclusion: Confirmed measles outbreak occurred in Kechene Medhanialem Orphanage, and cases were associated with low vaccination rate. A vaccination campaign, case management and health education program were implemented. Supplementary immunization activity should be enhanced and surveillance should be strengthened.

Key words: Measles, outbreak, Orphanage, Ethiopia

Introduction

Measles is a highly contagious vaccine preventable disease, caused by the genus Morbillivirus and is characterized by fever, runny nose, cough, red and watery eyes; and a generalized, maculopapular erythematous rash. Transmission is through respiration via aerosolized droplets or by direct contact with the nasal and throat secretions of infected persons [1]. Incubation period is approximately 10–12 days from exposure to the onset of fever and other nonspecific symptoms and 14 days (a range of 7–18 days) from exposure to the onset of rash [2].

In certain high-risk populations, the disease case-fatality rates as high as 30% have been reported in infants aged less than one year of age. Malnutrition (including vitamin A deficiency), underlying immunodeficiency and lack of access to medical care are all factors leading to the high case fatality rates observed in many parts of the world. In Ethiopia context, the expected case-fatality rate is between 3% and 6%; the highest case-fatality rate occurs in infants 6 to 11 months of age, with malnourished infants at greatest risk. These rates may underestimate the true lethality of measles because of incomplete reporting of outcomes of measles illness[2].

Worldwide, the disease causes an estimated 20 million cases and 164,000 deaths each year [3]. It is one of the leading causes of death among young children even though a safe and cost-effective vaccine is available [4]. All six World Health Organization (WHO) regions have targeted measles for elimination by 2020. In 2001 the WHO launched a number of immunization strategies to reduce mortality from measles, and global measles mortality rates dropped by an estimated 74% between 2000 and 2010. Strategies have included providing a second opportunity for measles vaccination using supplementary immunization activities (SIAs), improving measles-case management, and establishing case-based measles surveillance [2]. However, measles remains endemic in Ethiopia.

On 25 January 2014, a suspected measles outbreak was reported from Gullelle sub city-Kechene Medhanialem Orphanage. Accordingly team deployed to the area to confirm the outbreak, identify risk factors and implement control and prevention measures.

Methods

Investigation area

The study conducted in Kechene Medhanialem Orphanage, which is located in Woreda four Gullelle sub city under Addis Ababa city administration. The orphanage is supported by the government and established 1959. Since establishment up to now it grows up many children that joined the center because of different reason from whole parts of the country. Currently the center has 324 female children age group between 7 -18 years. In the Orphanage there are three different living rooms which categorized based on orphans age. The first living room for age group 7-12 years and called "Tach Bet", the second room for age group 13-15 years and they called it "Wello Bet" and the third one for age group above 15 years they called "Foke Bet".

Study design

We conduct a case control study supported by descriptive study design.

Sample Size

Unmatched case control study in the ratio of 1:3(14 cases-42 controls) was conducted

Definition

Suspected Case: - defined as any person with fever and maculopapular (nonvesicular) generalized rash and cough, coryza or conjunctivitis (red eyes) OR any person in whom a clinician suspects measles.

Confirmed Case:- defined as a suspected case with laboratory confirmation (positive IgM antibody) or epidemiological link to confirmed cases in an epidemic.

Controls: - a child in the orphanage without sign and symptom of the disease

Data collection method

Registration book of the center clinic was reviewed retrospectively to evaluate for previous outbreak and determine the baseline rate of disease. A Structured questioner was used to interview both the case and controls group. An active search was conducted using line listing of cases. Discussion were made with sub city health promotion and disease prevention case team, head of the center, health worker at the center clinic and care givers about the disease.

Laboratory Investigation

Blood specimens were collected from nine suspected measles patient and sent to National polio and measles laboratory for confirmation.

Environmental Investigation

General housing condition sleeping room, housing ventilation and hygienic condition of the cases and controls were visual inspected.

Data analysis

Collected quantitative data was checked and entered on a computer and analyzed using Microsoft office Excel and Epiinfo 7.1

Ethical issue

Informal consent was obtained from all respondents before interviews.

Result

Descriptive analysis

We identified 7 laboratory confirmed and 7 epidemiologically linked measles cases in the Kechena Medhanialem Orphanage of Gullele Sub City between 25 January to 2 February 2014. There were no deaths. Seven of nine blood specimens tested positive for measles specific IgM antibodies. All cases were female aged 7 to 14 years.

The overall attack rate 4.3% and the attack rate in the Tach bet room was 9.6% and the Wello bet room was 2.2%. We observed overcrowding in their living room (two to three children were sleep together in one bed up to 50 children live in one class).

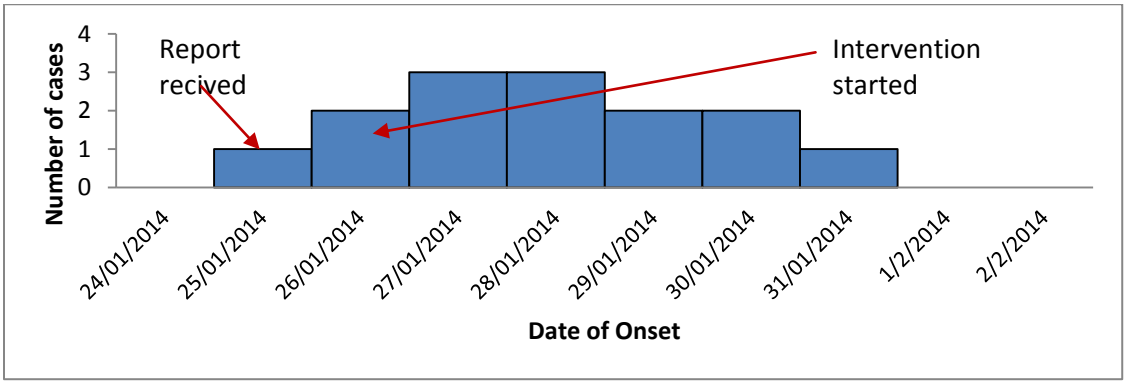

Figure 8: Measles Cases by Date of Onset in Kechene Medhanialem Orphanage, Addis Ababa, 2014

As per the explanation made by head and health workers in the Orphan; the health status of children was unknown and also the vaccination rate of the orphan. They also explained that they had problem in referral linkage of the orphan with the nearby health facilities. In addition to this we observed no surveillance system and delegated focal person in the orphanage and we also made discussion with care givers about the disease no one of the care giver respond about how transmitted and prevent the disease.

Analytical analysis

We obtained 1:3 ratios of 14 cases (median age of 10 years) and 42 control (median age of 13 years). On bivarate analysis the factor associated with illness were vaccination status (OR: 7.1; 95% CI: 1.6-31.2) and having contact with sick with measles patient (OR: 15; 95% CI: 3.0-77.3).

Table 22: Bivarate Analysis for Different Exposures, Kechene Medhanialem Orphanage, Addis Ababa, 2014

Exposure		Case (%)	Control (%)	OR(95% CI)	P-Value
Being Unvaccinated	Yes	6(60%)	4(40%)	7.1(1.6-31.2)	0.01
	No	8(17.4%)	38(82.6%)		
Is there any person with measles	Yes	12(50%)	12(50%)	15(2.9-77.3)	0.00
visited your dormitory or class	No	2(6.2%)	30(93.7%)		
Do you have measles infection	Yes	2(13.3%)	13(86.6%)	0.3(0.07-1.90)	0.30
before	No	12(29.3%)	29(70.7%)		
Knowledge on Measles					
Is measles is vaccine preventable	Yes	7(18.9%)	30(81.1%)	0.4(0.11-1.38)	0.25
disease	No	7(36.8%)	12(63.2%)		
Do you know mode of	Yes	5(17.2%)	24(82.7%)	0.4(0.11-1.4)	0.27
transmission of measles	No	9(33.3%)	18(66.6%)		
Do you think medical treatment	Yes	11(23.4%)	36(76.6%)	0.6(0.13-2.8)	0.39
can cure measles	No	3(33.3%)	6(66.6%)		

Public health Intervention

All patients received supportive care including oral antibiotics for bacterial infections, tetracycline ointment, oral rehydration solution, anti-pyrtics, and vitamin A. Measles vaccination was provided for all children found in the Orphanage.

Discussion

Our investigation confirmed a measles outbreak in the Medhanialem Orphanage in the Gullele Sub City, Addis Ababa City Administration. The outbreak primarily affected children age group between 7-12 years they where live in "Tach Bet". The overall living and hygienic condition of this room was very poor comparing with the other two rooms of orphans.

Several factor may increased the chance of developing measles disease. Unvaccinated or inadequately vaccinated is one of the factors to develop the disease. In this investigation we identified that the vaccination status of many of children in the Orphanage was unknown. This is one of the factors that increased susceptibility of the disease among children. Living in crowded and/or unsanitary conditions is another risk factor of measles. In related we observed in our visual inspection very crowded living condition in the Orphanage which is two to three children sleeping together in one bed and more than 50 children live in one class which aggravated the transmission of the disease in the area. [5]. In addition to these, care givers in the orphanage they did not have enough knowledge about the disease and also how to manage and protect one uninfected child from contacts.

There was no well organized health service and surveillance system in the orphanage and also no clear referral linkage with the surrounding facility. In addition to this, no one of the care givers knows about the orphan health status. When they join the orphanage, they simply join the group based on their socioeconomic and related problems. So, this factor might be contributed to the occurrence of the disease in the area.

On bivaraite analysis the risk factor statically associated with illness were being unvaccinated and having contact with measles patient. These are associated with an outbreak investigation done in two Nigeria states of (Kaduna and Sokoto) in 2013 [6, 7].

Conclusion

A confirmed measles outbreak occurred in Kechene Medhanialem Orphanage, in Addis Ababa. It primarily affected children aged 7-12 years. We recommend enhancing supplementary immunization activities and surveillance for disease to reduce the risk of future outbreak in the orphanage.

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5.2 Dengue Fever Outbreak Investigation in Adaar Woreda, Afar Region, Ethiopia-2014

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Abstract

Introduction: Dengue fever is a rapidly spreading mosquito borne viral disease in the world. Globally, an estimated 50 to 200 million cases and 20, 000 deaths occurred annually. In Ethiopia dengue has become a new emerging public health problem. On 03 April 2014 unusual increment of acute febrile illness negative for malaria were reported from Afar region-Adaar Woreda. Team deployed to the area to confirm the existence of the outbreak, identify the etiology, source, risk factors and finally to implement intervention measures.

Method: We conducted a descriptive study of the outbreak for which a suspected case was defined as any person with an acute febrile illness (fever, severe headache and/or diarrhea) with a negative malaria test from 19 March to 30 April, 2014. We also conducted unmatched case-control study. A structured questioner was used to collect data from 60 cases and 120 controls. Thirteen nine (28 serum and 11 whole blood) specimens collected for laboratory confirmation.

Result: We identified a total of 708 acute febrile illness cases without deaths from Ehelliwa town, Adaar district of Afar region. Of which 387(55%) were male and 316(45%) were female. The crude attack rate was 12,048/100,000 population (male=12,298/100,000 and female=11,756/100,000). The age group 15-44 years was more affected by the disease AR of 17,472/100,000. Median ages of cases were 25 years and controls were 26 years. On bivariate analysis the factors associated with illness were having dengue fever patient in the household (OR: 2.3: 95% CI: 1.2-4.4) and wearing short pants and T-shirt (OR: 3.6: 95% CI: 1.2-11.1). Out of 28 serum sample collected 14 specimens were tested ELISA test at national laboratory and 9 were positive for dengue fever. Eleven whole blood specimens were cultured and there was no growth for any bacteria.

Conclusion: We confirmed a dengue fever outbreak in Adaar district of Afar region. This was the third dengue fever outbreak detected in Eastern Ethiopia since September 2013. However, it is the first reported dengue fever from the Afar Region. The age group 15-44 years and people

live in urban were more affected. Supportive case management, health education and vector control activities controlled the outbreak from the district.

Key Word: Dengue Fever, Afar, Ethiopia

Introduction

Dengue fever is the most common and rapidly spreading mosquito borne viral disease in the world [1]. It is caused by an arthropod-borne flavivirus. The main vector is the mosquito Aedes aegypti. There are four distinct serotypes of dengue virus (DEN-1, DEN-2, DEN-3 and DEN-4). The dengue virus is transmitted by day time bites of Aedes aegypti and Aedes albopictus mosquito[1, 2]. There are two main forms of dengue disease, dengue fever and the more severe dengue hemorrhagic fever (DHF). Infection with dengue virus present with severe headache, pain in the eyes, muscle and joint pain as well as rash and the more severe hemorrhagic fever presents with dengue-like symptoms and hemorrhagic manifestations. In severe cases, patients may suddenly deteriorate, develop hypothermia and go into circulatory shock we called dengue shock syndrome [3].

The dengue virus infection is prevalent across the tropical belt in over 100 countries and 2.5 billion people at risk of acquiring the infection. Globally, an estimated 50 to 200 million cases of dengue fever and 500,000 cases of dengue hemorrhagic fever, resulting in around 20, 000 dengue related deaths occur annually[4, 5]. Urbanization, substandard housing, intentional or unintentional water storage patterns, and population growth have created environments that favor transmission of dengue fever [6].

In Ethiopia dengue has become a new emerging public health problem. An outbreak of dengue fever was reported for the first time in Dire Dawa in September 2013 and in Somali Region in January 2014. On 03 April 2014 an unusual increment of malaria negative cases with symptoms of fever, severe headache, back and joint pain suspected for dengue fever were reported from Afar Region- Adaar Woreda. A team from the Ethiopian Public Health Institute deployed to the area to confirm the existence of the outbreak, identify the etiology and risk factors and finally to institute control and prevention measures.

Methods

Investigation area

The study conducted in Adaar Woreda, Zone One of Afar Region. The Woreda is 455Km far from the capital city Addis Ababa to the north east. The woreda has 13 kebeles (one urban and 12 rural) with a total population of 63,630 (male 34,360 and female 29,270). The population of urban (Ehelliwa was 5843 and male population were 3155 and female 2688)

Study design

We conducted a descriptive study followed by case-control.

Sample Size

Unmatched case control study in the ratio of 1:2 (60 cases-120 controls) was conducted.

Definition

Suspected Case of Acute Febrile Illness

Any person with an acute febrile illness (fever, severe headache and/or diarrhea) with a negative malaria test.

Probable Case of Dengue Fever

Any person infected with an acute febrile illness with 2 or more of the following: headache, retro-orbital pain, arthralgia, rash, hemorhagic manifestations, leukopenia; and Supportive serology (a reciprocal HI antibody titer > 1280, a comparable IgG assay ELISA titer or (+) IgM antibody test on a late or acute convalescent phase serum specimen

Confirmed Case of Dengue Fever

A case confirmed by laboratory

Controls

Any person in the area without signs or symptom of the disease

Data collection method

Registration book of the health center was reviewed retrospectively to observe if similar outbreak had recently occurred and to set background status of the disease. Active case search

was conducted using line listing of suspected cases. A structured questionnaire was used to interview both the case and controls group. In addition discussions were made with Woreda Health Office, Regional Health Bureau, health workers at the health facility and some community members.

Laboratory Investigation

A total of 28 serums and 11whole blood samples were collected from malaria negative patients and transported to the national reference laboratory for viral and bacterial investigation.

Environmental Investigation

We assessed the general living environment of cases and controls. In addition to this we assessed the possible mosquito breeding sites within the community and nearby rivers.

Data analysis

We analyzed the collected quantitative data using Microsoft Excel and Epi info 7.1

Ethical issue

Informed verbal consent was taken informally from all respondents before interviews and all agreed to take part.

Result

Descriptive

A total of 704 acute febrile illness cases without deaths were identified from 19 March to 30 April 2014. Of which 388(55%) were male and 316(45%) were female. The crude attack rate was 12,048/100,000 population. Of which male were 12,298/100,000 and female 11,756/100,000. All cases were outpatient and reported from the town Ehelliwa. The age group 15-44 years was more affected by the disease with an attack rate of 439(17,472/100,000) population followed by age group 5-14 years AR 159(8,951/100,000) population. Since 30/4/2014 no case were reported.

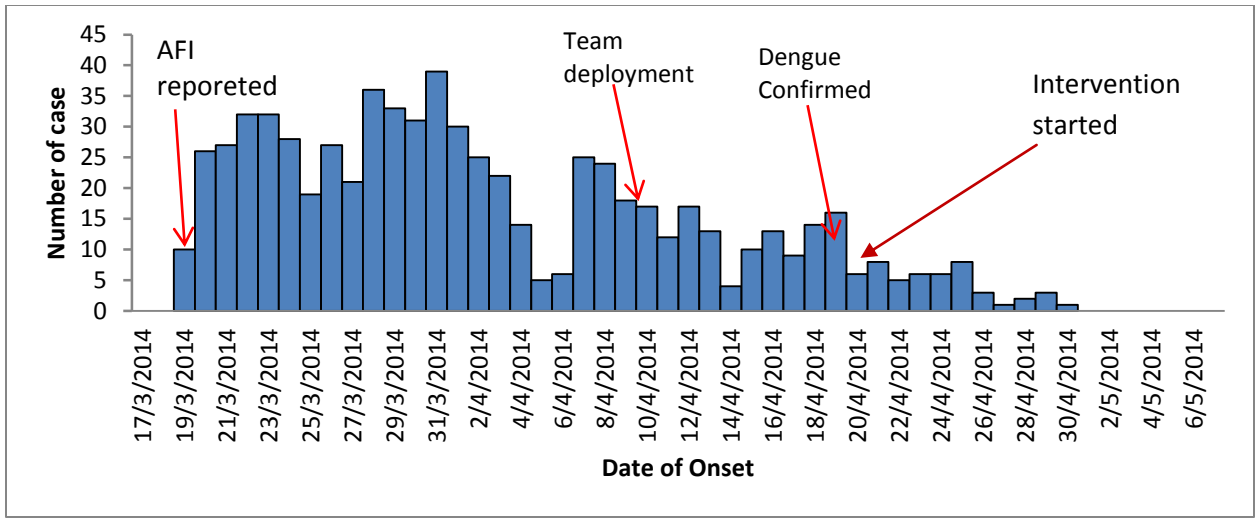

Figure 9: Dengue Fever Outbreak by Date of Onset, Adaar Woreda, Afar Region-2014

Laboratory Investigation

Of the total collected 39 sample (28 serum and 11 whole blood), 14 serum sampleswere tested by ELISA at the national laboratory and 9 (64%) were postive for dengue fever. All the 14 serum specimens were checked for other arbovirus and negative for yellow fever, west nile fever, crimean-congo, rift vally fever and chikugunya virus. The 11 whole blood samples were sent for culture and no growth for streptococcus pneumonia, E.coli, Salmonella species, Klebsiella Pneumonia or brucella species was documented.

Environmental Investigation

The source of drinking water of the community is piped water. However, we observed every household using man made containers like jars and pots to store their water. We also observed mosquitoes in the area and people seated and sleeping outside their homes wearing short pants and t-shirts during day time.

Analytical

We interviewed 60 cases and 120 controls (median ages of cases were 25 years and controls were 26 years.). On bivariate analysis the factors associated with illness were having a dengue fever patient in the household (OR: 2.3: 95% CI: 1.2-4.4) and mostly wearing short pants and T-shirts (OR: 3.6: 95% CI: 1.2-11.1).

Table 23: Bivarate Analysis for Different Exposure Adaar Woreda, Afar Region-2014

Exposure		Case (%)	Control (%)	OR (95% CI)	P-Value
Having close contact with	Yes	51(36%)	90(63.8%)	1.8(0.8-4.2)	0.17
case the last one to two week	No	9(23%)	30(77%)		
Having bed net	Yes	25(29.7%)	59(70.2%)	0.7(0.3-1.3)	0.62
	No	35(36.4%)	61(63.5%)		
Having travel history the last	Yes	8(23.5%)	26(76.4%)	0.5(0.2-1.3)	0.25
two weeks	No	52(35.6%)	94(64.4%)		
Using air conditioning or	Yes	27(38.5%)	43(61.4%)	1.4(0.7-2.7)	0.30
window and door screening	No	33(30%)	77(70%)		
Using mosquito repellent	Yes	2(28.5%)	5(71.4%)	0.7(0.1-4.2)	0.89
	No	58(33.5%)	115(66.4%)		
Presence of dengue fever	**Yes**	**39(42.4%)**	**53(57.6%)**	**2.3(1.2-4.4)**	**0.01**
patient in the home	**No**	**21(23.8%)**	**67(76%)**		
Presence of river around the	Yes	48(31.2%)	106(68.8%)	0.5(0.2-1.2)	0.20
village	No	12(46.1%)	14(53.8%)		
Presence of any stagnant	yes	4(50%)	4(50%)	2.0(0.4-8.5)	0.30
water around your village	No	56(32.5%)	116(67.4%)		
Is your house sprayed	Yes	35(31.2%)	77(68.7%)	0.7(0.4-1.4)	0.54
	No	25(36.7%)	43(63.2%)		
Type of clothing mostly	**Shorts/T-**	**56(37%)**	**95(63%)**	**3.6(1.2-11.1)**	**0.01**
using	**Shirts**				
	Trousers/	**4(13.7%)**	**25(86.2%)**		
	full dress				

Public Health Intervention

Supportive case management, health education and vector control activities were undertaken.

Discussion

The investigation confirmed a dengue fever outbreak of 704 cases with common symptoms of fever, headache, back pain and joint pain in Adaar Woreda, Afar Region. This was the third

dengue fever outbreak detected in Eastern Ethiopia since September 2013. However, it is the first reported dengue fever from the Afar Region. The first outbreak in September 2013 was reported from Dire Dawa (11,400 cases), the second in January 2014from Gode Town Somali Region (<200 cases) and the third and the current outbreak occurred in Addar Woreda of Afar Region. The disease rapidly spreading to eastern and north eastern parts of Ethiopia[7].

Mostly dengue mosquito born infections are found in tropical and sub-tropical regions around the world. Transmissions predominantly increased in urban and semi urban areas for the reason that Aedes aegypti mosquito lives in urban habitats and breeds mostly in man-made containers[8, 9]. Similarly in this outbreak all most all cases were reported from the Town of Ehelliwa and the community uses man made water containers like jars and pots which are favorable breading sites for mosquitoes.

The disease affects both sexes nearly equally. But, age group 15-44 years were more affected by the disease than others age groups with an attack rate of 439(17.4%). During our investigation time we observed that those age groups prefer to sit outside the home during daytime hours chewing "chatt" when the Aedes mosquito prefers to bite. This may attribute to the increased incidence of the disease among this age group.

On bivariate analysis having dengue fever patient in the household was significantly associated with illness. This may be due to infected humans being the main carriers and multipliers of the virus, serving as a source of the virus for uninfected mosquitoes. Patients who are already infected with the dengue virus can transmit the infection (for 4–5 days; maximum 12) via Aedes mosquitoes after their first symptoms appear[8]. In addition wearing short pants and T-shirts was significantly associated with illness likely because this may increase exposure to mosquito bites and the disease infection.

The investigation had some limitations. First was the absence of an entomologist from the team. Because of that we were unable to identify the mosquitoes and larva breading sites in the field beyond visual inspection. Recall based was also another limitation of the study.

Conclusion

We confirmed a dengue fever outbreak in Ehelliwa Town of Afar Region. The disease was detected in Ethiopia for the third time since 2013; however, it is the new for Afar Region. The outbreak mainly affects the age group 15-44 years and people living in an urban environment. We recommended supportive case management; health education and vector controlled the dengue fever outbreak from Ehelliwa Town of Adaar District.

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Chapter VI – Abstract for Scientific Presentation

6.1 Meningitis Outbreak, Hababo Guduru Woreda-Oromia Region, Ethiopia-2013

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Background: Ethiopia is within the meningitis belt and experiences local meningitis epidemics almost yearly. Most of the causes of meningococcal meningitis outbreak in the country is due to serogroup A. On 01 May 2013 Hababu Guduru District of Oromia region reported a suspected meningitis outbreak to the Federal Public Health Emergency Management Center. Investigated was launched to identify the etiological agent, risk factors and to implement control measures.

Methods: A suspected case was defined as any person with a history of sudden onset of fever and one of the following signs neck stiffness, altered consciousness or other meningeal signs. A descriptive study was done than followed by an unmatched case-control study from 01-28 May 2013. A structured questionnaire was used to collect data from 57 cases and 57 controls. Controls were any person in the village without sign or symptoms of meningitis.

Results: The descriptive study reviled a total of 244 suspected meningitis cases and two deaths (CFR= 0.8%). One hundred forty nine (61.1%) were female. The overall attack rate was 46/10,000 and the highest rate was among children aged 5-14 years (AOR=79/10,000). In the case control study, a multivariate analysis showed attendance in a public gathering area (OR=3.3; 95% CI= 1.3-8.2), sharing a bedroom with more than two people (AOR=10.5; 95%CI=3.2-33.9) and living with a sick family member (AOR= 26.7; 95%CI=4.0-175.5) were associated with meningitis. There was no history of vaccination in the community for *N. meningitidis*. Eleven cerebro spinal fluid specimens(CSF) were collected, and nine were positive for *Neisseria meningitidis* W135 in a rapid latex agglutination test at district level. Of these seven CSF specimens were sent to National laboratory which were negative by culture.

Conclusion: A suspected meningococcal meningitis outbreak in Hababu Guduru district mainly affects females and age group 5-14 years. Overcrowding was significantly associated with the

outbreak. Health education and increasing laboratory capacity for RT-PCR for better diagnostic capacity is recommended in the future.

Key words: Meningitis, outbreak, Ethiopia

6.2. Measles Outbreak in Kechene Medhanialem Orphanage, Addis Ababa, Ethiopia-2014

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Abstract

Background: Measles is a highly contagious vaccine preventable disease, and has been targeted for elimination in all six World Health Organization (WHO) regions. In Ethiopia, recurrent outbreaks have continued. On 25 January 2014, a suspected measles outbreak was reported from Gullelle sub city-Kechene Medhanialem Orphanage, Addis Ababa. We investigated to confirm the outbreak, identify risk factors and implement control measures.

Methods: A case was defined as any person with fever and maculopapular rash and cough, coryza, or conjunctivitis or any person in whom a clinician had suspected measles. Unmatched case-control study was conducted. Structured questioner used to collect data from 14 cases and 42 controls. Controls defined as any person in the orphanage without sign and symptom of the disease. Nine blood specimens collected for laboratory confirmation.

Results: We identified a total of 14 measles case without death. Seven of nine blood samples tested positive for measles IgM antibodies. All cases were female aged 7 to 14 years and overall attack rate 4.3%. Median age of case was 10 years and control 13 years. The factor associated with illness were being unvaccinated (OR=7.1; 95% CI=1.6-31.2) and having contact with measles patient (OR=15; 95% CI=2.9-77.3). Knowledge about measles and previous measles infection were not statistically significant.

Conclusion: We confirmed a measles outbreak occurred in Kechene Medhanialem Orphanage, and cases were associated with low vaccination rate. A vaccination campaign, case management and health education program were implemented. We also recommended enhancing supplementry immunization activity and surveillance.

Key words: Measles, outbreak, Orphanage, Ethiopia

6.3. Dengue Fever Outbreak Investigation in Adaar Woreda, Afar Region, Ethiopia-2014

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Abstract

Introduction: Dengue fever is a rapidly spreading mosquito borne viral disease in the world. Globally, an estimated 50 to 200 million cases and 20, 000 deaths occurred annually. In Ethiopia dengue has become a new emerging public health problem. On 03 April 2014 unusual increment of acute febrile illness negative for malaria were reported from Afar region-Adaar Woreda. Team deployed to the area to confirm the existence of the outbreak, identify the etiology, source, risk factors and finally to implement intervention measures.

Method: We conducted a descriptive study of the outbreak for which a suspected case was defined as any person with an acute febrile illness (fever, severe headache and/or diarrhea) with a negative malaria test from 19 March to 30 April, 2014. We also conducted unmatched case-control study. A structured questioner was used to collect data from 60 cases and 120 controls. Thirteen nine (28 serum and 11 whole blood) specimens collected for laboratory confirmation.

Result: We identified a total of 708 acute febrile illness cases without deaths from Ehelliwa town, Adaar district of Afar region. Of which 387(55%) were male and 316(45%) were female. The crude attack rate was 12,048/100,000 population (male=12,298/100,000 and female=11,756/100,000). The age group 15-44 years was more affected by the disease AR of 17472/100,000. Median ages of cases were 25 years and controls were 26 years. On bivariate analysis the factors associated with illness were having dengue fever patient in the household (OR: 2.3: 95% CI: 1.2-4.4) and wearing short pants and T-shirt (OR: 3.6: 95% CI: 1.2-11.1). Out of 28 serum sample collected 14 specimens were tested ELISA test at national laboratory and 9 were positive for dengue fever. Eleven whole blood specimens were cultured and there was no growth for any bacteria.

Conclusion: We confirmed a dengue fever outbreak in Adaar district of Afar region. This was the third dengue fever outbreak detected in Eastern Ethiopia since September 2013. However, it is the first reported dengue fever from the Afar Region. The age group 15-44 years and people

live in urban were more affected. Supportive case management, health education and vector control activities controlled the outbreak from the district.

Key Word: Dengue Fever, Afar, Ethiopia

6.4 Epidemiology of Meningococcal Meningitis-Ethiopia, 2005-2012

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Abstract

Background: Globally an estimated 500,000 cases and 50,000 deaths of meningococcal disease occur each year. The highest rates of meningococcal disease are found in the "meningitis belt," which extends from Senegal to western Ethiopia. A new meningococcal vaccine program for serogroup A was introduced in 2010 in three countries within the meningitis belt and produced a dramatic decline in meningitis cases. We analyzed surveillance data to describe the epidemiology of meningococcal meningitis in Ethiopia in anticipation of the implementation of a national meningococcal vaccination program.

Method: We analyzed routine weekly surveillance data reported to the national Public Health Emergency Management (PHEM) center from 2005-2012. We defined a suspected case of meningitis any person with sudden onset of fever and one of the following signs: neck stiffness, altered consciousness or other meningeal sign.

Results: We identified 8,866 suspected meningitis cases between 2005-2012. The annual incidence of meningococcal meningitis was 1.4/100,000 and there were 174 deaths (case fatality rate of 2%). The highest incidence (13.3/100,000) was from Harari Region, which is located in eastern Ethiopia outside the meningitis belt. Thirty-five percent (3146) of suspected cases and 72 % (126) of the deaths were reported during epidemics. During epidemics 1444 suspected cases (46%) were aged 15-44 years old (age adjusted attack rate 2.9/100,000).

Conclusion: We determined that the highest rates of meningococcal meningitis in Ethiopia occurred outside of the traditional borders of the meningitis belt. In anticipation of widespread meningococcal vaccination campaigns, epidemiological and laboratory surveillance should be strengthened throughout Ethiopia to more clearly delineate high risk areas for meningococcal meningitis in Ethiopia.

Key Word: Meningococcal Meningitis; African Meningitis Belt; Ethiopia

6.5. Evaluation of Measles Surveillance System in Afar Region, Ethiopia, 2013

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Background: Measles is an acute, highly contagious vaccine preventable disease caused by Morbillivirus. It is among the top causes of death in children less than 5 years of age in many African countries including Ethiopia. We evaluated the measles surveillance system in Afar region to determine whether the system meeting set objectives and to assess its attributes.

Method: A cross sectional descriptive study design was conducted from 1-12 July 2013. A total of 9 study units, two woreda health office Gewane and Buremuditu (one health center and two health post from each woreda) and regional health bureau were selected. We used Center for Disease Control updated guidelines for public health surveillance system evaluation.

Result: We found the regional reporting rate for the last six month were 27.7%, Zone 39.2%, Woredas (Gewane =64.4% and Buremuditu =20%). We observed poorly acceptable and analyzing of surveillance data for action, and donor dependent surveillance system. But, it was useful, simple and flexible at all level.

Conclusion: The surveillance system of measles is useful to detect outbreaks and to estimate the magnitude of morbidity and mortality of the disease in the area. The system is simple and flexible but poorly accepted. We recommend the reporting rate, feedback system, government funding for sustainability, data analysis and quality should be improved.

Key words: Surveillance, System Evaluation, Measles, Afar, Ethiopia, 2013

Chapter VII – Narrative Summary of Disaster Situation Visited

Meher Human Health and Nutrition Emergency Need Assessment- Gedio, Kenbata Tenbaro, and Sidama Zone of SNNP Region-2013

Summary

The government of Ethiopia has been conducting emergency health and nutrition assessment twice in a year following post harvesting season Belg and Meher. The assessment is leaded by Federal Disaster Response Management and Food Security Coordination office in collaboration with governmental and nongovernmental sector offices.

The assessment was conducted in three Zones (Kenbata Tenbaro, Gedio and Sidam) from November 23 to December 16, 2013. From each Zone two to three woredas were selected based on emergency health and nutrition problems in consultations with the RHB and ZHDs. A cross-sectional study design and structured questioner classified by Region/Zone and woreda level were used to collected health and nutrition data. The main objective of the assessment was to identify areas where emergency health and nutrition assistance needed for the upcoming year and to determent the gap in the capacity of the health system in addressing anticipated risks so as to develop humanitarian requirement document.

Multisectoral PHEM coordination forum present in most of assessed zones and woreda. However they are not meet regularly except Sidama Zone. No epidemics were reported from the assessed woreda except ongoing measles outbreaks were reported from Sidama zone of Aleta Cheko woreda. Epidemic preparedness and response plan is available in all visited zones and woredas but not supported by budget. AWD, malaria, meningitis, measles and flood are the anticipated risk in the upcoming year in the assessed zone and woredas.

Background

Southern Nations, Nationalities and Peoples Region is one of the nine regional states in Ethiopia. It is administered by 15 zones, 4 special Woreda, 131 Woreda, 21 town administration, 3608 rural and 324 urban kebeles. 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 with a population of 18,375,050 (Male 9,142,901 and Female 9, 232, 149). The population density per square km is 138 person and population growth rate of 2.9%.

In the region there are, 26 Hospitals (18 GO, 3 NGO, 5 private), 563 health centers, and 3635 health posts which provide health service. Other private health facilities 76 diagnostic laboratory centers, 10 special clinics,15 NGO clinics, 13 higher clinics, 110 medium clinics, 483 lower level clinics, 20 Pharmacies , 9 drug distribution centers, 133 drug stores and 333 drug venders found in the region with potential health service coverage greater than 80%. In the region the causes of mortalities and morbidities are mostly attributed to lack of clean drinking water supply, poor sanitation, overcrowding, and low public awareness of environmental health and Vaccine preventable diseases. Therefore this factor exacerbates the vulnerability of the population to disease outbreaks.

Ethiopia has been conducting human health and nutrition emergency needs assessment twice a year following Meher and Belg seasons. The assessment lead by Disaster Risk Management and Food Security Sector in collaboration with sector governmental institute (Ministry of Health, Ministry of Water and Energy, Ministry of Education, National Metrology Agency and respective regional bureaus) and non-governmental organizations (WHO, UNICEF, OCHA, MSF, Plan International, World Vision, ACF, World food program etc).

This assessment was conducted from November 23-December 16/2013. The main purpose of the assessment was to identify the possible emergency health and nutrition needs for the upcoming six months in order to develop humanitarian requirement document so as to minimize and control the occurrence public health events and impacts timely.

Objective

- To assess the extent, types, magnitude, severity and likelihood of different risks in the most "vulnerable" woredas
- To assess the existing capacity of the health system to address those risks
- To determine gaps in the capacity of the health system to address anticipated risks and existing threats
- Based on the findings to develop response document

Methodology

Study design

A cross sectional study design was used to assess and identify human health and nutrition emergency needs in the upcoming months.

Study Area

The assessment was conducted in Kemabata Tembaro, Gedio and Sidama Zones of SNNP region. From selected Zones one to three woredas were selected and visited based on their risk trend.

Study period

The assessment was conducted from November 24-December 16/2013.

Assessment Team

Ten experts from federal DRMFSS, EHNRI, SNNP-RHB, NMA, GOAL, WVI, WFP, REW, ACF and Plan int. were participated in the assessment. Half day orientation was given for all assessment team at federal DRMFSS before deployed to regions.

Assessment Tools

Two different structured questioners were used to collect health and nutrition related data at woreda 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 as stated in the annex.

Source of Data

Secondary data were collected through discussion and interview from Zonal Health department and woreda health offices. Head of Zonal and woreda health offices, PHEM officers and Phamacisists 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 and UN agencies are represented. However, the forums not meet regularly only they meet when outbreak occurred except Sidama zone.

Outbreak

During the last three month August-October, 2013 outbreaks were not reported from the assessed zone except Sidama. In Sidama zone there is an ongoing measles outbreaks, a total of 265 cases without death were reported from Aleta Cheko and adjacent woreda of the zone starting from 30/02/2006EC.

Anticipated epidemic

Malaria is one of the anticipated risks in all assessed zones. In addition, Measles (Sidama and Kembata Tembaro), Meningitis (Kenbata Tenbaro and Gedio Zone) and Malnutrition in Kenbata Tenbaro Zone are the major anticipated risk.

Public Health Emergency Management

Public health emergency preparedness and response plan is available in all assessed Zones. However the plans were not supported by budget but when outbreaks occurred resources were mobilized from the region and other nongovernmental and UN organizations. In all assessed Zones there is a trained staff on Public Health Emergency Management. Rapid Response Team is available in all visited Zones and the team is activated if outbreak or emergency situation occurred.

Stock

In all assessed Zones there are no sufficient emergency drugs and medical supplies used to treat and diagnose Malaria, Measles, Meningitis and AWD at least for six month (annex 5).

Requirements

Due to the presence of malaria breeding site, endemic area and low ITN utilization, presence of ongoing measles outbreak, low immunity for meningitis and previous outbreak report, low safe water, latrine and utilization coverage; Malaria, Measles, Meningitis and AWD are the anticipated risk in the assessed zones as the following below in the table

Table 24. Type of Risk and Population at Risk Identified at Zone and Woreda Level, 2013

Zone	Woreda at Risk	Type of risk	At risk population
Kenbat Tenbaro	Tenbaro	Malaria	125,700
	Hadaru Tunto	Malaria	119,508
	Kacha Bira	Malaria	136,467
	Kedida Gamella	Malaria	106,174
	Dambya	Malaria	98,686
	Hadaru Tunto	Measles	119,508
	Tenbaro	Measles	125,700
	Kacha Bira	Measles	136,467
	Kedida Gamella	Measles	106,174
	Tenbaro	Meningitis	87,990
	Hadaru Tunto	Meningitis	83,656
	Kacha Bira	Meningitis	95,527

Zone	Woreda at Risk	Type of risk	At risk population
	Kedida Gamella	Meningitis	74,322
	Dambya	Meningitis	65,080
	Tenbaro	Malnutrition	24,332
	Hadaru Tunto	Malnutrition	20,543
	Kacha Bira	Malnutrition	26,453
	Kedida Gamella	Malnutrition	23,214
	Dambya	Malnutrition	18,988
Gedio	Dila Zuria	Malaria	30,000
	Wonago	Malaria	25,000
	Kochora	Malaria	25,000
	Dila Town	Malaria	40,000
	All Woreda of the zone	Meningitis	747,619
Sidama	Aleta Chuck	Measles	203,971
	Aleta Wondo	Measles	202,472
	Dara	Measles	285,880

Woreda level findings

Coordination

Functional multisectoral coordination committees were present in all assessed woreda. In addition assessed woredas have public health emergency and preparedness plan but not their plan supported by budget except Borcha woreda of Sidama Zone.

Top five causes of morbidity

Table 25. Top five causes of morbidity by age group, 2005 EC

Zone	Woreda	Rank	Top five causes of morbidity	
Kenbata Tenbaro	**Tenbaro**	**Below five year**		**Above five year**
		1	Malaria	Malaria
		2	AURTI	AFI
		3	Pneumonia	Typhoid Fever
		4	Diarrheal Disease	AURTI
		5	AFI	Trauma
	Doyo Gena	1	Pneumonia	Typhoid Fever
		2	AURI	AFI
		3	AFI	UTI
		4	Other	AURI
		5	Diarrhea	Others
Gedio	**Kochera**	1	Pneumonia	Malaria
		2	Non bloody diarrhea	Pneumonia
		3	Intestinal Parasite	AFI
		4	URTI	URTI
		5	Helementhisais	Intestinal Parasite
	Bule	1	Pneumonia	Typhoid Fever
		2	Diarrheal disease	Pneumonia
		3	Helementisis	Helementisis
		4	Acute Malnutrition	AFI
		5	Otitis Media	URTI
Sidama	**Borcha**	1	Malaria	Malaria
		2	Pneumonia	Trauma
		3	Diarrheal Disease	Typhoid Fever
		4	Intestinal Parasite	AFI
		5	Skin Infection	Pneumonia
	Arorsa	1	Pneumonia	All accidental Case

		2	Acute Malnutrition	Helmentisis
		3	Diarrheal Disease	Typhoid Fever
		4	Helmentisis	Skin Infection
		5	Malaria	Pneumonia
	Aleta Wondo	1	Pneumonia	Intestinal Parasite
		2	Diarrheal Disease	UTI
		3	Malnutrition	Malaria
		4	URTI	Typhoid Fever
		5	Skin Infection	URTI

Outbreak

During three month period (August-October) period no outbreak occurred in all assessed woredas. However ongoing measles outbreaks were reported from Sidama zone of Aleta Cheko and adjacent woredas.

Preparedness

Among the assessed woredas, only Borcha woreda of Sidama Zone, Tenbaro woreda of Kenbata Tenbaro Zone and Bule woreda of Gedio Zone have adequate emergency drugs and supplies at least for one month.

Risk Factors

Malaria

All assessed woredas are malaria endemic except Bule woreda of Gedio zone. 15 Kebeles (87,014 populations) in Tenbaro woreda, 5 Kebeles(29,042 population) in Doyo Gena, 13 Kebeles(55,964 population) in Kochera, 42 Kebeles(305,451 population) in Borcha, 15 Kebeles(124,675 population) in Aleta Wondo and 22 Kebeles(152,384) in Arorsa woredas are identified as malarias. Although malaria control and prevention activates are conducted in the area, the following risk factors were identified: presence of malaria endemic area and malaria breeding site except Aroresa, interrupted or potentially interrupting rivers except Doyo Gena, Bule and Borcha Woredas, ITN and IRS coverage is very low in Doyo Gena and Borcha Woredas.

Meningitis

Five Meningitis case without death were reported from Borcha (4 Case) and Tenbaro (1 Case) Woreda of Sidam and Kenbata Tenbaro Zone respectively. However outbreak of the disease were not occurred in all assessed woredas of the Zone in the year of 2013(Jun-October), but last year outbreak of meningitis were reported from Kacha Bira woreda of Kenbata Tenbaro Zone. On the other hand unimmunized people were present in neighbouring woredas of the zone this may be consider meningitis as risk in the area.

AWD

There was no AWD epidemic in the last three years in all assessed woredas.

Measles

Ongoing measles outbreaks were reported from Aleta Chucko woreda (265 cases and zero death) of Sidama Zone. Furthermore sporadic cases of measles were reported from Kochera (5 cases and 1 death) and Bule and Borcha woredas each 2 case and Aleta wondo one case without death were reported from the assessed wordas. In addition, measles vaccination coverage below 85% in Kocher and Borcha woredas of Gedio and Sidama zone respectively.

Nutrition

Adequate therapeutic supplies of (F-100, F-75 and RUTF) available for one month in most assessed woreda except Doyo Gena woreda of Kenbata Tenbaro Zone. On the other way children discharged from OTP not referred to supplementary feeding program because of lack of TSF supplies except Borcha, Arorsa and Tenbaro woredas of Sidama and Kenbata Tenbaro Zone respectively. Relatively high number of SAM cases was observed in Arorsa woreda comparing with other assessed Woreda (Figure 12)

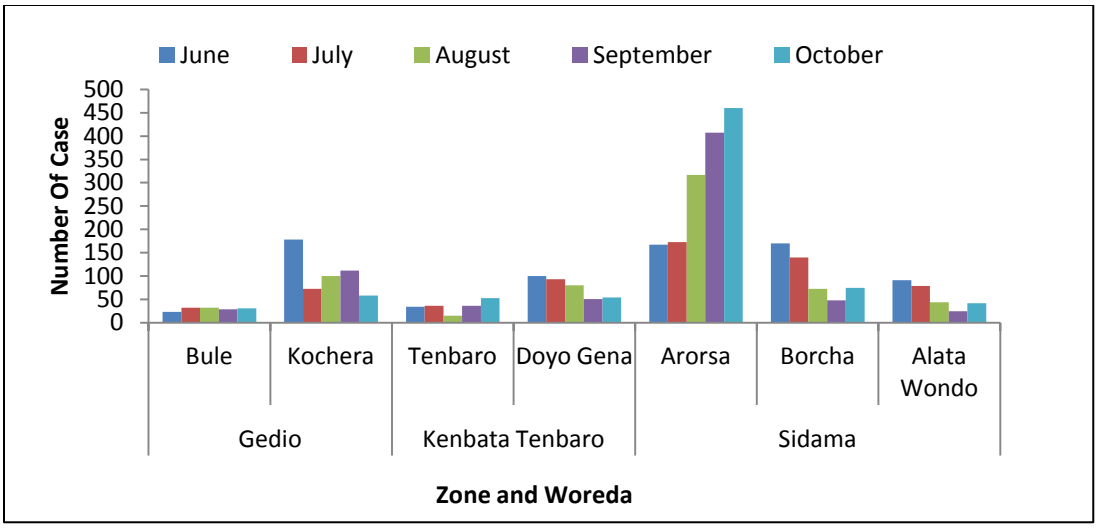

Figure 10**:** SAM Cases Reported by Woredas, From Jun-October, 2013

Table 26**:** SC and OTP Sites by Zone, From Jun-October, 2013

Zone	Woreda	SC	OTP
Kembata Tembaro	Tenbaro	4	23
	Doyo Gena	1	18
Sidama	Arorsa	1	31
	Borcha	3	38
	Aleta Wondo	2	27
Gedio	Kochera	1	25
	Bule	1	30

Conclusion

There was a functional multi-sectoral coordination forum in all assessed zone and woredas. However they are not meeting regularly except Sidama zone. All assessed woredas have their own public health emergency preparedness and response plan but not budget allocated except Borcha Woreda of Sidama zone. Malaria, measles, AWD and meningitis were the main anticipated risk in the visited zone and woreda. During Jun to October outbreak were not reported in any of assessed woreda. However measles outbreak was reported in Aleta cheko woreda of Sidama zone. On the other hand many of assessed woreda and zone not have enough emergency drug and supplies for 1 month except Borcha, Tenbaro and Bule woreda. Adequate therapeutic supplies RUTF, F100 and F75 available in all assessed woreda except in Doyo Gena

woreda of kenbata tenbaro zone. However, children discharged from the OTP are being sent home without enrolling them into supplementary feeding program because of lack of TSF supplies in most assessed woredas except Borcha, Tenbaro, and Arorsa.

Recommendations

Disease control and prevention activities for major epidemic prone disease (measles, malaria, AWD and meningitis) should be strengthening. Zonal and woreda level EPRP should be supported by budget. In addition minimum emergency drugs and supplies should avail at zone and woreda level stock for preparation and timely response.

Annex 5: Zonal Level Preparedness

S. No	Description	Zone Name								
		Kenbata Tenbaro			Gedio			Sidama Zone		
		requirement	Available	Gap	requirement	Available	Gap	requirement	Available	Gap
Vaccine										
1	Meningitis vaccines	--	--	--	--	--	--	--	--	--
Drugs										
2	Coartem	233 box	375 box	No gap	400,000 dose	0	400,000 dose	--	802 box of 30 dose	--
3	Oily CAF	9486 vials	0	9486 vials	12,000 dose	98 dose	2,130 dose	--	0	--
4	Doxycycline	1164 tin	10 box		160 box	0	160 box	--	0	--
5	Ringer Lactate	2327 bag	12 bag	2315 bag	1000 bag	-	1000 bag	--	44 bag	--

6	ORS	12605 pic	-	12,605 pis	102 box	66 box	36 box	--	0	--
7	Amoxil Suspension	63 bottle	2700 bottle	No gap	3000 bottle	--	3000 bottle	--	0	--
8	Cotrimoxazole Suspension	19393 bottle	150 bottle	No gap	2000 bottle	500 bottle	1500 bottle	--	0	--
9	Tetracycline Ointment	--	--	--	1000 tube	--	1000 tube	--	0	--
10	Vitamin A	388 tin	90 tin	298 tin	3000 capsule		3000 capsule	--	41 Tin	--
Lab Supplies										
11	RDT (Malaria)	-	-	-	--	--	80	--	13,400 box	--
12	Pastorex (Meningitis)	-	-	-	--	--	--	--	0	--
13	LP set	-	-	-	--	--	--	--	0	--
14	TI Bottle	-	-	-	--	--	--	--	0	--

CTC kit										
15	CTC kit (AWD)	8	0	8	--	--	--	--	0	--
Medical Supplies										
16	Gloves		9696 pis		80 box	10 box	70 box	--	50 box	--
17	Syringe	737,767	0	737,767	80 box	18 box	62 box	--	60 box	--
18	PPE	-	-	-	--	--	--	--	0	--

Annex 6: <u>Regional/Zonal Level Questioner</u>

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? Yes□ No□

Was there any outbreak in the last 3 months? YES_____ NO_____	
If yes, specify the type of disease Type of outbreak _____Number of cases _____Deaths _____(specify the time period)_____	

If yes, specify the type of disease_____, _____, _____

Type of outbreak _____Number of cases _____Deaths _____(specify the time period)_____

Type of outbreak _____Number of cases _____Deaths _____(specify the time period)_____

Type of outbreak _____Number of cases _____Deaths _____(specify the time period)_____

3. Mention anticipated epidemics_____,

If yes please indicate Zone/Woreda at risk and risk population per anticipated risk: (Use the back side)

4. Public Health emergency Management					
A. Is there a Public Health Emergency Preparedness and Response plan? Yes□ No□					
If yes, is the plan budgeted/ funded? Yes□ No□					
B. Is there a trained staff on PHEM (Regional/Zonal/Woreda/HFs) the last 2 year Yes□ No□					
If yes specify number of trained personnel_____					
C. Is there a Regional trained Rapid Response team (RRT)? Yes□ No□					
D. Is there stock of: (Use the Stock estimation matrix to estimate the amount of stock for each drug/supply for 6 months)	Drugs and medical supplies		Total requirement	Available	Gap
	i. Meningitis vaccine				
	ii. Drugs:	Coartem			
		Oily CAF			
		Doxcycline			
		Ringer lactate			
		ORS			
		Amoxil suspension			
		Cotrimoxazole suspension			
		Tetracycline Ointment			
		Vit A.			
	iii. Lab supplies	RDT (Malaria)			
		Pastorex (Meningitis)			

		LP set			
		TI bottle			
	CTC Kit (AWD)				
	Medical Supplies	Gloves,			
		Syringe			
		PPE			
	Others(specify)				

Annex 7 : Woreda Level Questioner

Interviewer name _____ Institution:_____

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:____
1.2. Special Population (if any):	Pastorals____	Refugees____	IDPs____	Migrant Workers___

SECTION II: HEALTH PROFILE	
2.1. Coordination	
Is there a multi sectoral PHEM coordination forum?	Yes□ No□
Is there a PHE preparedness and response plan?	Yes□ No□

Is there accessible emergency response fund	Yes□ No□

2.2. Morbidity (List top 5 causes of Morbidity) in the year 2005 EC (2012-2013GC)		
a. Morbidity below 5	b. Morbidity above 5	
1.	1.	
2.	2.	
3.	3.	
4.	4.	
5.	5.	

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

Month	AWD		Malaria		Measles		Meningitis		Other (specify)
	Cases	Deaths	Cases	Deaths	Cases	Deaths	Cases	Deaths	
June 2013									
July 2013									
Aug 2013									
Sept 2013									
Oct 2013									

2.4. Outbreak?

Was there any outbreak in the last 3 months? YES_____ NO_____

If yes, specify the type of disease Type of outbreak _____Number of cases _____Deaths _____(specify the time period)____	
Is there any ongoing outbreak of any disease? YES_____ NO_____	
Type of outbreak _____Number of cases _____Deaths _____(specify the time period)_____	
Type of outbreak _____Number of cases _____Deaths _____(specify the time period)_____	
Type of outbreak _____Number of cases _____Deaths _____(specify the time period)_____	
2.5. Preparedness: Is there emergency drugs and supplies enough for 1 month? Or easily accessible on need?	
Ringer Lactate (to treat AWD cases) Yes□ No□	
ORS (to treat AWD cases): Yes□ No□	
Doxycycline (to treat AWD cases): Yes□ No□	
Consumables : Syringes, Gloves (for AWD management): Yes□ No□	
Amoxil susp (measles) Yes□ No□	
Tetracycline ointment (measles Yes□ No□	
Vit A (measles) Yes□ No□	
Coartem for Malaria Yes□ No□	
Lab supply: RDT for Malaria Yes□ No□	
Lab supply: RDT (pastorex) for M eningitis Yes□ No□ LP set Yes□ No□	
Number of CTC kit available: (for A WD) Yes□ No□	
Main shortage (if any): Specify	

Is budget allocated for emergency Rapid response by the woreda?			
SECTION III: RISK FACTORS			
Diseases	**Risk factors for epidemics to occur**	**Yes**	**No**
Malaria	Malaria endemic area		
	Presence of malaria breeding site		
	Interrupted or potentially interrupting rivers		
	Unprotected irrigation in the area		
	LLINs coverage <80%, what is the %		
	Indicate the coverage of IRS 2005		
	Depleted prevention and control activities		
	Number of malarious kebeles and total population in these Kebeles	Keb ____ pop ____	
Meningitis	Was there Meningitis epidemic in the last 3 years (If yes specify date)		
	Has vaccination been conducted in the past 3 years		
	If yes : Indicate the date and number of people vaccinated	date	No
AWD	Was there AWD epidemic in the last three years (If yes specify date)		
	Latrine coverage %		
	Latrine utilization %		

	Safe water coverage %		
Measles	Is there ongoing measles outbreak		
	What is the measles vaccination coverage of 2005, less than one year (Sene 2005-Tikemet 2006)		
	Has SIA been conducted in 2005 EFY		
	If yes, Indicate the month and number of children vaccinated including the age group	Month__	
		No. Vaccinated	
		Age group	

Chapter VIII – Protocol/Proposal for Epidemiologic Research Project

Assessment of Knowledge, Attitude and Practice of Bed Net use to Prevent Malaria Infection among Rural Community, Wolyita Zone, Southern Ethiopia-2014

Background

Malaria is a life-threatening disease caused by plasmodium parasites. The parasites are spread to through the bites of infected Anopheles mosquitoes, called "malaria vectors". The most common symptoms of the disease are fever, headache, chills, muscle and joint pains, nausea, and general malaise. Untreated malaria can result in anemia, kidney failure, coma and death [1].

The disease causes an estimated number of 219 million cases and 660,000 deaths annually worldwide. Of this 85% of cases and 90% of deaths were from African region. In this region 85% of malaria deaths occur in children under five years of age. In addition, on every 30 seconds a child dies because of malaria [1, 2]. In Ethiopia, an estimate of 52 million people 68% lives malaria-endemic areas, primarily at altitudes below 2,000 meters. Malaria is mainly seasonal in the highland fringe areas and of relatively longer transmission duration in lowland areas, river basins and valleys. Historically there have been estimated 10 million clinical malaria cases annually; however cases have reduced since 2006 [3].

In order to reduce malaria transmission, malaria prevention and control strategies include early diagnosis and prompt treatment with safe and effective drugs, vector control in selected areas mainly through the use of ITNs and IRS; epidemic monitoring, epidemic preparedness and response and, cross cutting strategies that include information, communication and education materials, human resource development and monitoring and evaluation. Of this appropriate use of ITN is one of vector control method can reduce malaria transmission from very high levels to nearly close to zero [3-5].

Statement of the problem

According to 2013 public health emergency management surveillance data; a total of 3,316,013 malaria cases were reported nationally. Of which the highest 996,210 (30%) malaria case were from SNNP region comparing with other regions. In Ethiopia free bed net distribution started in 2005 and by 2010 the Ministry of Health seat a goal to reach 100% ITN coverage [6]. However, as malaria indicator survey (MIS) reported, national percentage of households with at least one

mosquito net in malaria endemic areas is lower by 13.7% in 2011 (55.2%) comparing with 2007 (68.9%). In addition to this the 2011 MIS report indicated that, SNNP region performing low, where percentage of household (57.2%) with at least one mosquito net next to Oromia region and only 53.3% of women have knowledge on mosquito nets as prevention for malaria [7]. In related study done in Tigray region indicated that only one-third (33.1%) of the participant mentioned they used ITN properly to prevent malaria [6, 8, 9]. This indicated that appropriate use of bed net by the public to prevent malaria still have limitation. This is therefore; this study will conduct to assess knowledge, attitude and utilization of bed net in order to prevent malaria infection among rural community members of Wolyita zone.

Literature Review

Malaria accounts the first on the list of health and health related indicator of ministry of health as of 2010/2011 for morbidity and hospital admission[10, 11]. Since the 1950's Ethiopia's fight against malaria, the national malaria control program has developed a strategic plan consists, early diagnosis and prompt treatment; selective vector control and epidemic prevention and control[6].

Insecticide treated bed nets (ITNs) are a highly effective tool on the prevention and control activity of malaria when used correctly. In Tanzania, studies have shown that ITNs reduce child mortality by 25.3%[12]. Another study done on knowledge attitude and practice regarding malaria control in an endemic area of southern Iran, knowledge about malaria transmission routes was good; 72.7% knew mosquito bites can transmit malaria, and 97.2% knew at least one or more symptoms of the disease. The majority of the studied population (93.9%) knew using bed nets can help prevent malaria. Fifty-nine point five percent of households used bed nets and 58.6% of respondents knew bed nets can prevent malaria infection [13].

In Ethiopia a study conducted in Jimma zone, showed that 50.2% of the household have at least one ITN, but utilization by young children was only 37.2 % [12]. Another study done in Jimma zone, out of 274 subjects knowledge and practice of ITN of respondents indicated that 159(60.2%) have been taught about ITN and the remainder 105(38.2%) have never been taught about ITN. Regarding of availability of ITN 198(75%) of respondents reported that there were not enough ITN in their home and 114(43.2%) had a single ITN in their home. In relation to the

availability of ITN at home, subjects were asked whether they had slept under ITN the night before data collection day; 135 (51.14%) household heads didn't sleep under ITN while the rest, 129(48.86%), slept under ITN. Data from the same subjects also shows that for various reasons they never used ITN, 72(27.27%), though they have at least one. About 89 (33.7%) household heads admitted that they used ITN always while a larger number of the respondents, 103 (39.01%), reported they use ITN only sometimes. In terms of proper utilization, only 87(32.95%) households believed that they always check whether the ITN was stretched properly while 92 (34.85%) checked only sometimes. The rest, 85 (32.2%), never checked the proper stretching of the ITN while they are sleeping under [14]. The reason described for this low utilization was the use of nets for other purposes than primarily intended. Other factors like age of the head of the house-hold, educational status, occupation, knowledge on malaria and possession of beds were found to be predictors of utilization [12].

Objectives

General Objective

- To assess knowledge, attitude and practice of ITNs use to prevent malaria in malaria hot spot district in Wolyita zone, Southern Nation and Nationality peoples (SNNP) region, Ethiopia.

Specific objectives

- To identify the proportion of households with insecticide treated nets
- To assess knowledge and attitude of respondents that affecting utilization of ITN

Method

Study Design

We use community based cross-sectional study design to conduct a research.

Study Area

The study area will be in rural malaria endemic community of Wolyita zone, located in SNNP Region, 400 km from Addis Ababa in southern part of Ethiopia. The zone has 12 rural and 3 urban Woreda with a total population 1,851,452 (male=912,867 and female=938,585). It is selected amongst other zone of the region according to the PHEM surveillance data of 2013 indicated that of the total case 996,210 reported from the region 110,270(11.1%) cases were

contributed from Wolyita zone which is the second highest number next to Gamo Gofa Zone 128,173(12.9%). Among the zone two rural woreda (Humbo= 5499(8.8%) and Sodo Zuria= 4603(7.4%) were selected based on the highest cases reported comparing with other woredas in the zone.

Source Population

All house hold living in Humbo and Sodo Zuria Woredas of Wolyita Zone.

Study population

Number of households selected in Humbo and Sodo Zuria Woredas.

Inclusion Criteria

Any household head/leader or adult member of the household, volunteer to participate in the study, and available at home during data collection period.

Exclusion Criteria

Children, relatives who came during study period were excluded.

Sample size determination

The study sample size will be calculated using a formula a single population proportion. It is calculating considering study done in Jimma zone [14]. Assuming that utilization of bed net to prevent malaria in the area was, p = 0.34, confidence interval 95% and 5% error of estimate.

To determine the sample size we use the following formula

$$\underline{n = t^2 * p\,(1-p)}$$

$$d^2$$

Whereas:-

n= sample size

p= 0.34 (proportion of HH with knowledge, attitude and practice of ITN using to prevent malaria)

t=1.96 (Z=score corresponds to 95% confidence interval)

d= 0.05 (Precision desired)

$n = \frac{(0.34)*(0.66)*(1.96)^2}{(0.05)^2} = 345$ HH

We will estimate 10% of the population might be non respond due to different reasons and this make total sample is 345 +34 =379 HH

Sampling Procedure

From the total 12 rural malaria endemic Woreda in the zone, Humbo and Sodo Zuria were selected based on the highest malaria case reported as of 2013 PHEM surveillance report. Using the same fashion two kebeles from each Woreda will be selected. Total household of the Woreda and kebeles will be obtained from the respective woreda and kebeles administrative then systematic random sampling method will be employed to select household to be included in the study. Only one individual (mostly head of household) will participated in the study, if the head not there in the study period the next family member representative or another next household will take in the study.

Data collection

A structured questionnaire will use to collect data. The data will collect by 15 data collector and will supervise by 5 supervisors. Training will be given for data collectors and supervisors prior to study period for three days. The data collection tools have two main parts to assess the socio-demographic characteristics of the respondent and issues concerning knowledge, attitude and practice of using bed net to prevent malaria. Pre-test will be conducted in a non-study area to identify and correct the potential problems encountering during data collection and interview (Ambiguous question and repetitive idea).

Variables

Dependent variable:

- Practice on ITN utilization to prevent malaria

Independent variables:

- Knowledge and attitude of the community
- Socio-economic characteristics (e.g. age, educational status, and income)

- Environmental factor (living room, place of residence and season of the year)
- Availability of ITN in the household

Data Quality

The questionnaire will be prepared originally in English and then will be translated in to local language then back to English to ensure reliable information (Annex 11). Pre-test of questionnaire and training of data collectors and supervisors will be conducted to ensure the quality of data. Data collectors and supervisors will review every questionnaire for completeness and logical consistency, and checked by the principal investigator every day in the field. Finally data cleaning will be conducted at the end of data entry.

Operational definitions

- **Malaria: -** a disease caused by plasmodium parasites.
- **Knowledge: -** assessment of what the individual knows about malaria, its prevention and whether that knowledge is right or wrong.
- **Attitude: -** assessment of the predisposition to respond in favor or unfavor towards malaria and its prevention.
- **Practice: -** assessment of respondents what they actually practicing during this study of malaria prevention and control.
- **Insecticide Treated Nets: -** A net or screen dipped in an insecticide for protection against mosquito bite during sleeping.
- **Community: -** a group of people living in the same place or having a particular characteristic in common.
- **High risk groups: -** Part of the populations, which are highly vulnerable to the disease malaria and identified as children less than 5 years of age and/or pregnant women.
- **Risk factors: -** factors such as housing conditions and mosquito breeding sites that may contribute for high risk of malaria.

Ethical Consideration

The study was carried out after getting ethical clearance from the Ethical Committee of Faculty of Public Health, Addis Ababa University. Permission will be also obtained from the concerned bodies of SNNP regional health bureau, Wolyita Zonal Health Department, Selected Woredas and Kebeles. Interview will be carried out only with full consent of the person being interviewed. Before each interview, clear explanation will be given about the objective of the study will not neither to evaluate the performance of the individual nor to blame anyone for weakness but to gather information may direct to improvement in the knowledge, attitude and practice of bed net use to prevent malaria. Each respondent will assured that the information provided by them would be confidential and used only for the purpose of research.

Data Analysis

Data will be entered, cleaned and analyzed using Epi info software version 7.1 and Microsoft Excel.

Dissemination of findings

The findings of this study will be disseminated to Ministry of Health, SNNP Regional Health Bureau, and Wolyita Zone health department and selected Woredas. It will also be disseminated to different organizations that will have contributions on the malaria prevention and control program. In addition, the study finding will also be presented at national and international conferences.

Expected outcomes

Knowledge, attitude and practice of using bed net to prevent malaria will be clearly identified and documented.

Budget and Implementations Time

A total of 3500 $USD will be needed to conduct the study and the detail of budget and time table of study annexed below.

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14. Tesfa, G., Peoples' Belief, Attitude, and Practice in the Use of Insecticide Treated Bed Net(ITN): The Case of Serbo, Nado, and Asendabo Towns, Jimma Zone, Southwest Ethiopia.

Annex 8: Project Budget Break Down

Items	Detail activities	Cost $USD
Training	Training for data collectors and supervisors	500.00
Stationery	A4 size paper, flip chart, notebook, tonners, pens	600.00
Perdium	Perdium payment for data collectors and supervisors	1000.00
Transportation	Vehicle rent, fuel	1500.00
Total		3500.00

Annex 9: Project Implementation Time

Activities	Time in Month			
	May	Jun	July	August
Training of data collectors	x			
Pretesting Questioner	x			
Data collection		x		
Data analysis			x	
Report writing			x	
Progress report submission			x	
Final report submission				x

Annex 10: Consent Form

Objective: To assess knowledge, attitude and practice of ITNs use to prevent malaria infection among rural community, Wolyita zone, Southern Ethiopia

Procedure: This study questioner will take about 15 minutes of your time. During the study time, we will clearly explain you the objective, benefits and risks of the study and then will give you a chance to ask questions and gate answers about the study. Finally, we will ask you about the knowledge, attitude and practice of bed net use among your family. All information collected during this study will be kept private.

Benefits: This study will help to enhance knowledge, attitude and utilization of ITN to prevent and control malaria transmission throughout the community.

Risks: There is no risk to you answering the questions or participated in this study.

Privacy: We will keep information about you private. We will not collect your name. We will not use any information that might identify you when we present or publish the study's results.

Payment: There is no cost to you being part of the study.

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

Participant Signature_____Date_____

Date of interview _____Time started_____ Time completed_____

Checked by supervisor: Name_____ Signature_____ Date_____

Annex 11: Questionnaires on KAP of Bed Net Use

Knowledge, attitude and practice of use of bed net to prevent malaria

No.	Question	Possible answers	Go To
1. Demography Information			
1.1	Region	SNNP	
1.2	Zone	Wolyita	
1.3	Woreda	1. Humbo 2. Sodo Zuria	
1.4	Kebelle/Gote		
1.5	Age of respondent		
1.6	Sex of respondent	1.Male 2. Female	
1.7	Level of education of respondent	1. Illiterate 2. Able to read and write 3. Primary completed grade (1-8) 4. Secondary and above	
1.8	Level of education of children in the house (write the number of children in space provided)	1. Illiterate 2. Able to read and write 3. Primary completed grade (1-8) 4. Secondary and above	
1.9	Occupation of respondent	1. Farmer 2. Student 3. House wife 4. Civil Servant	

1.10	Religion	1. Protestant 2. Orthodox 3. Muslim 4. Other	
1.11	Ethnicity	1. Wolyita 2.Other	
1.12	House number		
2. Knowledge			
2.1	Do you know about Malaria?	1.Yes 2.No	
2.2	What are the main symptoms of malaria?	1.Fever 2.Chills 3. Headache 4.Muscle and Joint pain 4. Nausea 5.General malaise	
2.3	How do we acquire malaria?	1.Mosquito bite 2.Not using ITN and insecticides 3. Swampy areas, pond and stagnant water 4. Not spraying chemical at home 5. Bimbi bite 6. poor hand washing practice 7. contaminated food 8.close contact 9.If other, specify	
2.4	How can we prevent malaria infection/transmission	1. IRS 2. Source reduction 3.Drugs(prophylaxis) 4.ITNs utilization	

		5. keep personal hygiene 6.If other, specify 7.Sleeping with fully dressed 8. close door early and smoking in the house 9.Closing doors and windows in a time	
2.5	Who are at risk of malaria in the Household?	1.Under five children 2.Pregnant women 3.Adults 4.Old age 5.If other, specify	
2.6	Have you seen or heard any education messages pertaining to malaria from any source in the past one year?	1.Yes 2.No	
2.7	If yes where did you see or hear these education messages from? (Multiple responses possible)	1.Radio 2.TV 3.News paper/magazine 4.Posters/notices 5.Friends 6.Parents 7.Health workers 8.Government officials 9.Church/mosque 10.School 11,Other (please specify)	
2.9	Do you or anyone in your household own a functioning radio currently?	1.Yes 2.No	
2.10	Do you or anyone in your household own a functioning	1.Yes 2.No	

	Television currently?		
2.11	How much time took nearby health facility from the village through walk?	1. 5 -10 minute 2.15-30 minute 3. one hour 4. More than a hour	
3. Attitude			
3.1	Do you believe malaria is the most serious health problem?	1.Yes 2.No	
3.2	Do you think using bed nets have any benefit?	1.Yes 2.No	
3.3	If yes what are the benefits of bed net? (Multiple responses possible).	1.To prevent mosquitoes/Insect biting 2. To prevent malaria 3.To sleep under 4. To generate heat 5. To prevent from disease 6. To protect dirt during sleep 7. As domestic container 8. As curtain 9. To collect straw 10. As carpet 11. As head cover 12. As sieve	

		13. For close 14. for sale/ to generate income 15. As bed sheet 16. To sift/ filter water 17. To decorate house 18. Other: (please specify)	
4. Practice			
4.1	Dose the household own bed net?	1.Yes 2.No	
4.2	If yes, How many bed nets do you have?	_____	
4.3	Number of family size in one HH	_____	
4.4	Did you use /slept inside bed net last night?	1.Yes 2.No	
4.5	If No to Q3.4 what was the reason?	1.It is not prevent against malaria 2.The bed net was not treated 3.Mosquitoes can still bite through the net 4.It takes time to tuck the net each night 5.Carlessness 6. Thinking that malaria can be prevent by having sufficient food 7. Disliking or hatred net	

		8. Lack of understanding 9. Thinking malaria is from God thus can't be prevented using bed net 10. ITN can't fit their bed 11. do not have ITN 12. Lack of trust on ITN 13. Lack of information, how and when to use ITN 14.Using the freely given ITN for sale 15. Lack of sufficient education 16. It is too hot sleeping under a net 17. Smell of the chemical in which the ITN is dipped 18. Feeling breathless while sleeping under ITN 19. Burning nature of the chemical of the ITN	
4.6	How frequent and when should one use bed net	1.Every night 2.Seasonally 3.When Mosquito seen in the house 4.If other	
4.7	Who should be given priority in malaria prevention in the household?	1.Under five children 2.Pregnant women 3.Adults 4.Old age 5.If other, specify	

Chapter IX – Other Additional Output Report

Public Health Emergency Management Week 07 Bulletin-2013

Highlights of the Week

- Report received from all regions,
- National surveillance reporting rate was 81.2%,
- A total of 393,000 meningitis vaccine were given to Oromia region,
- Vaccination against meningitis started in Dale, Shalla and Shashemene woredas
- Measles outbreak in Meta woreda of west shewa zone is under investigation and response,

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 06 and daily phone communication for week 7 of 2013.

II. Completeness of reporting

National surveillance completeness rate was 81.2% in week 06 of 2013, comparing with week 5 completeness rate (83.7%) was decreased by 2.5%. This might be attributed to the slightly decreasing of completeness rate in Oromia, Amhara, Addis Ababa, SNNP and Afar region were decreased compared to previous week 05. (Figure12 & 13).

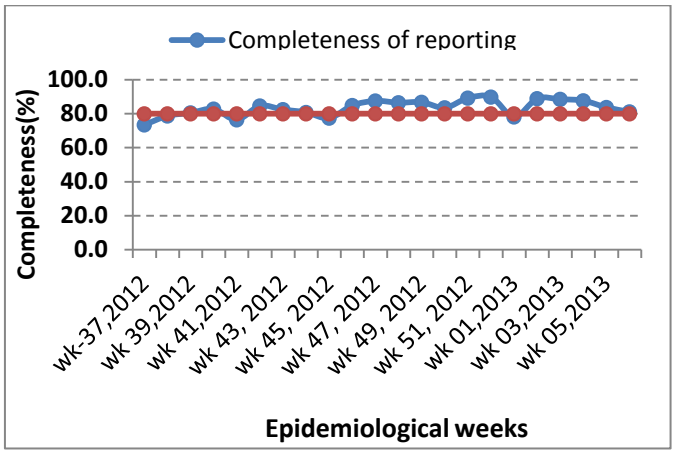

Figure 11: National report completeness - week 37,2012-week 6, 2013.

During week 6, Tigray, Amhara, Addis Ababa, Dire Dawa, SNNPR, and Somali met the minimum requirement, which is above 80% while Afar, Gambella, Hareri and Benishangul Gumuz reported below expected (Figure 13).

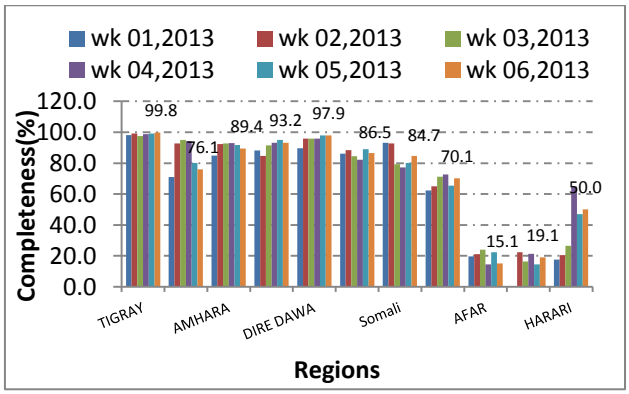

Figure 12: Reporting completeness by region-week 1-6, 2013

III. Diseases and conditions

1) Malaria

During week 6, a total of 58,082 clinical and confirmed malaria cases and 8 deaths were reported nationally. Majority of the cases were from SNNP 18,361(32%) followed by Amhara 15,050(26%) and Oromia regions 12,240(21%).

The national figure shows that malaria trend increased by 0.5% as compared to week 05, 2013 (Figure 14).

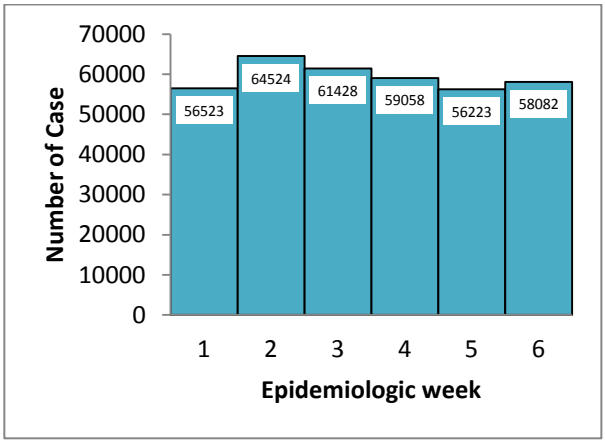

Figure 13: National Malaria Trends By Week Of Week 1-6, 2013

Similar to the national figure, comparing with the data of week 5, malaria cases slightly increased in Oromia, Gambella, Amhara and Benishangul Gumuz region. In contrast, the number of cases slightly decreased in other regions (Figure 15).

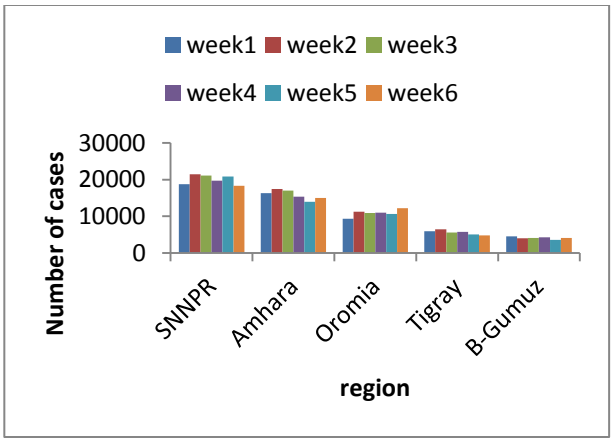

Figure 14: malaria confirmed and clinical cases by region of week 1-6, 2013

SNNP region

In week 6, a total of 18,361 confirmed and clinical malaria cases with one death were reported from the region, irrespective of the size of the zones, majority of the cases were reported from Sidama zone 2734(15%) followed by Gamo Gofa 2307(13%) and wolayita 2093(11%) zones. Comparing with week 5 surveillance data, this week the trend of malaria cases shows decreasing of cases. One death was reported from Segen zone.

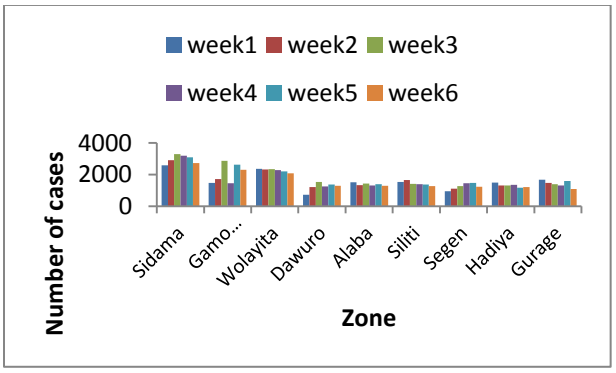

Figure 15: Malaria confirmed and clinical cases of SNNP region by zone, week 1-6, 2013

Amhara Region

A total of 15,050 case and three deaths were reported from the region, of which the highest number of cases were reported from West Gojam 4,597(31%), North Gondar 3,137(21%), South Gondar zones 2537(17%) and Awi zone 2512(16.6%).

Comparing with data of week 5, the number of malaria cases shows increment in West Gojam and North, South Gonder zones (Figure 6). In the other zones of region malaria cases has been maintaining for the five weeks. Two deaths were reported from West Gojam and one death from North Gonder zone.

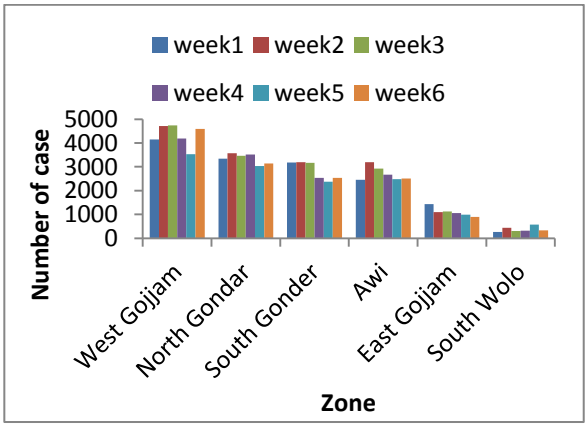

Figure 16: Malaria clinical and confirmed cases of Amhara region by zone, week 1-6, 2013.

Oromia Region

Among total clinical and confirmed malaria cases reported from the region in week 6(12,240), majority of the cases were reported from Jimma zone 1437(12%) followed by West wellega zone 1391(11.4%), Illuababora zone 1293(10.5%) and the rest zones increment is slight in number. Of two deaths were reported from Borena zone and Nekemet town, one death from each.

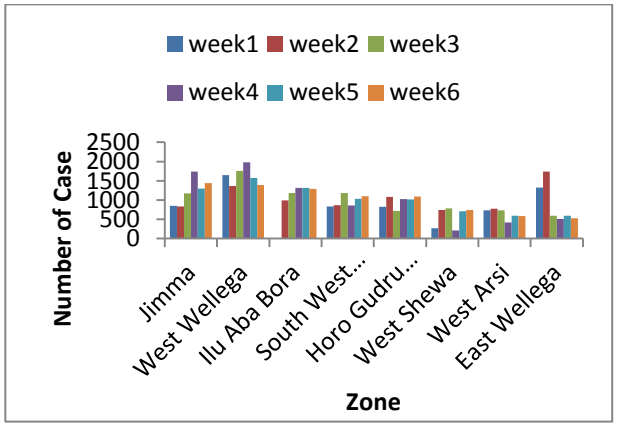

Figure 17: Malaria confirmed and clinical cases by zone of Oromia Region, week 1-6, 2013

2) Meningitis

During week 6, a total of 90 meningitis cases and 2 deaths were reported nationally. The highest cases 76(84%) were reported from SNNP region. Oromia, Amhara and Somali reported six, four and two cases respectively. Two deaths reported from Sidama zone and Hawassa town each reported one death.

During week 7, a total of 100 suspected meningitis cases were reported. Majority of cases 63(63%) were reported from SNNPR followed by Oromia region 35(35%) and

two cases were reported from Tigray region. Of the total cases reported from SNNP region, most of the cases were reported from Sidama zone 33(52%) followed Hawasa Town 11(17%) and Gurage zone five case (8%), Hadiya zone four cases, Halaba and south Omo zone three cases each, Gamo Gofa zone two case, Silti and wolayita zone one case each. Of 35 cases reported in Oromia region, all cases were reported from West Arsi zone.

3) Measles

A total of 506 cases with no death were reported in week 6. Most of the cases 211(41.7%) were reported from SNNPR region followed by Oromia 199(39.3%) region, Somali 62(12.2%) and the other cases were sporadically reported from Addis Ababa, Benishangul Gumuz, Afar and Harari regions.

Among the total 211cases reported from SNNP region, the highest cases were reported from Gamo Gofa zone 176(83.4%) and all the cases were from Chencha woreda, followed by Segen zone where 18(8.5%) cases reported from Konso woreda, Bench Maji and Sidama zone were reported six cases each, Gurage zone three case and kembata Timbaro zone two case.

Of the reported 199 case in Oromia region, Kelem Wollega zone 84(42.2%), Arsi zone 54(27%), Bale and South West Shewa zones 12(6%) cases each.

On week 6, of all the total 62 cases reported from Somali region, majority of 58(93%) cases were reported from Jijiga zone, Kabribayah 41(70%), Aw-Bare 12(20.6%) and Harshin five(8.6%) and the rest four cases reported from warder zone of Warder woreda.

4) Rubella

During week 7, a total of 43 Rubella cases were reported from Benishangul Gumuz region, Metekel zone, Wonbera and Debate woredas. Among the total cases reported, the highest 40(93%) were reported from Wenbera woreda and the rest three cases were reported from Debate woreda. (Fig 19).

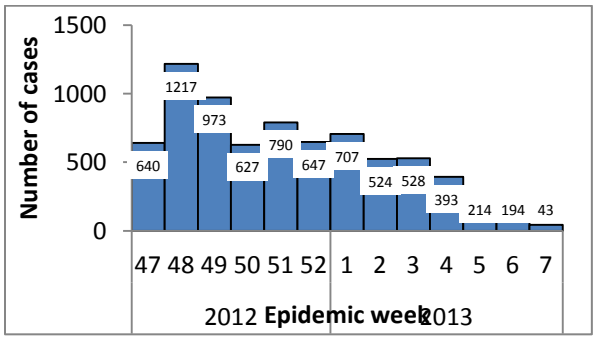

Figure 18: Rubella case report of Benishangul Gumuz region by week, as week 47/2012- 7/2013.

5) Polio

Nationally, a total of 18 suspected AFP cases were reported, of which 10 cases from Oromia, five and three cases from Amhara and SNNP regions respectively.

6) Dracunculiasis (Guinea worm disease)

One suspected case reported in Itang woreda of Gambella Region and was admitted to Gog Health Center for further investigation.

IV. Response activities

- Strengthening the surveillance on rubella, health education and case management is ongoing in Wenber and Debate woreda of Metekel zone.
- A total of 393,000 doses of meningitis vaccines with 107 cartoon of 3300 AD syringe, 30cartoon of 1200 10ml syringe, 123 safety box of 25 and 10 emergency kits were given to Oromia region,
- Vaccination against meningitis started in Dale woreda of Sidama zone and Sheshemene and Shalla woredas of West Arsi zone,
- Team sent to Meta Robi of west Shewa zone to investigate and respond to measles outbreak.

Declaration

I, the undersigned, declare that this is my original work and has never been presented by another person in this or any other University and that all the source materials and references used for this thesis have been duly acknowledged.

Name: Elsabetee Megrssa Sorassa

Signature: _____

Place: Ethiopian Public Health Institute

Date of Submission: _____

The thesis has been submitted for examination with my approval as a university advisor.

Name of advisor: _____

Signature: _____

Date: _____