Addis Ababa University, College of Health Sciences,

School of Public Health

Ethiopian Field Epidemiology Training Program (EFETP)

Compiled Body of Works in Field Epidemiology

By

Woubayehu Kassa

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

November,2014

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Approval by Examining Board

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_____	_____
Examiner	

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First of all I really forward my gratitude to my mentors Dr Adamu Addisise (AAU academic coordinator of Field epidemiology) and, Dr Negussie Deyessu for their help, guidance and encouragement to finish this program successfully

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Abbreviations/Acronyms

AIDS .....Acquired immune deference syndrome
ANC .....Antenatal care centre
ART .....Anti retro viral therapy
AFI.....Acute Febrile Illness
AFP .....Acute flaccid paralysis
AR.....Attack rate
CBC .....Complete blood count
CSF.....Cerebro spinal fluid
CDC .....Centre for disease control
EPHI..... Ethiopian Public Health Institute
HEV .....Hepatitis E virus
HIB .....Haemophilic influenza type B
HIV .....Human immunodeficiency virus
MCH .....Maternal child health
NP_AFP .....Non polio AFP rate
OTP.....Outreach Therapeutic Program
OPD .....Outpatient department
OPV .....Oral polio Vaccine
RDT .....Rapid Diagnostic Test
PBM.....Paediatric bacterial meningitis
PLWA .....People living with HIV/AIDS
WHO.....World health organization
VHF .....Viral Hemorrhagic Fever
VDPV.....Vaccine derived polio virus
WHO.....World Health Organization

Executive summery

The Ethiopian Field Epidemiology Training program (EFETP) is a two year field based masters program. The school of public Health /Addis Ababa University, Federal Minister of Health, Ethiopia Public Health Institute(EPHI), Ethiopia Public Health Association (EPHA) and CDC Ethiopia are running the program together .the field work comprises seventy five (75%) of the program which called residence with the aim of learning by working in public health emergency management centre

This Body of work contains my outputs for the two years stay in the program. It includes outbreak investigations, surveillance data analysis, surveillance system evaluation, description of health profile report, writing of scientific manuscript for peer review journal, abstracts submitted/presented in scientific conferences, writing protocol/proposal of epidemiologic research project and a summary of disaster situation in selected area.

In the outbreak investigation chapter or section two outbreaks were investigated, one of the outbreak investigation done in Dire Dawa city administration "Dengue fever outbreak investigation "a case control study and the other one was a descriptive study was which was done among South Sudan refugees in Gambella regional state "suspected Hepatitis E outbreak investigation among the refugees"

Chapter two contains report of surveillance data analysis which was conducted on Acute flaccid paralysis in Ethiopia, A five year data were analyzed.Chapter three addresses surveillance system evaluation "An Evaluation of Ethiopian Paediatrics bacterial meningitis among 5 years children. This chapter include the purpose and objectives of the sentinel surveillance and its progress towards its objectives, challenges and gaps, the sentinel surveillance attributes: simplicity, flexibility, stability, acceptability, representativeness, timeliness, data quality, sensitivity and predictive positive value were also assessed in the chapter

Chapter four contains assessment of West and East Harerega zone health profile. In the chapter health and health related data of the zone populations were presented

Chapter five contains Scientific Manuscripts for Peer reviewed Journals. In his chapter two manuscripts are presented. The manuscripts were prepared according to Ethiopian journal of health development author's guideline.

Chapter six contains abstracts of outbreak investigations, surveillance data analysis, and surveillance system evaluation. The abstract entitled "Acute febrile illness outbreak with first report of dengue fever - Diredewa city administration, Ethiopia ,November/2013 was accepted for poster presentation at 63rd EIS conference in Atlanta /Georgia Similarly another abstract entitled "Acute Flaccid Paralysis in Ethiopia from 2008-2010 was accepted and presented on the 5th African Field Epidemiology Network conference in Addis Ababa.

Chapter seven contains a report on Health and Nutrition need assessment (risk assessment) on selected districts of East and West Harerega zones of Oromia region, the report conducted in collaboration with other team members, WHO, UNCHEF, and Goal/Ethiopia.

Chapter eight epidemiological research project in title "Prevalence and risk factors of Hepatitis B among pregnant women in Addis Ababa "were written and submitted

Chapter nine include other outputs and in this chapter training conducted on influenza sentinel surveillance review meeting and it was a one day training focused on sample collection, storage and transportation for the diagnosis of Influenza in this chapter Public Health Emergency weekly bulletins were included

Chapter-I Outbreak investigation

1.1 Acute febrile illness outbreak with first report of dengue fever - DireDewa city administration, Ethiopia, November/2013

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Abstract

Background: Dengue Fever is one of the causes of Acute Febrile Illness (AFI) and a leading cause of illness and death in tropical and sub tropical countries. On September 2013 Diredewa health bureau, reported an AFI outbreak of unknown origin in the town. An investigation was conducted to identify the etiology of the outbreak, determine risk factors and to recommend control and prevention methods.

Methods: Descriptive study supported by an unmatched case-control (1:2) study was conducted. Cases were defined as any person with fever ≥ 38^{oc} and having headache, joint and back pain, Control subjects were persons who did not exhibit the same clinical manifestations as cases in the period extending from October 14 to November 5, 2013. Odds ratios and 95% confidence intervals were calculated using Epi Info version 7. For laboratory investigation blood samples were collected and examined for different vector-borne viral infections using IgM ELISA and PCR.

Result: A total of 11400 cases were reported within the study period both genders affected equally. Crude AR was 3.4 % Kebele 9 were the most affected Kebele. Forty cases and 80 controls were enrolled. The median age for cases and controls was 23 and 28 years respectively. On multi-Variables analysis risk factors associated with the disease were wearing short-sleeved shirts (OR: 8.8, 95% CI: 3.2-24), presence of a sick family member (OR: 14.1, 95% CI: 3.3-61. Fifty serum samples were tested for vector-borne viral infections and out of them 26(52%) were positive for dengue fever.

Conclusion: This is the first reported outbreak of dengue fever in Ethiopia., Both genders were equally affected, The age group 15-44 years and children < 5 years were the most and least affected groups respectively. Environmental management and providing health education for the community should be emphasized to control the outbreak.

Keyword: Acute febrile illness, Dengue

1. Introduction

Acute febrile illnesses is define as a disease characterized by an increase of body temperature more than 37.5^{oc} resulting from infection process, It is caused by various pathogens, Many pathogens caused febrile illness and clinical diagnosis is difficult and unreliable unless supported by laboratory diagnosis

Diradewa health burio reported at the end of September 2013 unkonown AFI outbreak occurred in the urban part of the town .Cases occurred only in the urban part of the town and case load were seen espacially in three health facilities (Sabian health center , G/Gerado health center and Legehare health center). Clinical sign and symptom of the cases looks like malaria so all the cases were examined for hemoparasite but only in few cases were malaria parasite seen. The laboratory result showed that people are sick not because of malaria and it creats a confusion to all physician the patient will got recoverd on average 7-10 days by it self .As the town had no recent history of the AFI disease all health facilities didn't know what is the cause of the febrile illness. The Diradewa regional laboratory collected 11 serum samples from patients within 2-3 days the onset of disease and before the investigation starts and send to EHNRI for differential diagnosis and all samples were negative for six viral tests(for Dengue fever, Rift valley Fever, Yellow Fever, West Nile fever, Chikungunya, and Crimean-Congo virus.)

Having concerned with the problem, the Federal PHEM organized a team to identify and investigate the outbreak from 11/10/2013-22/10/2013 incollaboration with the Diredewa PHEM office.The investigation was conducted to identify the etiology, risk factors and finally come up with control and prevention measures and finally from the investigation we identify Dengue fever is the etiology of the out break

Dengue Fever

Dengue fever is a mosquito-borne flaviviral infection that causes a severe flu-like illness. It is an endemic in the tropics and subtropics countries. There are four dengue virus serotypes, called DEN-1, DEN-2, DEN-3, and DEN-4. They belong to the genus Flavivirus, family *Flaviviridae* (of which yellow fever virus is the type species), which contains approximately 70 viruses (1,2)

Infection with one serotype confers protection to re-infection with the same serotype, while re-infection with dissimilar serotypes confers no long-term protection and may even predispose to worse clinical outcome. (3)

Dengue can vary from mild to severe forms it could manifest including dengue shock syndrome and dengue hemorrhagic fever (DHF). Patients who develop the serious forms of dengue fever usually need to be hospitalized (4) .Dengue is transmitted between people by the mosquitoes Aedes aegypti and Aedes albopictus, which are found throughout the world. Symptoms of infection usually begin 4 - 7 days after the mosquito bite and typically last 3 -10 days. In order for transmission to occur, the mosquito must feed on a person during a day period when large amounts of virus are in the blood (5)

To date about half of the world's population is at risk. Dengue infection is a leading cause of illness and death in the tropics and subtropics. .Dengue is endemic in at least 100 countries in Asia, the Pacific, the Americas, Africa, and the Caribbean. WHO estimates as many as 100 million people to be infected yearly (6, 7). In Ethiopia there was no report of dengue fever yet and it is the first time to identify and report the disease, The vector A.egeypities is the vector that is not only transmitting Dengue fever but also yellow fever as well , so from this investigation we will find out what are the risk factor associated with the transmission of the disease.

2. Objectives:

2.1 General Objective:

To investigate the outbreak and assess the causative agent and factors associated with the cause of the outbreak

2.2 Specific Objectives:

- To describe the outbreak by time, place and person
- To verify the causative agent of the disease
- To identify the risk factor of the disease

3. Material and methods

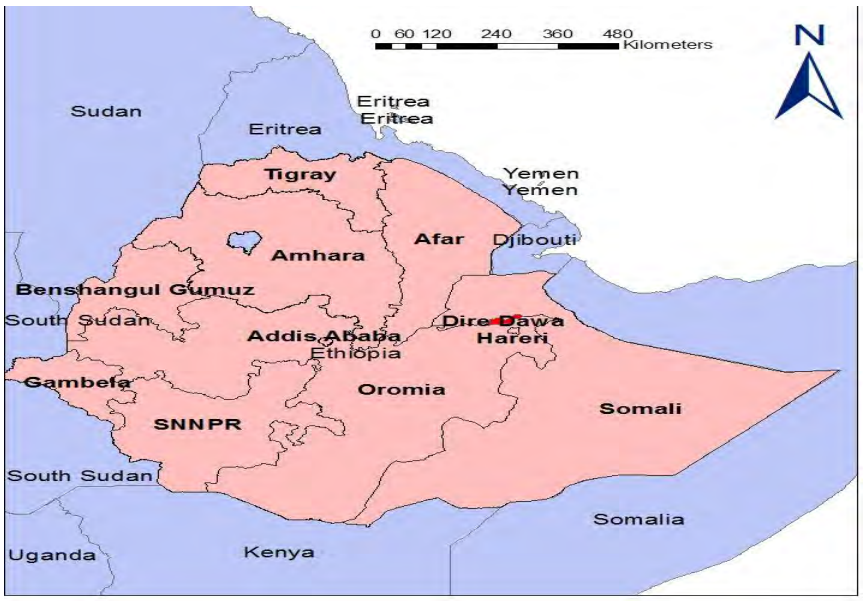
3.1 Study design

Descriptive: study design was used to assess the distribution of the disease by person ,place and time : and further unmatched case control study was conducted to verify and identify the outbreak and risk factor

3.2 Study site

The study was conducted in Diredawa city Administration.Diradewa city Administration - is located in the eastern part of the country surrounded by the state of Somalia and the state of Oromia and it is one of two chartered cities (*astedader akabibi*) in Ethiopia It is 525 kilometer far from the capital city of Ethiopia (It is divided administratively into two Woredas, the urban woreda and the non-urban woreda of Gurgura ,the town has nine operational woredas (8)

Based on the 2007 Census conducted by the Central Statistical Agency of Ethiopia (CSA), Dire Dawa has a population of 336,720 of whom 167,663 were male and 169,057 were female; 233,224 or 68.23% of the population are urban inhabitants. For all of Dire Dawa 76,815 households were counted living in 72,937 housing units, which results in an average of 4.5 persons to a household, with urban households having on average 4.2 and rural households 4.9 people



Map1 Map of horn of Africa, Ethiopia showing DireDawa

3.3 Data source

We selected three health facilities out of the nine health facilities based on their case load and its representativeness (Legahara and Sabian health centre) for the cases because of their high number of reported cases and also more than three Keble dwellers are getting the health service from those health centres; Addis ketema health centre for the controls because of its low number of reported AFI cases, information were collected by using structured questioner , interview cases and control found on the selected health facilities , document and line list also reviewed to get the actual number of the cases

Case definition:-Cases were defined as any person with fever $\geq 38C^{o}$ and having headache, joint pains ,back pain and in some patients vomiting and nasal bleeding from October 14-21, 2013 , and a control subject were enrolled any person who doesn't have same clinical manifestation of the above sign and symptoms

3.4 Descriptive study

We assessed patient medical records , logbook which is found in OPD , daily line list and daily epidemic summary report were collected from all health facilities.All the collected data were compiled and descriptive analysis were done by time ,place and person by using Microsoft excel

3.5 Analytical study

We conducted (1:2) unmatched case control study to identify the possible risk factor. We designed a structured questionnaire that addresses the possible exposures for the suspected Acute febrile illnesses, oral consent for study subjects were given and interviewed 40 suspected cases and compared with 80 control subjects from Diredewa selected health facilities . We calculated odds ratio and 95% confidence intervals using Epi Info version 7.

3.6 Laboratory Analysis

We checked blood film for hemoparasite for all AFI suspected cases, beside that 33blood samples were collected (27 for virological investigation and 6 samples for bacteriological identification) most of the sample collected for virological identification were very acute cases and 12 convalescent samples were collected after a week from the community who had recovered from the illness, Laboratory examination were done for vector born viral infection by using ELISA technique for six viruses (yellow fever , Dengue fever, Westnile

fever,Riftvaleyfever,checkungunia and Crimean-Congo).Six whole blood samples were examined for (Salmonella specie, Streptococcus pneumonia, E.coli, Klebsiella Pneumonia, brucella species) samples collected for virological investigation were send to WHO referral laboratory IP Dakar for confirmation of dengue fever and further investigation.

4. Result

4.1 Descriptive analysis

A total of 11409 cases were collected from September 30-December31,2013 out of this 5729(50.2%) were male and 5680 (49.8%) were female.The crude attack rate(AR)was 3.4 %, and both sexes affected equally .Kebele 9 was reported the highest cases with a number of 3198 (28%) of the total cases followed by kebele 2 and 4 with a number of 2556(22.4%) and 1220(10.6 %) while kebele 5 reported the least number of cases 555(4.8%) of the total cases whose age group found between 15-44 were highly affected with attack rate (AR:4.3%) followed by 45+ with Attack Rate of 2.89 % and children <5 yrs were the list affected

Table 1- The distribution of acute febrile illness by Age and sex distribution, Diredewa from Oct14- December 31, 2013

Age group	Population			Cases			Crude AR	Sex specific AR	
	Total	M	F	Total	M	F		M	F
< 5 yrs	41665	21314	20351	581	303	278	1.39	1.4	1.36
5-14 yrs	80869	41088	39781	2200	1182	1018	2.7	2.87	2.5
15-44 yrs	172704	84616	88088	7429	3679	3750	4.3	4.3	4.25
45+ yrs	41482	20645	20837	1199	564	635	2.89	2.7	3.0
Total	336720	167663	169057	11409	5729	5680	3.8	3.4	3.3

The epidemic curve show that the outbreak started before the beginning of October and cases were increasing from day to day and starting from October 14, 2013 .AFI cases were

increasing dramatically it was difficult to find the index cases from the community as it started before a month ago

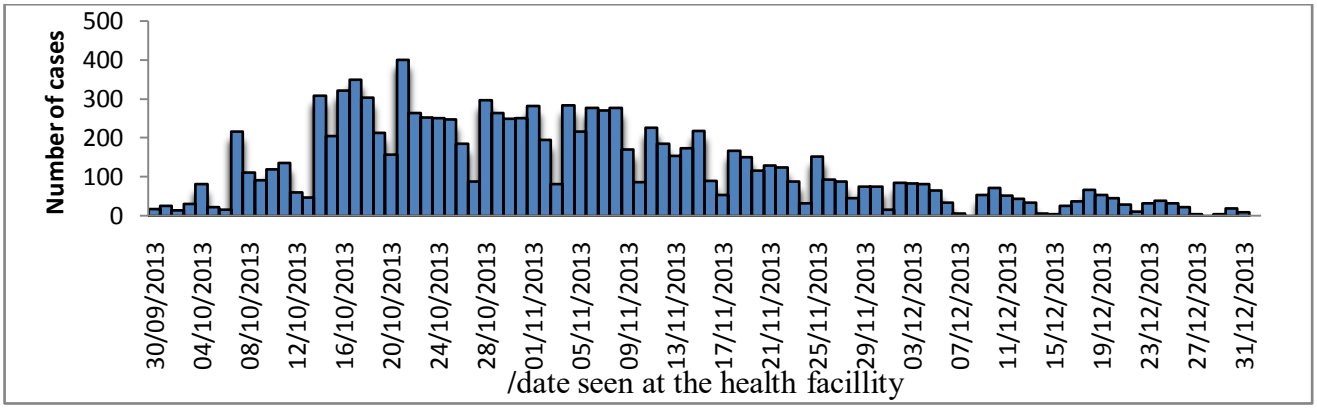


Fig 2 Acute febrile illness outbreak cases distribution by date seen at the health facility, DireDewa city administration, November, 2013

5. Case- control

We collect a total of 120 Acute febrile illness cases (40 cases and 80 control) with 1:2 unmatched case control study was conducted with median age 23 for cases and 28 for control .On bivariate analysis risk factors associated with the disease were wearing short sleeves and T-shirts (OR :6.3 95% CI: 2.5-15.7 : P :<0.001) , presence of sick family member (OR:11,95%CI:2.8 -41,P:<0.001), having manmade stagnant water around their living environment (OR:4.3,95%CI:1.3-14%,P:0.01) while using bed net during sleeping, travel history out of DireDewa using mosquito repellents on skin ,having contact with sick person before two weeks age didn't show any association with dengue fever . But on multi variate analysis only presence of sick family member and wearing of short sleeves show the risk factor associated with the disease.

Table 2. Bivariate analysis for different exposures, DiraDewa city administration, Ethiopia October14- 21, 2013

Exposure		**Cases**	**Control**	**OR(95%CI)**	**P value**
Wearing of short T-shirts during day time	Yes	19(47.5%)	10(12.5%)	**6.3 (2.5-16.7)**	**≤0.001**
	No	21(52.5%)	70(87.5%)		
Presence of sick family member	Yes	12(30%)	3(3.75%)	**11(2.8-41)**	**≤0.001**
	No	28(70%)	77(96.25%)		
Have close contact with the person sick the same clinical picture	Yes	6(15%)	12(15%)	1(0.3-2.8)	0.59
	No	34(85%)	68(85%)		
Using of bed net during sleeping	Yes	9(22.5%)	20(25%)	0.8(0.3-2.1)	0.47
	No	31(77.2%)	60(75%)		
Travel history to out of DireDewa	Yes	5(12.5%)	4(5%)	2.6(0.6-10.5)	0.14
	No	35(87.5%)	76(95%)		
Using of window screen and air conditioner	Yes	3(7.5%)	5(6.25%)	1.2(0.2-5.3)	0.53
	No	37(92.5%)	75(93.5%)		
Using mosquito repellent on your skin	Yes	1(2.5%)	1(1.25%)	2(0.12-33)	0.56
	No	39(97.5%)	79(98.75%)		
Presence of stagnant water around living area	Yes	9(22.5%)	5(6.25%)	**4.3(1.3 -14)**	**0.01**
	No	31(77.5%)	75(93.75%)		
Do you use air conditioning or window and door screening?	Yes	3(7.5%)	5(6.25%)	1.2(0.2-5.3%)	0.5
	No	37(92.5%)	75(93.75%)		
Presence of river around living area ?	Yes	2(5%)	1(1.25%)	4.1(0.3-47%	0.25
	No	38(32%)	79(98.75%)		

Table 3: Multi-variate analysis of risk factors associated with dengue fever, Dire Dawa, 2013

Exposure	Cases N=40	Controls N=80	AOR	95% C.I.
Wearing T-shirts and shorts in daytime	19(48%)	10(13%)	8.8	3.2-24
Presence of sick family member with AFI	11(28%)	3(4%)	14.1	3.3-61

6. Laboratory investigation

For all of the 40 cases blood film were examined at the health facility and all of them were negative for hemoparasite,From the same cases we collected 33 blood samples and brought to EPHI(virology laboratory) for different differential diagnosis (27 serum sample for virological investigation and 6 whole blood samples for bacteriological investigation), 6 whole blood samples were cultured at national bacteriology laboratory for different type of bacterial pathogens (Salmonella specie, Streptococcus pneumonia, E.coli, Klebsiella Pneumonia and brucella species) and no growth seen .For virological investigation beside the 27 serum samples convalescent sample collected and a total of 50 serum were examined at EPHI by using ELISA for six vector born viral infection (Yellow fever, West Nile fever, Dengue fever,chekungunia,Crimean-Congo and Rift valey fever) and a total of 14 samples were positive for dengue IgM antibody , all samples were sent to IP Dakar for conformation and further investigation ,from those sent samples 26 (52%) were confirmed dengue positive (11 samples positive by PCR technique and the rest 15 were positive by using ELISA techniques (IgM antibody) all the samples were serotype DEN-2.

7. Environmental Investigations:

The living environment of cases which were highly affected by the disease were observed and there are suitable environments for mosquito breeding like water from plant pot plates, Flower vases around their living compound and there were holes in some of the patients living area which is used for disposing liquid west. All mosquitoes and larvae were identified as *Aedes aegypti* and tested negative for DF by PCR.

8. Discussion

The laboratory findings and clinical manifestations assured that the etiologic agent of the outbreak were dengue fever. This is the first finding and report of Dengue fever in Ethiopia, since dengue fever affects most of the tropical and subtropical countries and Ethiopia is found on this region it makes the country exposed for dengue fever and other vector born viral infection .The outbreak started on early September and it become peaked on October and mid of November ,2013 ,the crude attack rate were 3.8 % and both sex were affected equally with the same attack rate (3.4%) Age group 15-44 yrs were highly affected by the disease, this shows that they are active age groups and they spent most of the time outside of the house which exposed them to day bite mosquito, followed by 45+ years and children under five were the least affected age groups with attack rate of (4.3%,2.89%and1.39%) respectively. A study conducted in Salvador assessing the risk factors of dengue in pre school children and the dengue virus is in active circulation during early childhood; consequently, children have heterotypic antibodies and run a high risk of developing dengue hemorrhagic fever, because the sequence and intensity of the three dengue virus serotypes currently circulating in this city(9)

In our study, the risk factors that associated with dengue fever were wearing short sleeves and T-shirts during day time were highly affected (AOR:8.8 ,95%CI:3.2-24%), As long as the vector (A.egypities) is a day feeder mosquito, persons who have the habit of wearing short sleeves dress are highly venerable to mosquito bite and getting the disease while wearing long sleeves and full trouser were not affected and it is a protective for not infected by the disease ,Another risk factor for the disease were presence of sick family member with acute febrile illness (AOR:11.1 , 95%CI: 3.3-61%) .Infected humans are the main carriers and multipliers of the virus and 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

9. Conclusion

In Ethiopia there were no report of dengue fever before and it is the first time to report. Confirmed DF cases were identified within a cluster of over 11,000 AFI cases in one urban centre from September to December 2013 with no deaths and no reports of dengue hemorrhagic fever .The disease affected only the urban part of the town and cases were not evenly distributed, from nine urban health facilities three of them were highly affected , both

sexes were affected equally and persons aged 15-44 yrs were most affected .On multi-variate analysis wearing T-shirts and shorts during the daytime and having a family member with AFI were identified as risk factors for contracting DF. *Aedes aegypti* mosquitoes were identified in the urban centre during the outbreak

10.Challenges /gaps

- The organized team didn't include expertise from different discipline (entomologist, epidemiologist, and clinician veterinarian.)
- Unable to get line list and daily epidemic summery report on time
- Very weak participation of the region Expertise and physician during the investigation.
- Unable to get convalescent samples at the health facilities because people came to the health facility immediately they got sick .
- At the laboratory side there is shortage of laboratory reagents for both ELISA and conventional PCR techniques to diagnosis all the collected samples.
- Some of the laboratory reagents used for diagnosis of Dengue fever are not commercially available

11. Recommendation

- Work on environmental management to avoid mosquitoes breeding sites and also ; disposing of liquid waste properly to minimize artificial man-made habitats seeks to change the environment in order to prevent or minimize vector propagation and human contact with the vector pathogen by destroying, altering, removing or recycling non essential container that provide larval habitat. using of personal household protection such as window screens.
- Local laboratory needs to strengthen by providing the necessary technical and other input in order to diagnose dengue fever by their own.
- Health education should given to the community to avoid being outside at dawn, dusk and early evening and to seek medical treatment as soon as they got sick .
- Health education to avoid exposure to mosquitoes (long sleeves and pants, repellents, bednets)
- Strengthen surveillance system for AFI and dengue like illness and local laboratory capacity for early detection of DF in Ethiopia.

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Annex 1: Dire dewa Dengue fever Outbreak Investigation Questionnaire

no.	Question	Coding Classification	Go To
	1. Demographic Information		
1.1	Respondent ID	_____	
1.2	Sex	1.Male 2.Female	
1.3	Age	_____Years, _____ Months	
1.4	Maritul Status	1. Single 2. Married 3. Divorced 4. Widowed 5.NA	
1.5	Occupation	1. Student 2. Dailly laberer 3. House wife 4. Merchant	
1.6	Number of family members?	_____	
	2. Clinical Information		
2.1	Respondent Classification	1. Cases 2. Controls	If Control skip to 3.1
2.2	Date of Onset	dd/mm/yyyy _____	
2.3	Sign and symptoms	1.Fever 2. Headache 3. Joint Pain 4. Chill 5. Nasal Bleeding 6. severe muscle and joint pain	
2.4	Date seen at health Facility	dd/mm/yyyy _____	
2.5	Treatment	Antibiotics _____ Antiviral _____ Antipiretics _____	
	3. Laboratory Specimens		
3.1	Blood Serum	1.Yes 2.No	
3.2	BF	1.Yes 2.No	
3.3	Whole Blood	1.Yes 2.No	
	4. Exposure		
4.1	Do you have bed net?	1.Yes 2.No	
4.2	If Yes, do you use bed net while sleeping?	1.Yes 2.No	

no.	Question	Coding Classification	Go To
4.3	When did you get the last bed net?	_____ Year	
4.4	Who use bed net always?	1.Children 2.Women 3. All use equally	
4.5	Is there any stagnant water around your village?	1.Yes 2.No	
4.6	If Yes, approximately distance of stagnant water from your house?	1.less than 100m 2.more than 100m	
4.7	Is your house sprayed?	1.Yes 2.No	
4.8	When was the last time that your house sprayed?	1.One month ago 2.Two months ago 3, Three months ago 4. More than three months ago	
4.9	Is there any river around your village?	1.Yes 2.No	
4.10	If Yes what is the name of the river?	_____	
4.11	Approximately distance of the river from your house?	1.less than 100m 2.more than 100m	
4.12	Is there other person diseased in your family?	1.Yes 2.No	
4.13	If Yes, how many family members become ill?	_____	
4.14	Did you have close contact with person with same complaint within the last one to two weeks?	1.Yes 2.No	
4.15	Did you have travel history within the last two weeks?		
4.16	If, yes to where?	_____	
4.17	Do you use air conditioning or window and door screens?	1.Yes 2.No	
4.18	Do you use mosquito repellents on your skin?	1.Yes 2.No	
4.19	What kind of clothes you usually wear	1. Short and T-shirts 2. Trousers/ body full dress	

1.2 Outbreak investigation of suspected Hepatitis E among South Sudan refugees in Ethiopia, Gambella, June 2014

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Abstract

Background

Hepatitis E is a liver disease caused by the hepatitis E virus. It is a common cause of acute hepatitis in developing countries with poor sanitation and hygiene. The virus is classified into four genotypes. In endemic areas, large outbreaks of acute hepatitis caused by viruses' of genotype 1 or 2 frequently occur due to faecal–oral transmission, usually through contamination of drinking water .It is usually a self-limiting infection and resolves within 4–6 weeks

On mid of June there was a report of suspected Hepatitis Disease and yellow fever outbreak from Gambella regional state where the south Sudanese refugee camp is found, team were organized from different sectors and deployed to confirm the outbreak, investigate the causative agent and to recommend the prevention mechanism

Methods: Patient observation and searching active case was made at MSF clinic, line list were collected from MSF France clinic from June 6- July 9, 2014.A cases was defined as a patient with fever, acute onset of jaundice, headache, dark urine, hepatomegale and sometimes having vomiting. Immunization status for yellow fever and Hepatitis were assessed through patient medical history card. Blood specimens were collected and sent to WHO referral laboratory for conformation and further investigation. Descriptive analysis was conducted Microsoft Excel-

Result

From both refugee camps, a total of 240 jaundice cases were reported between first week of May to first week of July 2014 .There were 12 deaths reported with a case fatality rate of 5% ,From the total cases 99(41%) were females and 141(59%) were males .Age groups 5-14 were highly affected with 110 (46%) followed by age group 15-44 of 76(32%) and age group < 5 were the least affected with a percent of 22% . Twohundered (83%) refuges who

develop jaundice cases were from Lietchuor camp and 35 cases from kule 1 and 2.From the total jaundice cases ,52 were RDT positive for malaria parasite. Twenty two blood samples were tested and out of them 12 (54%) were positive for Hepatitis E by PCR technique.

Conclusion

HEV is the leading cause of non-A, non-B enterically transmitted among south Sudan refugees, It is known that there was a big outbreak in South Sudan and most of the refugees came from upper Nile, one of the state where hepatitis E outbreak was reported. The emergence of the disease in refugee camps is a major concern because of the difficulty in implementing effective preventive measures under camp conditions. The risk factors associated with the transmission of virus are currently unknown but the area is very prone to water born diseases in addition to that, all the residents of the refugee camps had no latrine and had shortage of safe water supply

Introduction

Hepatitis E is a liver disease caused by the hepatitis E virus: It is a common cause of acute hepatitis in developing countries with poor sanitation and hygiene. The virus is classified into four genotypes with one serotype. Genotypes 1 and 2 exclusively infect humans, whereas genotypes 3 and 4 also infect other animals, particularly pigs. In endemic areas, large outbreaks of acute hepatitis caused by viruses' of genotype 1 or 2 frequently occur due to faecal–oral transmission, usually through contamination of drinking water (1)

The virus is a non-enveloped, positive-sense, single-stranded ribonucleic acid (RNA) virus. It is one of the five known hepatitis viruses: A, B, C,D and E. Infection with this virus was first documented in 1955 during an outbreak in New Delhi, India .The hepatitis E virus is transmitted mainly through contaminated drinking water: its incubation period will stay between 2 – 8 weeks .It is usually a self-limiting infection and resolves within 4–6 weeks (2).

It bears a high risk of developing chronic hepatitis in immunocompromised patients with substantial mortality rates. Hepatitis E occasionally develops into an acute, severe liver disease, and is fatal in about 2% of all cases. Clinically, it is comparable to hepatitis A, but in pregnant women the disease is more often severe and is associated with a clinical syndrome called fulminant hepatic failure. Pregnant women, especially those in the third trimester, suffer an elevated mortality rate from the disease (3).

Globally, there are approximately 20 million incidents of hepatitis E infections every year Hepatitis E has a restricted distribution: epidemics of hepatitis E have been found in much of Central and South-East Asia, North and West Africa, and in Mexico, confined to geographic areas where faecal contamination of drinking water is common(4).

Like Cholera hepatitis E virus spreads in environments with poor sanitation and contaminated drinking water.The outbreak was able to take a hold because of poor condition such as inadequate distribution of safe water, limited access of functioning latrines and too few hand washing points

Since the virus was identified in 1983, epidemics have occurred regularly in many countries across South and Southeast Asia when seasonal floods have contaminated drinking water supplies and in Africa during humanitarian crises among refugee populations without access

to clean water. In addition, sporadic cases and small clusters of HEV infections have been recognized throughout the world in developed countries over the past couple of decades (5).

Prior to this outbreak in 2013 and in 2014, there was a big Hepatitis E outbreak in South Sudan and people are migrating from south Sudan to Ethiopia. In Ethiopia there was no Hepatitis E outbreak reported, on mid of June there was a report of suspected Hepatitis E and yellow fever outbreaks from Gambella regional state where the south Sudanese refugee camp is found. The regional health bureo of the Gambella region, UNHCE, WHO and other partners concerned with the issue and reported to EPHI to investigate the outbreak and to assist them team was deployed to confirm the outbreak, investigate the causative agent and to recommend the prevention mechanism

2 .Objectives

2.1 General Objective:

To verify and identify the ethologic agent of the outbreak, describe the affected population by person place and time and asses the possible risk factors.

2.2 Specific Objectives:

- To describe the distribution , magnitude and severity of the outbreak
- To identify the etiological agent and risk factors for the disease
- To constitute a prevention and control measure

3. Material and methods

3.1 Study area

The outbreak was seen in Gambella regional state in western Ethiopia,Gambela regional state is one of the 9 region in the country with a population of 385,997 (in 2012 census) located in the south western part of the country and covers an area of 25,802km^2. The capital Gambella town is found at a distance of 777 kms from Addis Ababa. The region has five native ethnic groups, and administratively it has14 districts(6).

In Gamble regional state there are six refugee campus (Kula 1 &2 , Lietchuor, Okugo, Pugnido) with seven entry points for south suddenness refugees

3.2Study population

The study population was the entire population of the refugee camp .- In Gambella there are 154,617 south Sudan refugees living in six refugee camps Kule 1 having the highest refugees (51,476) , Letchore (47,485) Kule 2(35,681), Okung (1,8290,)and Punidio (1,683)

3.3Case definition:- The working case definition was a patient, acute onset of fever ,jaundice, headache, dark urine, hepatomegale and sometimes having vomiting.

3.4 Descriptive study method

Upon reaching to the MSF France clinic in the camp, a briefing meeting was held with the MSF France staff, about the situation including how many cases were found, the clinical complication, the entire setup of the camp and where we can find cases when they presented Generally all the cases have had fever and jaundice, the fatal cases have had GI haemorrhage in the form of hematemesis, blood in urine, finally developed anuria, encephalitis, seizure, coma and death.

MSF France reported that they launched active case search and contact tracing through their community outreach workers, Line list from MSF France clinic were collected and patient medical history card assessed and reviewed. Physicians working in MSF clinic at the refugee were interviewed and also direct patient interview was conducted and questioners were administered. Data were entered in Excel and descriptive analysis was done by time, person and place. Age and sex distribution, Case fatality rate (CFR), percentage and ratios were calculated

5 Laboratory analyses

We collected 22 blood samples of suspected Hepatitis E patients those admitted at the MSF clinic and samples were sent to IP Dakar/Senegal and KEMRI / Kenya for hepatitis E and Arbovirus diagnosis.

6 Result

From both refugee camps a total of 240 jaundice cases were reported between May to first week of July 2014.There were 12 deaths reported with a case fatality rate of 5 % ,From the total cases 99(41%) were females and 141(59%) were males ,age group 5-14 were highly affected age group with 110 (46%) and followed by and age group 15-44 76(32%) and age

group < 5 were the least affected with a percent of 22% .Two hundred(83%) refuges who develop jaundice were from Lietchuor camp and 35 cases from Kule 1 and2.All cases have fever, jaundice and dark urine and they fulfilled the case definition of hepatitis E.From the total jaundice cases,52 were RDT positive for malaria parasite .

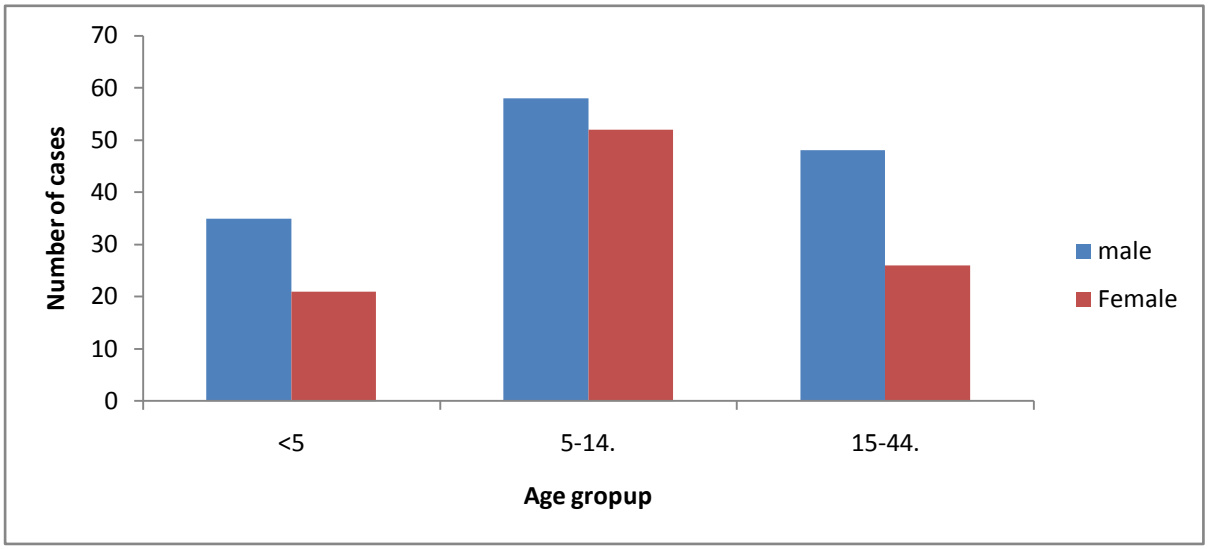

Fig 3 Distribution of suspected Hepatitis E cases among South Sudan refugees by age and sex

6.1 Laboratory Result

A total of 22 blood samples were collected from both camp and samples sent to Kenya virology laboratory and 12 samples were positive for hepatitis E by PCR techniques. At the same time, samples were run for yellow fever and all of them were negative.

The epidemic curve shows that it had multiple date of onset. The outbreak started on May 10,2014 with two jaundice cases then cases were increasing and between June 17 to July5 a lot of cases were reported on weekends few numbers of cases were presented in the health facility.

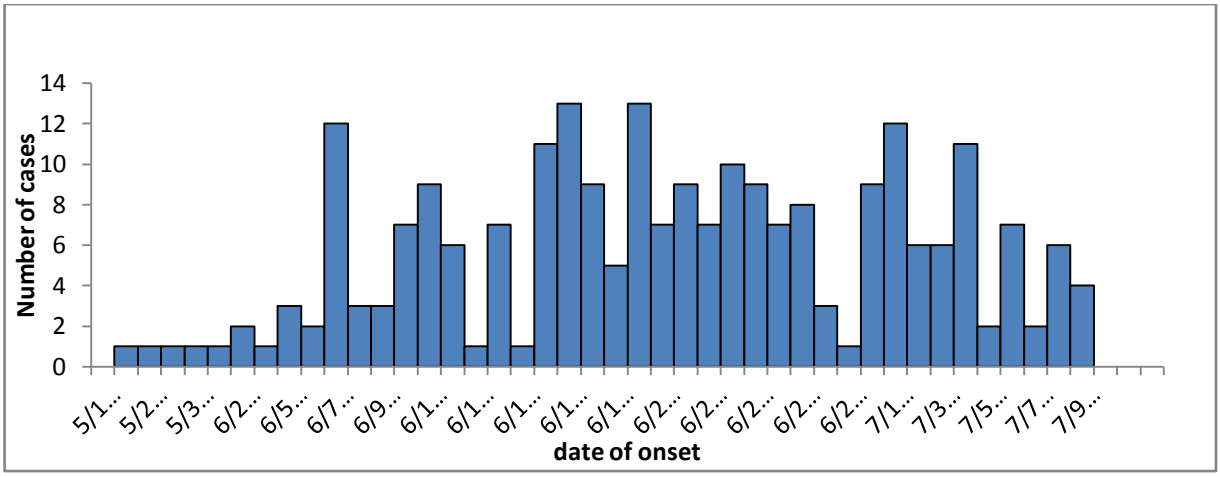

Fig 4 Suspected Hepatitis E outbreak distribution among the refugees by date of onset

Table 4. Clinical manifestation of hepatitis E cases in Kule and Letchor refugee camp from June 10-August 15, 204

Symptoms	Frequency	%
Fever	227	95%
Jaundice	238	99%
Abdominal pain	98	41%
Nasal bleeding	9	3.75%
Splenomegally	83	35%

7 .Discussions

From the laboratory investigation, the cause of the outbreak was Hepatitis E, the area where the refugee camp is found very prone to flood, there was no latrine at all in the entire compound and peoples are used to defecate in an open area, in a container and they throw it in to the bush, There is no water for hand wash after defecation, before and after eating meals. We observe that there is water supply which is treated by UNCHER but there is safe water shortage. In every household there is water container with/no cover usually.The risk factor associated with the disease was not known because all of the refugees have the same exposure and had the same living standards

It is known that there was an earlier hepatitis E outbreak in south Sudan, and a daily of 1200 refugees were coming to Ethiopia crossing the border and most of the refugees were came from upper Nile which was highly affected by the outbreak .

When we see the sex distribution males were more affected than female which could be most of the time males have a habit of drinking alcohol and which makes them immunocompromise to the virus.

Like cholera, hepatitis E virus spreads in environments with poor sanitation and contaminated water. This outbreak was able to take hold because of the poor conditions of the community – such as inadequate distribution of safe water, no latrines and there were almost no hand-washing points

The disease is very sever in pregnant in this report there were three pregnant women were reported and out of these one pregnant women died, study done in Uganda reported that pregnant women were highly affected by the disease (7)

8. Conclusion

HEV is the leading cause of non-A, non-B enterically transmitted in south Sudan refugees. Males and age group 15-44 were highly affected than female and other age groups. The risk factors associated with the virus are currently unknown but the area is very porn to water born diseases in addition to that all the residents of the refugee camp there were no latrine and shortage of safe water supply.

9. Recommendation

- Health education focused on hygiene , sanitation and ITN utilization must be conducted
- UNHCR and other partners should construct latrine supply safe drinking water for the refuge
- HEV vaccination should be prioritized in this population, especially for pregnant women
- Specific attention should be given to persons at higher risk of severe illness and pregnant women by giving priority to the prevention of infection in this vulnerable group during HEV outbreaks..
- Response to the outbreak, UNHCR and partners initiated control measures, including training of health care workers, increasing community awareness, improving hygiene promotion activities, and hastening latrine construction.
- Reorient the health workers at MSF France clinic on the reportable diseases and the SOP
- Strengthen the Woreda epidemic task force where the refugee are found
- Both active and passive surveillance be enhanced with provision of case definition for facility health workers and community outreach workers in the camp, and health extension workers in the host community.
- The public health measures to be enhanced are personal hygiene and sanitation with provision of safe drinking water which the WASH team will further elaborate the detailed intervention to be rolled out as well as vector control measures.
- New ITNs should be available at household level and utilization also need to be exerted.

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Chapter II- Surveillance data Analysis report

2.1 Surveillance data analysis report on Acute Flaccid Paralysis in Ethiopia from 2008- sep2012

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Abstract

Background: Polio eradication program is fulfilled through a combination of high immunization coverage and syndrome surveillance for acute flaccid paralysis (AFP) among children less than fifteen years is important. Analysis of the surveillance system of the flaccid paralysis by person, time and place appears important. Therefore, this paper assessed the five year data of acute flaccid paralysis from PHEM by person, place, time including identification and type of polio virus.

Methods: Using a descriptive analysis, the distribution of Acute Flaccid Paralysis was summarized by person time and place from data collected between 2008 - Sep2012 by PHEM Ethiopia. The data was also assessed for other non polio virus (either wild form or vaccine derive polio virus). Following data collection it was entered to to Microsoft excel software and was cleaned and analysed using Epi-info version 7 and is presented by tables, and appropriate graphs.

Result: A total of 5042 AFP cases were tested from 2008-2012. Out of these tested 03(60 per 100,000) cases were confirmed to have wild polio virus, 12 (240 per 100,000)to have Vaccine derived polio virus, 4733 were discarded cases and 65 were compatible with poliomyelitis after 60 days of follow up. The non-polio AFP rate was above 2 /100,000 for all years and the stool adequacy rate were >80% that fulfilled 2 important indicators which is recommended by WHO.

Conclusion:

The surveillance activity of AFP in Ethiopia is improving from year to year and it is closer to the target to eradicate polio from the country. All the three wild polio cases imported and from Gambela region,some regions like Somalia report low NP-AFP rate .

Keywords: Polio, AFP surveillance, Ethiopia

Introduction

Poliomyelitis is a disease of great antiquity, from the late 1800s several outbreaks were occurring in several Europe countries and in the United States, and they remained a major public health problems in the developed world in the first half of the 20 century (1)

Polio virus belongs to the genus entrovirus in the family picornaviridae, that is the causative agent of poliomyelitis. Poliomyelitis is an acute and highly infectious disease involving invasion of the gastro-intestinal tract by one of the three serotypes. In a minority of patients it invades the nervous system, and can cause total paralysis in a matter of hours. The incubation period is from 3-21 days. Signs and symptoms - include fever, fatigue, headache, vomiting, and stiffness in the neck and pain in the limbs. One in 200 infections leads to irreversible paralysis (usually in the legs). Amongst those paralyses, 5-10% die when their breathing muscles become immobilized. there are several routes of poliovirus transmission ,in most developing countries the most important route is faecal- oral(2)

Wild polio viruses were circulating in much of the developing world, with an estimated 350,000 paralytic polio cases occurring in >125 endemic countries. In 1988, the World Health Assembly resolved to eradicate poliomyelitis globally by 2000.Following the signing of the Yaoundé Declaration on Polio Eradication in Africa in 1996, Ethiopia joined global efforts toward polio eradication may 2007. Since then, Ethiopia has accelerated implementation of polio eradication strategies (3).

Polio eradication program will achieve towards its goal by using four strategies which is recommended by WHO. Reaching and maintaining high routine immunization coverage (>80%) with oral polio vaccine (OPV);conducting successful national immunization days (NIDs) and sub-national immunization days (SNIDs); Establishing surveillance for acute flaccid paralysis (AFP); and Targeted 'mopping-up' immunization in the later phase of eradication(4).

Even though, Ethiopia has remained polio free since April 2008, it has achieved and maintained certification level surveillance performance indicators and achieved great improvement in immunization coverage but the immunization and surveillance gaps at the sub national level increased the country's susceptibility to polio importation particularly in the bordering regions of Somali, Afar,Benushangle and Gambella.The population immunity gap along the neighbouring boarder areas in countries such as Somalia, South Sudan, and

Sudan, due to access, security and seasonal challenges and frequent cross boarder movement have been further threats of polio virus(5)

2. Rational

Since poliomyelitis is very contagious and one of the major public health priorities, globally every case should be captured through the routine surveillance system. Even if there was no wild polio virus report since 2008; Ethiopia is found in the area with highly venerable to polio importation risk due to movement of the population with neighbouring countries, thus it is mandatory to asses burden and distribution of the disease and Polio immunization coverage of bordering regions to take immediate action.

3. General objective

The objective of this surveillance data analysis was to analyze and review the distribution of AFP and Polio cases in Ethiopia from data collected between 2008- sep2012.

3.1 Specific objective

To assess the burden and distribution of AFP cases in Ethiopia from 2008-2012.
To assess vaccination status of the cases and regions .

4 .Materials and Methods

4.1 Study design

A descriptive cross sectional study was conducted on the national Acute Flaccid paralysis data collected from 2008-Sep2012 in Ethiopia. A secondary data collected by PHEM section of the Minister of Health was triangulated with data with WHO surveillance data .

4.2 Sampling

All suspected and confirmed cases of Acute flaccid paralysis (AFP) from different part of Ethiopia reported to PHEM section and EHNRI laboratory during 2008-sep2012 were included.

4.3 Statistical analysis

Descriptive statistical analysis was made using Microsoft Excel and Epiinfo version 7 and is presented by tables and appropriate graphs.

Case definition

Any child under 15 years of age with weakness and floppiness of one or more limbs or any at any age in whom a clinical suspect of polio is made.

Compatible AFP case:A follow-up examination was conducted at least 60 days after onset of paralysis for a case of AFP investigated 14 days after onset of paralysis and whose stool sample were inadequate follow-up is to check whether or not there is residual paralysis, the follow-up result is important for final classification of cases - i.e to either classify the case as polio compatible, or to discard the case as non-polio AFP.

Discarded AFP cases AFP suspected cases but confirmed negative for polio viruses

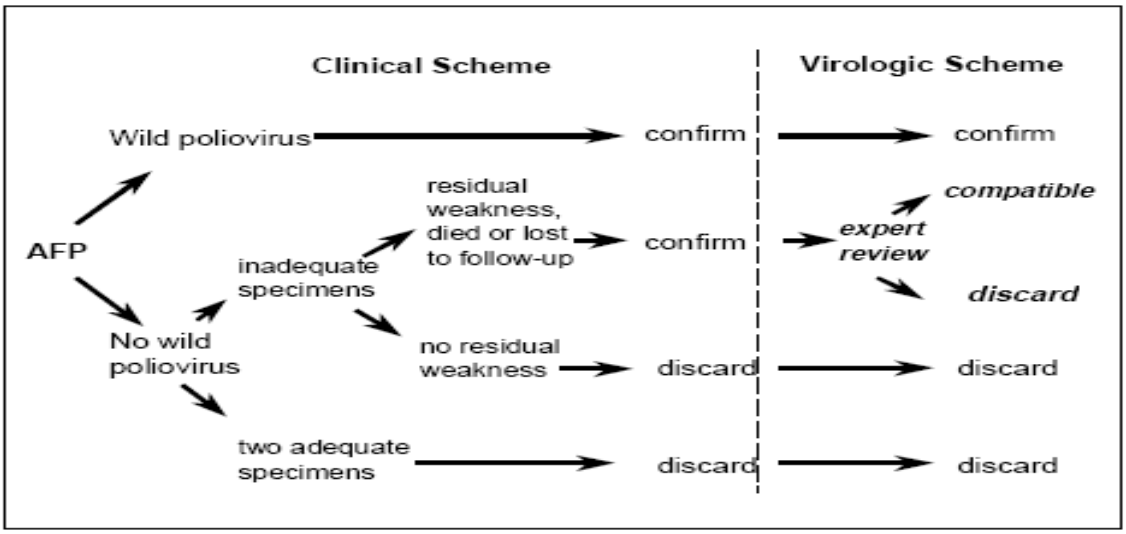

Fig5. Schematic presentation for case definition of AFP

Role of Laboratory

Two stool specimens were collected from AFP cases from anywhere in the country and samples sent to EPHI national laboratory for investigation. When the stool reached at the national laboratory the condition of the stool is checked wether it reached in good condition or not .

“Good condition” means that upon arrival :

- there is ice or a temperature indicator (showing < 8°C) in the container
- two stool specimen volume is adequate (>8 grams)

- there is no evidence of leakage or desiccation and also samples collected with interval of 24 hrs and collected with in 14 days after onset of disease also checked .

Every step of the laboratory procedure were done by following the standard operational procedure (SOP). The laboratory results along with the clinical findings is used for final classification of cases confirmed wild polio virus, non polioentro virus ,negative for polio virus (discard cases) and compatible polio cases

5 .Results

From the study, a total of 5042 AFP cases were tested from 2008-sep2012; High level of cases were reoprted by the year 2010 with a total of 1110 (22%) followed by 2008 with a total of 1098(22%). From the tota tested cases only 03(60/100,000) cases were confirmed as wild polio cases registered in the calander year 2008.The three are imported cases and are from Gambela region,12(240/100,000)cases were vaccine derivative polio virus, and 4733(94/100,000) discarde or negative cases and 65 cases were compatible with poliomyelitis after 60 days follow up stool adequacy rate were above 80 % for the five consequative years.

Proportion of non-polio acute flaccid paralysis (NP-AFP) cases with 2 stool specimens collected within 14 days of onset of paralysis also improved in most regions and got above 2/100.000 for all years and the stool adequacy rate was ≥80% which fulfilling two important indicators.

Table -5 Virological classfication of Acute flacide Paralysia in Ethiopia from 2008- sep2012

Year	Reported AFP cases	Confirmed AFP cases	VDPV cases	Compatible cases	Discarded case	stool adequacy rate
2008	1098	3	3	2	950	86.8
2009	1000	0	2	22	932	85.8
2010	1110	0	6	38	1055	87
2011	1040	0	0	0	863	89
2012	794	0	1	2	933	90
Total	5042	3	12	65	4733	87.7

From the data the mean avarage age of acquiring the illness is 4.8 yrs in females and 5.2yrs in males.188 (3.7%) cases were found in the age group < 1 year, 2682 (53.19 %) were found between 1-4 yrs old,2075 (41%) were between 5-14 yrs old, 50 (0.99%)cases were 15and above years old age groups and the rest 47 (.91%) were unknown or not regesterd their age groups

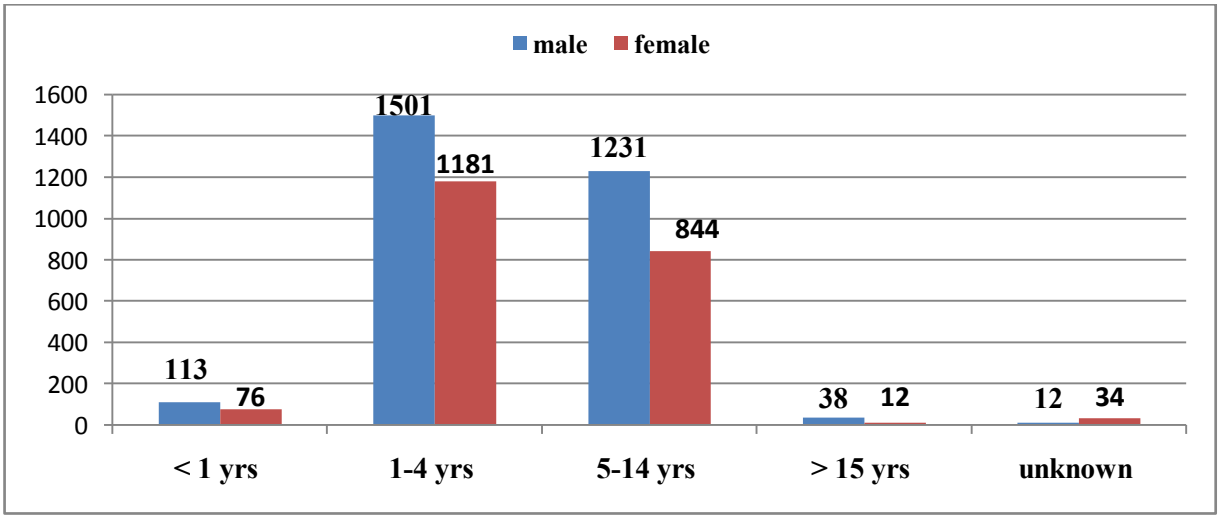

Fig-6 distribution of AFP cases by sex and age in Ethiopia from 2008-2012

When we see the vaccination status of the reported cases, 1317 (26 %) took vaccine less than three doses while 2954(58.8 %) took three and above three OPV vaccine doses.The vaccination status was unknown for 771(15%) cases.

Table -6 Vaccination status of AFP cases in Ethiopia from 2008-Sep2012

Age	< 3 dose		3 & above		unknown Vx status	
	Number	%	Number	%	Number	%
< 1 yrs	87	6.6	82	2.8	16	2
1-4 yrs	709	54	1650	56	336	43.5
5-14 yrs	502	38	1211	41	397	51.4
> 15 yrs	19	1.4	11	0.3	22	2.8
Total	1317	100	2954	100	771	100

When we see the AFP reported cases by region, Oromia repored high number of cases1920 (52%) , Amhara1158(23%), SNNP 1111(22%) followed by Tigray Addis ababa and somalia Harier region reported the least number of cases 18(0.4%).(fig7)

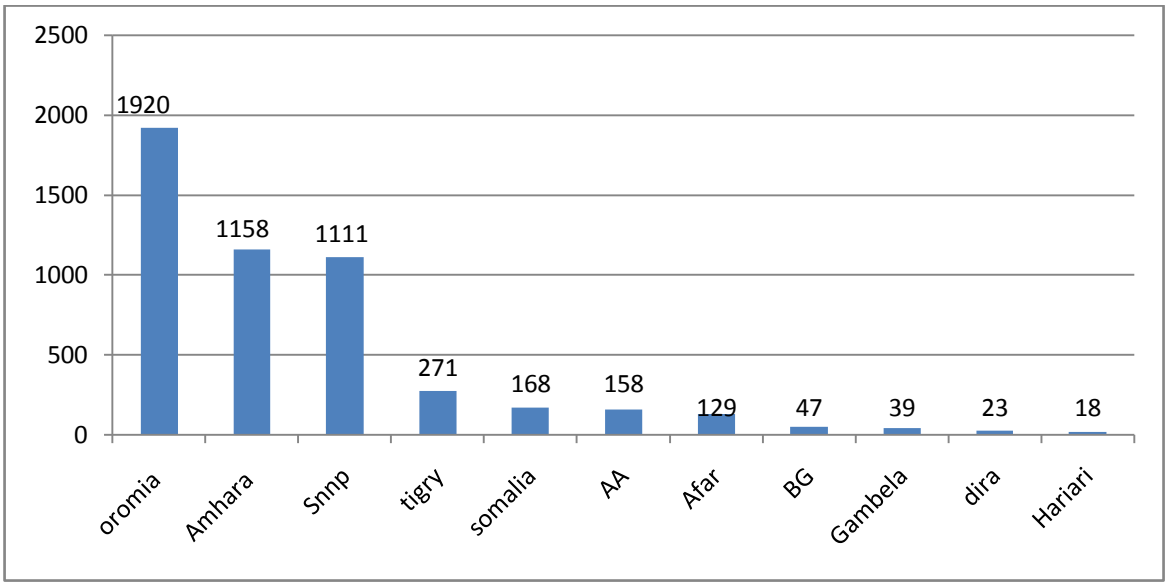

Fig -6 Distripution of AFP cases by region from 2008-Sep 2012

Concerning stool adequacy rate most of the regions met the required criteria which is > 80%, In 2011 Beneshangule region stool adequacy rate was 92% but it decreased to 70% in 2012.Afar showed good progress starting from 2009,Harieri region in 2012 were 100%but

before that it was lower. Somalia region is still reported the lowest stool adequacy rate.(Table 7)

Table- 7 Stool adequacy rate of AFP cases by year and region from 2008-sep 2012

Regions	2008	2009	2010	2011	2012
Addis Ababa	88.6	94.1	91	97	94
Tigray	96.2	88.7	90	89	98
Oromia	87	85.6	84	87	90
SNNP	91	92.8	94	97	97
Amhara	84.5	79.7	87	82	86
Afar	73.3	92.9	97	94	86
B.Gumuz	88.9	77.8	78	92	70
Gambela	46.2	85.7	60	86	67
DiraDdewa	100	100	100	100	88
Hariri	100	50	50	60	100
Somalai	82.4	72	58	73	65
National	86.6	85.5	87	88	90

5.1 Poliomyelitis and Vaccine Derived polio virus

All the three laboratory confirmed wild polio cases were reported from Gambella region by the year 2008.All cases were age less than 5 years one male and two female; Two of the cases had history of taking 3 polio doses and one case has less than three polio dose. Both cases were identified as imported.From 2008 to 2012 a total of 12 VDVP cases were reported from the total cases 9(75%) from oromya 2 (17%) SNNPR and 01 (8.3%) case from Somali region , 8 (67%) were male and the rest 4(33%) female . four of them were below one years old ,7 cases were between age group 1-4 yrs and one case between 5-14

yrs old .Their vaccine status show that 7 cases took OPV less than three dose and the rest 05 cases took OPV 3 and more than three doses.

Addis Ababa, Afar, Amhara, Gambela, Oromia, SNNP and Tigray their NP-AFP rate were 2 and above 2 from year to year, diredewa and Harari got < 2 NP-AFP rate by 2009, after 2009 they improved to the minimum requirements that are 2/100000. Somalia region had low NP-AFP rate till 2011 by 2012 it becomes 2.4

Table-8 Non polio Acute flaccid paralysis rate by region from 2008-sep 2012

Region	2008	2009	2010	2011	2012
Addis Ababa	2.2	2.1	2.4	2.1	2.5
Afar	4.2	4	5.3	2.6	4
Amhara	2.4	2.5	3.1	2.4	3.1
Benshangul	4.1	4	3	4	3
DereDawa	3.6	0.5	2	2.5	4.2
Gambella	10.6	7	2.5	3.5	3.7
Harari	3.1	1	3	5	4.2
Oromia	3.1	3	2.7	2.8	2.6
SNNPR	2.8	2.6	3.2	3	3.3
Somali	1.1	1	1.5	1.2	2.4
Tigray	2.1	2.7	2.9	2.6	2.5
National	2.8	2.6	2.9	2.8	2.9

5.2 Compatible cases of Poliomyelitis

From 2008-2012 a total of 65 compatible cases of AFP were reported after 60 days follow up,23cases were from Oromya region,9 from Amhara, 7 fromSNNP, 8from Somalia, 2 Harieri, 01 Beneshangul,and 3 were from Tigray.

6 .Discusion

Polio eradication program aims to free all countries from polio virus. But there are countries still reporting endogenous polio cases and endemic countries play the major role in the transmission of the virus , to eradicate polio from the world and to make countries free from Polio there should be strong surveillance and high immunization coverage for AFP.

In Ethiopia AFP surveillance started in 1998 and emphasis had been given to awareness the population and health workers to report every single AFP case. In our findings the case reports have been improved dramatically from year to year the highest cases were reported in 2010.which is around 22 % of the total reported cases of the five years.The non-polio AFP rate has increased from year to year, proportion of NP-AFP cases with 2 stool specimens collected within 14 days of onset of paralysis also improved in most regions and got above 2/100.000

By the year 2009 Diredewa, Hariri and Somalia got below 2/100,000 NPAFP rates but starting from 2010,except Somalia, other regions improved above the expected and by the year 2012 almost all regions reported above 2/100,000 NPAFP rate, The only region whose NPAFP rate below 2/100,000 was Somalia region for the last consecutive years and by the year 2012 the region got 2.4 /100000 NP-AFP rate.

Additionally, surveillance data is accepted as the most reliable way to monitor how effectively routine and supplementary OPV immunization has succeeded in order to decreasing polio virus transmission. when we see the immunization coverage for AFP ,Addis Ababa and diredewa had highest (>80%) in three and above three OPV doses followed by Tigray 79%, all the other regions had low report of AFP immunization status.

The immunization coverage of the country is not uniform from region to regions ,by the year 2012 the immunization coverage of Addis Ababa(82%) , Tigray(79%) and diredewa(82.6) while , Amhara, Oromia , SNNP were between 50 - 60 % , Somalia and Afar regions had very low immuniazation coverage of three and above three OPV doses.

VDPVs can cause polio outbreaks in areas with low OPV coverage and can replicate for years in immune deficient person.Three new outbreaks of circulating (cVDPVs), ranging in size from six to 16 cases, were identified in Afghanistan, Ethiopia, and India; three previously identified outbreaks in Nigeria, Democratic Republic of Congo (DRC), Somalia continued through late 2010 or into 2011 and resulted in 355, 37, and 13 total cases

respectively; Two countries experienced importations of cVDPVs from Nigeria; Nine newly identified paralyzed immunodeficient persons in seven middle-income and developing countries were found to excrete VDPVs.VDPVs were found among persons and environmental samples in 15 countries. With the use of alternate OPV formulations since 2005 and with enhanced poliovirus surveillance sensitivity and laboratory screening, the number of identified cVDPV outbreaks per year has increased over time .

7 .Conclusion

In general the surveillance activity of AFP in Ethiopia is improving from year to year and it is closer to the target to eradicate polio from the country. All the three wild polio virus were imported cases and reported from Gambela region. some regions like Somalia report low NP-AFP rate.

8 .Recomendation

Strengthening the EPI and maintaining the immunization coverage at higher level is one of the back bones for the eradication program .The survilance system for AFP cases should be strangthening not to miss any case specially regions where pastoryalists found and borderig regions where peoples are migrating.Regions whose NP-AFP rate are low need close follow up of the survilance system ,to minimayz the VDPV out break, imminization coverage should give empasiized .To prevent VDPV emergence and spread, all countries should maintain high poliovirus vaccination coverage against all three poliovirus serotypes. Joint effort with bordering countries is needed on surveillance and Immunization programs

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Chapter III- Surveillance System evaluation report

3.1 Evaluation of Paediatrics bacterial meningitis (PBM) sentinels Surveillance System in Black Lion and Yekatit 12 Hospitals. Addis Ababa, Ethiopia

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Abstract

Background

Bacterial meningitis is a serious infection of the meninges that affects the brain membrane. According to world health organization, Haemophilus influenza type b(Hib), is estimated to be responsible for about three million serious form of the illnesses and an estimated 386 000 deaths per year, Almost all victims are children under the age of five, Haemophilus influenza type b (Hib) is a significant cause of childhood morbidity and mortality in Ethiopia, Ethiopia started PBM surveillance in 2002 at Tikur Anbessa (Black Lion) Hospital and by the year 2008/09 two additional sentinel sites were included, We evaluated this surveillance system to determine whether the system meets the set objectives and to assess its attributes

Methods

We reviewed the 2012 surveillance data of surveillance in two sentinel sites and administered semi-structured questionnaire to surveillance staff. We performed descriptive analysis and assessed the surveillance systems attributes. The CDC updated guidelines for public health surveillance system evaluation was used as reference.

Results

A total of two sentinel sites in Addis Ababa city administration were evaluated. The surveillance system is limited to Addis Ababa and Gondor hospitals only, there is repeated variables found on the reporting case based format it affects the quality of the data .The positive predictive value or the proportion of cases reported by the system that actually have paediatrics bacterial meningitis due to (Hib, S.penemonia and N.menengits) was 5.5%.

The system has few levels; it is simple, flexible, stable and acceptable at all levels. Timeliness of reporting was not calculated because of poor data quality.

10. Conclusion

The PBM sentinel surveillance system has a lot of advantages in providing epidemiologic and laboratory information used to knowing the disease burden, characterizing and monitoring of bacterial meningitis among paediatrics in Ethiopia. The staffs who are engaged on the system are satisfied with the procedures .Data quality were poor due to too much missed variables on the cases based formats. Generally the PBM sentinel surveillance system is simple, acceptable, flexible and sensitive.

11. Recommendation

Continuous supportive supervision and timely feedback should be given to increase the quality of data, Regular review meeting should be scheduled and conducted to identify and discuss on the gaps, challenges and achievements to take immediate corrective action .

1. Introduction

Generic and standard public health surveillance is “an ongoing systematic collection analysis and interpretation of health-related data essential to the planning, implementation, and evaluation of public health practice, closely integrated with a timely dissemination of these data to those responsible for prevention and control.(1)

Bacterial meningitis is a serious infection of the meninges that affects the brain membrane, it can cause due to bacteria.There are three main bacterial species that contribute to this disease (Haemophilus influenza type b, Streptococcus pneumonia (Pneumococcal) and Neisseria meningitis (Meningococcal).Haemophilus influenza type b *is* first described by Pfeiffer in 1892. H. influenza is a small (1µm x 0.3µm), pleomorphic, non-motile Gram negative coccobacillus. Hib is the most virulent organism and it causes approximately 95% of server H. influenza systemic infections (2).

According to world health organization, Haemophilus influenza type b(Hib), is estimated to be responsible for about three million serious illnesses and an estimated 386, 000 deaths per year, chiefly through meningitis and pneumonia. Almost all victims are children under the age of five, with those between four and 18 months of age especially vulnerable (3).

Haemophilus influenza type b (Hib) is a significant cause of childhood morbidity and mortality in Ethiopia. Studies have been conducted on childhood meningitis in Ethiopia and Hib was found to be the commonest cause of meningitis in children.In a hospital based study in Black Lion Hospital (1993 to 1995) of 120 cases of meningitis 74 (61.6%) were due to Hib and among 47 deaths 28 (59.6%) were due to Hib. The case fatality rate was 37.8%.(4)

Ethiopia started PBM surveillance in 2002 at Tikur Anbessa (Black Lion) Hospital and by the year 2008/09 two additional sentinel sites were included, Gondar University Hospital (GUH) and Yekatit 12 Hospital (Y12H).Currently, three sentinel surveillance sites are giving services to under 5 children. The main objectives of the PBM surveillance is to determine the local disease burden caused by haemophilus influenza type b (Hib) among under five children and advocate and implement the proper control strategies such as immunization and to know which strain is circulating in the country and to contribute the production of S.penomonia vaccine. They have been collecting and reporting sentinel surveillance data on bacterial etiologies of paediatric bacterial meningitis .These sites could

be useful for monitoring the impact of Hib vaccine in Ethiopia and to provide more information on the epidemiology of paediatric bacterial meningitis and the impact of Hib vaccine. So evaluating the performance of the PBM sentinel surveillance and identifying the gap of surveillance system is mandatory for immediate response and prevention of the Paediatric meningitis due to bacteria. On the other hand, evaluation of public health surveillance system is used to ensure that problems of public health importance are being monitored efficiently and effectively. Thus, public health surveillance systems should be evaluated periodically, and the evaluation should include assessing usefulness of the system. Including Simplicity, flexibility, data quality, acceptability, sensitivity, positive predictive value, representativeness, timeliness, and stability and provide recommendations for improving the system.

2. Rational of the study

In Ethiopia paediatrics bacterial meningitis due to Haemophilus influenza type b (Hib) is a significant cause of childhood morbidity and mortality. Evaluation of public health surveillance system is useful to ensure that problems of public health importance are being monitored efficiently and effectively, These include knowing the disease burden and which sero type is predominant in the Ethiopia , what challenges/gaps does the system is facing. Besides that, the system was not evaluated since the start of the surveillance and little is known about the effectiveness and efficiency of the system. Therefore the aim of this paper is to evaluate the surveillance system of the Hib in paediatric age.

3. General objective

To assess the performance of core activities and attributes of surveillance system of Paediatrics meningitis due to Homophiles influenza type b(HIB) in Addis Ababa.

3.1 Specific Objectives

1. To assess the major challenges and gaps on the quality of the PBM surveillance system
2. To assess the simplicity, flexibility, acceptability, timeliness, sensitivity, Simplicity, data quality, representativeness, specificity and stability of Ethiopian PBM surveillance.

4. Materials and methods

4.1 Study design and study area

A cross-sectional descriptive study was conducted in Addis Ababa city administration.. Two PBM sentinel sites which are found in Addis Ababa (Black lion Hospital and yekatit 12 Hospitals) were selected for the study. One year data (2012) were included in the study. Additional Primary data was collected using structured questionnaire. Interview was administered to PBM sentinel surveillance focal persons. Secondary data was also collected from Black lion and yekatit 12 hospitals laboratory and paediatrics ward. Data was collected on August 12-25/2013.

4.3 Data collection methods

4.3.1 Primary data collection tools

Standard semi-structured questioner was used to collect the necessary information and observation using check-list which is adapted from CDC guideline, using the tool PBM surveillance focal persons ,laboratory personnel and OPD physician were interviewed.

4.3.2 Secondary data: Different data sources such as review meeting report, records from WHO and EPHI were used.

5. Case definition

Confirmed case: - Clinical evidence of invasive disease with laboratory conformation of infection and growth of heamophilus influenza serotype b from a normally sterile site (CSF, Blood)

5.1 Probable case:- Clinical evidence of invasive disease and laboratory evidence of infection and presence of abnormal CSF findings and detection of H. influenza serotype b antigen in CSF by Gram stain or detection by latex agglutination antigen (LA) or DNA polymerase chain reaction (PCR) tests;

Abnormal CSF will be defined by the presence of one or more of the following:

1) Visibly turbid CSF,

2) CSF white blood cell count (WBC) > 30 cells/mm^3 for neonates and > 10 cells/mm^3 for older infants and children),

3) CSF neutrophils > 70% of total CSF WBCs, 4) CSF protein concentration > 170 mg/dl for neonates ≤1 month of age or > 75 mg/dl for older infants and children, or 5) CSF glucose concentration < 40 mg/dL.

5.2 suspected bacterial meningitis: Presence of abnormal CSF with no identifiable bacterial pathogen by culture or other testing;

I. Operational case definitions

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

- **Case detection**: is the process of identifying cases and outbreaks.
- **Case registration**: is the process of recording the identified cases
- **Case/outbreak**: Confirmation: refers to the epidemiological and laboratory capacity for confirmation.
- **Reporting**: Refers to the process by which surveillance data moves through the surveillance system from the point of generation.
- **Stakeholders**: The organizations or individuals that generate or use surveillance data for promotion of health, prevention and control of diseases.
- **Usefulness**: Usefulness of the surveillance system is reflected by documented changes in policies and procedures as a result of information generated by the system.
- **Simplicity**: Simplicity denotes the structure and ease of operation of the surveillance system.
- **Flexibility**: Flexibility of a surveillance system is its capacity to adapt to changing information needs or operating systems within minimal additional time, personnel and funding.
- **Quality**: The quality of data reflects the completeness and validity of the data recorded in the Zonal Health Department.
- **Acceptability**: Acceptability is the willingness of persons, institutions or organizations to participate in the surveillance system.
- **Sensitivity**: Sensitivity refers to the ability of the system to detect cases or outbreaks through trends in the surveillance data.
- **Positive predictive value**: Positive predictive value refers to cases that actually have the health condition in question.

- **Representativeness:** Representativeness refers to the extent to which the surveillance system accurately describes the occurrence of medical condition over time and their distribution in the population by place and person.
- **Stability:** Stability was assessed by questioning the surveillance officers on the consistency of the system.

6. Results

The surveillance system of pediatric bacterial meningitis was assessed, In this assessment both sites (Black Lion hospital and Yekatit 12 hospital) were included and the main focuses of the evaluation was assessing the core activities of the surveillance system , supportive functions and quality components of the surveillance system.

6.1 Description of surveillance system

6.1.1 Public health importance of Heamophilus influenza type b

Haemophilus influenza type b (Hib) is one of the causes of bacterial meningitis in children and causative agent for childhood morbidity and mortality in Ethiopia. Studies have been conducted on childhood meningitis in Ethiopia and the study showed that Hib was found to be the commonest cause of meningitis in children. Knowing the disease burden in under five children and which strain is circulate in the country is mandatory and has great public health importance for the production and importation of vaccine.

6.1.2 Task A Stakeholder involvement

There were a brief discussion with the laboratory personnel, physicians and nurses working on the PBM surveillance, on the structure of the surveillance system, how patients(children whose age group <5 yrs) are identified and collect CSF samples for the laboratory diagnosis , how samples are transport from the collected ward in to the lab and from the lab to EPHI The discussion was also very important showing what are the big challenges that hinder the system not fulfilling its goal, and it help us for the assessment and to develop recommendation based on the assessment findings.

6.1.3 Purpose of the PBM sentinel surveillance system

In Ethiopia PBM Surveillance initiated 2002 by the time in may 2007 Hib vaccine was introduced the main aim of the Ethiopian PBM sentinel surveillance is determine the local

disease burden caused by Hib , Quantify bacterial meningitis caused by Hib among under five children ,knowing which strain is circulating in the community and advocate and implement the proper control strategies such as immunization

6.1.4 Case detection and registration

In both visited health facilities the case definition of bacterial meningitis due to Heamophilus influenza type b is not found in all OPD, but all health workers working on this surveillance were aware of the disease. Similarly all paediatricians and physicians who could identify and take CSF sample from patients are aware of the disease. Registration books which are found inpatient wards and in a laboratory did not register all variables which are found on the case based formats.

6.1.5 Reporting

There was no shortage of reporting form in the past 6 months in both visited health facilities. All the reports were sent to the next level via mail.

6.1.6 Feedback and Supervision

Both sites did not have the experience of timely supervision and feedback. In Yekatit 12 hospital very weak supervision was conducted by EPHI sometimes they did not contact with the right focal persons the PI of the project did not know who is engaged on the surveillance system, the supervisor team conducted conversation only with the laboratory personnel. In Black Lion hospital also there was no regular supervision

6.1.7 Training

All staffs engaged on the system (laboratory personnel, surveillance focal persons, HMIS officer) participating in PBM surveillance took training but their number was not enough especially the laboratory personnel.

6.2. Surveillance system attributes

6.2.1 Usefulness

The surveillance system is useful in order to estimate the magnitude of morbidity and mortality of the disease among fewer than five children and also it is able for identification and antimicrobial testing which will be used as base line information for national status of

Hib. Beside that it is very useful to advocate for the implementation of proper control strategies such as immunization

6.2.2 Simplicity

The subject repeated that the case definition of PBM is simple and understandable by every staff engaged on the surveillance, but according to them the reporting format is not simple to fill, it contains too many and repetition of variables because of these it took time to fill the format and mostly some variables were not filled properly.

6.2.3 Flexibility

Subjects said that the system is flexible; there is a plan to make some adjustments on the case based and reporting format and plan to expand in to other regions.

6.2.4 Data quality

The presence of many variables on the reporting case based format affects the quality of the data. The reporting formats are filled by not only one person, rather paediatrician, laboratory personnel, and surveillance officer were engaged in filling the format. All the information were compiled by HMIS officer and sent to EPHI.When we see the data that was found from the laboratory section, in 2012, a total of 1143 suspected cases were reported and CSF was drown from all of the cases 44 cases had sex variable missed, 45 cases age variable missed and 278 cases didn't have laboratory identification numbers .

6.2.5 Sensitivity

The subjects mention that case definition is very sensitive to detect cases. In every neonatal who are admitted in paediatric ward CSF sample is collected either they fulfill the case based definition or not.

6.2.6. Predictive Value Positive

The positive predictive value or the proportion of cases reported by the system that actually have paediatrics bacterial meningitis due to Hib, S.penemonia and N.menengits was 5.5%.

6.2.7 Acceptability

All health professional who are engaged on this surveillance are willing to work, laboratory personnel working at EPHI bacteriology laboratory are taking the responsibility to collect samples from both sites and also they perform onsite supervision every week. In both sites there are trained laboratory personnel, in contrast some staffs assigned to work besides their routine work they are not give attention for the work because of motivation issue

9. Challenges at the health facilities

There are many challenges and gaps mentioned by the health facility especially from the laboratory side which affects the quality of the work and make it difficult to get quality data Some of the gaps are :-

- There is no responsible body who transport the sample from the collected ward to the laboratory (Sample transported by patient taker and not given proper care to the collected CSF sample ,generally poor handling of sample)
- Unlabeled samples are sent to the laboratory (not mentioned the type of specimen, whether it is body fluid or CSF) , physician didn't order what tests should be done
- Missed filled case based formats and laboratory request sent to the laboratory
- Not to give the right direction of the laboratory to the person who transport the CSF sample to the lab and samples are not delivered to the laboratory keeping its safety
- Too many and repetition of variables on the cased based formats.
- There is no adequate material to collect the CSF (test tube,) in yekatit 12 hospital.
- CSF collected with only one test tube but In the laboratory three tests were performed (bacteriology, hematology and clinical chemistry)

10. Conclusion

The PBM sentinel surveillance system has a lot of advantages in providing epidemiologic and laboratory information used to knowing the disease burden, characterizing and monitoring of bacterial meningitis among paediatrics in Ethiopia. The staffs who are engaged on the system are satisfied with the procedures.Both sites report meningitis cases to EPHI and EPHI report to WHO .Data quality were poor due to too much missed variables on the cases based formats and because of this timeliness could not calculate. Generally the PBM sentinel surveillance system is simple, acceptable, flexible and sensitive.

11. Recommendation

Health professional working in HIB program should know each other to create harmonized work environment in order to achieve the targeted goal . Continuous supportive supervision and timely feedback should given to increase the quality of data. Increase the number of trained laboratory personnel by giving refreshment training .Regular review meeting should scheduled and conduct to identify and discuss on the gaps, challenges and achievements to take immediate corrective action. The sentinel site should be expanded to other regions to increase representativeness and one fully engaged health personal should recruit to the program to perform different activities especially to transport samples from different wards to the laboratory .

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Chapter IV- Health profile description report

4.1 Health profile description in Sendafa Baka town May, 2013, Ethiopia

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1. INTRODUCTION

Health Profile provides an overview of the situation and trends of priority health and health related problems in a given community. The data in a profile reflects the health of a given community from many different angles and the health systems profile including a description of institutional frameworks, trends in the national response, key issues and challenges. Its purpose is to promote evidence-based health policymaking through a comprehensive and rigorous analysis of the dynamics of health situations and health systems in the country. A community health profile is a comprehensive compilation of information about a community. The data in a profile reflects the health of a given community from many different angles. The information may include data already collected and published about a community or information collected by the organizations or individuals (1).

The information may include data already collected and published about a community or information collected by the organizations or individuals creating the profile.

The purpose of this health profile report is to give information about health and health related system and other infrastructures which are taking place at Sendafa town, and to identify what are the major problems of the district which helps to make prioritize and planning to take intervention. Therefore, the main objective of this document is to present compiled information concerning physical and socio-economic condition of SendafaBeka town of Oromiya Special Zone Surrounding Finfinne (OSZSF)

2. Rational of the study

Health description is important for planning and prioritizing health and other health related problems of a district or anywhere in the country. There was no previous health profile report about Sendafa Beka town. Therefore this paper will give us information about the town general health and health related issues, it will be helpful for identifying the problems, prioritizing, planning and implementation of an intervention.

3. Objective

3.1 General Objective

The organization health profile for Sendafa Beka town will give baseline information on health related issues including health status, health indicators and to identify problems for priority setting.

3.1.2 Specific Objectives

- To describe health problems of the Sendafabeka town.
- To describe the health coverage of the town
- to assess the current health infrastructure .
- to assess the vital statistic of the town

4. Materials, methods and procedures

4.1 Study area: - SendafaBeka town (Oromya Special Zone Surrounding Finfinne of the Oromya Region)

4.2 Study period: - From April 22-may 4, 2013

4.3 Data collection procedure

All necessary and available data in major sectors of the town were reviewed. In addition standard questionnaire were prepared and used for collection of information, beside interview and discussion was conducted with concerned bodies. Reviewing of Publication and Literature, 2007 national census about the town also used for as data collection. Source of data were district health office, district education sector, city administration office, district water office, and other Sector offices.

4.4. Data analysis

The major components of the questionnaire are: demography characteristics, political and administrative information, economical, education and information on vital health statistics and major health programs and other important information were gathered. The data were entered into computer and tables are used to show the findings.

5. Result

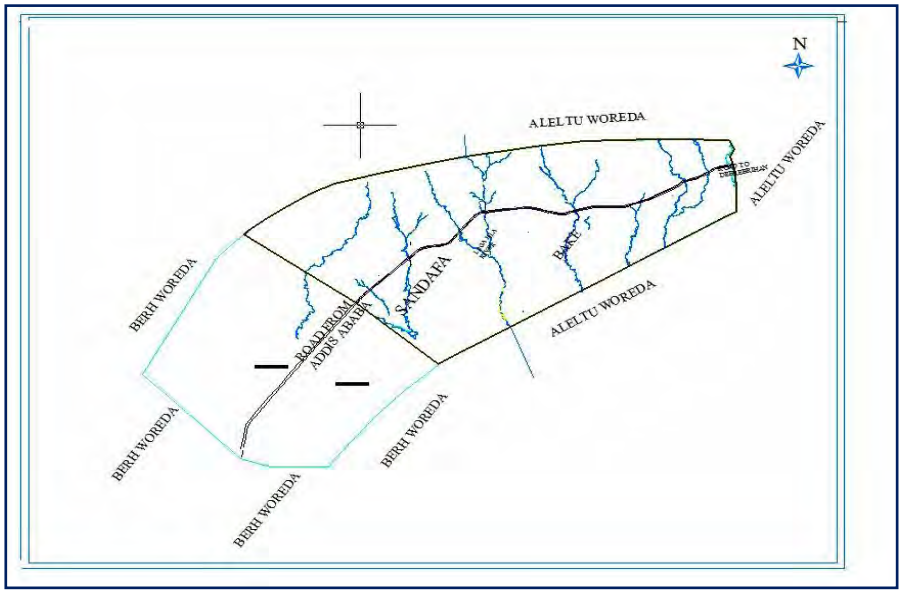
5.1 Background

SendafaBeka is a town and separate woreda in central Ethiopia which was found in 1929. Its name is taken from the Amharic name for a kind of thick, jointed grass which grows in swampy areas. the town is founded in 1929 located in the Oromya Special Zone Surrounding Finfinne of the Oromya Region, about 84.2 % of the population are orthodox Christian 11.4 % are Muslim and the rest 3.9 % are protestant and about 0.5 % are other believers , when we see the Ethnic group majority of the population (65 %) are Oromo followed by , Amhara 25.2 %, 1.1 Tigri and the rest 8.7 % is other races .

5.2 Geography and climate

Sendafa beka town is found 40 kms East north of Addis Ababa has a latitude and longitude of 9°09′N 39°02′E with an elevation of 2514 meters above sea level. The town lies on the paved Addis Ababa to Dessa road, it is boundary by Aleltu in the north and surrounded by berh woreda in south , east and west.Its total surface area is 717.54 km (14/2 Square kilometre) which accounts 14.9% from the total area of the Oromya special zone surrounding Finifinna with an average. The annual rainfall of the town is about 1055 mm.it has average. annual temperature of 15.7o$_c$.The main rainfall season in the town between June and September (79%) and between March -May is 15 %

Sendafa town has 2 kebeles. Kebele 01 and kebele 02 as it is a town there is no rural kebele found. Different minister or sector offices are found in the town.



Map2. Map of Sendafa Beka town

5.2 Population

According to 2007 national statistical agency information the total population of the town was 12,298 with two kebeles, with Kebele 01(Sendafa) having a population of 6025 and Kebele 02 (Baka) a population of 6273. The total population in sendafa for 2011/12 is 25,578 of whom 13099(51%) were males and 12479 (49%) are females. The average population growth rate is 3.5%. About 84.2 % of the population are Orthodox chrisitian,11.4 muslems,3.9% protestant and 0.5%followers of other religion. Concerning ethnicity, 65% are Oromya, 25.2% Amhara and about 9.8% constitute other ethnic groups.

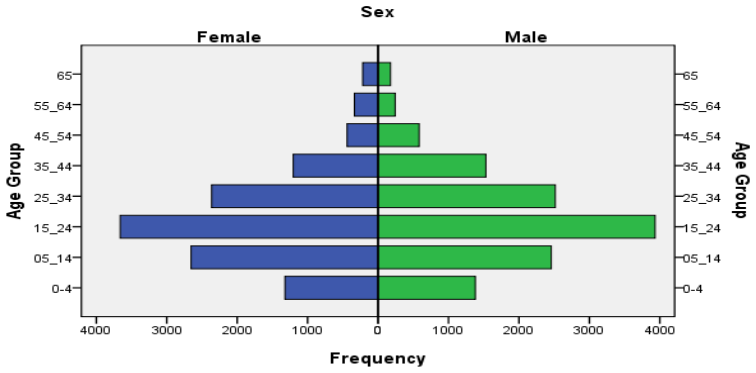


Fig7 Population pyramid of SendafaBeka woreda, 2013

Source : Sendafa town city administration office

5.3 Education

In SendafaBaka town there are 8 KG schools (7 private and 1 community) 07 primary schools (04 are government and 03 are privates), 02 secondary and 01 preparatory school and 01 TVET are found. As per town education office record the plan was enrol 8903 students for 2005 and currently 9182 students are in schooling , of whom 4558 (49.6%) are female students found in the town (the male and female ratio is almost 1:1) but the number of female students in the highschools(11-12cycle) are low in number (Table 10).

Table 10. Number of students by cycle in sendafa town , 2005 E.C

Cycle	Male	%	Female	%	Total
1-4	1719	19%	1809	20%	39
5-8	1371	15%	1410	15%	30
9-10	1174	13	1105	12%	25
11-12	358	3.9	234	2.5%	6
Total	4622	50.4%	4558	49.6%	100

Source :- Sendafa baka town education office

The school dropout rate is 3.2 % in 2005 E.C.When we compare the rate with the past year it shows progress, The main reason for school drop out is migration of students to Addis Ababa and Arab countries for searching job and also economic problems of their family(Table 11)

Table 11 number of dropout students in Sendafa Beka town , 2005 E.C

Cycle	Male	Female	Total
1-4	29	42	71
5-8	55	31	86
9-10	56	67	123
11-12	8	9	17
Total	148	149	297

Source : SendafaBaka town Education office

5.4 Transport communication and power supply

The town has one well constricted road (asphalete) which cross the town ,it is 13.5 km and a way from Addis Ababa to Sheno. Generally the road of the town is not standard but substandard gravel surface. In the town 9 motorized 155 non motorized faculities are available. The town has good communication facility like telephone, mobile and internet services besides 95 % of the town got 24 hrs electric supply

5.5 Economy

In the town there is urban agricultural activities including , cattle bearing , horticultural and about 20 % of the total area are used for dairy farming. When we see the economic activity of the town 3444(13.4%) males and 2086(8%) females are economically active. Generally 59% of the population is laborforce about 43.2% of the population is unemployed male (11.7%) and Females (31.5%)

5.6 Health service coverage

In the town health service coverage of the community is 100% , there is no government or private hospitals ,1 government health centre. 11 privates health facilities or clinics and one government health post. When we see the ratio of population to health facilities 1 HC and HP : for 13,799 population , health personal distribution of the town shows that 1 Nurse for 2300 person.(Table 12)

Table 12 Number of human resource in Sendafa Beka town

Ser No	Professional	Number
01	Health officer	6
02	Nurse	6
03	Laboratory technologist	2
04	Midwifes	2
05	Pharmacy	2
06	Environmental health	2
07	HIT	2
08	HEWS	8
Total		30

Source : Sendafabaka town Health department

5.6.2 Immunization coverage

Most of the immunization programs have above 100 %. Ranging from 99% for measles to 158% for TT2.

Table 13. Immunization coverage of < 1 yrs children and pregnant women

Serial No	Activities	Cases	Coverage (%)	Remark
01	BCG	548	104	
02	OPV3	533	111	
03	Penta 3	533	111	
04	Measles	441	99	
05	PCV	235	112	
06	TT2+P.W	699	158	
07	TT2+N.P.W	2144	101	

Source ; Sendafabaka town Health department

5.6.3 Maternal health service

Decreasing mother and child death is one of the MDG goals and currently it gives emphasized in every part of the country. During 2004E.C the town planed to give ANC service for 490 pregnant women and 918 mothers were served and the ANC achievement was 187% and 467 women were received post natal care service , 381 pregnant women give birth by attended skilled birth attendants which was higher than planned (305 pregnant women).

5.6.4 Family planning service

The town health institution give family planning service. for the year 2004E.C the town planned to give family planning service for 3050women but 3615 women got familly planing service.

5.6.5 Top ten disease

Causes that are the leading for Admission are diarrhea due to secondary infection due to HIV/AIDS patients who are on ART treatments(Table 14).

Table 14.Top ten leading cause of OPD visits

Ser No	**Adults**	**< 5 years or paediatrics**
1	Injury	Upper respiratory infection
2	Acute upper respiratory infection	Bronchopneumonia
3	Parasitic infection	Intestinal
4	Fever of unknown origin	Tonsillitis
5	Bronchopneumonia	Gastro infection and colitis
6	Rheumatism	
7	Hypertrophy of tonsils and adenoid	
8	Gastric and duodnits	
9	Typhoid fever	
10	Unspecific Typhus	
Source ; Sendafabaka town Health department		

5.6.5 Health budget allocation

For the district a total of 13,377,682 birr is allocated for 2004 E.C ,from this 1,512,407 (11.3%) is allocated to the health sector. Funds for different program are allocated from NGOs and a total of 44170.25 birr was contributed by these different NGOS

5.6.6Water hygiene and sanitation

Safe water coverage of the town is 87% and the latrine coverage and utilization is 81 % .the source of water for the town is borehole there are around 8 borehole in the town but only 5

of them are protected and functional , population who is getting safe water coverage is 72 % ,daily water consumption of individual per day is 16 lit .in the town there is no any system of liquid and solid west management this is the big challenge and problem of the city

5.6.7Endemic disease

TB /Leprosy

In SendafaBeka town a total of 84 TB cases are found and a district laboratory smear positive detection rate for pulmonary tuberculosis is 143%,TB Rx success rate is 179 % and TB cure rate is 171 % there are 02 death of patients on TB treatment ,50 TB patients had HIV checked, in the town only 2 leprosy cases are found .

Table 15 TB indictors for Sendafa Beka town

Serial No	Indicator	Total cases	Achievement %	Remark
1	Total TB cases	84	-	-
2	TB detection rate	20	143	
3	TB Rx completion rate	40	105	
4	TB cure rate	25	179	
5	TB Rx success rate	65	171	
6	Death on TB Rx	2	-	

HIV/AIDS

HIV /AIDS is one of the problems in the town especially patients who are admitted in the health centre due to diarrhea and secondary infection of HIV . There are a total of 963 people are living with HIV / AIDS out of them 47 (5%) are on ART and 120(12.4%) are on pre- ART .The HIV prevalence of the town is 0.8 % . 2469 persons got VCT service and totally 5723 persons have screen for HIV in the last one year .2433 individual got PITC and 821 mothers got service for PMTC .

Nutrition

There is a program called food pipe it gives service for under five malnourished children , TB patients and persons with HIV/AIDS especially those who are on ART have these supplementary program as a therapeutic food

Essential dugs

There is no shortage of essential drugs in the Sendafa Beka town but sometimes due to stock out problems a shortage of some drugs may happen.

Action Plan

Activities	Responsible	Time											
		February	March	April	May	July	July	August	Septembe	October	November	December	January
Objective 1: Awareness creation for the community													
Educate the community towards liquid and solid west	the district: water bureau,education bureau, health bureau	X	X	X	X	X	X	X	X				
Awareness creation among the community about injury	woreda: health bureau	X	X	X	X	X	X	X	X	X	X	X	X
Objective 2: Promoting hygiene and sanitation													
Coordination and collaboration with other sectors working in WASH program	woreda Health office	X	X	X	X	X	X	X	X	X	X	X	X
providing health education to the students	woreda Health office: HEWs	X	X	X	X	X	X	X	X	X	X	X	X
Preparing health education material used for the community	Regional,Zonal and woreda Health offices		X	X	X	X							
Objective 3: Promoting maternal health service within the community													
Educating females about pregnancy and its complication	Woreda health office: HEW	X	X	X	X	X	X	X	X	X	X	X	X
Educate the community about family planning a	Woreda health office: HEW	X	X	X	X	X	X	X	X	X	X	X	X
Providing family planning service at the health facility	Health professionals	X	X	X	X	X	X	X	X	X	X	X	X

6 .Conclusion and Recommendation

The problem of the town is mostly disease which is related with poor environmental and personal sanitation, inadequate community awareness towards liquid and solid west disposal in addition to that there is no system or mechanism to dispose west materials which is the big challenge of the town .fighting and injured patients contribute the great number who visited OPD there is no study why number of injured patients contribute a great number and it needs further study to take a measure . Others problems which is mentioned by the town health officials is planning problem ,when they develop planning for health indicators they use undervalue total population which create a problem in the denominator which makes the town health indicators overvalued and it is better to give due attention during planning.

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Chapter V – Scientific Manuscripts for Peer Reviewed Journals

1.1 Acute febrile illness outbreak with first report of dengue fever - DireDewa city administration, Ethiopia, November/2013

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Abstract

Background: Dengue Fever is one of the causes of Acute Febrile Illness (AFI) and a leading cause of illness and death in tropical and sub tropical countries. On September 2013 Diredewa health bureau, reported an AFI outbreak of unknown origin in the town. An investigation was conducted to identify the etiology of the outbreak, determine risk factors and to recommend control and prevention methods.

Methods: Descriptive study supported by an unmatched case-control (1:2) study was conducted. Cases were defined as any person with fever ≥ 38^{oc} and having headache, joint and back pain, Control subjects were persons who did not exhibit the same clinical manifestations as cases in the period extending from October 14 to November 5, 2013. Odds ratios and 95% confidence intervals were calculated using Epi Info version 7. For laboratory investigation blood samples were collected and examined for different vector-borne viral infections using IgM ELISA and PCR.

Result:A total of 11400 caese were reported with in the study period both genders affected equally. Crude AR was 3.4 % Kebele 9 were the most affected Kebele. Forty cases and 80 controls were enrolled. The median age for cases and controls was 23 and 28 years respectively. On multi-Variables analysis risk factors associated with the disease were wearing short-sleeved shirts (OR: 8.8, 95% CI: 3.2-24), presence of a sick family member (OR: 14.1, 95% CI: 3.3-61. Fifty serum samples were tested for vector-borne viral infections and out of them 26(52%) were positive for dengue fever.

Conclusion: This is the first reported outbreak of dengue fever in Ethiopia., Both genders were equally affected, The age group 15-44 years and children < 5 years were the most and least affected groups respectively. Environmental management and providing health education for the community should be emphasized to control the outbreak.

Keyword: Acute febrile illness, Dengue

1. Introduction

Acute febrile illnesses is define as a disease characterized by an increase of body temperature more than 37.5^{oc} resulting from infection process, It is caused by various pathogens, Many pathogens caused febrile illness and clinical diagnosis is difficult and unreliable unless supported by laboratory diagnosis

Diradewa health burio reported at the end of September 2013 unkonown AFI outbreak occurred in the urban part of the town .Cases occurred only in the urban part of the town and case load were seen espacially in three health facilities (Sabian health center , G/Gerado health center and Legehare health center). Clinical sign and symptom of the cases looks like malaria so all the cases were examined for hemoparasite but only in few cases were malaria parasite seen. The laboratory result showed that people are sick not because of malaria and it creats a confusion to all physician the patient will got recoverd on average 7-10 days by it self .As the town had no recent history of the AFI disease all health facilities didn't know what is the cause of the febrile illness. The Diradewa regional laboratory collected 11 serum samples from patients within 2-3 days the onset of disease and before the investigation starts and send to EHNRI for differential diagnosis and all samples were negative for six viral tests(forDengue fever, Rift valley Fever, Yellow Fever, West Nile fever, Chikungunya, and Crimean-Congo virus.)

Having concerned with the problem, the Federal PHEM organized a team to identify and investigate the outbreak from 11/10/2013-22/10/2013 incollaboration with the Diredewa PHEM office.The investigation was conducted to identify the etiology, risk factors and finally come up with control and prevention measures and finally from the investigation we identify Dengue fever is the etiology of the out break

Dengue Fever

Dengue fever is a mosquito-borne flaviviral infection that causes a severe flu-like illness. It is an endemic in the tropics and subtropics countries. There are four dengue virus serotypes, called DEN-1, DEN-2, DEN-3, and DEN-4. They belong to the genus Flavivirus, family *Flaviviridae* (of which yellow fever virus is the type species), which contains approximately 70 viruses (1,2)

Infection with one serotype confers protection to re-infection with the same serotype, while re-infection with dissimilar serotypes confers no long-term protection and may even predispose to worse clinical outcome. (3)

Dengue can vary from mild to severe forms it could manifest including dengue shock syndrome and dengue hemorrhagic fever (DHF). Patients who develop the serious forms of dengue fever usually need to be hospitalized (4) .Dengue is transmitted between people by the mosquitoes Aedes aegypti and Aedes albopictus, which are found throughout the world. Symptoms of infection usually begin 4 - 7 days after the mosquito bite and typically last 3 -10 days. In order for transmission to occur, the mosquito must feed on a person during a day period when large amounts of virus are in the blood (5)

To date about half of the world's population is at risk. Dengue infection is a leading cause of illness and death in the tropics and subtropics. .Dengue is endemic in at least 100 countries in Asia, the Pacific, the Americas, Africa, and the Caribbean. WHO estimates as many as 100 million people to be infected yearly (6, 7). In Ethiopia there was no report of dengue fever yet and it is the first time to identify and report the disease, The vector A.egeypities is the vector that is not only transmitting Dengue fever but also yellow fever as well , so from this investigation we will find out what are the risk factor associated with the transmission of the disease.

2. Objectives:

2.1 General Objective:

To investigate the outbreak and assess the causative agent and factors associated with the cause of the outbreak

2.2 Specific Objectives:

- To describe the outbreak by time, place and person
- To verify the causative agent of the disease
- To identify the risk factor of the disease

3. Material and methods

3.1 Study design

Descriptive: study design was used to assess the distribution of the disease by person ,place and time : and further unmatched case control study was conducted to verify and identify the outbreak and risk factor

3.2 Study site

The study was conducted in Diredawa city Administration.Diradewa city Administration - is located in the eastern part of the country surrounded by the state of Somalia and the state of Oromia and it is one of two chartered cities (*astedader akabibi*) in Ethiopia It is 525 kilometer far from the capital city of Ethiopia (It is divided administratively into two Woredas, the urban woreda and the non-urban woreda of Gurgura ,the town has nine operational woredas (8)

Based on the 2007 Census conducted by the Central Statistical Agency of Ethiopia (CSA), Dire Dawa has a population of 336,720 of whom 167,663 were male and 169,057 were female; 233,224 or 68.23% of the population are urban inhabitants. For all of Dire Dawa 76,815 households were counted living in 72,937 housing units, which results in an average of 4.5 persons to a household, with urban households having on average 4.2 and rural households 4.9 people

Map1 Map of horn of Africa, Ethiopia showing DireDawa

3.3 Data source

We selected three health facilities out of the nine health facilities based on their case load and its representativeness (Legahara and Sabian health centre) for the cases because of their high number of reported cases and also more than three Keble dwellers are getting the health service from those health centres; Addis ketema health centre for the controls because of its low number of reported AFI cases, information were collected by using structured questioner , interview cases and control found on the selected health facilities , document and line list also reviewed to get the actual number of the cases

Case definition:-Cases were defined as any person with fever $\geq 38C^{o}$ and having headache, joint pains ,back pain and in some patients vomiting and nasal bleeding from October 14-21, 2013 , and a control subject were enrolled any person who doesn't have same clinical manifestation of the above sign and symptoms

3.4 Descriptive study

We assessed patient medical records , logbook which is found in OPD , daily line list and daily epidemic summary report were collected from all health facilities.All the collected data were compiled and descriptive analysis were done by time ,place and person by using Microsoft excel

3.5 Analytical study

We conducted (1:2) unmatched case control study to identify the possible risk factor. We designed a structured questionnaire that addresses the possible exposures for the suspected Acute febrile illnesses, oral consent for study subjects were given and interviewed 40 suspected cases and compared with 80 control subjects from Diredewa selected health facilities . We calculated odds ratio and 95% confidence intervals using Epi Info version 7.

3.6 Laboratory Analysis

We checked blood film for hemoparasite for all AFI suspected cases, beside that 33blood samples were collected (27 for virological investigation and 6 samples for bacteriological identification) most of the sample collected for virological identification were very acute cases and 12 convalescent samples were collected after a week from the community who had recovered from the illness,Laboratory examination were done for vector born viral infection by using ELISA technique for six viruses (yellow fever , Dengue fever , Westnile

fever,Riftvaleyfever,checkungunia and Crimean-Congo).Six whole blood samples were examined for (Salmonella specie, Streptococcus pneumonia, E.coli, Klebsiella Pneumonia, brucella species) samples collected for virological investigation were send to WHO referral laboratory IP Dakar for confirmation of dengue fever and further investigation.

4. Result

4.1 Descriptive analysis

A total of 11409 cases were collected from September 30-December31,2013 out of this 5729(50.2%) were male and 5680 (49.8%) were female.The crude attack rate(AR)was 3.4 %, and both sexes affected equally .Kebele 9 was reported the highest cases with a number of 3198 (28%) of the total cases followed by kebele 2 and 4 with a number of 2556(22.4%) and 1220(10.6 %) while kebele 5 reported the least number of cases 555(4.8%) of the total cases whose age group found between 15-44 were highly affected with attack rate (AR:4.3%) followed by 45+ with Attack Rate of 2.89 % and children <5 yrs were the list affected

Table 1- The distribution of acute febrile illness by Age and sex distribution, Diredewa from Oct14- December 31, 2013

Age group	Population			Cases			Crude AR	Sex specific AR	
	Total	M	F	Total	M	F		M	F
< 5 yrs	41665	21314	20351	581	303	278	1.39	1.4	1.36
5-14 yrs	80869	41088	39781	2200	1182	1018	2.7	2.87	2.5
15-44 yrs	172704	84616	88088	7429	3679	3750	4.3	4.3	4.25
45+ yrs	41482	20645	20837	1199	564	635	2.89	2.7	3.0
Total	336720	167663	169057	11409	5729	5680	3.8	3.4	3.3

The epidemic curve show that the outbreak started before the beginning of October and cases were increasing from day to day and starting from October 14, 2013 .AFI cases were

increasing dramatically it was difficult to find the index cases from the community as it started before a month ago

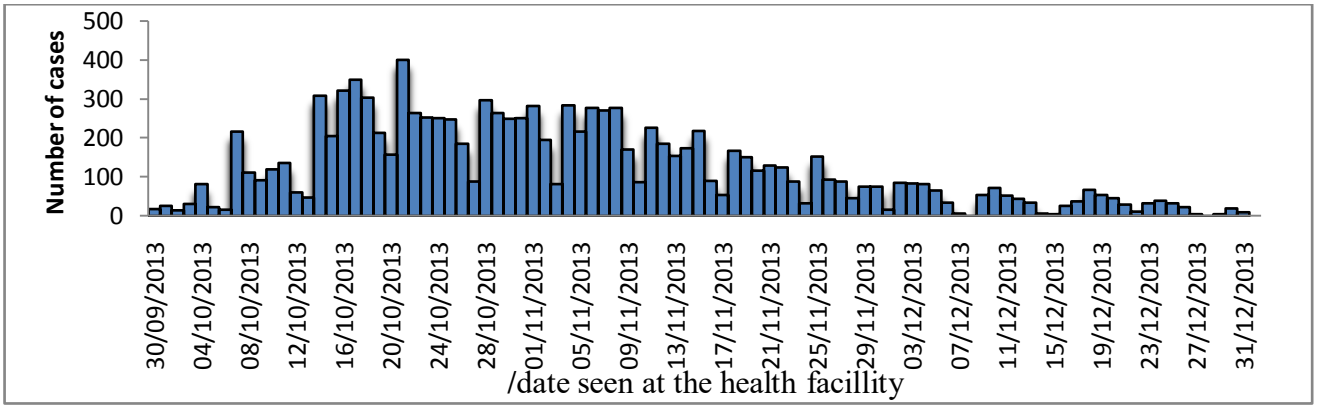

Fig 9 2 Acute febrile illness outbreak cases distribution by date seen at the health facility, DireDewa city administration, November, 2013

5. Case- control

We collect a total of 120 Acute febrile illness cases (40 cases and 80 control) with 1:2 unmatched case control study was conducted with median age 23 for cases and 28 for control .On bivariate analysis risk factors associated with the disease were wearing short sleeves and T-shirts (OR :6.3 95% CI: 2.5-15.7 : P :<0.001) , presence of sick family member (OR:11,95%CI:2.8 -41,P:<0.001), having manmade stagnant water around their living environment (OR:4.3,95%CI:1.3-14%,P:0.01) while using bed net during sleeping, travel history out of DireDewa using mosquito repellents on skin ,having contact with sick person before two weeks age didn't show any association with dengue fever . But on multi variate analysis only presence of sick family member and wearing of short sleeves show the risk factor associated with the disease

Table 2. Bivariate analysis for different exposures, DiraDewa city administration, Ethiopia October14- 21, 2013

Table 2. Bivariate analysis for different exposures, DiraDewa city administration, Ethiopia

Exposure		**Cases**	**Control**	**OR(95%CI)**	**P value**
Wearing of short T-shirts during day time	Yes	19(47.5%)	10(12.5%)	**6.3 (2.5-16.7)**	**≤0.001**
	No	21(52.5%)	70(87.5%)		
Presence of sick family member	Yes	12(30%)	3(3.75%)	**11(2.8-41)**	**≤0.001**
	No	28(70%)	77(96.25%)		
Have close contact with the person sick the same clinical picture	Yes	6(15%)	12(15%)	1(0.3-2.8)	0.59
	No	34(85%)	68(85%)		
Using of bed net during sleeping	Yes	9(22.5%)	20(25%)	0.8(0.3-2.1)	0.47
	No	31(77.2%)	60(75%)		
Travel history to out of DireDewa	Yes	5(12.5%)	4(5%)	2.6(0.6-10.5)	0.14
	No	35(87.5%)	76(95%)		
Using of window screen and air conditioner	Yes	3(7.5%)	5(6.25%)	1.2(0.2-5.3)	0.53
	No	37(92.5%)	75(93.5%)		
Using mosquito repellent on your skin	Yes	1(2.5%)	1(1.25%)	2(0.12-33)	0.56
	No	39(97.5%)	79(98.75%)		
Presence of stagnant water around living area	Yes	9(22.5%)	5(6.25%)	**4.3(1.3 -14)**	**0.01**
	No	31(77.5%)	75(93.75%)		
Do you use air conditioning or window and door screening?	Yes	3(7.5%)	5(6.25%)	1.2(0.2-5.3%)	0.5
	No	37(92.5%)	75(93.75%)		
Presence of river around living area ?	Yes	2(5%)	1(1.25%)	4.1(0.3-47%	0.25
	No	38(32%)	79(98.75%)		

Table 3: Multi-variate analysis of risk factors associated with dengue fever, Dire Dawa, 2013

Exposure	Cases N=40	Controls N=80	AOR	95% C.I.
Wearing T-shirts and shorts in daytime	19(48%)	10(13%)	8.8	3.2-24
Presence of sick family member with AFI	11(28%)	3(4%)	14.1	3.3-61

6. Laboratory investigation

For all of the 40 cases blood film were examined at the health facility and all of them were negative for hemoparasite,From the same cases we collected 33 blood samples and brought to EPHI(virology laboratory) for different differential diagnosis (27 serum sample for virological investigation and 6 whole blood samples for bacteriological investigation), 6 whole blood samples were cultured at national bacteriology laboratory for different type of bacterial pathogens (Salmonella specie, Streptococcus pneumonia, E.coli, Klebsiella Pneumonia and brucella species) and no growth seen .For virological investigation beside the 27 serum samples convalescent sample collected and a total of 50 serum were examined at EPHI by using ELISA for six vector born viral infection (Yellow fever, West Nile fever, Dengue fever,chekungunia,Crimean-Congo and Rift valey fever) and a total of 14 samples were positive for dengue IgM antibody , all samples were sent to IP Dakar for conformation and further investigation ,from those sent samples 26 (52%) were confirmed dengue positive (11 samples positive by PCR technique and the rest 15 were positive by using ELISA techniques (IgM antibody) all the samples were serotype DEN-2.

7. Environmental Investigations:

The living environment of cases which were highly affected by the disease were observed and there are suitable environments for mosquito breeding like water from plant pot plates, Flower vases around their living compound and there were holes in some of the patients living area which is used for disposing liquid west. All mosquitoes and larvae were identified as *Aedes aegypti* and tested negative for DF by PCR.

8. Discussion

The laboratory findings and clinical manifestations assured that the etiologic agent of the outbreak were dengue fever. This is the first finding and report of Dengue fever in Ethiopia, since dengue fever affects most of the tropical and subtropical countries and Ethiopia is found on this region it makes the country exposed for dengue fever and other vector born viral infection .The outbreak started on early September and it become peaked on October and mid of November ,2013 ,the crude attack rate were 3.8 % and both sex were affected equally with the same attack rate (3.4%) Age group 15-44 yrs were highly affected by the disease, this shows that they are active age groups and they spent most of the time outside of the house which exposed them to day bite mosquito, followed by 45+ years and children under five were the least affected age groups with attack rate of (4.3%,2.89%and1.39%) respectively. A study conducted in Salvador assessing the risk factors of dengue in pre school children and the dengue virus is in active circulation during early childhood; consequently, children have heterotypic antibodies and run a high risk of developing dengue hemorrhagic fever, because the sequence and intensity of the three dengue virus serotypes currently circulating in this city(9)

In our study, the risk factors that associated with dengue fever were wearing short sleeves and T-shirts during day time were highly affected (AOR:8.8 ,95%CI:3.2-24%), As long as the vector (A.egypities) is a day feeder mosquito, persons who have the habit of wearing short sleeves dress are highly venerable to mosquito bite and getting the disease while wearing long sleeves and full trouser were not affected and it is a protective for not infected by the disease ,Another risk factor for the disease were presence of sick family member with acute febrile illness (AOR:11.1 , 95%CI: 3.3-61%) .Infected humans are the main carriers and multipliers of the virus and 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

9. Conclusion

In Ethiopia there were no report of dengue fever before and it is the first time to report. Confirmed DF cases were identified within a cluster of over 11,000 AFI cases in one urban centre from September to December 2013 with no deaths and no reports of dengue hemorrhagic fever .The disease affected only the urban part of the town and cases were not evenly distributed, from nine urban health facilities three of them were highly affected , both

sexes were affected equally and persons aged 15-44 yrs were most affected .On multi-variate analysis wearing T-shirts and shorts during the daytime and having a family member with AFI were identified as risk factors for contracting DF. *Aedes aegypti* mosquitoes were identified in the urban centre during the outbreak

10 .Challenges /gaps

- The organized team didn't include expertise from different discipline (entomologist, epidemiologist, and clinician veterinarian.)
- Unable to get line list and daily epidemic summery report on time
- Very weak participation of the region Expertise and physician during the investigation.
- Unable to get convalescent samples at the health facilities because people came to the health facility immediately they got sick .
- At the laboratory side there is shortage of laboratory reagents for both ELISA and conventional PCR techniques to diagnosis all the collected samples.
- Some of the laboratory reagents used for diagnosis of Dengue fever are not commercially available

11. Recommendation

- Work on environmental management to avoid mosquitoes breeding sites and also ; disposing of liquid waste properly to minimize artificial man-made habitats seeks to change the environment in order to prevent or minimize vector propagation and human contact with the vector pathogen by destroying, altering, removing or recycling non essential container that provide larval habitat. using of personal household protection such as window screens.
- Local laboratory needs to strengthen by providing the necessary technical and other input in order to diagnose dengue fever by their own.
- Health education should given to the community to avoid being outside at dawn, dusk and early evening and to seek medical treatment as soon as they got sick .
- Health education to avoid exposure to mosquitoes (long sleeves and pants, repellents, bednets)
- Strengthen surveillance system for AFI and dengue like illness and local laboratory capacity for early detection of DF in Ethiopia.

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Chapter VI – Abstracts for Scientific Presentation

6.1 The first report of Dengue Fever outbreak in Diredewa, Ethiopia, November 2013

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1 .Ethiopian Public Health Institute /Emergency Management Centre, 2. Ethiopian Field Epidemiology Training Program

Background: Dengue Fever is one of the causes of Acute Febrile Illness (AFI) and a leading cause of illness and death in tropical and sub tropical countries. On September 2013 Diredewa health bureau, reported an AFI outbreak of unknown origin in the town. An investigation was conducted to identify the etiology of the outbreak, determine risk factors and to recommend control and prevention methods.

Methods: Descriptive study supported by an unmatched case-control (1:2) study was conducted. Cases were defined as any person with fever ≥ 38^{oc} and having headache, joint and back pain, Control subjects were persons who did not exhibit the same clinical manifestations as cases in the period extending from October 14 to November 5, 2013. Odds ratios and 95% confidence intervals were calculated using Epi Info version 7. For laboratory investigation blood samples were collected and examined for different vector-borne viral infections using IgM ELISA and PCR.

Result: A total of 11400 cases were reported within the study period both genders affected equally. Crude AR was 3.4 % Kebele 9 were the most affected Kebele. Forty cases and 80 controls were enrolled. The median age for cases and controls was 23 and 28 years respectively. On multi-Variables analysis risk factors associated with the disease were wearing short-sleeved shirts (OR: 8.8, 95% CI: 3.2-24), presence of a sick family member (OR: 14.1, 95% CI: 3.3-61. Fifty serum samples were tested for vector-borne viral infections and out of them 26(52%) were positive for dengue fever.

Conclusion: This is the first reported outbreak of dengue fever in Ethiopia., Both genders were equally affected, The age group 15-44 years and children < 5 years were the most and least affected groups respectively. Environmental management and providing health education for the community should be emphasized to control the outbreak.

Keyword: Acute febrile illness, Dengue

6.2 Acute flaccid paralysis in Ethiopia from 2008-2012

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Abstract

Background: Polio eradication program is fulfilled through a combination of high immunization coverage and syndrome surveillance for acute flaccid paralysis (AFP) among children less than fifteen years is important. Analysis of the surveillance system of the flaccid paralysis by person, time and place appears important. Therefore, this paper assessed the five year data of acute flaccid paralysis from PHEM by person, place, time including identification and type of polio virus.

Methods: Using a descriptive analysis, the distribution of Acute Flaccid Paralysis was summarized by person time and place from data collected between 2008 - Sep2012 by PHEM Ethiopia. The data was also assessed for other non polio virus (either wild form or vaccine derive polio virus). Following data collection it was entered to to Microsoft excel software and was cleaned and analysed using Epi-info version 7 and is presented by tables, and appropriate graphs.

Result: A total of 5042 AFP cases were tested from 2008-2012. Out of these tested 03(60 per 100,000) cases were confirmed to have wild polio virus, 12 (240 per 100,000)to have Vaccine derived polio virus, 4733 were discarded cases and 65 were compatible with poliomyelitis after 60 days of follow up. The non-polio AFP rate was above 2 /100,000 for all years and the stool adequacy rate were >80% that fulfilled 2 important indicators which is recommended by WHO.

Conclusion: The surveillance activity of AFP in Ethiopia is improving from year to year and it is closer to the target to eradicate polio from the country. All the three wild polio cases imported and from Gambela region,some regions like Somalia report low NP-AFP rate .

Keywords: Polio, AFP surveillance, Ethiopia

6.3 Evaluation of Paediatrics bacterial meningitis (PBM) sentinels Surveillance System in Black Lion and Yekatit 12 Hospitals. Addis Ababa, Ethiopia

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1. Ethiopian Public Health Institute /Emergency Management Centre
2. 2 Field Epidemiology and Laboratory Training Program

Abstract Background

Bacterial meningitis is a serious infection of the meninges that affects the brain membrane. According to world health organization, Haemophilus influenza type b(Hib), is estimated to be responsible for about three million serious form of the illnesses and an estimated 386 000 deaths per year, Almost all victims are children under the age of five, Haemophilus influenza type b (Hib) is a significant cause of childhood morbidity and mortality in Ethiopia, Ethiopia started PBM surveillance in 2002 at Tikur Anbessa (Black Lion) Hospital and by the year 2008/09 two additional sentinel sites were included, We evaluated this surveillance system to determine whether the system meets the set objectives and to assess its attributes

Methods

We reviewed the 2012 surveillance data of surveillance in two sentinel sites and administered semi-structured questionnaire to surveillance staff. We performed descriptive analysis and assessed the surveillance systems attributes. The CDC updated guidelines for public health surveillance system evaluation was used as reference.

Results

A total of two sentinel sites in Addis Ababa city administration were evaluated. The surveillance system is limited to Addis Ababa and Gondor hospitals only, there is repeated variables found on the reporting case based format it affects the quality of the data .The positive predictive value or the proportion of cases reported by the system that actually have paediatrics bacterial meningitis due to (Hib, S.penemonia and N.menengits) was 5.5%.

The system has few levels; it is simple, flexible, stable and acceptable at all levels. Timeliness of reporting was not calculated because of poor data quality.

10. Conclusion

The PBM sentinel surveillance system has a lot of advantages in providing epidemiologic and laboratory information used to knowing the disease burden, characterizing and monitoring of bacterial meningitis among paediatrics in Ethiopia. The staffs who are engaged on the system are satisfied with the procedures .Data quality were poor due to too much missed variables on the cases based formats. Generally the PBM sentinel surveillance system is simple, acceptable, flexible and sensitive.

11. Recommendation

Continuous supportive supervision and timely feedback should be given to increase the quality of data, Regular review meeting should be scheduled and conducted to identify and discuss on the gaps, challenges and achievements to take immediate corrective action .

6.4 Outbreak investigation of suspected Hepatitis E among South Sudan refugees in Ethiopia, Gambella, June 2014

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Abstract

Background

Hepatitis E is a liver disease caused by the hepatitis E virus. It is a common cause of acute hepatitis in developing countries with poor sanitation and hygiene. The virus is classified into four genotypes. In endemic areas, large outbreaks of acute hepatitis caused by viruses' of genotype 1 or 2 frequently occur due to faecal–oral transmission, usually through contamination of drinking water .It is usually a self-limiting infection and resolves within 4–6 weeks

On mid of June there was a report of suspected Hepatitis Disease and yellow fever outbreak from Gambella regional state where the south Sudanese refugee camp is found, team were organized from different sectors and deployed to confirm the outbreak, investigate the causative agent and to recommend the prevention mechanism

Methods: Patient observation and searching active case was made at MSF clinic, line list were collected from MSF France clinic from June 6- July 9, 2014.A cases was defined as a patient with fever, acute onset of jaundice, headache, dark urine, hepatomegale and sometimes having vomiting. Immunization status for yellow fever and Hepatitis were assessed through patient medical history card. Blood specimens were collected and sent to WHO referral laboratory for conformation and further investigation. Descriptive analysis was conducted Microsoft Excel

Result

From both refugee camps, a total of 240 jaundice cases were reported between first week of May to first week of July 2014 .There were 12 deaths reported with a case fatality rate of 5% ,From the total cases 99(41%) were females and 141(59%) were males .Age groups 5-14 were highly affected with 110 (46%) followed by age group 15-44 of 76(32%) and age group < 5 were the least affected with a percent of 22% . Twohundered (83%) refuges who develop jaundice cases were from Lietchuor camp and 35 cases from kule 1 and 2.From the

total jaundice cases, 52 were RDT positive for malaria parasite. Twenty two blood samples were tested and out of them 12 (54%) were positive for Hepatitis E by PCR technique.

Conclusion

HEV is the leading cause of non-A, non-B enterically transmitted among south Sudan refugees, It is known that there was a big outbreak in South Sudan and most of the refugees came from upper Nile, one of the state where hepatitis E outbreak was reported. The emergence of the disease in refugee camps is a major concern because of the difficulty in implementing effective preventive measures under camp conditions. The risk factors associated with the transmission of virus are currently unknown but the area is very prone to water born diseases in addition to that, all the residents of the refugee camps had no latrine and had shortage of safe water supply

Chapter VII – Narrative Summery of Disaster situation

I. Introduction

Humanitarian need assessment is a participatory process for assessing hazards, vulnerabilities, risks, ability to cope, preparing coping strategies and finally preparing a risk reduction options implementation plan by the local community and concerned body .Humanitarian need assessment uses scientific information and predictions and participatory discourses to identify, analyse and evaluate risk environment of a particular community, reach consensus amongst the community on actions that are needed to manage the risk environment.

Minister of Agriculture and the regional DPPc s in collaboration with different minister offices and other partners like WHO, UNICEF , WFP , CARE and GOAL Ethiopia conducts a nationwide vulnerability assessment twice a year. These assessments are called Belg and Meher Assessments which undertaken in different season of the year .Good and effective assessment practice is used to have enough and relevant information on the findings and give a baseline information to take the necessary response. This informs decision-making in relation to the following four main issues .

1 To decided the need of intervention
2. The type and scale of the intervention
3. Prioritization and allocation of resource and
4. Program design and planning.

Formal needs assessments may also aim to force a decision by others, to influence the decision which is already taken. Health emergency assessment is crucial to forecast the magnitude of the emergency threats and accordingly to make the necessary plans and preparations to prevent unexpected disaster in animals as well as human . Accordingly, this health assessment as part of Bulg assessment was conducted for 10 selected hotspot Zones of Oromia region .

Background

Oromiya National Regional State is one of the Regional States in the Federal Democratic Republic of Ethiopia. Geographically, the Region extends from It shares borderlines with all the Regional States in the Federal Democratic Republic of Ethiopia, except Tigray.Oromia National Regional State is the largest Regional state Federal Democratic Republic of Ethiopia.

The Region is divided into 18 administrative zones, 304 woredas (out of which 39 are towns structured with the level of woredas and 265 rural woredas), more than 6,342 farmer and 482 urban dwellers Kebeles.

East and west Harereghe is one of the 18 administrative zones of the region with a total population of 4,595,556 which accounts about 17% of the total population of the region out of this total population 2342059 are male and 2253497 are female there are 10567 pastoralists found in the two zones

2. Objectives

2.1 General Objective:

To assess the types, magnitude, extent and likely of health risks in the most vulnerable selected woredas and develop response plans.

2.2 Specific Objectives:

- To identify districts affected by epidemic prone disease and malnutrition
- To identify challenges, gap and assess the capacity of districts in preparedness & response activity.
- To suggest action points for epidemic preparedness and response
- Based on the findings of the assessment and the need to address potential emergencies to develop necessary plans and complete preparedness actions early in the health and nutrition sectors for adequately addressing the potential emergencies

3 .Methods

3.1Study design: A cross-sectional study design was used to assess and identify human health and nutrition emergency needs in the next six upcoming months.

3.2 Study Area Profile: The assessment was conducted in East Harereghe and West Harereghe zones of Oromia Region. From the two zones totally ten districts were selected and visited during the assessment. The zones and districts were selected based on their natural, manmade disasters and diseases trends.

3.3 Assessment team

A team comprising of experts from RHB, WFP, USAIDE, CRDA,Goal Ethiopia , Regional Water bureo, National Metrology Agency and Catholic Church Aid have participated in the assessment. The assessment was conducted in the following selected district which is suggested by the region and zone level.

Table 19. Selected woredas which are found in East and West Harereghe zones .

Selected Zones	**Woredas visited**	Remark
E/Harerghe	Chinaksen,Gurawa,Melka-bello,Meyu-muluke,Meta,Midega tola	
W/Harereghe	Tulo,Burka-dimitu, Doba,Hawi- gudina	Burka-dimitu not visited

Got orientation on data collection tools and briefing on the Bulg assessment objectives at the regional level before deployment to their respective field sites.

- Briefing was conducted at zonal and at each assessed Woredas
- Primary and secondary data were collected using checklists
- Formal discussion and interview was made with respective officers
- Community Interviews and observations was conducted
- Debriefing was made on assessment findings for visited Woredas and zone

3.4 Source of Data: Both primary and secondary data were collected from zonal health departments and district health offices. Head of zonal health departments and district health offices, pharmacist, and public health emergency management officers, maternal and child health officers were interviewed.

4. Assessment findings

Table 20. Population of west and east Harerega zones selected wereda

	Population					
Woreda	Male	Female	Total	< 5	Pregnant	PLW
Melkabello	214592	104948	319540	35193	3584	6438
Meta	150133	147123	297256	48750	10998	20421
MidhadgaTola	43527	45303	88830	14565	2994	2994
Chinakison	50,654	52721	103,375	16954	3825	3825
Grawa	143020	139022	282042	46245	10436	9871
Mayu	38003	39554	77557	8937	2071	4142
Tulo	85365	88849	174214	28571	6445	6445
Burka-dimtu	N/A	N/A	N/A	N/A	N/A	N/A
Doba	77071	80216	157287	25795	5820	5505
Hawi-gudina	48939	49135	98074	16084	3306	5757
Total	851,304	746871	1,598,175	241094	49479	65398

4.1 Coordination

There is existence of Multi-sectoral coordination forum from different relevant government ,(NGO,and UN agencies) at the woreda level and monthly regular meeting conducted at zonal level , there is public health Emergency Management preparedness and response plan at zones health department in some visited districts but in all visited woredas there is no budget allocated for emergencies purposes and it is very difficult to take an immediate action and manage if any health emergencies occurred .

Table21. top morbidity diseases under five and above five individuals

Woreda	**Top morbidity (Under 5)**					**Top Morbidity (Above 5)**				
	1	2	3	4	5	1	2	3	4	5
Meyu	AURTI	Diarrhea	Eye and ear infection	Burning injury	Disease of skin	Pneumonia	Gastritis	USTI	Kidney infection	Amoebiasis
Metta	Diarrhoea non bloody	Pneumonia	AURI	Trauma (233)	Violence and other intentional injury (203)	Pneumonia	Trauma(falling accident)	Violence and other intestinal injury	AURI	Diarrhoea non bloody
M/tola	Pneumonia	Intestinal Parasite	Conjunctivitis	Diarrheal disease	Tonsillitis	Pneumonia	Diarrheal disease	Intestinal parasite	UTI	Rheumatoid Arthritis
B/dimitu	Diarrhea	Pneumonia	ARTI	SAM	I/Parasite	N/A	N/A	N/A	N/A	N/A
Chenakson	Pneumonia	UTI	Helmentiasis	Diarrheal infection	Skin infection	N/A	N/A			
Doba	Sever Pneumonia	Pneumonia	Common cold	Diarrheal with dehydration	Diarrheal with no dehydration	Trauma	Diarrhoea	Pneumonia	Acute upper respiratory infection	UTI

Tullo	Pneumonia	Diarrhea	AURI	Intestinal parasite	AFI	Trauma	Pneumonia	AURI	UTI	Dyspepsia
H/gudina	Diarrhea	Intestinal parasite	Pneumonia	Skin infection	Conjunctivitis	Pneumonia	Upper respiratory infection	Soft tissue infection(cornea)	Intestinal parasite	
Grawa	Pneumonia	Diarrheal disease	Acute upper respiratory infection	Unspecified disease of eye	Malnutrition	Pneumonia	Acute upper respiratory infection	Trouma or injury	Intestinal parasite	Acute febrile illness
Melka-belo	Upper respiratory infection	Diarrhoea	Lower respiratory infection	Conjunctivitis	Ear infection	Respiratory infection	Fighting	Malaria	Gastritis	Alcer

5. HEALTH & NUTRITION SITUATION

5.1 Human health:

All of the assessed woredas reported no ongoing disease outbreak during the assessment. However, Chinkson woreda on border to Somalia region there were measles cases build up in the month of April 2013. Local governments have taken preventive and treatment measures to control the disease. On the other side woredas (Measo and Daro-labu) which were not selected to visit, there were dog bite and rabies cases. In measo woreda 11 rabies suspected cases and two death were reported in the last three month , in Daro-labu woreda a total of 45 suspected cases of rabies and one death were reported .

Even though, zonal health department and all the visited district health offices are functional on providing health service to the community, Zonal surveillance system report lie on the standard (80%) but data shows that all visited woredas their surveillance system is weak. Information gathered from Meyu and Chinakeson woreda health offices shows that anticipating of disease outbreak may occur due to interrupting of health care services particularly in internal displaced peoples ,the finding shows that there are risk factors that indicate the possible outbreak of diseases e.g. AWD, Malaria and Measles particularly to those IDPs .

As a result of little of rain, lack of potable water, poor cold chain management system and shortage of preventive supplies in most of the woredas, there is anticipation of disease outbreaks in the form of AWD, malaria and measles. IDPs in the East and West Hararghe Zones are highly vulnerable to such outbreaks due to interrupting of health care services. Stock of emergency supplies and drugs found to be inadequate in most visited Woredas. In addition to restocking treatment supplies, it would be beneficial to ensure sufficient preventive measures to control possible disease outbreaks

6. Emergency drugs and supplies.

from the six visited woredas of E/ Harereghe(Melkabelo, Meta and Grawa) districts they don't have any shortage of emergency drug and supply but Medegatola, Meyu and Chinakson districts shortage of emergency drug and supply especially for malaria, AWD, meningitis and measles . Different case based and weekly reporting formats and guide lines which was distributed from Federal and regional health bureau to zonal health department distributed to all district health offices and health facilities which helps health professionals in order to manage cases as according to standard case management. E.g. Cholera guide line, PHEM guide line and Measles guide line.

In W/Harereghe visited woredas general there is a shortage of emergency drug and supply . All the visited district health offices had a shortage emergency drug and supply particularly for malaria, AWD, meningitis, measles and malnutrition case management

7. Risk Factors for Disease Outbreak

7.1 Malaria

The collected data indicated that a total of 335 suspected malaria cases were reported from Meyu, M/tola,Grawa and H/dudina districts the trend of malaria cases reported from the zones was increasing and highest malaria cases reported in Grawa woreda with 177 (53%) suspected cases .According to information collected from zone and visited districts and site observation there might be malaria outbreak can be occurred due to unprotected irrigation, low ITN coverage and under utilization by community especially in H/Guddina district. Even though, the coverage of ITNs in past years was 100%, currently it needs replacement for almost all HHs and new ITN should distribute to those internal displacement peoples in all visited districts these indicating risk factors of malaria in those districts

7.2 AWD /Dysentery

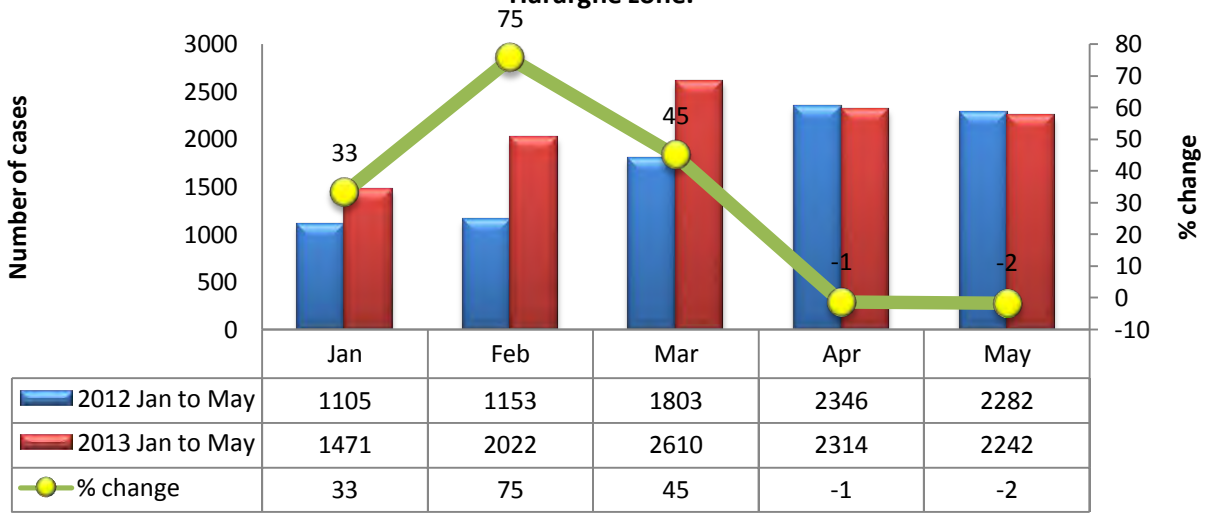
There is no AWD was reported for the last six months in both zones. This assessment finding indicates that all visited districts face shortage of safe water for drinking for human and live stocks because of low rain fall in Belg season in the zone. thus ,animals and humans forced to share unsafe water for daily conception , shortage and low utilization of water treatment

chemicals, low latrine coverage and under utilization can cause AWD outbreak in visited risky districts .

7.3 Measles

There were Cases build up in chenakson district border to somali and 3 death due to measles and eight confirmed cases were reported. in othere districts 12 measle cases were reported in the five months time . The overall zonal measles vaccination coverage of 2005 EFY was 68% which is below national expected in E/Harerege. in all visited districts there is low immunization coverage even if the population of under 5 children are in great number,in addition to that malnutrition as the result of shortage of rain fall, internal displaced people living in a very crowded area and also dwellers share boundaries with Somalia regions are the most vulnerable group for measles , in W/harerege districts like Tullo and H/ gudina were 93%and 64% respectively

Fig 8 Change in OTP trends during 2013 Belg as compared to 2012 in East Hararghe zone.



	Jan	Feb	Mar	Apr	May
2012 Jan to May	1105	1153	1803	2346	2282
2013 Jan to May	1471	2022	2610	2314	2242
% change	33	75	45	-1	-2

8. Meningitis

Meningitis is serious disease that need close follow up at present; there is no meningitis outbreak in the visited Woredas but one suspected meningitis cases were reported from district, Preparation for response of meningitis outbreaks is highly needed as there was no vaccination activities carried out and laboratories are not capacitated with training and laboratory equipments and reagents .Moreover there are no meningitis drugs and laboratory supplies for early detection and management of cases.

9.* Malnutrition*:

Majority of visited Woredas have reported higher rates of malnutrition as compared to the last consecutive months mainly due to poor food security situation at household level. In five visited Woredas of East Hararghe, for example, OTP admission was increasing since January 2013 and total of 3325 severely malnourished under-five children and 135 SAM cases with complication reported. Monitoring data from the zone health office also confirmed that OTP admission is showing an increasing trend since January 2013 and that is also higher from last year of the same season

In W/harerega zone from the total three visited woreda a total of 1050 new admissions SAM cases were reported from (Jan-May, 2013). H/Guddina and Tullo districts reported 813 , 237 cases respectively, excluding Doba and B/dimitu woredas OTP admission . This might indicate that there will be special attention needed to take immediate intervention as per standard. There is no significant shortage of nutritional supplies in the zone as well as visited hotspot districts.

Table 22. Admission of Sam cases in West Harerega zones,2013

Month	Visited hot spot districts in W/Hararghe zone OTP admission			
	Tullo	H/ Guddina	B/Dimtu	Doba
January	26	123	N/A	N/A
February	49	148	N/A	N/A
March	45	172	N/A	N/A
April	45	172	N/A	N/A
May	72	208	N/A	N/A
Total	**237**	**813**	**N/A**	N/A

9. Emergency drugs

All visited zones and Woredas need to have some essential emergency drugs in stock for Epidemic responses (AWD,Malaria and measles ...cases) . some of the Woredas have stock of drugs that could serve for the next one month with some of these drugs are inadequate. most of the woredas in W/hareregha zone they don't have emergency drug supply for the next one month.

10. Potential health threats

The predicted diseases that could occur as an outbreaks are malaria, measles, Meningitis, and AWD diseases as a result of drought, shortage of safe water supply in most woredas.

10.1 Malaria

The assessment shows the last six months data from zone health department and visited districts health offices malaria is an endemic disease in most districts. This might be due to the following reason:

- Low coverage and under utilization of ITN among those HHs in the visited districts

- Even though, the coverage of ITNs in past years was 100%, currently it needs replacement especially in E/harerega zone for almost all HHs and new ITN should distribute to those internal
- low IRS coverage in all visited district.
- there are unprotected rivers in some observed districts

10.2 AWD

There is no AWD was reported in all visited zones. This assessment finding indicates that almost all visited districts face shortage of safe water for drinking for human and live stocks because of low rain fall in Belg season in the zone. thus ,animals and humans forced to share unsafe water for daily conception ,these shortage and low utilization of water treatment chemicals in these visited districts lead to:

- Low latrine coverage and under utilization among some visited districts.
- Poor sanitation and hygiene practices due to lack of inadequate safe water supplie, these poor sanitation & Hygiene lead to AWD and dysentery disease outbreak.

10.3 Measles

In E/Harerega zone Chenakson district 03 death due to measles reported, low vaccine coverage is the risk factors for measles disease outbreak beside that malnutrition is the risk factor for immerging measles out break

10.4Meningitis:

Meningitis is contagious and serious disease which occurs seasonally and that need close follow up ; there need Preparation for response of any outbreaks , there was no vaccination activities carried out in West and East Hararghe in the past years in addition to that there are no meningitis drugs and laboratory supplies for early detection and management of cases.

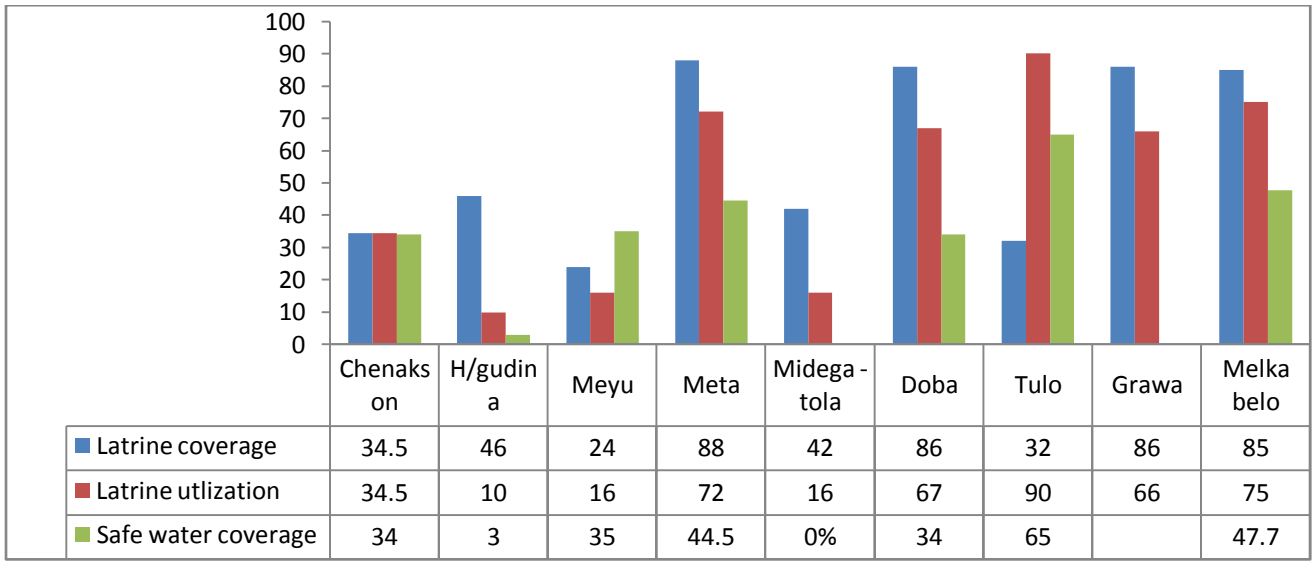
11.Sanitation and Hygiene

Sanitation and hygiene activities are getting attention by the zone and woreda health offices. Because of this, they give strong emphasis both to the software component (educating the

community) as well the hardware component (construction of latrines) of sanitation and hygiene activities at the grass root community level. The average latrine coverage and utilization of the sampled ten woredas were 54% and 56.5% respectively in both woredas There was no acute water shortage reported in most of the visited Zones except some Woredas including Kumbi Woreda of East Hararghe where one water truck is operating. Kumbi Woreda normally has zero potable water supplies

Most of the visited Woredas reported to have shortage of water treatment chemicals which predisposes to water borne diseases mainly diarrhoea and typhoid fever as people are using water from unprotected sources. Especially the safe water coverage of H/ Guddina is 3%

On the other hand the average safe water coverage of the five(Melkabello, Meta,Chinakison and Mayu)woredas is 40.3%. Exceptionally, the safe water coverage of MidhadgaTolais 0% The exact latrine coverage, latrine utilization and safe water coverage is indicated just as follow.



	Chenakson	H/gudina	Meyu	Meta	Midega - tola	Doba	Tulo	Grawa	Melka belo
Latrine coverage	34.5	46	24	88	42	86	32	86	85
Latrine utlization	34.5	10	16	72	16	67	90	66	75
Safe water coverage	34	3	35	44.5	0%	34	65		47.7

Fig 9 Latrine coverage and utilization,safe water coverage status in visited woredas of Harereghe

12. Conclusion

- Luck of supplies and drugs for emergency health problems at the zone and the woreda as well.
- The is a risk of having Malaria, Measel, Rabbis and AWD in some of the visited woredas
- Budget for PHEM is not allocated by the government both at zonal and Woreda level.
- The coverage of safe water is still low as compared to the national standard.
- Low latrine and utilization coverage although there progress.
- There is an increased trend of SAM cases in the visited and targeted woredas.
- Luck of coordination between sector offices for example there is no uniformities on figures on safe water coverage between the woreda water and health offices

13. Recommendation

- Emergency preparedness& response plan must be supported by budget to effectively implement it at the woreda level.
- There should be effective sanitation and hygiene education activities implementation strategy so as to increase latrine coverage and its utilization.
- Priority must be given for having safe water in those visited woredas where the problem is unique and chronic.
- Woreda sector offices have to work in collaboration and together rather than working separately.
- There should be enough medical supplies and drugs at the woreda level for the emergency purposes.
- To improve documentation problems, strong attention must be given for data base management activities at the woreda level.

- Availing transportation services at the zone, woreda and kebele level is key issue so as to implement planned health activities in general.
- Increasing latrine coverage and promotion sanitation and hygiene
- Transportation problems should be solved

Annex 2: Requirement of drug and medical supply in East Harerghe

Drug medical supply	**Total Requirement**	**Availability**	**Gaps**
Meningitis Vaccine	-	-	-
Coartem	4960	140 box	4820
Artesunate (rectal)	1000	-	1000
Artesunate (Inj)	5700	300	5400
Artemether IM	5700	-	5700
Quinine (PO)	620	-	620
Quinine (IV)	110	-	110
Chloroquine	1240	30	1210
Ceftriaxione	380	-	330
Oily CAF	2500	-	2500
Doxcycline	480	-	480
Ringer lactate	2110	-	2110
ORS	20,000	-	20000
Vit A	2000	1400	600
RDT malaria	8000	200	7800

Pastorx (meningitis)	10pack	-	05
LP set	300	-	300
TI bottle	800	-	800
CTC Kit (AWD)	75kit	-	75
Gloves,	2500pack	-	2500
Syringe	2500pack	-	2500
PPE	100pack	-	100
Clinical Delivery Assistance kit PART A: Reusable Equipment	24kit		24
Clinical Delivery Assistance kit PART B: Drugs & Disposable Equip.	50box	-	80
Mgt. of Complications of Abortion kit (Manual Vacuum Asp. Set)	98kit	-	98

Annex 3: Requirement of drug and medical supply in west Harerega

Drug medical supply	Total Requirement	Availability	Gaps
Meningitis Vaccine	63325dose	0	63325 dose
Coartem	17128	4080	13048
Artesunate (rectal)	3425	0	3425
Artesunate (Inj)	1750	0	1750
Artemether IM	3425	0	13425
Quinine (PO)	1750	0	1750

Quinine (IV)	890	0	890
Chloroquine	6900	0	6900
Ceftriaxione	-	200vial	-
Oily CAF	345 tin	0	345
Doxcycline	25900	4500	21400
Ringer lactate	51960	1000	50900
ORS	60620	4608	56012
Vit A	3000	0	3000
RDT malaria	33050	8400	24650
Pastorx (meningitis)	-	-	-
LP set	500	0	500
TI bottle	500	0	500

Chapter VIII- Protocol/Proposal for Epidemiologic Research project

8.1 Prevalence and determent factors for hepatitis B infection among pregnant women in Addis Ababa, September 2014

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Introduction

Hepatitis B is an infectious illness of the liver caused by the hepatitis B virus (HBV) that affects apes, including humans. It was originally known as "serum hepatit" The acute illness causes liver inflammation, vomiting, jaundice, and, rarely, death .Chronic hepatitis B may eventually cause cirrhosis and liver cancer. The infection is preventable by vaccine (1)

The viruses replicate through an RNA intermediate form by reverse transcription, which in practice relates them to retroviruses. Replication takes place in the liver, the virus spreads to the blood where viral proteins and antibodies against them are found in infected people. The hepatitis B virus is 50 to 100 times more infectious than HIV. The virus is transmitted through infected blood, sexually and vertically (mother to child) in the prenatal period. Prenatal transmission is the most common mode of HBV transmission worldwide (2)

Hepatitis B virus (HBV) infection is a major global public health problem. Of the approximately 2 billion people who have been infected worldwide, more than 350 million are chronic carriers of HBV.Approximately15–40% of infected patients will develop cirrhosis, liver failure, or hepatocellularcarcinoma (HCC) (3)

The prevalence of HBV in a population can be calculated by risk factors associated with the transmission of infection such as unsafe injections, blood transfusion, surgical procedures, body and tooth tattooing, occupational injury, sexual and vertical transmission4)

HBV infection accounts for 500 000 to 1.2 million deaths each year and is the 10th leading cause of death worldwide. Hepatocellular carcinoma incidence has increased worldwide, and the disease is now the 5th most frequent cancer, killing 300 000–500 000 people each year. Overall, approximately45% of the global population live in areas of high chronic HBV prevalence .In

sub-Saharan Africa, the Pacific, and particularly Asia, HBV infection is highly endemic, with the majority of individuals becoming infected during childhood (5) Infections with the Hepatitis B virus (HBV) are public health problems and are highly endemic in the sub-Saharan Africa (6,7)

Chronic infection is defined by the presence of HBsAg for more than 6 months. Without immunization, up to 90% of infants born to mothers who are positive for HBsAg and HBeAg, become chronic carriers (8,9)

Maternal mortality has been shown to increase in pregnant women with liver cirrhosis Peri-natal transmission of this disease occurs if the mother has had acute Hepatitis B infection during late pregnancy, in the first postpartum or if the mother is a chronic HBsAg carrier (10) Peri-natal transmission of this disease occurs if the mother has had acute Hepatitis B infection during late pregnancy, in the first postpartum or if the mother is a chronic HBsAg carrier (15) .

In Ethiopia the disease burden of viral Hepatitis is very high and different studies done at different time in different regions. There for this study was therefore designed to determine the sero-prevalence of Hepatitis B virus infections among pregnant women in Addis Ababa

2. Rational of the study

Hepatitis B infection causes significant causes of acute and chronic liver disease burden globally, and it is preventable if effective vaccination is undertaken. There is limited data is available concerning on the total case of hepatitis, deaths and infection in Ethiopia due to Hepatitis B infection. Vertical transmission from mother to baby is an important route of transmission for hepatitis B virus infection. Neonates who contract hepatitis B will have almost 90 % risk of developing chronic HBsAg carriage and chronic liver disease so knowing the actual disease burden and status hepatitis B for every pregnant women is very important to start the immunization because Neonatal immunization interrupts this vertical transmission.

3. Literature Review

A cross- sectional study on Seroprevalence of HBsAg and its risk factors among pregnant women in Jimma, Southwest Ethiopia was conducted the overall prevalence of HBsAg was 3.7% ranging from 1.4% to 6.4%. It was highest in Jimma and lowest in Shebe town. The socio-demographic status of the study population shows that high proportion of HBsAg positivity

was among the illiterate (61%), those whose income <500 Birr / month (88.9%) and among the Oromo ethnic subgroup (83%). Pregnant women who experience abortion had a higher prevalence of HBsAg (7.3%). The odds of having HBsAg were more than twice with those with history of abortion than with other risk factors. When pregnant women of Jimma town were separately analyzed, dental procedure, cesarean section and tattooing are associated with HBsAg positivity, unlike other towns (9)

Another study done in Nigeria among pregnant women Sero-Prevalence of Hepatitis B and Hepatitis C Virue Co-Infection among Pregnant Women in Nigeria. Viral hepatitis during pregnancy is associated with high risk of maternal complications; infections with Hepatitis B virus (HBV) or the Hepatitis C virus (HCV) are public health problems. Worldwide, there are about 350 million HBV carriers and 130 to 170 million people infected with HCV. Age group 26-30 and 31-35 had highest frequency of 240 (36.98%) and 206 (31.74%) respectively in HBV and HCV. Sero prevalence of HBV and HCV were 44 (6.78%) and 9 (1.39%) respectively. Prevalence of HBV and HCV co-infection was 1 (0.15%) in age group 31-35 (10 Sero-prevalence and risk factors of hepatitis B virus and human immunodeficiency virus infection among pregnant women in Bahir Dar city, Northwest Ethiopia: a cross sectional study were done and a total of 318 pregnant women with the mean age of 25.72 (SD. ±5.14) years old were enrolled. Overall, 21/318 (6.6%) and 12 /318 (3.8%) of the pregnant women were positive for HIV and HBsAg, respectively. Of these, HIV/HBV co-infection rate was 4 (19.0%). Previous history of blood transfusion (AOR = 3.7, 95% CI, 9.02-14.84), body tattooing (AOR = 5.7, 95% CI, 1.24-26.50), history of surgery (AOR = 11.1, 95% CI, 2.64-46.88) and unsafe injection (AOR = 5.6, 95% CI, 1.44-22.19) were significantly associated with HBV infection. Previous history of piercing with sharp materials (AOR = 3.0, 95% CI 1.17-7.80) and history of abortion (AOR = 6.6, 95% CI 2.50-17.71) were also statistically significant for HIV infection (11)

Hepatitis B viruses are major public health problems worldwide. a study conducted in patients with chronic liver disease in Addis Ababa showed that Hepatitis B surface antigen was detected in 43 (35.8%) and anti-HCV antibody 27 (22.5%) patients clinically diagnosed to have chronic liver diseases. Hepatitis B virus infection was higher in males 29/76 (38.2%) compared to 14/44 (31.8%) females, while ant hepatitis C virus antibody was higher in females 13/44 (29.5%) compared to 14/76 (18.4%) males. Of the study participants, 3 (2.5%) had dual hepatitis B and C virus co infection. (12)

A study conducted in Ivericost to Determine the Prevalence of Hepatitis B virus (HBV) infection in children (contact subjects) of chronic Hepatitis B surface antigen (HBsAg) and Search for factors associated with HBV infection in these children .HBV infection prevalence was 24% (23/96 of which, 4 were HBsAg positive and 19 HBcAb positive subjects without HBsAg). Independent factors associated with HBV infection in children of index subjects were HBV DNA for index subjects >2000 IU/ml (OR = 11.5; p = 0.001), existence of HBV in two parents (OR = 7.9; p = 0.03) and absence of HBV vaccination in the children (OR = 30.9; p = 0.003). (13)

Another cross sectional study conducted in Brazil to show the prevalence and risk factors associated with HBV showed that the mean age of patients was 68.6 ± 7.0 years, 39% were men and 92% Caucasian. Five subjects (0.6%) presented with positive HBsAg and 124 (15.1%) were anti-HBc reactive. From the study the prevalence of anti-HBc among the elderly in the city of Tubarão was higher than in previous studies evaluating blood donors in the same region. Despite the association of previous HBV infection and factors indirectly related to sexual risk behaviours, the results suggest the involvement of invasive therapeutic procedures in the HBV transmission chain. (14)

4. Objective

2.1 To estimate the prevalence of the disease among pregnant women in Addis Ababa

2.2 To determine the possible risk factors for the disease

5. Material and Method

5.1 Study Area and study design

Cross sectional study will be conducted in Addis Ababa city Administrative; Addis Ababa is the capital city of Ethiopia. It is the largest city in Ethiopia with the area of 540 square kilometer and a population of 3,384,569 according to the 2007 population census with annual growth rate of 3.8% the city is populated by people from different regions of Ethiopia ,in the city there are 12 government hospitals and 65 Health centers ,four sub cities will select and from the selected sub cites 2 government hospitals and 4 health center will be select based on their case load and representativeness of the subcites.

5.2 Study period

The study will be conducted from October - November,2014

5.3 Study population

The study population will be all pregnant women attending in the selected health institute MCH clinic during the study period.

5.4 Sample size and data collection

The study sample size will be determined by statistical calculation by using single population proportion formula considering the following assumptions

- Proportion of 5% (considering considering previous study in Jimma hospital)
- Level of significance = 0.03
- Marginal of error = 5%
- Non-response rate= 10%

The formula for calculating the sample size (n) used:

$$n = \frac{(Z\alpha/2)^2 \, P \times (1-P)}{d^2}$$

Where:

• n= sample size

• Z(α/2) = Z-score at 95% confidence interval = 1.96

$n= (1.96)^2 \times 0.05 \times 0.95 / (0.03)^2$

n=203

Including 10 % non-response rate the total sample size will be 223 Hepatitis B positive pregnant women

5.5 Sampling technique/procedures

Non probability sampling technique will be used to select the study subject, two hospitals (Zewditu and Yekatit 12 hospitals) and four health(Akaki health centre , Addis ketema health centre , Bole health centre and Kirkose health centre) will be selected based on their case load and representativeness . In each Health facility 37 samples will be collected by randomly selecting pregnant women who came to the Health facility for antenatal follow up

5.6 Study instrument and data collection

A semi-structured questionnaire will be prepared and used to collect information about study subject, socio-demographic information, assessment of risk factors and other important variables will be collected by direct interview of the study participant, nurse who are working in MCH follow up clinic will be the one who is responsible for collecting the data and training will be given how to fell the questionnaires

5.7 Data processing and Analysis

After collection of data, it will be entered in to Epi Info version 7 and analysis will be done finally the results will displayed by using tables and graphs.

5.8 Ethical Consideration

Ethical clearance will be obtained from ethical committees from College of Health Sciences Addis Ababa University and formal letter of support will be requested from Addis Ababa Health Bureau for each study facility. Every individual study subject will be request the consent form verbally to confirm their willingness to participate in the study.

Annex 4 Work plan for hepatitis B among pregnant women

Activities	**Responsible person**	**August**		**September**		**October**				**November**			**December**			
		W-3	W-4	W-3	W-4	W-1	W-2	W-3	W-4	W-1	W-2	W-3	W-1	W-2	W-3	W-4
Prepare proposal	Principal investigator															
Finalize the proposal																
Ethical clearance of the proposal	Principal investigator															
Select data collectors and research assistants	Principal investigator															
Preparation of letter for RHB	Principal investigator															
Training for data collector	Principal investigator															
Data collocation	All members															
Data entry and cleaning	Principal investigator															
Data analysis and write up	Principal investigator															
Final paper	Principal investigator															

Annex 5 Budget breakdowns for prevalence of Hepatitis B among pregnant women

Sr No	Description	Quantity needed	Unit cost		Total cost
1	**Stationary materials**				
	Photocopy	300	50/cent		150 .00 birr
	Printing	300	1		300
	Pen	10	5		50
	Pencil	10	2		20
	Notebook	15	10		150
	Eraser	10	5		50
2	**Training**			**Duration of day**	**720**
	Supervisors	2	200	1	400
	Data collectors	6	100	1	600
3	**Personal/Perdiem**				**1000**
	Supervisor	2	250	**12**	6000
	Principal investigator	1	250	12	3000
	Data collectors	6	150	12	10800
4	**Communication**				**19800**
	Telephone card	9	**100**		900
	Transportation/vehicle	2	**400**	**12**	9600
Total cost					32020.00
Contingency (10%)					3200
Grand total					**35220**

Annex 6- Questionnaires for the risk factor assessment of Hepatitis B

No.	Question	Coding Classification	Go To
	1. Background information		
4.20	Region	Addis Ababa	
4.21	Sub city		
4.22	Kebele		
4.23	House Number		
4.24	Age		
1.6	What is your occupation	1. House wife 2. Government Employee 3. Private Employee 4. Merchant 5. Student 6. Daily Laborer 7. Other_____	
1.6	level of Education	1. Illiterate 2. Elementary school 3. Secondary School 4. Tertiary School(college and above	
1.7	How many family members	_____	
1.8	What is your religion	1. Muslim 2. Orthodox 3. Protestant 4. Catholic 5. Other(Specify)_____	
1.9	Average monthly income	1. <1000 2. 1000-1500 3. 1500-3000 4. Above 3000 5. Unknown	
1.9	What is your marital status	6. Married 7. Single 8. Divorced 9. Widowed	
	5. Pregnancy related information		
5.1	In which trimester you are	1- 1st trimester 2- 2nd trimester 3- 3rd trimester	
5.2	Did you follow antenatal care service for your recent birth	1.Yes 2.No	
5.3	Where did you attend delivery service	1.At home	

	for your recent birth?	2. At health facility	
6. Risk factor associated questions			
6.1	How many sexual partner do u have	1. One 2. Two 3. More than two	
6.2	Do you have history blood transfusion	1.Yes 2.No	
6.3	Do you have history of abortion	1. Yes 2. No	
6.4	If yes , was it safe or not	1- Yes 2- No	
6.5	History of tooth extraction	1. Yes 2. No	
6.6	Did u do tooth tattooing	1.Yes 2.No	
6.7	Have you done surgery	1.Yes 2.No	
6.8	Do you have body tattoo	1- Yes 2- No	
6.9	What is your monthly income?	_____	

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Annex 7: Questionnaire for the prevalence of Hepatitis B infection among pregnant women in Addis Ababa -2014

Consent form

Good morning/good afternoon: My name is _____ I come from Addis Ababa University to Know the prevalence Hepatitis B infection and to know the possible risk factor of the disease The Main Objective of this study is to know the disease burden in the selected hospitals and identify the possible risk factors . These questionnaires will take about 20 minutes of your time. In

All information collected during this study will be kept private and will only be known by the investigators. You may change your mind and you can leave the study any time during the interview.

Benefits: This project will help the government and the community to make/improve in policy, strategies and plan on HBV infection

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

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

a) Agree _____ b) Disagree_____

Name of Interviewer_____

Signature of Interviewer_____

Date of interview _____

Time started_____ Time completed_____

Checked by supervisor: Name_____ Signature_____ Date_____

Date of Interview _____

Chapter IX– Other Additional Output Reports

9.1 PHEM weekly bulletin

Highlights of the Week

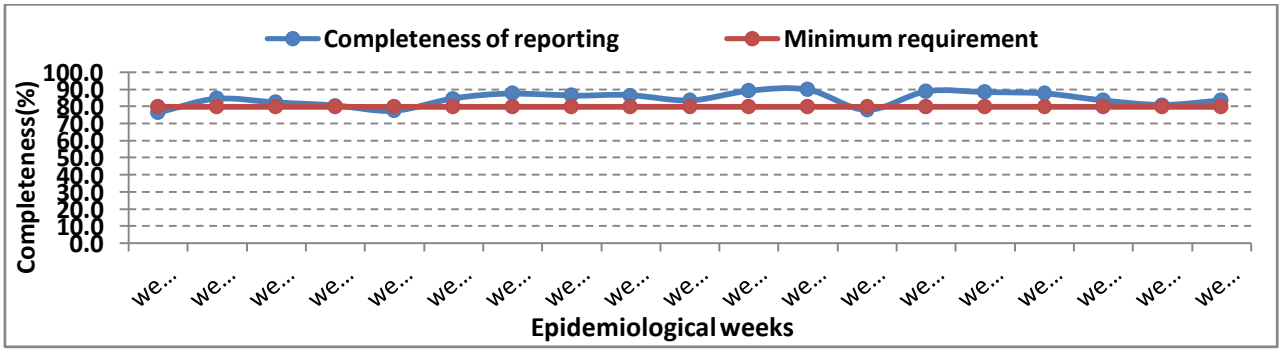
- Report received from all regions,
- National surveillance completeness was 83.7 %,
- Vaccination against meningitis is continued in Shashemene, Shalla, Dale and Wonsho woredas,
- Investigation and response on measles outbreak in Meta robe woreda of west Shewa zone has been continued.

I. Introduction

This bulletin aimed 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 07 and daily phone communication for week 8 of 2013

II. Completeness of reporting

National surveillance completeness rate was 83.7 % in week 07, 2013, comparing with week 6 completeness rates was (81.2 %) and it increased by 2.5 %. This might be attributed to the slightly increased of completeness rate in Oromia, Amhara, Addis Ababa, somalia and Afar regions



Fgure10: National report completeness - week 41 /2012-7,2013.

During week 7, 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 Comparing with previous weeks the completeness rate in Harari has been improving.

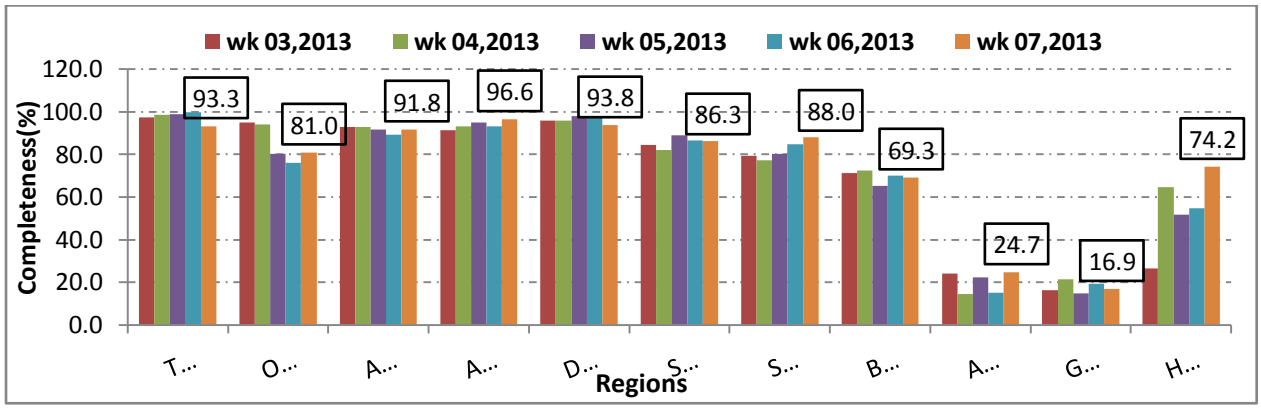


Figure11: Reporting completeness by region- week 3-7, 2013

III. Diseases and conditions

1) Malaria

During week 7, a total of 54,789 clinical and confirmed malaria cases with 1 death were reported nationally . Majority of the cases were from SNNP 18,562 (33.8%) followed by Amhara 14851(27%) and Oromia regions 9754 (18%). The national figure shows that clinical and confirmed malaria case slightly decreased as compared to week 06, 2013 (Figure3).

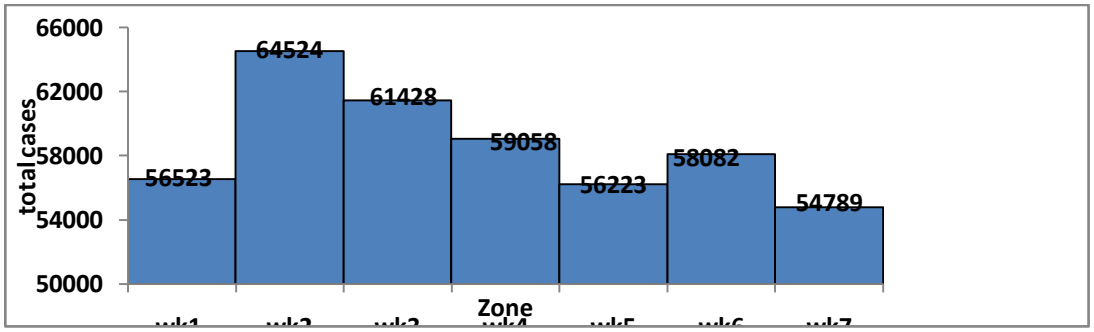


Figure 12: National malaria trends by week of week 1-7,2013

Compared to the data of week 6, malaria cases slightly decreased in Oromia, Gambella, Amhara , Tigray and Gambella regions(Figure 4).

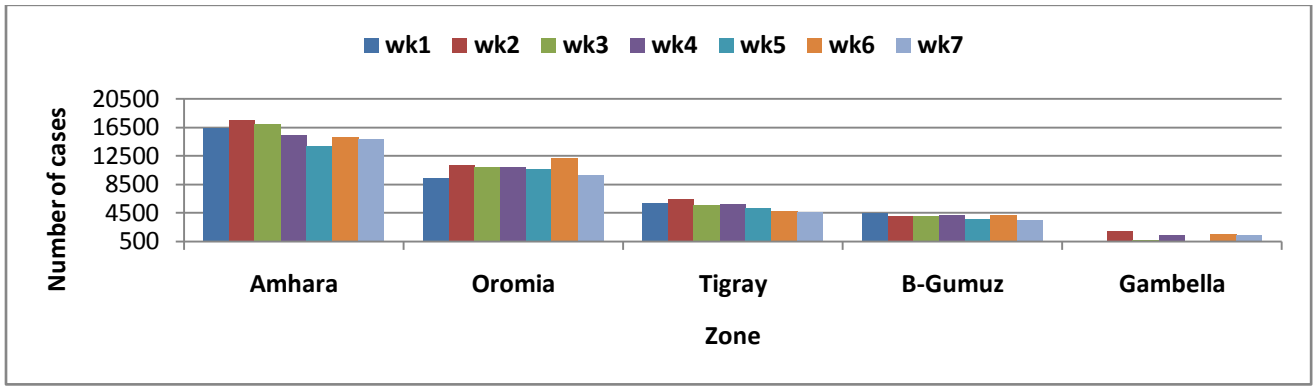


Figure 13: malaria confirmed and clinical cases by region of week 1-7, 2013

SNNP region

In week 7, a total of 18,562 confirmed and clinical malaria cases with no death were reported from the region, irrespective of the size of the zones, majority of the cases were reported from Sidama zone 2549(14%) followed by Gamo Gofa 2475(13.3%) and wolayita zone 2137(11.5%) . Comparing with week 6 surveillance data, this week the trend of malaria cases showed no significance deference in most zones of SNNP. However, the number of malaria cases in Gamo Gofa, Dawuro and Hadiya zone shows increasing of cases comparing with week 6.

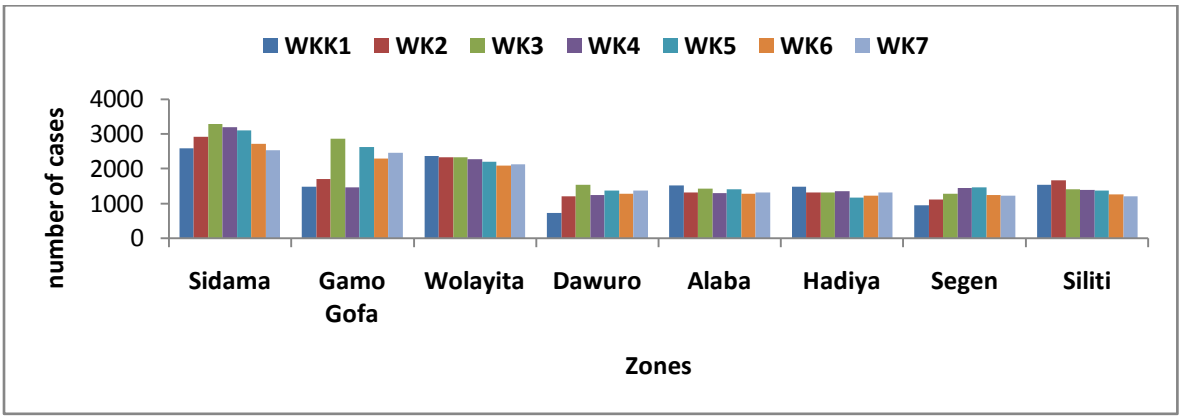


Figure 14: Malaria confirmed and clinical cases of SNNP region by zone, week 1-7, 2013

Amhara Region

A total of 14851 cases with no death were reported from the region. Most of the cases were reported from West Gojam 4,265(29%), North Gondar 3,513(24%), South Gondar 2455 (16.5%) and Awi 2421(16.3%) zones of the region

Comparing with data of week previous weeks, there is no significant increment or decrement of the cases across the zones of the region.fig 6

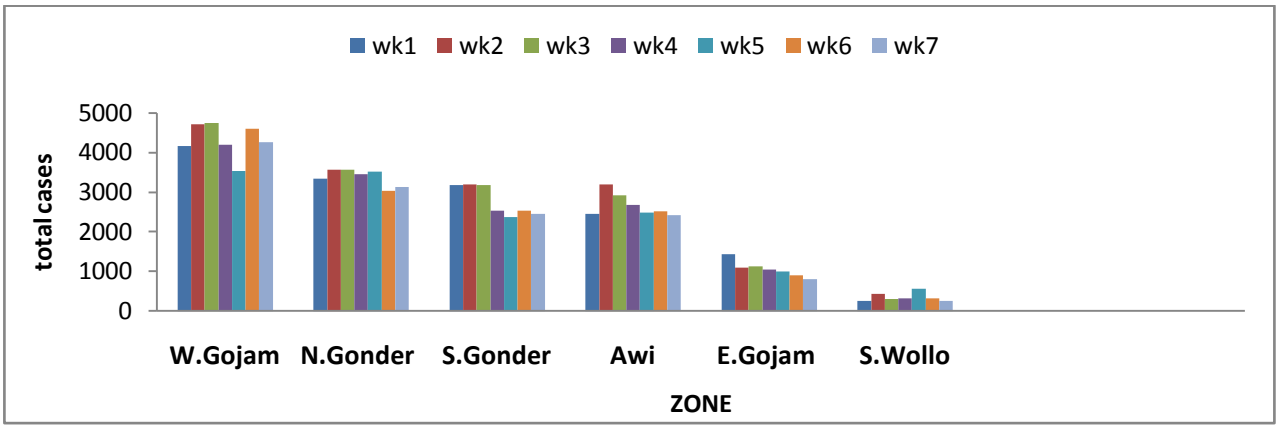


Figure 15: Malaria clinical and confirmed cases of Amhara region by zone, week 1-7 ,2013.

Oromia Region

Of the cases reported from the region in the week 7 were (9754), majority of the cases were reported from Jimma zone 1717 (17.6 %) followed by IlluAba Bora zone 1639 (17%). Comparing with week 6 data, the malaria cases show increasing in Jimma and Illu Ababora zones, while it was decreased West wolega zone . fig 7

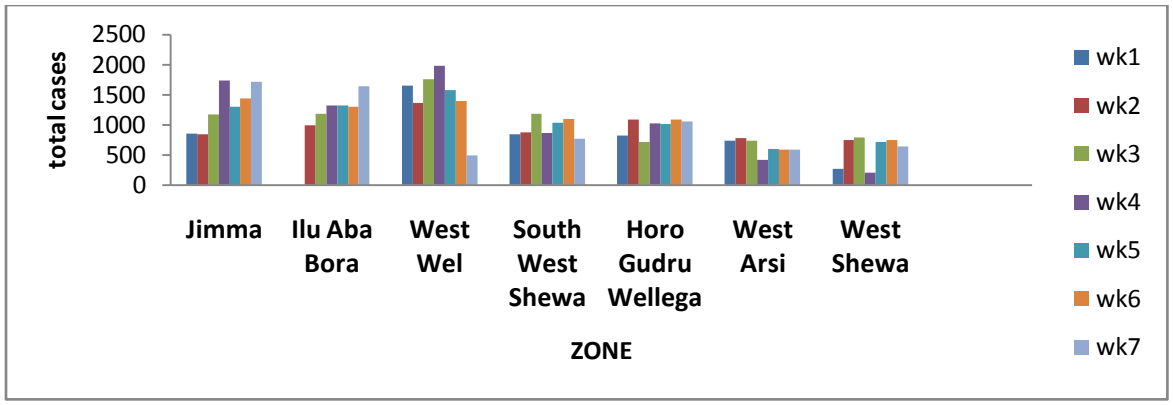


Figure 16: Malaria confirmed and clinical cases by zone of Oromia Region, week 1-7, 2013

2) Meningitis

During week 7, a total of 129 meningitis cases and 3 deaths were reported nationally by weekly report. The highest cases 74 (53%) were reported from SNNP region followed by Oromia 52(37%), Amhara 2(%) and Tigray 1(%). Sidama zone was reported the highest number of cases 31(%), of which Shebedino, Dale and Wonsho contributed the highest number of cases. Next to Sidama zone Hawasa town reported 12(%) and the rest cases 43 (%) were sporadically reported from Halaba, Gamo Gofa, Benchi maji, Gurage, Hadiya, Keffa. Kembata Timbaro, Konta, south omo and wolayta zones of the region.

Of the cases reported from Oromia region, west Arsi reported majority of the cases 45(%) while the rest 7 (%) cases were sporadically reported from Nekemte, Bale, and Arsi zones. Shashemene rural, Shashemene Town, Shalla and Wondo woredas reported

During Week 8, a total of 99 suspected meningitis cases were reported, of which 61(%) were from SNNP and 38(%) were from Oromia. Of the cases reported from SNNP in week 8, majority of the cases were reported from Sidama32 (%) zone followed by Hawasa town 14 (%), South omo 4 (%) and Walaita 3 (%).

Among the cases reported from Oromia region in week 8, west Arsi 31(%) and Guji 7 (%). Sheshemene rural, Shashemene town, Arsi Negele and Shalla woredas were contributed the highest number of cases to the cases reported from west Arsi zone while of the cases reported from Guji zone three cases were from Bore woreda while the rest four cases were sporadically reported from Girja, wadera, Ana sora and Adola woredas of the zone.

2 Meningitis cases were reported in Merhabet woreda, North showa zone of Amhara region during week 9 telephone communication .

3) Measles

Suspected measles outbreak is reported from SNNP region, Semien Bench woreda, Bench Maji zone during week 8 . As of Feb 22/13 .a total of 80 cases were reported from 6 affected kebeles. The first case was reported on January 14 from Gacha kebele and gradually spreading to other kebeles. Of the reported, the majority cases were from Bransha kebele 31(39 %), followed by Gacha17(21%)

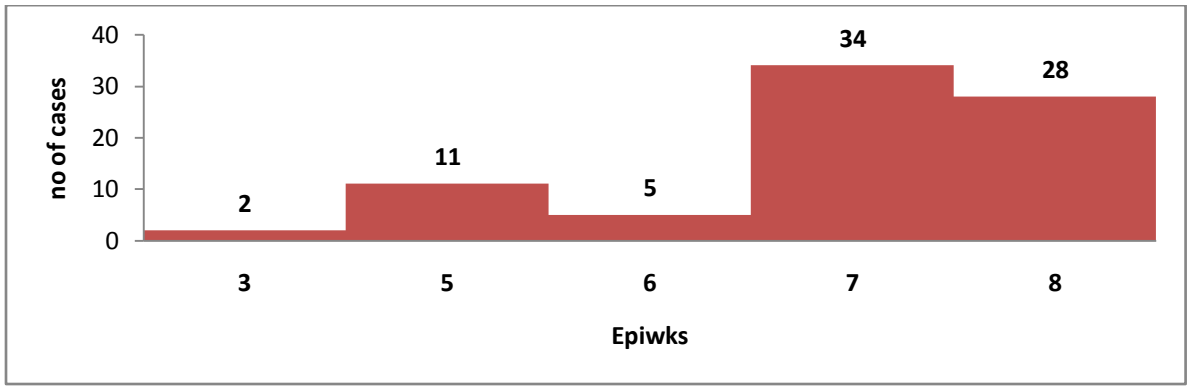


figure 17, Measels outbreak in Semen Bench woreda of Bench maji zone from week 3-8 2013

During week 7 in other regions a total of 628 suspected measles cases with no death were reported. Most of the cases 314(50%) were reported from SNNPR region followed by Oromia 235(37%), somalia 37 (6%) and Amhara 23(3.6%), the other cases were sporadically reported from Addis Ababa, Benishangul Gumuz, Afar and Harari regions. Among the total cases reported from SNNP region, the highest cases were reported from Gamo Gofa234 (74.5 %), followed by Benchmaji80(25.4 %) and Segen 25(7.9%) cases were reported while Seama , Guraga and Silita zones reported eight , three and two cases respectively .

Irrespective of the size of the region Oromia reported the second heights number of cases, of which Arsi 113(48%) , Kelem Wollega 55 (23%), West Shewa 21 (%) and Bale 19(%) while the rest few cases were sporadically reported from other zones of the region

4) Rubella

During week 8, a total of 16 Rubella cases were reported from Benishangul Gumuz region, Metekel zone, Wenbera wereda, when we compared with week 7 , cases were decreased (fig 9)

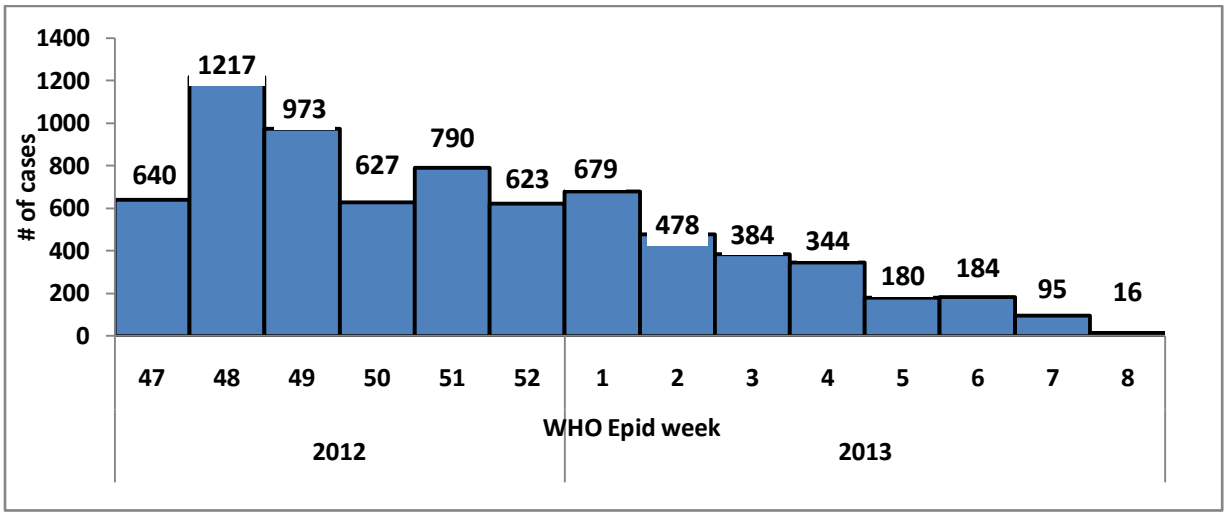


Fig18 Rubella cases reported from wembera wereda by week, from week 47- 8. 2013

5) Polio

Nationally, a total of 18 suspected AFP cases were reported, of which 7 cases from Oromia, SNNP and Amhara regions report 4 cases each, the rest Tigray 2 and somalia 01 cases.

V .Response activities

- Vaccination against meningitis started in Sheshemene and Arsi zone,
- Team sent to Meta Robi of west Shewa zone to investigate and respond to measles outbreak.
- Teams are preparing and will be deploy in order to further investigate and guide appropriate response in to semen bench woreda.

9.2 Sentinel site work evaluation review meeting report

By . Woubayehu Kassa , Addis Ababa/Ethiopia ,January , 2013

INTRODUCTION

Influenza is one of the contagious respiratory disease which is caused by influenza viruses. There are different strains of Influenza virus (A, B, C); only type A and B infect human beings and influenza A is the most importantly predominantly distributed around the world , it has also different subtypes ,to know which strains are circulating worldwide and has great contribution in the production of Vaccine .

Ethiopia start influenza sentinel surveillance at November 2008,at one health center targeted in ILI (outpatient or ambulatory cases)and at one hospital targeted Sever acute respiratory infection (SARI) cases in Addis Ababa city administration , in 2009 the laboratory got its full capacity to diagnose influenza viruses by using RT_PCR ,in 2010 the sites are expanded in to two sites , Kolfe Health center and Akaki health centers both are for ILI sites. Currently there are four functioning Influenza sentinel surveillance sites (Kolfe HC, Akaki HC, Shiromeda HC and Yekatit12 Hospital) ,the aim of the sentinel surveillance is to determine the infection burden of the influenza viruses which contribute a great input in to the production of vaccine other advantage is to know which virus strain is circulating in the country and knowing seasonality of the viruses .

Objective

General objective

The main objective of the review meeting is just to assess the gaps and challenges in the influenza sentinel surveillance and to improve by taking the appropriate measure

Specific objectives

- To discuss gaps and challenges with each sentinel sites focal persons and to give direction how to provide quality data..
- To share experiences with each sentinel site To discuss on influenza sentinel surveillance current status and giving them supportive supervision feedback.

- To discuss the correct handling of formats and documentation for Influenza Sentinel Surveillance , aggregate weekly data, individual cases based formats

Methods

every two month there would be a one day review meeting organize by NIL and PHEM section , all sentinel site focal person and kifle ketema health desk officer would invited for the review meeting focal persons from the four sites present a report the work performance , LCD were used for presentation.

Achievements

There was a discussion with all of the representative focal persons about the challenges that they face, how to capturing each cases and generate quality data would give emphasize during the training , the stock of VTM and some other issues were raised and discuss in detail.

From each sites , focal persons present the two month work performance , during one day training couples of topics have been addressed by participants from NIL,PHEM staffs , EFETP residents and focal persons from all influenza sentinel sites ,some of the topics which is addressed and presented :- influenza surveillance site (epi and gaps) , supportive supervision feedback both are by PHEM staffs ,Influenza sentinel site laboratory data by NIL , Specimen collection ,storage and transportation by EFETP residents were given. Reports from YK-12 hospital SARI focal person, from Sheromeda health center , Akaki health center and Kolfa health center (all of them are ILI center) presented their performance . after each presentation the room was opened for questions and discussions. A number of questions were raised and answered especially by the PHEM staffs .Most of the presentation were focused on the work performance ,challenges and gaps there was also a presentation on Specimen collection , storage and transportation .

during the presentation YK- 12 hospital focal person presented the three month performance data and it was very low comparing with others site , the main problem in Yekatit 12 hospital is misunderstanding of capturing SARI cases and also there was a problem on filing the aggregated data the issue create hot discussion and finally the room decided to give on site training how to fill the formats and aggregated data , when we see the performance of each site kolfa health

center performed very well even if it establish in 2010 most of the positives cases were from there and the site can be a role model for the other sites .

Challenges identified during site supervisions

- Flu B reagents are not available for the couple of months and it is a big challenge for the laboratory side
- all VTM(Viral transport medium) which is found in the laboratory and at the sentinel site were expired
- Absence of documented laboratory result (hard copy)
- Lack of awareness on flu surveillance by the general staff at the health facilities, many cases were likely missed because all cases are not referred for sampling
- Absence of printer, photocopier, functional computer ,non functional refrigerator in some sites
- Work over load, shifting of trained staffs to other work unit (Akaki HC and Kolfe HC Sheromeda health centre)

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: Woubayehu Kassa Abera

Signature: _____

Place: _____

Date of Submission:

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

Name of advisor: _____

Signature: _____

Date: _____