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

Getaneh Abrha

Submitted to the School of Graduate Studies of Addis Ababa University in Partial Fulfillment for the Degree of Master of Public Health in Field Epidemiology

May 2014

Addis Ababa

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Examiner

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Abbreviations

AAU, SPH	Addis Ababa University, School of Public Health
AFI	Acute Febrile Illness
AFP	Acute Flaccid Paralysis
AIDS	Acquired Immunodeficiency Syndrome
AR	Attack Rate
AWD	Acute Watery Diarrhea
BLD	Bloody Diarrhea
CDC	Center for Disease Control and Prevention
CDs	Communicable Diseases
CFR	Case Fatality Ratio
CSA	Central Statistical Agency
CSF	Cerebra Spinal Fluid
DRMFSS	Disaster Risk Management & Food Security Sector
EC	Ethiopian Calendar
EDHS	Ethiopia Demographic Health Survey
EFY	Ethiopian Fiscal Year
EHNRI	Ethiopian Health and Nutrition Research Institute
ELISA	Enzyme Linked Immunoservant Assay
EPHI	Ethiopian Public Health Institute
EPI	Expanded Program on Immunization
EPRC	Emergency Preparedness and Response Committee
EPRP	Emergency Preparedness and Response Plan
FGD	Focus Group Discussions
FMOH	Federal Ministry of Health
GPEI	Global Polio Eradication Initiatives
HC	Health Center
HEWs	Health Extension Workers

HFs	Health Facilities
HH	Household
HIV	Human Immunodeficiency Virus
IDSR	Integrated Diseases Surveillance and Response
IFHP	International Family Health Project
IgM	Immunoglobulin M
IRB	Institutional Review Board
IRS	Indoor Residual Spray
ITNs	Insecticidal Treated Nets
KAP	Knowledge, Attitude and Practice
KEMRI	Kenyan Medical Research Institute
Km	Kilo meter
LLINs	Long Lasting Insecticidal Treated Nets
LP	Lumbar Puncture
MDGs	Millennium Development Goals
MIS	Malaria Indicator Survey
MOH	Ministry of Health
MoWE	Ministry of Water and Energy
MSF	Medicines sans Frontiers
NID/SNID	National/Sub-National Immunization Days
NNT	Neonatal Tetanus
NP-AFP	None Polio - Acute Flaccid Paralysis
OPV	Oral Polio Vaccine
ORS	Oral rehydration salt
OTP	Outpatient Therapeutic feeding Program
PF	Plasmodium Falciparum
PHEM	Public Health Emergency Management
PV	Plasmodium Vivax
RDT	Rapid Diagnostic Test
RDT	Rapid Diagnostic Test
RHB	Regional Health Bureau
RL	Ringer Lactate

RNA	Ribonucleic Acid
RRT	Rapid Response Team
SAM	Severe Acute Malnutrition
SC	Stabilizing Centre
SIA	Supplementary Immunization Activities
SNNPR	South Nations, Nationalities and Peoples
TB	Mycobacterium Tuberculosis
TFP	Therapeutic Feeding Program
TI	Trans isolate
UN	United Nation
UNICEF	United Nations Children's Emergency Fund
VPD	Vaccine Preventable Diseases
w.h.o	Woreda Health Office
WASH	Water Sanitation and Hygiene
WHO	World Health Organization
WPV	Wild Polio Virus
ZHD	Zonal Health Department

Executive Summary

This document contains a two years Field Epidemiology Training Program outputs, which is equivalent with thesis to be submitted to graduate school of public health for partial fulfillment of master degree in Field Epidemiology. It includes reports of diseases outbreak investigations, public health surveillance data analysis, surveillance system evaluation, Health profile description, narrative summary of disaster situation report, manuscripts, abstracts, PHEM weekly bulletin, post meningococcal meningitis outbreak assessment and supportive supervision reports.

Accordingly the document is organized in nine chapters; chapter one contains diseases outbreak investigations. I conducted two outbreak investigations; the investigations were conducted using descriptive- cross sectional study designs, and the other one was a descriptive supported by case control study design. All investigation reports contain abstracts, introduction, methods, discussions, conclusion, recommendations, acknowledgement and references separately.

Chapter two contains report of surveillance data analysis which was conducted on Measles surveillance; I used five years measles line list and case based data. Measles prevalence in South, Nations, Nationalities and Peoples Region was noticeably identified; trends and seasonality of measles disease were determined. As well as most at risk populations and vaccination status and achievements were described.

Similarly, chapter three addresses surveillance system evaluation entitled "An Evaluation of Surveillance System in Oromo Nationality Administrative Zone". This chapter clearly presents the purpose and objectives of the surveillance system after the PHEM system instituted and its progress towards its objectives. The PHEM surveillance attributes: simplicity, flexibility, stability, acceptability, representativeness, timeliness and data quality were also assessed in the chapter.

Chapter four contains assessment of Oromo Nationality Administrative Zone Health Profile. In the chapter health and health related data of the Zonal populations were evidently presented which is very imperative for prioritizing high priority problems. It is basic for planning and undertaking appropriate public health interventions; and is entry point for operational public health researches. Stake holders of health and health related issues will access evidence based information from this chapter.

Chapter five contains Scientific Manuscripts for Peer reviewed Journals. The manuscripts were prepared according to Ethiopian Journal of Health Development author's guideline.

In chapter six, abstracts of outbreak investigations and surveillance data analysis were presented. The abstracts entitled "investigation of measles outbreak-Aleta Chuko District, Sidama Zone, Southern Nation, Nationalities and People's Region" , "investigation of Poliomyelitis Outbreak-Doolo Zone, Somali Region, Ethiopia" and "High-Measles prevalence—South Notions, Nationalities and Peoples Region, Ethiopia" were prepared and communicated.

Chapter seven includes the narrative disaster situation report, Belg Season Humanitarian Needs Assessment. As part of early warning and vulnerability assessment, the Government of Ethiopia has been conducting nationwide Humanitarian Needs Assessments in which health and nutrition needs are parts, twice a year in collaboration with different government sectors and partners. The assessment was conducted to identify potential problems which need humanitarian assistance. Based on the report from the assessment humanitarian requirement document was developed and shared with potential partners for response. This chapter clearly presents Belg Season Emergency Health and Nutrition needs assessment conducted in North Wollo and Wag Himra Zones of Amhara Region.

One protocol for epidemiological study is included in chapter eight. The proposal is entitled "Assessment of Knowledge, Attitude, Practices and Determinant Factors towards Malaria Prevention and Control Strategies".

Chapter nine encompass Public Health Emergency management weekly bulletin, Supportive supervision missions, and Post meningococcal meningitis epidemic evaluation mission conducted in Gambella, Amhara and SNNP Regions. The missions addressed overview of PHEM System Regional down to the Facility levels.

CHAPTER I– OUTBREAK INVESTIGATION

1.1 Investigation of Measles outbreak – Aleta Chuko Woreda, South Nations, Nationalities and Peoples Region, Ethiopia, January 2014

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Abstract

Introduction: Measles is one of the leading causes of death among young children even though a safe and cost-effective vaccine is available. In 2011, there were 158 000 measles deaths globally – about 430 deaths every day or 18 deaths every hour. More than 95% of measles deaths occur in low-income countries with weak health infrastructures. Measles vaccination resulted in a 71% drop in measles deaths between 2000 and 2011 worldwide. On 8 November 2013, Aleta Chuko Woreda reported suspected measles outbreak; and team was deployed to investigate the outbreak.

Methods: Reviewed of line lists from the Woreda Health Office; surveillance reports and records were reviewed. Defined cases based on national measles guideline. Besides, both descriptive and case control study designs were applied and data was analyzed using MS-Excel and EPI-INFO 7.

Results: Totally 478 cases were reported from Aleta Chuko Woreda during the outbreak period. Close to 129(27 %) of the cases had conjunctivitis, 410(85.8 %) had cough; 61(12.7 %) of them had diarrhea. Two hundred four (53%) of the cases were Males. Cases were aged 3 month to 60 years old; with mean age of 9 years and median age of 8years. Ninety four (19.6 %) of the cases were under five, while 384(80.3 %) of them were five and above years old. Only 186 (38.9 %) of the cases had one dose vaccination history; while 262(54.8%) and30 (6.3 %) of the case were unvaccinated and did not known their status respectively.

Conclusions: Age groups five and above year olds were highly affected. There was no outreach site and functional Cold chain system in the affected Kebeles of the Woreda. The protective effect of the vaccinations made so far were questionable. Low vaccination coverage, low community awareness and non-functional cold storage likely contributed to the outbreak.

Community awareness and enhancing quality vaccination coverage are crucial to reduce measles incidence in this Woreda and in the Region.

Key Words: Measles cases, age group, Vaccination, Aleta Chuko

Introduction

The measles virus is a member of the genus Morbillivirus of the Paramyxoviridae family in which humans are the only natural hosts of the measles virus. The virus appears to be genetically stable—there is no evidence that the viral antigens have significantly changed over time. When considered along with epidemiological information, identification of a specific virus genotype can suggest the origin of an outbreak. The risk factors for measles virus infection include infants who lose passive antibody before the age of routine immunization, children with vitamin A deficiency and immunodeficiency due to HIV or AIDS, leukemia, alkylating agents, or corticosteroid therapy, regardless of immunization status and children who travel to areas where measles is endemic or contact with travelers to endemic areas. Malnourished and young children are at higher risk of developing complications and mortality from measles infection. Many children experience uncomplicated measles [1]. In 1980, before the launch of the PEI program, measles caused an estimated 2.6 million deaths each year [2]. Measles is one of the leading causes of death among young children even though a safe and cost-effective vaccine is available. In 2011, there were 158 000 measles deaths globally – about 430 deaths every day or 18 deaths every hour. More than 95% of measles deaths occur in low-income countries with weak health infrastructures. Measles vaccination resulted in a 71% drop in measles deaths between 2000 and 2011 worldwide. In 2011, about 84% of the world's children received one dose of measles vaccine by their first birthday through routine health services – up from 72% in 2000[2]. Measles is one of the communicable diseases still causing preventable mortality and morbidity in the country and currently in Aleta Chuko Woreda of Sidama Zone. There was not any outbreak in all bordering Woredas; prior to the occurrence of measles outbreak in Aleta Chuko Woreda. On 30/202006EC, the Woreda reported the index cases of suspected measles outbreak from Watta Village. Immediately in consultation with the ZHD/PHEM, five specimens were sent to EHNRI and all were confirmed to be IgM positive. Since the Woreda had not funded EPRP; resources were channeled immediately from the RHB/ZHD and assistance from MSF for case management

activities that conducted mostly using home based approach. Because of the duration of the outbreak and high caseload flows, the Regional Health Bureau requested the Federal PHEM to assist the district health authority in the investigation. Accordingly, team comprised of EPHI and RHB officers was deployed on 24 December 2013 to learn more about the risk factors of the outbreak, interventions made so far and identify and undertake appropriate public health control measures.

General Objective

To describe and determine risk factors and recommend appropriate public health interventions to contain the spread of the outbreak in Aleta Chuko Woreda

Specific objectives

- To describe case by person, place and time
- To determine the risk factors of the outbreak
- To assess the intervention measures taken
- To recommend appropriate public health measures

Materials and Methods

Investigation area and Population

Aleta Chuko Woreda is among the 19 Woredas of Sidama Zone of South Nations, Nationalities and Peoples' Region (SNNPR); located by 62 Km from the Regional Capital and about 328Km from Addis Ababa. The Woreda emerged in 1998 EC from Aleta Wondo Woreda, which is bordered: by Dale in the North; Darra in South; Aleta Wondo in the East and Loka Abaya Woreda in the West. It comprised of 30 Kebeles (26 rural and 4 urban); most of the Kebeles are found in Kola climatic zones; with total population of 2003, 971 people of which 31,819 are under5 and 97,906 under the age of 15 years(Central Statistical Agency 2012). Previously two SIAs were conducted; in 2002 and 2005 EC, as to the Woreda Health Office that covered under five populations and in both situations the achievements were more than 100% coverage.

Study Design

We primarily conducted a descriptive study, and supported by case control study.

Sample size

Unmatched case-control study in the ratio of 1:1 (50 case-50 control pair) was conducted to describe /determines risk factors for the infection. Controls were selected conveniently from the place where the recent cases were identified.

Cases were defined based on national measles guideline.

- **Suspected**: Generalized maculo-papular rash and fever (38.5^0C and above) plus one of the following: cough or coryza or conjunctivitis or clinician suspects measles
- **Confirmed:** A suspected case that is sero-positive for IgM by ELISA (Lab-confirmed) or epidemiologically linked to a lab-confirmed case
- **Epidemiologically linked case:** A suspected measles case that has not had a specimen taken for serologic confirmation and is linked (in place, person and time) to a laboratory confirmed case

Data collection and analysis

Data on immunization coverage and other health related data were collected from Woreda and zonal health department. Surveillance data of the District Health Office was reviewed and to set background status of the disease and a structured questionnaire was used for interview the patients or controls families of. Active search was conducted using line listing of cases. Some of the information collected was information on demographic characteristics, clinical presentation (on cases only), and potential risk factors. Discussions were also made with RHB, ZHD, Woreda health personnel, case patients and community members. Case patient observations were made at health centers and at their homes. Data were analyzed using MS Excel, GIS and Epi-Info7 software.

Results

Descriptive Analysis: The outbreak was first detected on 3/102013 in Watta Village, Chucho Woyama Kebele. Five suspected specimens were taken immediately and all of them were IgM positive. This triggered both ZHD/RHB to visit the Woreda and gave additional supports. The Woreda reactivated after the confirmation of the cases; being measles and mobilize the community on how to report similar illnesses. That is Schools were sensitized and focal persons assigned to update if any absenteeism and report back to health personnel to track back their

absenteeism. To make the system more sensitive, the office distributed cases definitions and posted specially in HFs and areas community may gathered. Close to 478 measles cases were reported from Aleta Chuko Woreda during the outbreak period; with no mortality records. Close to 129(27 %) of the cases had conjunctivitis, 410(85.8 %) of the cases had cough, while 61(12.7 %) of them had diarrhea; only 0.6 %(3/478) of the cases had vomiting. Two hundred Fifty four (53%) of the cases were Males. Cases were as low as 3 months old and as high as 60 years old, with mean age of 9 years and median age of 8years. Ninety four (19.6 %) of the cases were under five, 274(57.3 %) of them five to 14, while 110 (23 %) of them were15 and above years old (Fig.1 below).

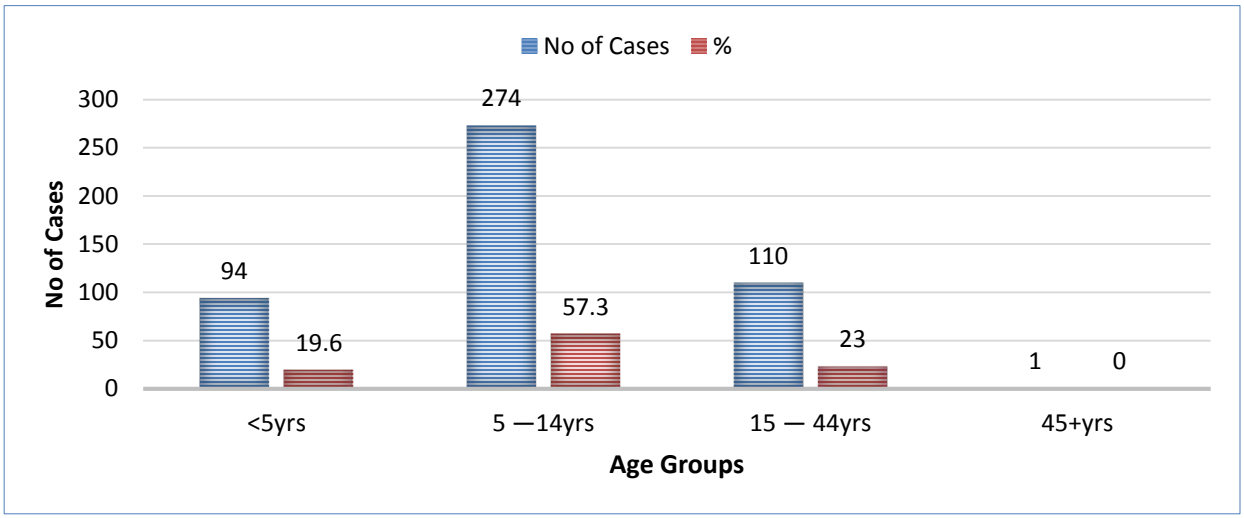

Figure 1: Measles Case Distribution by Age Group, Aleta Chuko Woreda Sidama Zone, 2014

Only 186(38.9 %) of the cases had one dose vaccination history; while 262(54.8%) and 6.3 %(30/478) of the case were unvaccinated and unknown their status respectively (Fig.2 below).

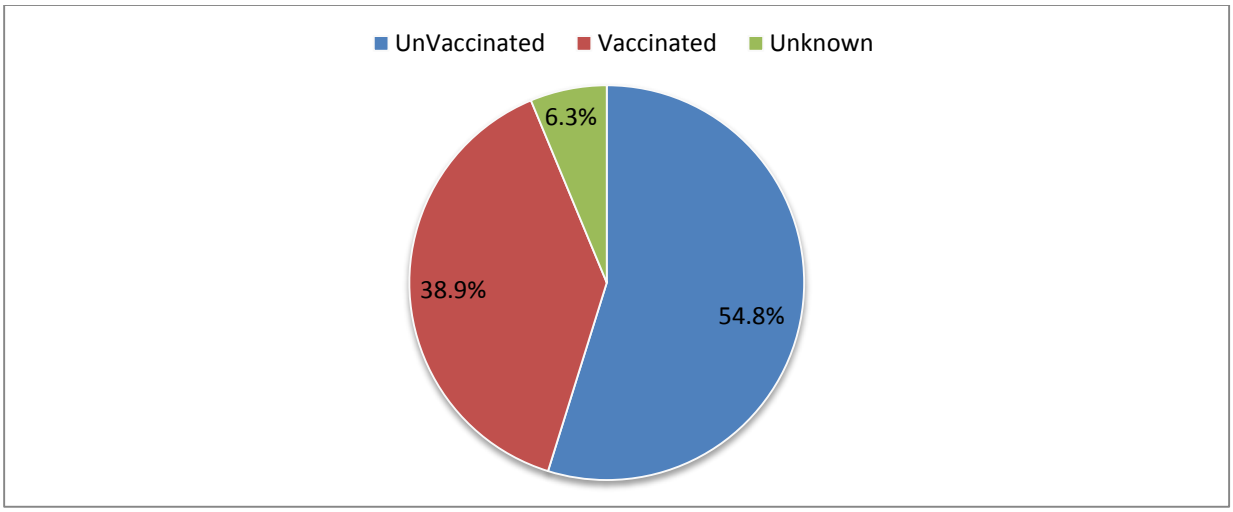

Figure 2: Measles Cases Category by Vaccination Status, Aleta Chuko Woreda, Sidama Zone, 2014

The index cases were detected on 22/10/2013 in Watta Village, and reach suspected outbreak status on 3/11/2013 in the same Village, Chucho Woyama Kebele Moreover; the outbreak continued up to 6 January 2014. More cases were observed on the 9th November, then followed by the 11th November and December 1st 2013(fig.3 below)..

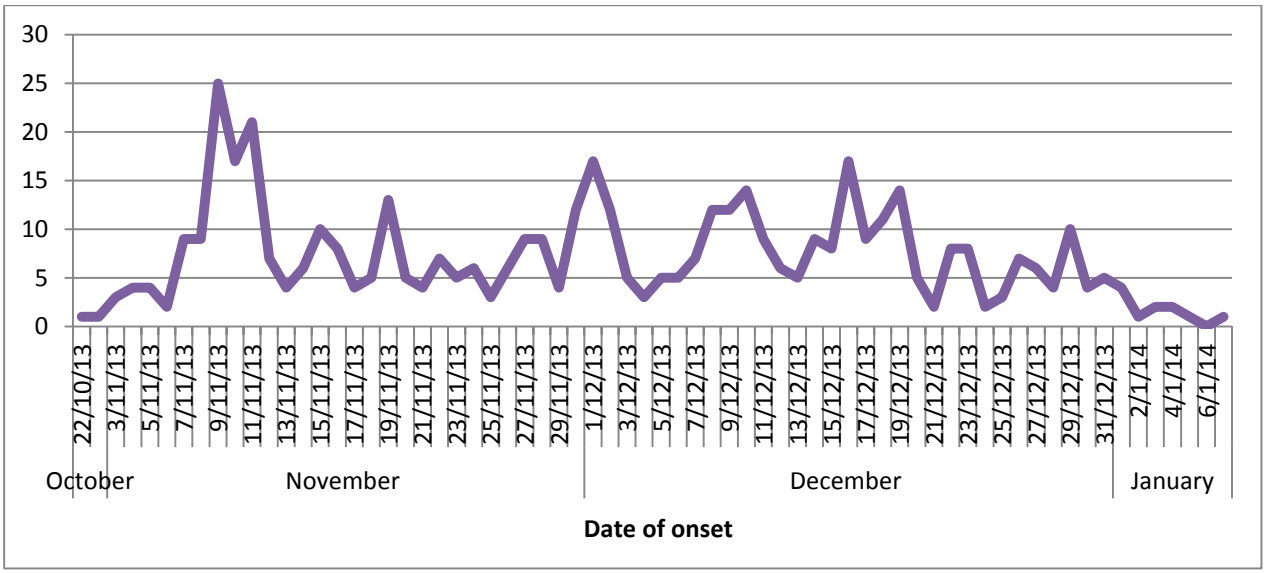

Figure 3: Measles Incidence by Date of Onset, Aleta Chuko Woreda, Sidama Zone January 2014

When it summarized on weekly basis, the index case was on week 43, with the highest cases of 70, 66 and63 during the weeks 45, 50 and 51 respectively. Moreover, the last case was reported on week 2 of 2014(fig.4 below).

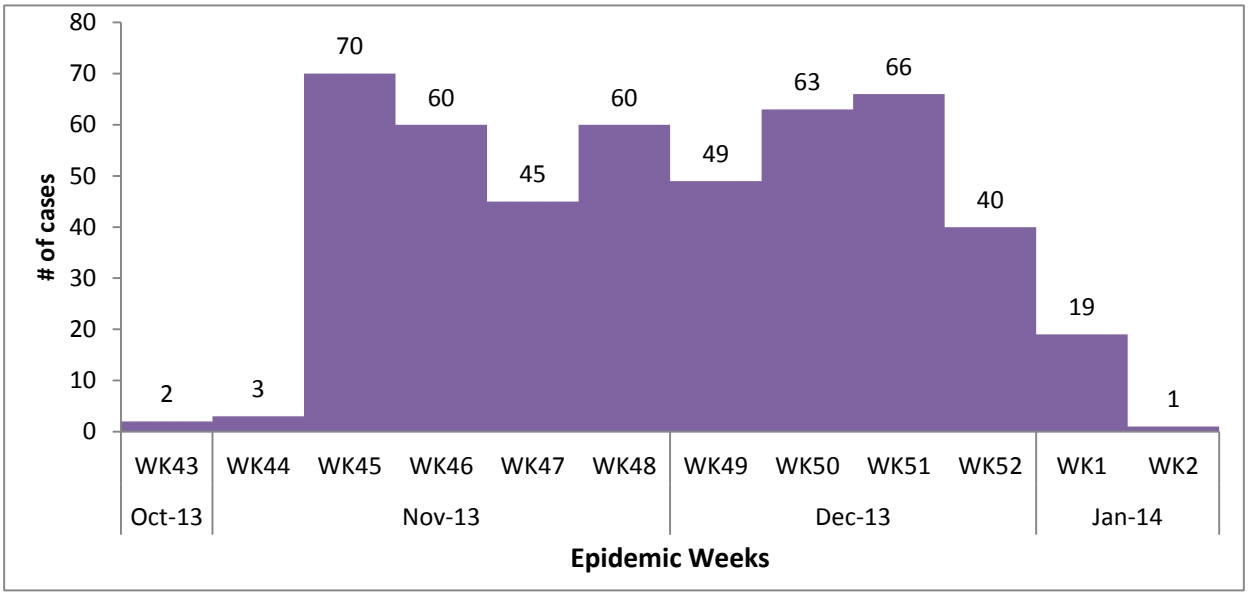

Figure 4: Measles Cases Load by Epidemic Weeks, Aleta Chuko Woreda, Sidama Zone, January 2014

Cases were from 24 Kebeles out of the 30 Kebeles in the Woreda; although varied in caseload in which the highest cases were from Chucho Woyama 265(55.2%), Chuko Woyama 61(12.7%) and Chuko01 35(7.3%) cases respectively (fig.5 below).

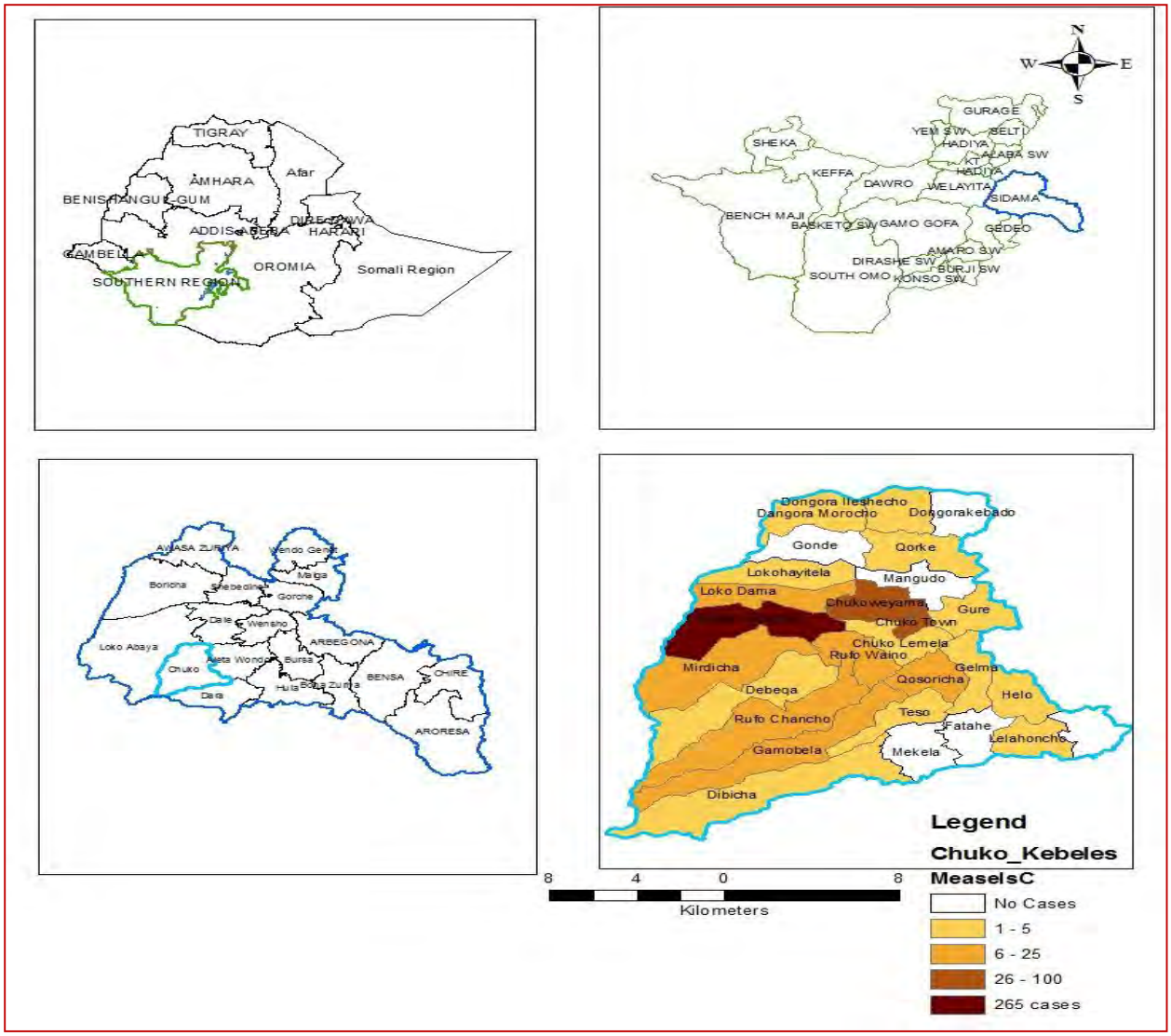

Figure 5: Map showing density of Case Distribution by Kebele, Aleta Chuko Woreda, Sidama Zone, January 2014

Due to those communities' practices on handling measles illness, the office decided to manage cases and treated by visiting house-to-house as to avoid death. Only 11 complicated out of the 478 cases were admitted; while the rest uncomplicated cases rather prescribed the necessary medication to take being at their homes. To control the transmission and stop the outbreak, about 84000 doses were distributed and 53140 (63%) of the eligible 84307 under 15year olds in 24 hot spot Kebeles were vaccinated.

Analytical investigation: We recruited 50 cases control pair; with minimum and maximum ages of one and 25 year olds. In addition, their mean and median ages were nine and eight years

respectively. On unmatched bi-variate analysis, some variables relating to risk factors on knowledge about measles disease transmission and preventions, vaccination status, religion, educational status and other variables were collected for further investigation and possible justifications of the outbreak. However, taking the exposures on Housing condition, education, religion, occupation, KAP towards how the measles disease can transmit, prevent and control were not statistically significant among the matched cases and controls enrolled. However, it does not mean there had not public health importance. For instance, the knowledge level of the interviewed 100 participants for the case control study relating to how the disease can be prevented was 55%. Similarly, most 61 (61%) of the case control pair had not vaccination history, while 14(41%) of them with vaccine exposure had developed the diseases. Close to 49% of the respondents claimed with an educational background of mainly with first cycle primary education level. Many factors that may exacerbate the problem were observed at the ground.

Discussions

The cases were first reported from Watta village, Chucho Woyama Kebele and spread to other Kebeles in the Woreda. Despite the fact that very high caseload, it was less severe; there was no any death among the reported 478 cases. The origin of the problem seems to be from Chucho Keble of the Woreda; similarly, the index cases too. This is because; there were no reported cases in the neighboring Woredas. Since the this Woreda is separated from Aleta Wondo Woreda, Actual EPI coverage was questionable; in that outreach sites from the center was considered as hard to reach areas; especially, the current highly affected Kebele is still hard to reach and had not outreach site to the nearby communities. But, to prevent child hood illness and ultimately death, there are basic strategies for sustained measles morbidity and mortality reduction tasks like Routine immunization of > 90% of children aged 9 to 11 months; Provide a second opportunity for measles vaccination; Case-based measles surveillance and Improved case management including provision of vitamin A[1]. The Woreda Health Office tried its best to stop the spread of the disease; rather the spread continued and covered many Kebeles in the Woreda. This is due to that Measles is so contagious that if one person has it, 90% of the people close to that person who Are not immune will also become infected with the measles virus [3]. Even though prolonged existence of the outbreak with the inclusive of almost all ages, its severity was very low compared to some studies; About 30% of Measles cases can result to several

complications such as pneumonia (up to 5% of the cases), Diarrhea (up to 8% of the cases), ear infections (up to 10% of the cases), encephalitis (up to 0.1%), blindness and death. In developing countries, the case-fatality rate may be as high as 25%. Measles is also a leading cause of blindness in African children [3]. Moreover, this outbreak was very less severe than similar outbreak in bale Zone in 2011 with case fatality rate of 9.1% [4]. Even if duplicated efforts in our country to eliminate measles then to highly decrease child mortality; still we are too far from the target that; By the 2020s, the strategies put in place to reach the MDGs should have brought deaths among children under five years old to an all-time low. Polio should be eradicated, and measles eliminated in all countries [5].

The EPI coverage of the Woreda was close to 96% during the outbreak time. However, there was big gap between the Woreda report and actualities at the ground; during our community assessment on cases control study as one exposure among the cases and controls. That may be the main risk factor for the occurrence and longevity of the outbreak; that resulted in many cases that might have been affected social activities. But, Vaccines are special because: first, unlike many other health interventions, they help healthy people stay healthy and in doing so help to remove a major obstacle to human development. Second, they benefit not only individuals but also even entire populations (the eradication of smallpox is a case in point). Third, vaccine impact on populations is more rapid than that of many other health interventions; finally, vaccines are both life- and cost-saving [6].

Conclusions

We concluded that the outbreak originated from Watta Village, Chucho Woyama Kebele of the Woreda. This is because there was no any reported measles disease in neighboring Woredas prior to this outbreak. The outbreak was detected timely and reposes started immediately; though the duration of the outbreak made questionable the quality of the intervention. But, the previous immunization reports and low community awareness hampered the stoppage of the problem. There was no outreach site in the mainly affected Kebeles of the Woreda, and Cold chain issue, leave alone the EPI coverage reports, the protective effect of the vaccine provided so far was questionable as to create herd immunity. But, there was a very strong response during the outbreak period in managing cases, mobilizing the communities and awareness creation activities. For that reason there was no death reported. However, there was low achievement on

vaccination conducted and currently there is less attention to the issue under caption. The outbreak primarily affected those aged five and above year olds. Low vaccination coverage, low community awareness due to low education background and limited health information and shortage and non-functional cold storage nearby the community likely contributed to the outbreak. Undertaking supplementary vaccination activities, educate the community, enhancing routine vaccination coverage and improvement in cold chain operation and maintenance are crucial in this regard to reduce measles incidence in Aleta Chuko and in the Region.

Recommendations

Even though the RHB/PHEM down to the Woreda level is becoming strong in managing outbreaks, still we strongly recommend the following:

- The HEWs have to devotedly work to make aware the community towards the benefit of vaccination and Increase their health seeking behavior
- Since communities are moving to far low land areas of the Woreda, outreach site should be accessible to the beneficiary community
- The Woreda Education office has to pay attention for access to education; as it can indirectly help for awareness creation of the communities on diseases like measles
- The EPI coverage reports of Woredas across the Zone and the Region should genuinely be the actual work performance; as not misleading public health interventions

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Annex 1: Checklist for Measles Outbreak Investigation, Aleta Chuko Woreda, December 2013

Respondent status; case_____ control _____ code_____ date of data collection_____

Address**:** Woreda ___Kebele _____village_____ Birth place_____ phone_____

I. Socio-demographic information

1. Age **:**_____ ; Gender**:** M __ F ____
2. Occupation**:** Farmer ☐ Employed ☐ Unemployed ☐ Student ☐ Pastoralist
3. Total family members: _____ ,<5 years_____ <15years_____
4. Ethnic group _____
5. Religious**:** Orthodox☐ Protestant ☐ Muslim ☐ Catholic ☐ other_____
6. Marital status :Single☐ Married ☐Widowed ☐ Divorced ☐
7. Education status: non-formal☐ Illiterate ☐ Primary ☐ Secondary ☐ Tertiary ☐
8. Parents' occupation :Farmer☐ Merchant ☐ Employed ☐ Unemployed ☐ Student ☐ Pastoralist ☐
9. Parents' education :Illiterate ☐ Primary ☐ Secondary ☐ Tertiary ☐

I. Clinical presentations (ask case ONLY)

10. What were the symptoms?
    a. rash: ☐ yes no ☐ b. fever: ☐ yes no ☐ c. runny nose (Coryza): ☐ yes no ☐
    d. red eyes: (Conjunctivitis) ☐ yes no ☐
    e. cough : ☐ yes no ☐ f. other _____

❖ **Ask ONLY if there is complications**

f. Pneumonia:☐ yes no ☐
g. Cornea: ☐ yes no ☐
h. Blindness : ☐ yes no ☐
i. Convolution ☐ yes no ☐
j. Otitis media: ☐ yes no ☐
k. diarrhea : ☐ yes no ☐
l. Feeding problem☐ yes no ☐

11. Date rash onset?: ____/_____/2013
12. Duration of rash_____

13. Location when rash started? District _____ Kebele _____
14. Date seen at health facility after rash? ☐ yes no ☐, if yes date____/____2013
15. If so, treatment taken? ☐ ORS ☐ Antibiotics ☐Vitamin A ☐ TTC ☐Antipyretic ☐ Other_____
16. Whether the case Admitted:☐ yes no ☐,
17. If admitted ; date of admission :___/___2013
18. Do you/did the case develop complications? ☐yes ☐no
19. If yes, which one? ☐pneumonia ☐ear infection ☐diarrhea ☐ encephalitis ☐ others____
20. Outcome: ☐Alive ☐ death ☐ any disability_____

II. Risk factors

21. Have you vaccinated ever? ☐yes ☐no
22. If yes, number of measles vaccine doses received? ☐ by history ☐ by card (**check**)
23. Date last measles doses vaccine received? ___/____/_____
24. Age of vaccination at first vaccinated; _____
25. If not vaccinated why? ☐lack of knowledge about vaccination ☐ absence during campaign ☐Other specify: _____
26. Did you ever experience measles/similar illness? ☐yes ☐no
27. Did you have contact with a person having measles symptoms within the last 2-3 weeks? ☐ yes no ☐
28. Travelled to other areas? ☐ yes, no☐ if yes, District _____ Kebele_____
29. Was there a person with measles symptoms in your household ☐yes, ☐ no
30. Sign of Malnutrition :☐yes, ☐ no
31. If yes specify: Moderate _____Severe_____
32. How the malnutrition management is handled? OTP_____SC_____
33. Distance from house to HC? ☐ greater than 5 km ☐5 km or less
34. House condition? ☐ ventilated ☐ not-ventilated

III. KAP indicators

35. What is measles? _____
36. How do you think people get measles? ☐contact with sick person ☐ wrath of God ☐Other specify _____
37. Point out how measles can be transmitted: _____

38. How many people sleeping together_____
39. Explain how measles can be prevented_____
40. Why do people vaccinate their children with measles vaccine? _____
41. What is the right age of child measles vaccination? a. 9 months, b.11 months, c. 23 months, d. other _____,e. don't know
42. Do you think vaccination can prevent measles? ☐ yes no ☐
43. Do you believe medical treatment can cure measles?☐ yes no ☐
44. If not what is the best to get cure from measles illness? _____

1.2 Investigation of poliomyelitis outbreak- Doolo Zone, Ethiopian Somali Region, January 2014

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Abstract

Introduction: When World Health Assembly launched Global Polio Eradication Initiative (GPEI) in 1988, polio was endemic in an estimated 125 countries, with more than 350,000 cases compared to 2010 of fewer than 1,500 cases. GPEI has reduced the global incidence of polio by more than 99.9%. In the African Region, the Polio Eradication Initiative launched its wide-scale activities in 1996 with a slogan "Kick Polio out of Africa by 2000". In 2013, poliomyelitis was detected in Doolo Zone, Ethiopian Somali Region. The investigation was conducted to identify risk factors and to forward appropriate interventions.

Methods: A descriptive cross-sectional and case study designs were employed; medical records and AFP surveillance activities were reviewed and local Oral Polio Vaccine (OPV) coverage was assessed. Data was analyzed using MS-Excel and GIS software.

Results: Nine cases with one death (CFR=11.1%) Wild Poliovirus1 (WPV1) were reported between July and November 2013 from Doolo Zone. The index case was on July 10, 2013 from Boreyal village of Galadin Woreda; next cases were three from Galadin, four and one from Bookh and Warder Woredas respectively. Amongst 55.6% (5/9) of them were males. Their age ranged from 13 months to 15 year olds; with median and mean ages of 4 and 6 years. Families of all cases are pastoralists with limited basic services; frequently move from Ethiopia to Somalia. Cases had fever at the initial stage; then manifested with acute paralysis. Only one case had right

limb paralysis, the rest with left limbs. Seven of the nine cases crossed to Somalia hospitals for medical care; then reported to Ethiopia as WPV1. Most cases had travel history to Somalia and had no OPV exposure.

Conclusion: The poliovirus was imported from Somalia. The virus entered Ethiopia through mobile and vulnerable communities across the border. All cases had developed paralysis. All cases and their peers had not OPV exposure and Surveillance in the area was very weak. Polio eradication strategies should be implemented.

Key Words: polio, polio cases, vaccine, paralysis, Doolo

Introduction

The words polio (grey) and myelon (marrow, indicating the spinal cord) are derived from the Greek. It is the effect of poliomyelitis virus on the spinal cord that leads to the classic manifestation of paralysis. Michael Underwood first described a debility of the lower extremities in children that was recognizable as poliomyelitis in England in 1789[1].

In 1988, the World Health Assembly launched the GPEI. In the first year of the GPEI, polio was endemic in an estimated 125 countries; and there were more than 350,000 cases compared to 2010 when fewer than 1,500 cases were reported. Since 1988, the GPEI has reduced the global incidence of polio by more than 99.9%, three of six WHO regions have been "certified" polio-free (the Region of the Americas in 1994, the Western Pacific Region in 2000 and the European Region in 2002), and one of the three WPV serotypes (type 2) has been eradicated[2,3]. In the African Region, the Polio Eradication Initiative launched its wide-scale activities in 1996 with a slogan "Kick Polio Out of Africa by 2000". Unfortunately, a number of previously polio-free countries were re-infected through polio importation from Nigeria and other polio reservoirs [4]. Importation of WPV is related to frequent contacts between the receiving area and the wild virus reservoir by at least part of the population and low population immunity in the receiving area [4].

The last indigenous case of wild poliovirus (WPV) reported in Ethiopia was in December 2001. However, Ethiopia was affected by six separate WPV importations from neighboring countries during 2004 to 2013 [5]. Ethiopia was polio free for almost three years prior to the first

importation of a wild poliovirus (WPV) from Sudan in December 2004. So far, Ethiopia reported four different importations (from both Somalia and Sudan); totally 41 WPV cases (1 in 2004; 22 in 2005, 17 in 2006 and 1 in 2008) affected five Regions of the country (Tigray, Amhara, Oromia, Gambella and Ethiopian Somali Region). In 2006, 16 wild poliovirus type1 were detected in Somali Region; due to importation and were genetically linked with Somalia wild poliovirus. With one case each in Afder, Degahabour and Kebridahar, while in Doolo zone 13 cases were identified. All cases were from Bookh (6) and Galadin Woredas (6) where the current outbreak is going on. The routine immunization is most critical part of the challenge in polio eradication. In the most recent coverage survey conducted in 2012, significant Regional disparities were observed in Somali persistently low compared to Addis Ababa or Tigray. To address these gaps, the country has developed a two years routine immunization improvement plan, mainly to address those most at risk Regions including Somali Region. Again in 2013, Doolo Zone of the Ethiopian Somali Region affected by an importation of WPV1 outbreaks. A team from the Ethiopian Public Health Institute (EPHI), Somali Regional Health Bureau and WHO was deployed to investigate the risk factors and recommend appropriate control strategies.

Objective

General objective

To describe the epidemiology of the poliomyelitis cases, and to recommend appropriate control strategies to prevent the continuation of the outbreak

Specific objectives

- To describe the outbreak situation by place person and time
- To identify factors for the continuity of the outbreak
- To assess the awareness of the community about poliomyelitis disease
- To identify main gaps and recommend appropriate interventions

Methods and Materials

Investigation area and population

The Ethiopian Somali Region is located in the eastern and southeastern part of Ethiopia. It is the second largest Regional State which contributes to 30% of the total land mass of the country with an estimated area of about 250,000 square kilometers. The Regional Capital is Jigjig, 630 Km from Addis Ababa. The Somali Region has a population of approximately 5 million; 85% of the population is pastoralist and agro-pastoralist. Administratively, the Somali Regional State is sub divided in to nine administrative Zones; which comprised of 68 Woredas and 4 Towns. The current hotspot, Doolo Zone also comprised of five Woredas and a population of 328,696(CSA 2007 projection for 2013). Averagely the Zone is far by some 650 Km from Jigjiga and 1280 Km from Addis Ababa. The Region has common boundaries with the Afar and the Republic of Djibouti in the north, Kenya in the south, Oromia Region in the west, Somalia Republic in the east and South.

Study design

A descriptive –cross sectional and case study designs were employed to investigate the outbreak.

Data Collection and Analysis

First, we collected the case based and lab results from EPHI polio laboratory, and then we made situational updates with RHB /PHEM office about intervention made so far, gaps and challenges of polio surveillance in the hot spot areas, mainly Doolo Zone. Next, we made similar briefing with Woreda Administration and Health offices concerning the progress of the outbreak. Then, we traveled to the Zonal Administration and made similar briefings about; and how to move within the Zone due to security problem; especially in Warder Woreda where the latest case was reported. After the Zone dispatched police officers to escort us during our travel to Nagardale Village, where the case is living, and then did our investigation accordingly. We conducted a descriptive cross-sectional study employing quantitative and qualitative data collection techniques. Persons in close contact to the confirmed polio cases were interviewed; and epidemiologic investigation was carried out on all confirmed WPV cases.

To elucidate causes and determinants of the polio outbreak, we conducted a rapid epidemiological assessment in the villages; routine immunization and cold chain status were assessed at nearby health institutions. Active case search was conducted for cases of acute flaccid paralysis. Attitudes and practices of health care providers and child caretakers were

assessed in affected communities. We assessed the EPI coverage in the affected districts for both routine and SIA coverage, by considering under five years old children nearer to the confirmed cases. In each surveyed community, focus group discussions (FGD) were conducted to assess the awareness and attitudes of the community members toward conditions of poliomyelitis illness. Each focus group consisted of more than 15 members representing various community groups. Separate semi-structured questionnaires were developed to assess the awareness of health workers and child caretakers. Records were reviewed in all nearby health facilities. The investigators inspected and took notes on the status of the cold chain system in all health facilities of the affected communities. During our investigations, we conducted these assessments: Clinical and physical evaluations were completed on all confirmed polio cases.
To do so, we used the National AFP case definitions as stated below;

Suspected AFP*:* Any child less than 15 years of age with sudden onset of weakness or floppiness of one or more limbs or any person of any age in whom a clinician suspects poliomyelitis;
Community AFP definition: Any weakness or paralysis;

Hot AFP case: An AFP case likely to be paralytic polio, either on clinical grounds (Age less than five years, asymmetric paralysis, fever at the onset, incomplete OPV doses, rapid progression of paralysis) and/or AFP case with direct contact to a confirmed case or a case from endemic area.

Confirmed Polio case: A suspected case with wild poliovirus isolation from stool sample

Finally we convened debriefings with the Woreda administrations and RHB/PHEM on what we observed from our assessments and actions suggested to be taken correspondingly at different levels.

All the quantitative data collected were checked, entered on a computer and analyzed using simple MS-Excel/ Pivot table and GIS software.

Results

Totally nine confirmed polio cases and one death (CFR=11.1%) were reported from Doolo Zone of Somali Region between July and November 2013; the index case was on week 28 while the latest cases was on week 45, 2013(fig.6 below).

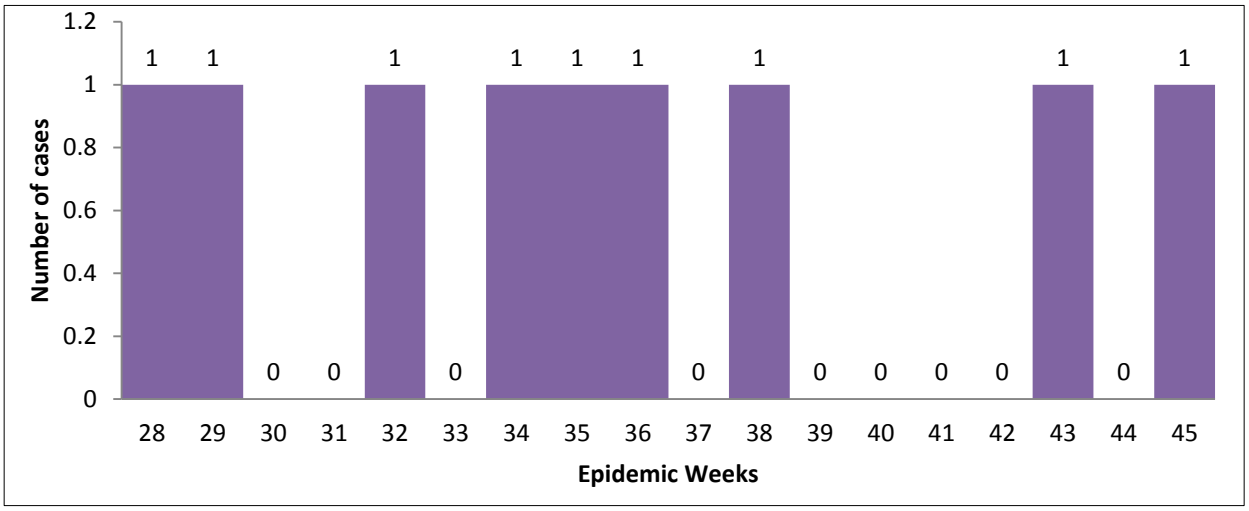

Figure 6: Incidence of Poliomyelitis Cases by Epidemic Week, Doolo Zone, January 2014

Cases were four from Galadin, four from Bookh and one from Warder Woredas in Doolo Zone. The outbreak was first detected on July 10, 2013 in Boreyal Village of Injiro Kebele of Galadin Woreda; next three cases from Dagafur village of Barisacde Kebele of Galadin Woreda; adjacent Mirfadle and Goderwahis Kebeles of Bookh Woreda. Four consecutive cases were confirmed in two villages of Bookh Woreda, in which two cases from Goderwahis Kebele, one from Mirfadle and one from Bookh Kebeles. The latest "case 9" was reported on 5 November 2013 from Nagardale village, Mire Kebele of Warder Woreda of Doolo Zone (fig.7 below).

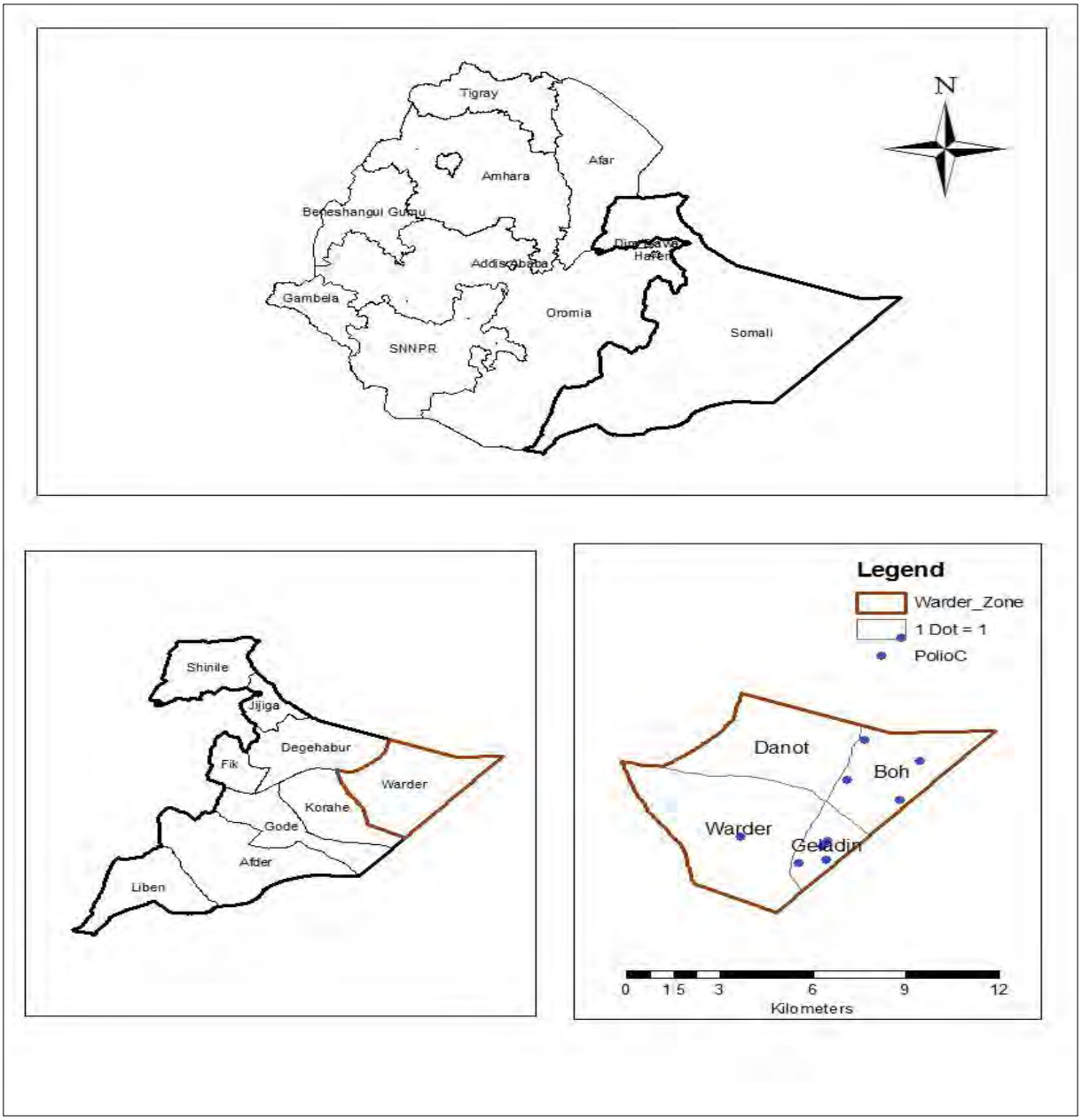

Figure7: Map showing distribution of Polio Cases by Woreda, Ethiopian Somali Region, January 2014

Among the nine cases, five (55.6 %) of them were males. The age ranged from 13 months to 15 years old; with the median age of 4 years while their mean age was 6 years. The families of all cases are pastoralist; frequently moving from Ethiopia to Somalia as situations prevail; and since they belong to the same clan, Darood Majerteen.

The main symptoms were fever in all cases and vomiting in some of them; and then resulted in acute paralysis; in which three cases with upper extremities, while six with lower extremities. Only one of them had right limb paralysis, while the rest with left limbs. Seven of the nine cases were notified from Kenyan polio lab after crossing the border to seek medical care; six to Goldegob and one to Galkayu Hospitals in Somalia. The first case was managed in Galkayu General Hospital in Somalia; the next successive six cases in Goldegob Hospital; specimen was collected and sent each to Kenya, KEMRI lab, confirmed and reported back to Ethiopia. Only the recent two of the nine cases were attended in Ethiopian facility; designated as "case 8" in Bookh HC and "case 9" in Nagardale HP; then experts from each facility took specimens and send to EHNRI National Polio laboratory; and all specimens were adequate and the result is confirmed to be WPV1. After alert warnings were made on May 2013 due to polio case report in neighboring Somalia, fortunately the NP-AFP rate was 14 per 100, 0000 population of under 15 years old as compared to the previous year 1.4. Generally, the NP-AFP rate of the Region is far low from the National level except slight improvements after the outbreak was declared (Fig.8 below).

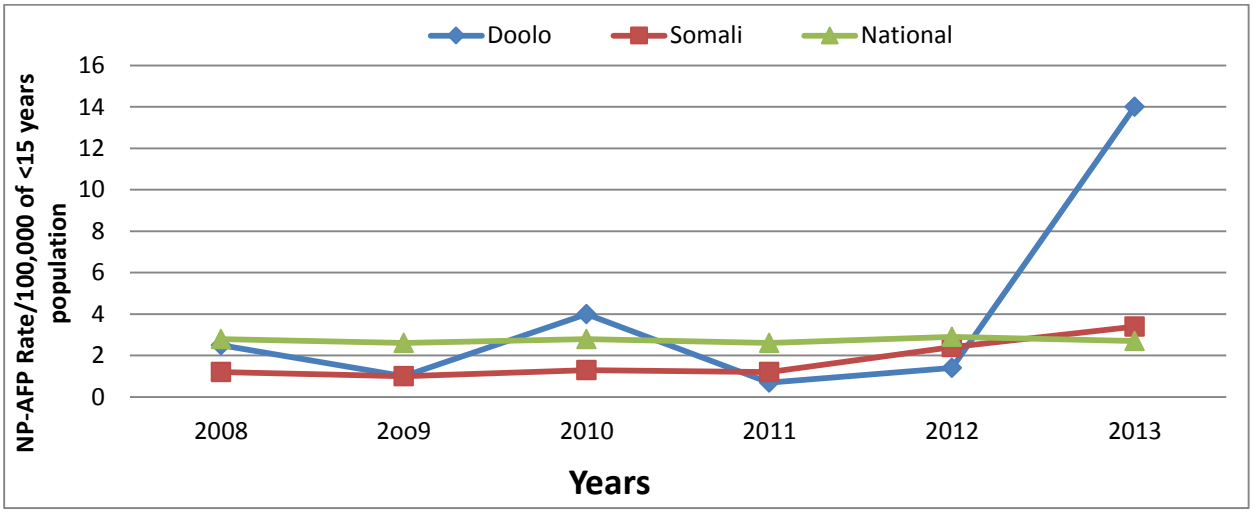

Figure 8: NP-AFP Surveillance Status of Doolo Zone, Somali Region by Year, January 2014

The Region is so vast with limitations on transportations to take specimens and reach effectively to the National laboratory. For instance, it was only in 2008 that the stool adequacy rate reached 100%. In 2013, stool adequacy rates were 57%, 64% and 88% for Doolo Zone, Somali Region and the National Respectively (Fig.9 below).

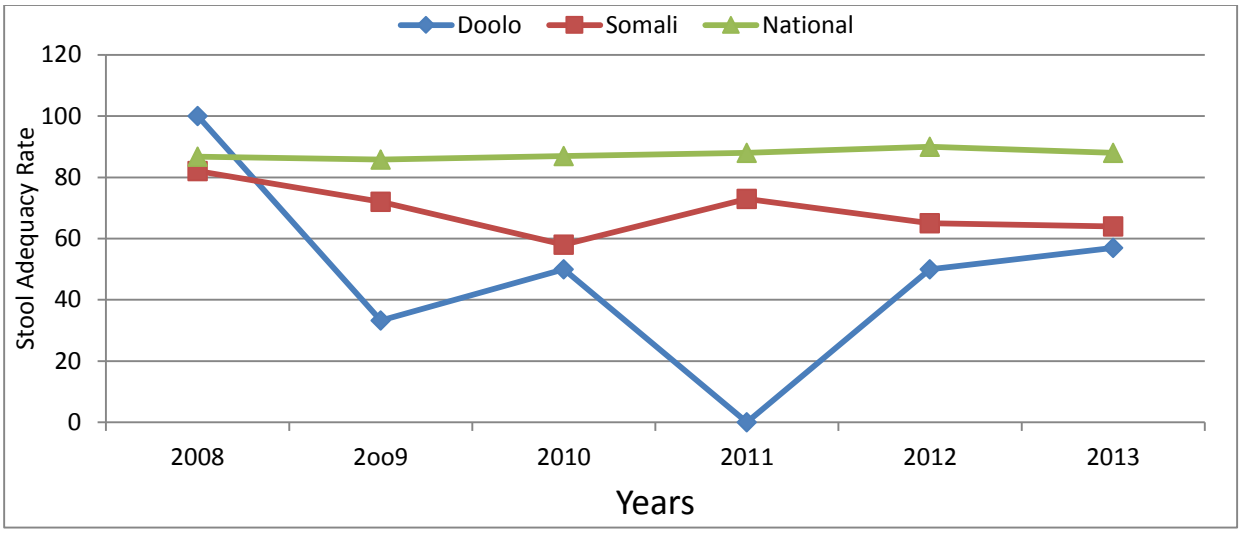

Figure 9: Stool Adequacy Rate of AFP Surveillance by Year, Doolo Zone, Somali Region, January 2014

Cases 6 and 7 were in the same vicinity probably 300-400 meters away each other but claimed never had history of contact between them. However, most of the cases had travel history to Somalia. Of the cases, no children completed or started routine EPI immunization schedule; even they had never taken any doses of OPV during supplemental immunization activities; due to lack of information and accessibility. To control the transmission and stop the outbreak, recent mop-up vaccination was conducted throughout the Woreda that covered under 15 populations.

Case1: Was a 3 years old boy reported as a confirmed polio case; he was among the three siblings and has been living with his parents in Boreyal village of Injiro Kebele, Galadin Woreda of Doolo Zone.

The child was relatively healthy before he developed fever, vomiting and cough for 3 days; then had sudden onset of muscle weakness on the left upper arm on July 10, 2013. The child had no history of falling, trauma, injection and animal bite prior to muscle weakness. The mother gave birth at home by Traditional Birth Attendant with no difficulty and the child has no vaccination history. The clan of family is Darood-Majerteen, sub-clan Omar Mohmud- reer Khalaf and the members of household are 12 including 3 under-5 children. The family is pastoralist living in Boreyal Village, which is 6 Km away from Injiro Kebele. Injiro is the Market place where the family purchases food and household goods that come from Galkayu (Somalia). The patient had also a contact history with a person, aged of 20 years old, who came from Bursalah, border town

of Somalia on June 29, 2013. Lastly, his grandmother took him to Galkayu General Hospital of Somalia, 180 kilometers away from Injiro Kebele, to seek medical care for the child. She mentioned two stool samples were taken. No history of falling, trauma, and injection, animal bite prior to muscle weakness and no vaccination history; but had contact history. The clan of family is Darood-Majerteen, sub-clan of Omar Mohmud- reer Khalaf.

Water Source: Is from unprotected Brikas (water reserved during rainy season to utilize it at dry season) and the family utilizes it without boiling and treating. No latrine utilization in the village and people simply use open field.

Case 2: Was a 9 years old male; and he is the second sibling in his family. He was not registered as a case in Ethiopia so the team considered as a missed case. He was among the 11 siblings lived with family; his father, pastoralist and illiterate, is from a clan of Majerteen and a father of 11 children from two wives one in Somalia and one in Ethiopian Somali. They lived in Mirfadle Kebele of Bookh Woreda. The child developed acute onset of fever followed by vomiting and paralysis of right upper extremity in the proximal arm. His father took him to Goldegob Hospital in Somalia before three months. The date of onset of paralysis was on 15 July 2013; parents took him to health facility. The paralysis was acute which affected only right upper proximal arm and the case was alive. He did not take any intramuscular injection before the onset of paralysis.

During physical examination, it was found that the bulk of the right upper arm muscle was not equal and the power was weak and muscle tone decreased while the child had normal bowl function. He did not take any polio vaccine during routine or SIA since his father had no information. He had no travel history outside of his village before onset of paralysis within 3-35 days. He did not have any contact history with AFP/Polio suspected or confirmed case. In addition, he had no any contact history with someone else within 10 days before or after onset of symptoms. He did not go to school within 10 days before or after onset of symptoms and his father do not know mode of transmission of polio and no any history of paralysis in their family. The community takes their children to prayer in such type of disease. The nutritional status of the child was normal. They usually fetch water from pond and use open field defecation. They did not use soap always to wash hands after using toilet. There was no any sick person with paralysis in his family. His father never heard about polio eradication and AFP surveillance. Stool sample

was investigated in Somalia and for adequacy and the final classification was confirmed WPV1. His contacts were assessed and found to be normal and they took zero to two doses of polio vaccine during SIA.

Case 3: Was 13 years old female from Dagafur Village, Barisacde Kebele of Galadin Woreda of Doolo Zone. She is the first among her seven siblings and from a clan of Lalkesie; in which family members are pastoralists; her father is a teacher and with a middle income according to the local context. The first symptoms were, fever on 9 August 2013, vomiting and progressive paralysis of left side. As per our discussion we made with her parents, it was evident that the case was a symmetric and very severe; after the onset of fever immediately, half of her left body from forehead to extremities changed the color; her eyes became tilted down and she was unable to move her body parts; then her father took her to Goldegob Hospital in Somalia, some 30 Km from her village. After five days of severe paralysis, she passed away. Although her father has little knowledge on the mode of transmission of polio disease, she had not any history of vaccination; including her seven siblings. However, she had no any travel history 3-35 days prior to the onset of paralysis from her village; although her parents did not know whether she had contacts with AFP cases; she had contacts with other children before and after she developed the disease. Her father decided that, he took first the child to Health institution/Goldegob Hospital in Somalia for treatment, due to his recent information on polio diseases from HEWs there; specimen was taken and the result was WPV1.

There was no any history of paralysis in her family; but the family exercised a prayer when such kind of illnesses happened. Community in the Kebele had not access to clean potable water; simply they used water from pond or Brikas.

Case 4: Was 4 years old female who was living in Dagafur village of Barisacde Kebele, Galadin Woreda, Doolo zone of Ethiopian Somalia Region. The Family of the child was Pastoralist, Muslim by religion and her clan is “Darood-Lalkesie with the sub-clan of “Mohammed Muumin”. The child has been living in the same village with her parents since she developed paralysis. The child developed fever and diarrhea for 3 days; then developed sudden onset of paralysis on the left lower leg on 23 August 2013, the family sent the child crossing the border of Ethiopia to Somalia of Goldegob District on August 26, 2013 to seek medical care, as the family stated two stool samples were taken.

The child had no history of falling, trauma, injection and animal bite prior to muscle weakness. The patient had a history of contact before 15 days of her onset of paralysis with **case 3** (already passed away due to a typical and symmetrical poliovirus) who lived in the same village; she had no vaccination history during routine, SIA or NID.

Case 5: Was 15 years old female who was living with her parents in Dagafur village of Barisacde Kebele, Galadin Woreda, Doolo zone of Ethiopian Somalia Region. The Family of the child was Pastoralist, Muslim by religion and her clan is "Darood-Lalkesie with the sub-clan of "Mohammed Muumin". The child has been living in the same village with her parents until she developed paralysis on 30August 2013. Prior to the paralysis, the child developed fever for 3 days, and then had sudden onset of muscle weakness on the left arm (weak limp at the time of onset) and she had no symptomatic residual paralysis. The patient crossed the border on 31August 2013 to seek medical care in Goldegob District (Border town of Somalia which is 15 kilometers far from Border of Ethiopia). Family said that the Goldegob Hospital Somalia took two stool samples. The child had no history of falling, trauma, injection and animal bite prior to muscle weakness. She and her family had travel to or from country 30 days prior to paralysis and no vaccination history, as a result of lack parental awareness of NID campaign and inaccessibility of Immunization service.

Case 6: Was a 3 years old male and he is the second among his three siblings in his family. Father was pastoralist by occupation and had with primary school education. They lived in Goderwahis village of Bookh Woreda, which is 30 kilometer away from Bookh Town. The child developed acute onset of fever followed by paralysis of left lower extremity in the distal leg. The date of onset of paralysis was on 5 September 2013; then seen at Goldegob Hospital in Somalia that is some 17 km away. The paralysis was acute and developed after 3 days of fever. He did not take any intramuscular injection. The paralysis affects only left leg and the case was alive.

During the physical evaluation, it was found that the bulk of the muscle was not equal and the power was weak and muscle tone decreased while the child had normal bowl function. He took polio vaccine during recent SIA. He had travel history outside of his village to Goldegob Hospital for other case treatment before onset of paralysis within 3-35 days. Contact history with

AFP/Polio suspected or confirmed case was unknown. But, by proxy he had contact history with someone else within 10 days before or after onset of symptoms. He went to school after he took polio vaccine and his father did not know mode of transmission of polio before his child developed and no any history of paralysis in their family. The community takes their children to health facility in such type of disease. The nutritional status of the child was normal. They used to fetch water from pond and use open field defecation. They did not use soap always to wash hands after toilet. There is no any sick person with paralysis in the family. The source of information is from other people and he never heard about polio eradication and AFP surveillance. The first stool sample was collected and sent to Kenya for confirmation; but there was no any information regarding the collection of the second sample. The first stool sample was adequate and the final classification was confirmed as WPV1. His contacts were assessed and found to be normal and they took 2 to 4 doses of polio vaccine during SIA.

Case 7: Was 2 years old female who was born and brought up in Goderwahis village in Bookh Woreda of Doolo Zone from a pastoralist family, and lived there since birth. Child was born normally and no major problems reported until that time. Based on parents history child was not vaccinated against polio previously; but got zero dose currently since they stayed over two months in Somalia after the outbreak. Parents were advised to get their children vaccinated in the coming round. The child was apparently healthy until 17-septmber 2013, on the following two days she developed high-grade fever and on 19 September 2013 she developed weakness/floppiness of lower left extremity (LL)). Her father took her to Goldegob Hospital in Somalia some 18 Km away for medical care, where she was detected as AFP and gave two stool specimens on 24 and 25 of September 2013; and was shipped to the polio laboratory in Kenya. The specimen condition upon arrival was adequate and the lab result was positive for Wild poliovirus type1 (WPV1). The child was unable to move her extremities as previous, had decreased power, decreased muscle tone, decreased deep tendon reflex of the affected limb; but was able to withdraw to painful stimuli (pinch/prick).

Child did not have history of past illness and history of similar illness in the family or neighborhood. Even there was no recent history of childhood illnesses like measles, mumps, sore throat, chicken pox, dysentery and no history of injection priori to onset of paralysis. Her father had history of travel frequently before and after onset of paralysis to Somalia, and

she traveled to Somalia after onset paralysis for medical consultation. There was no similar illness in the family. The family was poor and used unprotected rain harvested water, with poor quality and unhygienic conditions. She had no any vaccination exposure prior to the onset of paralysis; but, at time of investigation, she had one dose of POV. The OPV for routine vaccination was not available, but recent SIA rounds for polio (1-4) indicated a coverage range of a maximum of 90%. There was decreased tone, reflex and power in affected extremities; but had intact sensation. There was no muscle bulk atrophy or deformities. However, she developed residual paralysis of left extremities.

Case 8: Was a 13 months old male and he was the sixth sibling in his family. His father was married and a father of six children. Father was a merchant by occupation and with primary school education. Parents were living in Bookh Town. The child developed acute onset of fever followed by paralysis of left lower extremity in the distal leg on 21 October 2013; and immediately parents took the child to Bookh Health Center for treatment, which is less than one Km away from their village. The paralysis was acute and developed after 1 day of fever. He took intramuscular injection in both right and left glutei region prior to the recent paralysis. The paralysis affected only left leg distal and the case was alive. During neuromuscular examination, it was found that the bulk of the muscle was equal and the power was weak and muscle tone decreased while the child had normal bowl function. He took polio vaccine during SIA before six months. He had travel history outside of his village to Galkayu Kebele one month before the onset of paralysis. He had travel history before onset of paralysis within 3-35 days to Galkayu area. Contact history with AFP/Polio suspected or confirmed case was unknown. But, he had contact history with someone else within 10 days before or after onset of symptoms in Galkayu Kebele. He was in preschool age; and his father did not know mode of transmission of polio before his child developed and no any history of paralysis in their family. The communities take their children to health facilities in such type of diseases. The nutritional status of the child was normal. They fetch water from pipe; but used communal latrine. They did not use soap always to wash hands after toilet. There was no any sick person with paralysis in the family. The source of information was from other people and he never heard about polio eradication and AFP surveillance. The first stool sample was collected on 22/10/2013 and the second stool sample was collected within 24 hours. The stool samples were adequate and the final classification was

confirmed to be WPV1. His contacts were assessed and all were normal and they took 5 to 7 doses of polio vaccine during SIA.

Case 9: Was a 4 years old female who lived with her parents some three Km west of Nagardale village of Mira Kebele of Warder Zone. Her clan is Darood/Majerteen, the sub clan of Omar Mohamoud. The date of paralysis was on 5 November 2013. Moreover, she was investigated by the local HEW and notified to the next higher level on the same day. Stool was collected on 8 November 2013; then sent to EPHI and it was adequate and positive for WPV1. She was living there since four years back; and had no travel history with her parents and they were pastoralists and illiterate; but middle class in livelihood. The area is rural, had not access to routine EPI; though not well organized, the nearest facility is Nagardale HP, some 3 Km away from their house. There was also a suspected AFP case within the same Keble. The case developed paralysis on her lower left leg. The muscle tone was already decreased/ floppy. The case had not any history of trauma or injections prior to the onset of paralysis. The case also had no travel history during the last 30 days prior to the onset of her paralysis; and family members did not travel to other hot spots; and was not visited by any relatives assumed to be susceptible for AFP. Similarly, the child did not travel out of her residence after the onset of paralysis. And did not have any vaccination history; one reason the parents raised was vaccinators did not come to their home. After the incidence, the family is eager about immunization when to take and where to go if the trusted clan and community leaders tell them, to vaccinate their children.

With regards, Woreda Task force was established; with strong communication with local HP workers; however, there were gaps on micro planning for SIA; like team supervisors, number of vaccinators, identification of appropriate denominators, transportation, duration to cover the area in addition to that there was no fridge in the nearby HP to store the vaccine. Although there is EPI trained staff, there were many problems like community resistance, lack of transport for outreach programs, lack of per-diem, shortage of manpower and kerosene shortage for cold chain that affected the routine EPI activities. During our mission, active surveillance was conducted in the hot spot Kebeles. However, there was a gap on covering the whole Woreda/s. Since the Woreda focal person had not done it regularly. This was in general due to shortage of budget for surveillance.

As per the WHO recommendations, we assessed the EPI coverage of Polio Case Contacts in the hot spot villages. We identified age groups neighboring the current cases under investigation and assessed their routine OPV and SIA coverage; we found that only five(8.2%) of the 61 contacts had history of routine vaccination specifically in Bookh Kebele; but the recent SIA coverage was 85.2%. Majority, 39(63.9%) of the 61 contacts were males; in which 30 (76.9%) out of 39 had two and above doses of OPV exposure. In addition, 22 (36.1 %) out of 61 children were females; amongst 14(63.6 %) of the 22 contacts had an exposure of two and above doses during the recent campaign (Fig.10 below).

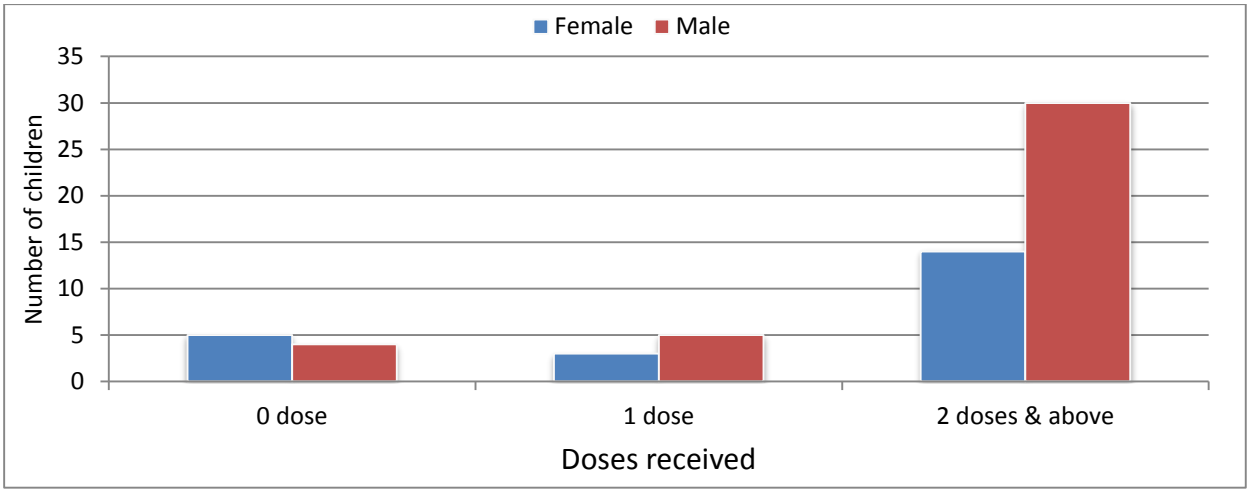

Figure 10: Polio Case Contacts by Vaccination Status and Sex, Bookh Woreda, Somali Region, January 2014

Among children aged 12 months and below, 10(52.6 %) out of the 19 contacts had two and above vaccination history while 34 (nearly 81%) of the 40 children between 13 and 60 months age took two and above OPV doses during the recent campaigns (Fig.11 below).

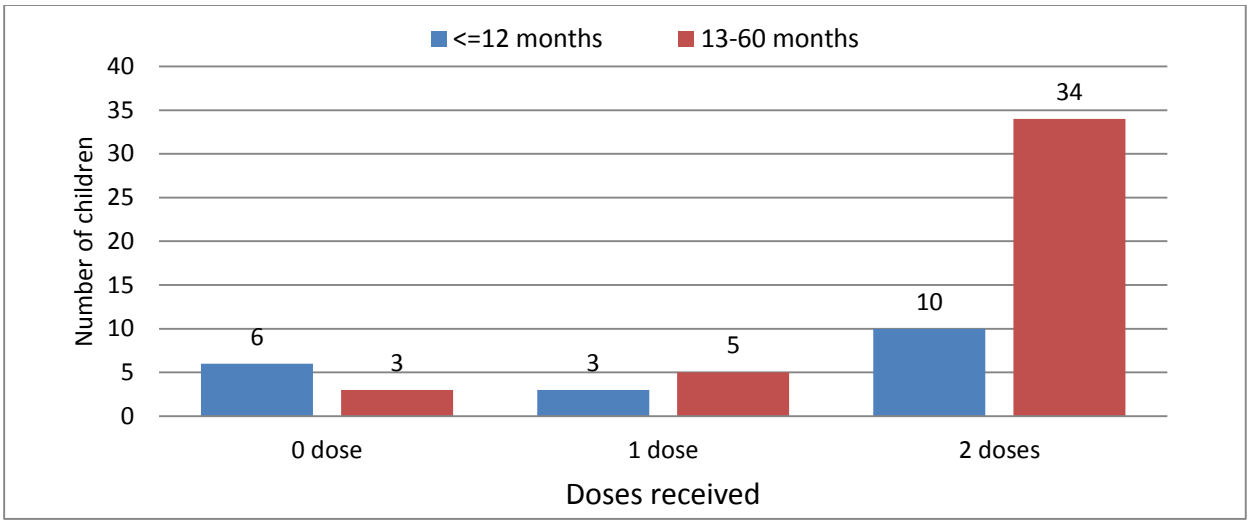

Figure 11: Polio Case Contacts by Vaccination Status and Age, Bookh Woreda, Somali Region, January 2014

Similarly, we conducted a mini OPV coverage assessment in Nagardale Village where the latest case 9 was living. We included 14 males 13 females; then found that 21(77.8%) out of 27 the assessed contacts received two and above OPV doses; and three (11.1%) of the 27 children had no OPV history during any of the SIA campaign (fig.12 below).

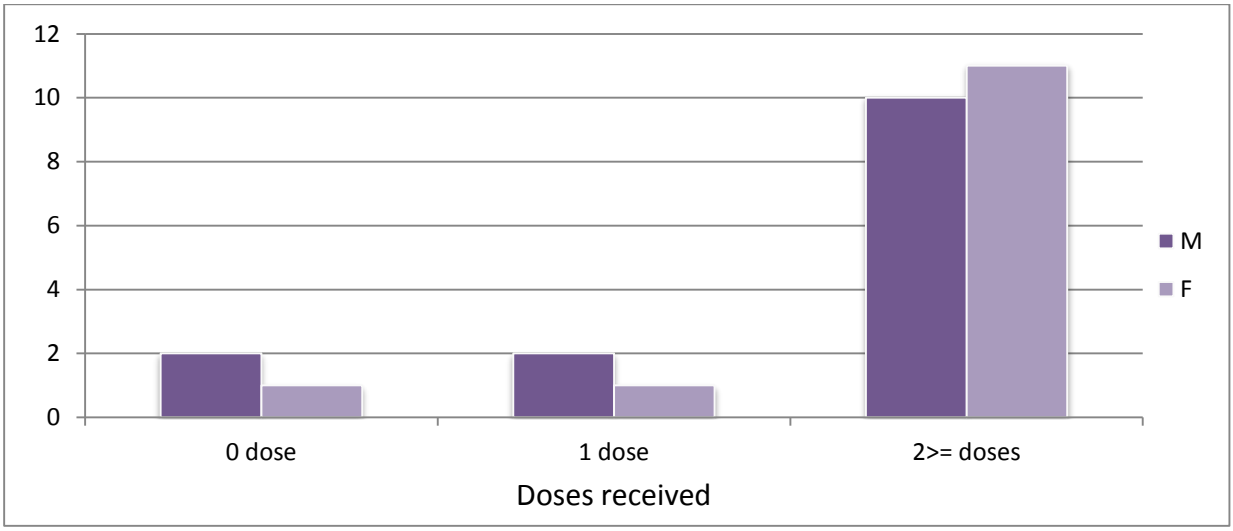

Figure 12: Polio Case Contacts by Vaccination Status and Sex, Warder Woreda, Somali Region; January 2014

Among the assessed 27 children, 19 (70.4 %) of them were under 2 years while eight (29.6 %) were 2 to 5 years old. Close to 79% of under 2 years had taken two and above doses; similarly 75% of aged 2to 5 years had it (Fig. 13 below).

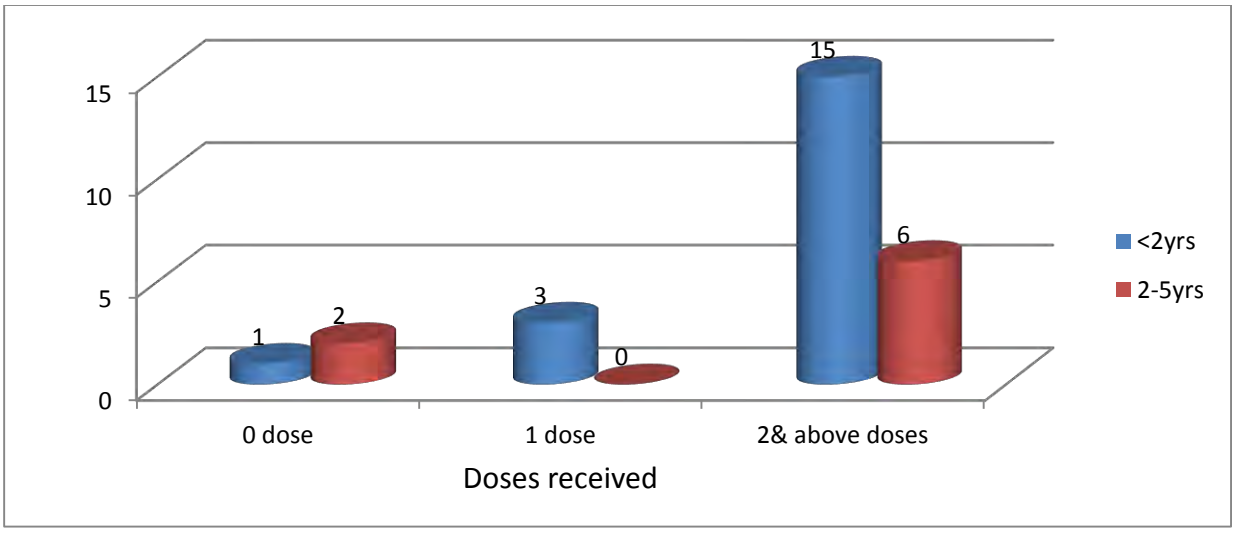

Figure 13: Polio Case Contacts by Vaccination Status and Age, Warder Woreda, Somali Region, January 2014

Furthermore, we understood that most of the communities in Doolo Zone claimed that they had not any awareness about poliomyelitis prior to the current outbreak. Even communities across the assessed Woredas previously believed that taking vaccination may sterilize people and limit their generation. Very few people also said they had no any information on when and where the vaccination is provided.

Discussions

As we understand from the sequencing of cases chronologically, the index case was from Galadin District and emerged during the month of July 2013. The virus is presumed to be Somalia origin. There were nine confirmed polio cases between July and December 2013. But, since the disease is mostly asymptomatic; there could be many silent cases in the Bordering areas of the Region. This is because; Poliomyelitis is a highly infectious viral disease, mainly affecting young children with catastrophic effects including acute flaccid paralysis and sometimes death. It is estimated that for every reported case, there are 200 asymptomatic carriers [4].

The latest case identified was in December 2013; which means that we are in outbreak; or ongoing event for which the last wild poliovirus detected was within the last 6 months [4]. As we understand from the investigation activities, there were no functional outreach sites in the Woredas. Likewise, there was no weekly surveillance report in the Woredas. Because of those gaps, most of the confirmed cases had no history of OPV and were detected in a neighboring

Country. From this, we could conclude that the pillars of GPEI of high immunization coverage in routine, supplementary immunization activities (SIAs), surveillance of acute flaccid paralysis and; mop-up activities; and with primary strategy for GPEI; strong routine immunization program that delivers at least 3 doses of OPV to all children from birth and within one year [2, 4] have not been achieved in the study locality. It is evident that if a population is fully immunized against polio, it will be protected against the spread of both wild and vaccine strains of poliovirus [6]. Across the border especially in Doolo Zone, our service delivery is still limited; given the mobile and vulnerable community. Furthermore, large areas of south-central Somalia that borders the Ethiopian Somali Region have not conducted immunization campaigns since 2009 due to insecurity, leaving as many as 500,000 children particularly vulnerable in this area[6]; which could continue to exacerbate the problem. From the FGDs we made, some people think that vaccination may compromise their fertilities in the future. This attitude is in agreement with the study conducted in India; myths is being spread by a small group of Muslim clerics that the polio vaccination effort is part of a plot to sterilize Muslim children and lower the Muslim birth rate; is particularly rampant in Uttar Pradesh, one of the Indian states with the highest polio case counts. Similar issues have been seen in some Muslim groups in Nigeria, Somalia, and other countries [7].

Conclusions

We conclude that the origin of the Polio outbreak is from Somalia; imported to Ethiopia due to the high mobility of the susceptible community across the border. The index case of the WPV1, designated as (ETH-SOM-WAR-13-0609) was reported on 10th July 2013; from Galadin Woreda of Doolo Zone. All cases were under 15 year olds; and developed full paralysis. All cases and their peers had not any routine OPV exposure. There was no any circulation of poliovirus during the investigation period; that is the total caseload remains to be nine. There was strong response during the outbreak period, mobilizing the communities, awareness creation activities, and SIA program. However, still many gaps exist concerning full implementation of Polio eradication strategies.

Recommendations

- The Federal Ministry of Health of Ethiopia and in particular the Somali RHB

in collaboration with WHO, UNICEF and other partners should continue implementing a sensitive surveillance, undertaking quality immunization campaign, coordinated nationwide in general and the Somalia Region in particular to conduct house- to-house campaign strategy and should continue until the interruption of WPV spread is documented.

- The Federal Ministry of Health and Somali Regional Health Bureaus and WHO, UNICEF and other partners should strengthen the routine immunization program in the affected areas and in the Region at large; reaching Every Child approach (REC) to all districts in Doolo zone and the Region.
- The Regional Health Bureau should take action and put extra efforts to strengthen the cold chain system in the hard to reach areas; particularly in affected Woredas of The Zone.
- Revitalize the OPV vaccination at all transit points and make sure that all coming from and going to Somalia get two drops of OPV.
- Regular cross-border meeting should be strengthened on both sides to improve the information exchange, Surveillance and EPI activities through static or mobile facility
- Strengthen social mobilization for community based surveillance system; considering the pastoralist nature of the population and the available traditional network of information sharing mechanism.
- Provide serious attention to the water, sanitation and hygiene in the epidemic areas as the polio virus is transmitted through faecal-oral route

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6. Global polio Eradication Initiative. Horn of Africa Polio Outbreak Bulletin; 1 July 2013
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Annex 2: Somali Region AFP/polio Outbreak Investigation Checklist, January 2014

Somali Region AFP/polio Outbreak Investigation Checklist

Investigator Name _____Phone_____

Date of Investigation: (DD/MM/YYYYY) _____

Patient Name_____ EPI no_____ Location (GPS) _____

Address: Zone_____ Woreda_____ Kebele _____ Village ____Phone _____

Date of Investigation: mm/dd/yyyy):___/____/_____

I. Socio-demographic Characteristics

S/n	Questions	Alternatives /response
1.1	Sex	1.Male 2.Female
1.2	Age	years_____ Months_____
1.3	What is the Occupation of the respondent	1. Farmer 2. Housemaid 3. Unemployed 5. Daily laborer 6. Merchant 7. Gov't Employee 8. Other (specify)_____
1.4	Monthly income(average birr)	_____
1.5	Educational level of the respondent	1. Illiterate 2.Primary 3. Secondary 4.Tertiary
1.6	Marital status of the respondent	1. Single 2. Married 3. Divorced 4. Widowed
1.7	Respondent relation with the patient	1. Mother 2. Father 3. Sister 4. Guardian 6. Other(specify)_____
1.8	Number of People living together;	_____

II**. Clinical History of Diseases:**

2.1	What was the symptom? Circle that apply List that apply.	1. Fever 2. Headache 3.Diarrhea 4. Vomiting 5. Coryza 6. Nausea 7. Paralysis 8. Neck stiffness 9. Ankle clones 10. Tonsillitis 11.Other(specify)_____
2.2	Date of onset of Paralysis (mm/dd/yyyy)	___/ /____
2.3	What measures were taken at home?	

2.4	Date seen at health facility (mm/dd/yyyy)	__/__/_____
2.5	How far is the nearest HF from your house?	_____
2.6	How many days were taken for the full paralysis?	_____
2.7	What is the type of paralysis?	1. Acute 2. Flaccid 3. Unknown
2.8	Is the paralysis Asymptomatic?	1.Yes 2.No 3.Unknow
2.9	Was there intramuscular injection before date of onset	1. Yes 2. No
2.10	If "Q2.7" is yes, Site of intramuscular injection	1. Rt. Glutei Region 2. Lt. Gluteil Region 3.Both
2.11	Where is the site of Paralysis?	1. R L 2.LL 3. RU 4.LU
2.12	If the Paralysis is in Arms, where is the paralysis?	1. Proximal 2. Distal 3.Both
2.13	If the Paralysis is in Legs, where is that?	1. Proximal 2. Distal 3. Both
2.14	What is the status of the case?	1. Alive 2. Dead 3. Unknown

III. Risk factors

3.1	Did the child ever been vaccinated for polio?	1.Yes 2.No 3.Unknow 4.Not applicable
3.2	If answer for Q 3.1 yes, What was the last date of vaccination?	1.Patient recall_____ mm/dd/yyyy 2. Card_____ mm/dd/yyyy
3.3	Number of vaccine doses received	1. One 2. Two 3.three & above
3.4	Did you have any travel history 3-35 days outside of your Village?	1.Yes 2.No If Yes where _____, When? _____
3.5	Did you have any travel history within 10 days before and after onset of symptom?	1. Yes 2. No If yes where? _____
3.6	Did you have contact history with AFP/Polio suspected or confirmed case?	1. Yes 2.No 3. Unknown
3.7	Do you have any contact history with someone else within the10 days before and after onset of Symptom?	1.yes 2.No If yes, with whom? _____
3.8	Did you go to School within the10 days before and after onset of Symptom?	1. Yes 2. No
3.9	Do you know modes of transmission for polio?	1.Yes 2.No 3. If yes mention_____
3.10	Is there paralysis history in your family	1.Yes 2.No
3.11	Where do people in your community take their children in such types of diseases?	1. Prayer 2. Holy water 3. HF 4. Traditional Healer 6. Other_____

3.12	Nutritional status of the cases	1. Normal 2.Moderate 3. SAM
3.13	What is your source of Water?	1. Pipe 2. Pond 3. River 4. Other:___
3.14	Where do you use Latrine?	1. Private latrine 2. Communal Latrine 3. Other(specify)_____
3.15	What do you use for Anal Cleansing?	1. Water 2. Soft Tissue 3. Paper 4. Stone 5. Other_____
3.16	Is there any sick person with Paralysis in your family?	1. Yes 2. No
3.17	If answer for Q 3.14 is yes, observe the cases	_____
3.18	Where did you take the child first?	1. Traditional healer 2. HF 3. Holy Water 4. Other (Specify)____
3.19	Who decides to take the child to the mentioned Place?	1. Mother 2. Father 3. Relatives 4. Community Elders 6. Other(Specify)_____
3.20	What is the source of Health related information in your surrounding?	1. Radio 2. TV 3. News letter 4. Health personnel 5. Other (Specify)_____
3.21	Have you ever Heard about Polio eradication and AFP surveillance?	1. Yes 2. No
3.22	**Note to the investigator**: please take up to 30 children close to the case and assess their OPV vaccination status, routine, SIA, NID/SNIDs	

IV. Laboratory Investigation

S. No	Questions	Alternatives
4.1	Was Stool samples collected?	1. Yes 2. No 3. unknown
4.2	If answer for Q4.1 is yes, when was the first stool collected?	mm/dd/yyyy_____
4.3	If Q4.1 is yes, when the second stool was collected?	mm/dd/yyyy_____
4.4	Was the sample adequate?	1. Yes 2. No
4.5	Final classification of the cases	1. Confirmed Polio 2. Compatible 3. Discarded 4.Not AFP
4.6	What was Type of poliovirus isolated?	1. Wild 1 2. Wild 2 3. Wild 3 4. Vaccine Derived_____

I thank you for collaboration!

CHAPTER II – SURVEILLANCE DATA ANALYSIS REPORT

2.1 Measles Surveillance-South Nations, Nationalities and Peoples Region (SNNPR), Ethiopia, 2008-2012

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Abstract

Background: Measles is an infection of the respiratory system due to a virus, genus Morbillivirus; humans are the only reservoir. In developing countries, up to 75% of patients may have complications. One out of four died where malnutrition and vitamin A deficiency are common. Outbreaks of measles are reported in the SNNPR each year. Therefore, to describe five years (2008-2012) measles data by person, place and time.

Methods: Performed a retrospective descriptive study to describe

Results: Totality 9143 cases with1189 deaths were recorded (CFR=13.0). Amongst, 4717(51.6%) and 3503 (38.3%) of the cases were under five (AR=37/100,000) and under 15 (AR=23/100,000) while 923 (10.1%) of them above 15 years. About 4742 (52%) of the cases were males whilst 4379(48%) females. Also 3599 (39.4 %) and 534 (5.8 %) of the cases were rural and urban dwellers respectively while 5010 (54.8 %) cases were missed their dwelling. Three hundred ten (6.6%) of under 5 years, 263(7.6%) 5 to14, and 98(11.1%) cases aged 15 to 45 years were positive for measles IgM. As well, 352 (7.5%) males and 318(7.3) female cases were positive. Ninety five (18.0%) and 540(15.0%) of the cases from urban and rural dwellers were positives respectively. Cases of 245 (5.4%), 161(6.4%), 22(5.5%) and 198(16.7%) which had no vaccination history; that had one dose, two and above doses of vaccine and with unknown their vaccination status were positives for measles IgM correspondingly. Majority 2986(32.7%) of the cases were reported during 2012; the highest 2904(31.8%) and the least 260(2.8%) of the cases on January and July from all Zones respectively.

Conclusions: Though limitations on recordings, age groups, residency and vaccination appeared to be related with the occurrence of measles outbreak. Attack rate in under five populations was very high; and most cases did not take optimal doses of vaccination. Caseload with severe fatality had increased seasonally among unvaccinated groups. The Region should enhance surveillance, address immunization activities with the target of reaching 90% of infants 9 to 11 months and cover to the age of 15 years.

Key word: measles, case, age groups, vaccination, residency

Introduction

Measles is an infection of the respiratory system caused by a virus, specifically a paramyxovirus of the genus Morbillivirus. Morbilliviruses, like other paramyxoviruses, are enveloped, single-stranded, negative-sense RNA viruses. Measles is a highly infectious viral disease for which humans are the only reservoir. Transmission is primarily person-to-person via aerosolized droplets. The average incubation period for measles is 10 – 12 days. The clinical syndrome is characterized by rash, prodromal fever, conjunctivitis, coryza, cough and the presence of Koplik's spots in the mouth. In developing countries, up to 75% of cases may have complications of pneumonia, diarrhea, otitis media, croup or encephalitis. Measles can also lead to lifelong disabilities including blindness, brain damage and deafness [1]. In developing countries, where malnutrition and vitamin A deficiency are common, measles has been known to kill as many as one out of four people. It is the leading cause of blindness among African children. Measles kills almost 1 million children in the world each year [2].

Ongoing analysis of surveillance data is important for detecting outbreaks and unexpected increases and decreases in disease occurrence, monitoring disease trends, and evaluating the effectiveness of disease control programs and policies. This information is also needed to determine the most appropriate and efficient allocation of public health resources and personnel. Analyses should be performed at regular intervals to identify changes in disease reporting. These analyses can be performed using standard approaches (tabulating reports manually and filling in a summary data sheet, for example, or running a standard computer program to generate a summary report). Findings of these analyses should be reviewed regularly, and provided as feedback to medical providers and others in the community who are asked to report cases. Additional special analyses are often needed to answer specific questions that arise; these analyses may require additional customized approaches beyond what are routinely performed.

Analyses looking at delays in reporting, completeness of reporting of critical variables, and applying case definition criteria are useful in evaluating the quality of case investigation and reporting, and should be undertaken regularly. Missing or inaccurate data may limit the usefulness of any analysis. Erroneous or incomplete data cannot be corrected through statistical procedures. Analyses should be regularly performed as part of routine analysis of surveillance data. By person; Describe the persons (cases) with vaccine-preventable diseases who were

identified by your surveillance system; attributes of the cases include age group, sex, and race or ethnicity and may be appropriate to divide age groups based on recommended ages of vaccine administration as well as the age distribution of reported cases. By place; Describe the persons with vaccine-preventable diseases (cases) detected by your surveillance system by geographic location; the place where the case was first reported, place of residence of the case, or place of hospitalization. By time; Describe the distribution of cases over time; look for changes in the number of cases over time, intervals may be in years, months, weeks, or other unit of time. Date may be defined as date of onset of illness, date of diagnosis, or date of report to health department. Analysis by date of onset gives the most accurate representation of disease occurrence [3].

Background

SNNP Region is among the nine regional states of Ethiopia, comprised of 15 Zones and 4 Special Woredas, with a total population of 17,353,928; with a sex ratio of 50.7% male and 49.3% female to date. The vulnerable age groups for the measles are, 2,707,213(15.6%) are under five, while 7,601,020(43.8%) of the population are under15 years of age. The Region had 4432 Government health facilities (19 Hospitals, 639 Health Centers and 3774 Health Posts) [4]; which are expected to report all priority disease under surveillance on immediate and weekly basis. Outbreaks of measles are reported in the SNNPR each year.

Rationale for the Analysis

Although surveillance reports are collected with many factors, affect its frequency and completeness of reporting on routinely basis, still there had not been surveillance data analysis conducted as it can help in revealing factors associated with persistent measles disease occurrences in the Region. Therefore, this case based and line list data analysis was conducted in an organized manner as it could describe measles epidemiology within the region, characterize the disease burden, and develop guidance to improve measles control efforts in revealing main factors associated with the repeated occurrence of measles disease in the Region. Moreover, hopefully that necessary measures will be taken by collaborates in every system as to minimize the overall measles prevalence across the Region.

Objective

General Objective

To describe measles surveillance data by person, place and time in SNNP Region, from 2008-2012;

Specific objectives

- To describe population highly affected by measles
- To describe the geographic distribution of cases
- To determine measles prevalence and forward recommendations

Methods

A retrospective descriptive surveillance data analysis took place, between February and March 2013. Data from PHEM center, which were collected from SNNP Regional Health Bureau for the last successive 5 years (2008-2012), was used with permission of EHNRI. Cases are classified as:

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

Confirmed measles case: A suspected case with laboratory confirmation (positive IgM antibody) or epidemiologically linked to confirmed cases in an outbreak. Data were first filtered and edited to make it easy for use. Then, using EXCEL sheet and SPSS version 16.0 were applied to enter, filter and analyze the data; so as to ease for data interpretation and summarization.

Results

During the years 2008 to 2012, 9143 cases were reported from SNNP Region; of which 1189 deaths were recorded (CFR=13.0). Among the total 9143 cases, 4717(51.6%) of the cases were under 5 years (AR= 37/100,000), 3503 (38.3%) of them were under 15 years (AR = 23/100,000); while 923 (10.1%) of them were above 15 years old. Similarly, close to 4742 (52%) of the cases were males whilst 4379(48%) of them were females. 3599 (39.4 %) and 534 (5.8 %) of the cases

were rural and urban dwellers respectively; while 5010 (54.8 %) of the cases were missed or unknown their dwelling address.

Among the age groups, 310 (6.6%) of under 5 populations and 263(7.6%) of aged five to15 year olds population were positive for measles IgM. Besides, 98(11.1%) cases, aged 15 to 44 years were positive. 352 (7.5%) of the male cases and 318(7.3) females were positive for measles IgM. 95(18.02%) of the cases from urban and 540(15.0%) of cases from rural dwellers were positives. 245(5.4%) of the cases which had no vaccination history were positives; 161(6.4%) of cases which had taken one dose and 22(5.5%) of cases with two doses and above vaccination history were positives; whilst 198(16.7%) of the cases with unknown on their vaccination status were positives for measles IgM (Table1 below).

Table 1: Classification of Cases by Measles IgM and Some Demographic Variables, SNNP Region, 2008-2012

Indicators	**Classification**		
	Positive, n (%)	**Negative, n (%)**	**Totals, n (%)**
Age Group			
<5yrs	310(6.6%)	4359(93.4%)	4669(100)
5-14yrs	263(7.6%)	3206(92.4%)	3469(100)
15-45yrs	98(11.1%)	788(88.9%)	886 (100)
45+yrs	0(0.0%)	29(100%)	29(100)
Totals	**671(7.4%)**	**8382(92.6%)**	**9053(100)**
Sex			
M	352(7.5%)	4341(92.5%)	4693(100)
F	318(7.3%)	4020 (92.7%)	4338(100)
Missing	1(4.5%)	21(95.5%)	22(100)
Totals	**671(7.4%)**	**8382(92.6%)**	**9053(100)**
Vaccination status			
Not vaccinated	245(5.2%)	4488(94.8%)	4733(100)
1dose	161(6.4%)	2344(93.6%)	2505(100)
>=2doses	22(5.5%)	377(94.5%)	399(100)
Unknown	198(16.7%)	989(83.3%)	1187(100)
Totals	**626(7.1%)**	**8198(92.9%)**	**8824(100)**
Residency			
Urban	95(18.0%)	433(82.0%)	528(100)
Rural	540(15.0%)	3055(85.0%)	3595(100)
Missing	36(0.7%)	4894(99.3%)	4930(100)
Totals	**671(11.4%)**	**5238(88.6%)**	**9053(100)**

Four hundred ninety four (5.4%) of the total cases were treated in an inpatient wards while 5667(62.0%) of the cases were treated in outpatient. But, 2982(32.6%) of the cases were missed untreated. Specifically, 173(35.0%) under 5 years, 135(27.3%) 5 to 15 years and 186(37.7%) of the cases aged 15years and above were treated in inpatient wards. Similarly, 3356(59.2), 1819(32.1) and (492(8.7%) of the cases aged under 5, 5 to 14 and 15 years and above were treated in outpatient whilst the rest missed untreated (Table2).

Table 2: Treatment Status of Cases by Age Groups, SNNP Region, 2008-2012

Age group	Inpatient	Outpatient	Missed	Totals
<5 years	173(35%)	3356(59.2%)	1188(39.8%)	4717(51.6%)
5-14 years	135(27.3%)	1819(32.1%)	1549(51.9%)	3503(38.9%)
15+ years	186 (37.7%)	492(8.7%)	245(15.8%)	923(10.1%)
Totals	**494(5.4%)**	**5667(62.0%)**	**2982 (32.6%)**	**9143(100%)**

The Measles caseload varied from year to year; with 803,904, 1908, 2542 and 2986 cases in the years 2008, 2009, 2010, 2011 and 2012 respectively. Proportion of reported cases investigated through 2008 to 2011 was 100% and 97 during 2012. And percent of laboratory confirmations were; 9.7, 9.4 12.8, 6.1, 3.7 throughout the successive 5 years respectively. Additionally, numbers of confirmed cases were; 78, 85,245, 154 and 109 in the years 2008 to 2012 respectively. Considering the population projections (CSA 2007), incidence of confirmed cases per 100,000 populations were 0.5, 0.53, 1.49, 0.91 and 0.63 throughout the reporting period as well (Table3).

Table 3: Measles Surveillance Performance Status, SNNP Region, 2008-2012

Indicator	2008	2009	2010	2011	2012
Total number of suspected cases reported	803	904	1908	2542	2986
Proportion of reported cases investigated with blood specimens (target: >80%)	100.0	100.0	100.0	100.0	97
% of lab confirmed cases (target :< 10%)	9.7	9.4	12.8	6.1	3.7
Total number of confirmed measles cases	78	85	245	154	109
Incidence of confirmed measles per 100,000 Population	0.5	0.53	1.49	0.91	0.63

During the reporting period of 2008 to 2012, majority 2986(32.7%) of the cases were reported during 2012, followed by 2542(27.8%) and 1908(20.9%) during the years 2011 and 2010 respectively (Fig.14 below).

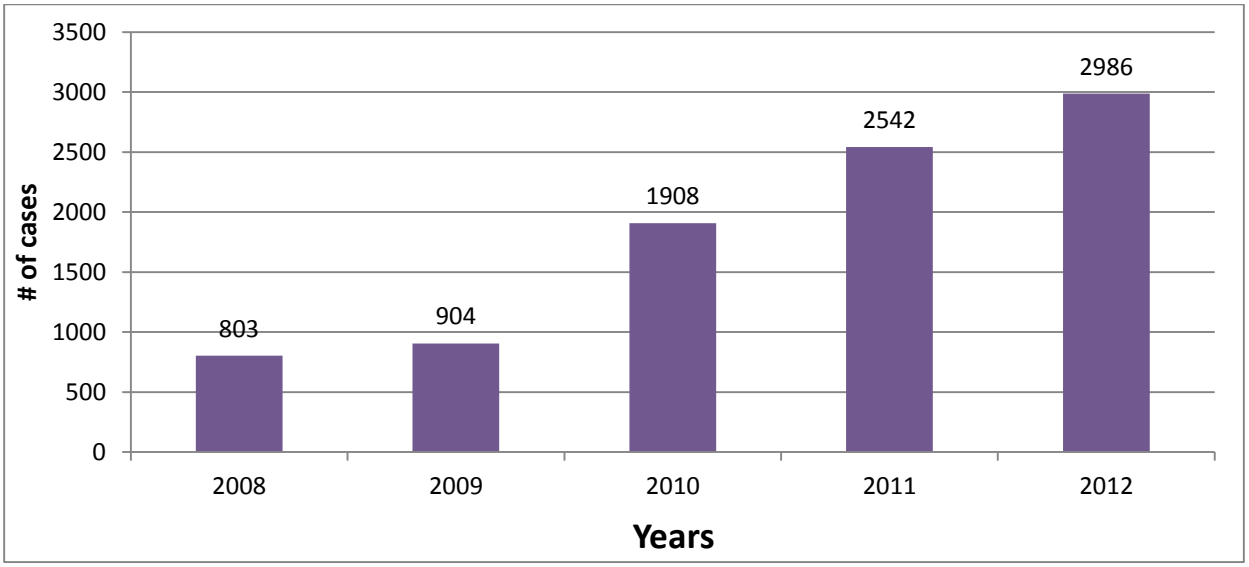

Figure 14: Measles Case Trend by Year, SNNP Region, 2008-2012

When we aligning similar months together through 2008 to 2012, the highest 2904(31.8% cases were reported on the month of January; followed by 1434(15.7%) and 770(8.4%) cases on the months of December and February throughout the years respectively. Conversely, the least of cases were reported during July, August and September with 260(2.8%), 275(3.0%) and 255(2.8%) cases respectively (fig.15 below).

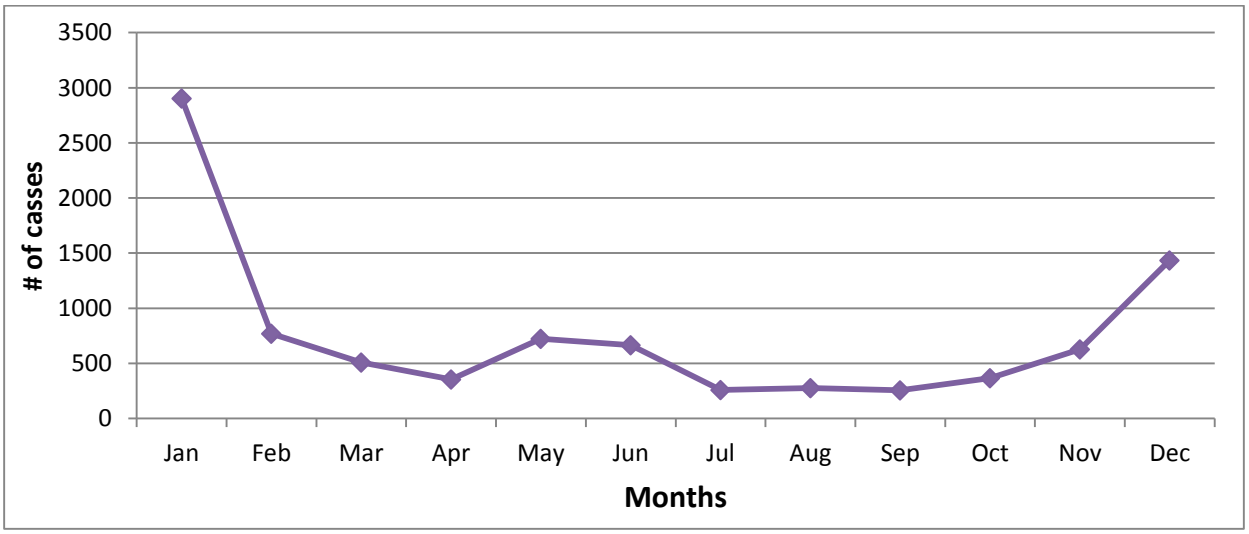

Figure 15: Measles Case Trend by Months, SNNP Region; 2008-2012

Specifically, during 2008, 192(23.9%) of the cases were reported on the months of December. 270(29.9%) in the months of January 987(38.8%) in the months of December and 1883(63.1%) of the cases were reported on the months of January through 2009 to 2012 years likewise (fig. 16 below).

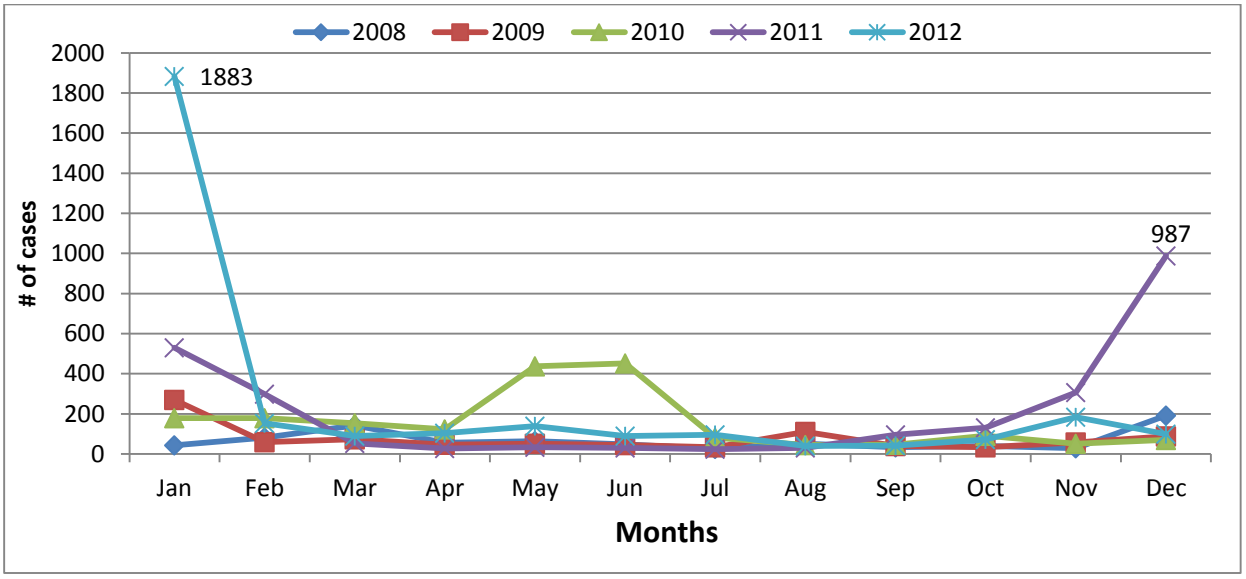

Figure 16: Measles Case Trend by Month and Years, SNNP Region, 2008-2012

In the years 2008 and 2009, there was no report from Basketo and 2008 from Yem Special Woredas. However, even though their caseloads were varied, all Zones and or Special Woredas had reported measles cases. Throughout the reporting period, majority 3593(39.3%) of the cases were reported from Kefa Zone; followed by 1947 (21.3%) and 568(6.2%) of the caseloads by Sidama and Guraghie Zones respectively (Fig.17 below).

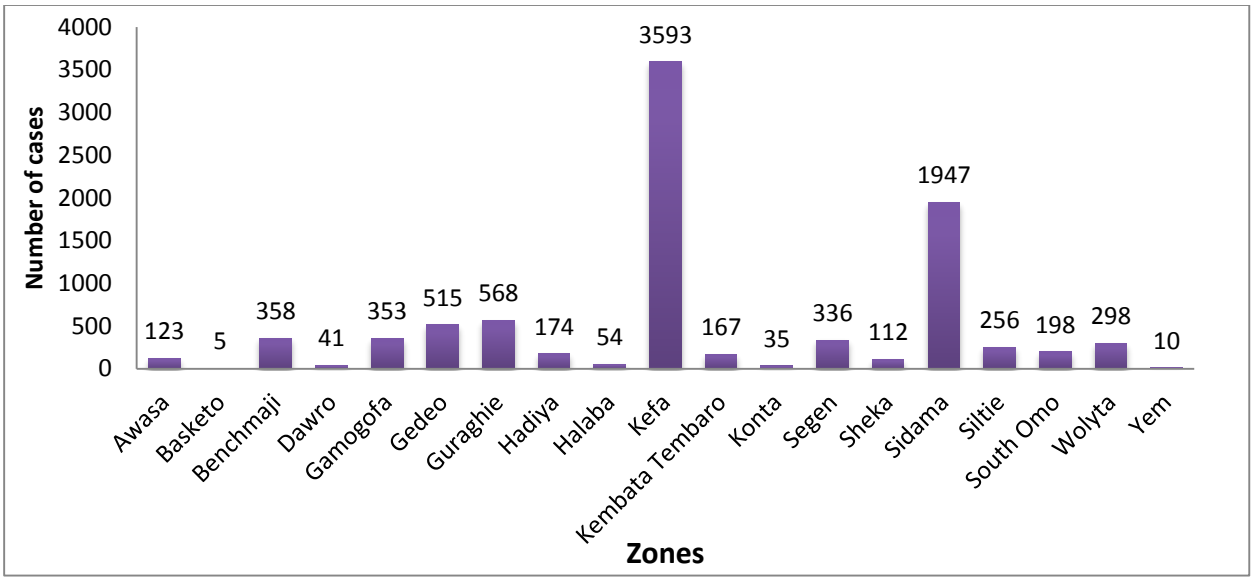

Figure 17: Measles Cases Load by Zone, SNNP Region; 2008-2012

Discussions

Regardless of limitations of the study design, relying on already collected data, the study revealed a number of important results. These were relating to quality of data collected by the surveillance system, populations still at risk of contracting measles in SNNP Region and how the Regional measles case- based surveillance system has been performing in the period under review. Close to 1189 deaths with a CFR of 13.0% were reported during the successive five years; specifically 1166 cases with CFR of 45.8% in 2011. The fatality was very high as compared to; in Ethiopia, the expected case-fatality rate is between 3% and 6% [5]. Most deaths, 1176(98.9%) of them occurred in under five years population. The result was related to the fact that the highest case-fatality rate occurs in infants 6 to 11 months of age, with malnourished infants at greatest risk [5]. Close to 3599 (39.4 %) of the cases were from rural area as compared to 534 (5.8 %) of them being urban dwellers. while 5010 (54.8 %) of the cases were missed or unknown their dwelling address. Additionally, only 228(2.5%) of the case from both Rural and Urban took more than two doses; while majority, 4810(52.6%) had not vaccine history and 1415(15.5%) of the cases were unknown their status. This contradicted with immunization coverage is one of the indicators used to monitor progress towards the achievement of MDG4 and the reduction of child morbidity and mortality, as it is one of the most cost-effective public health interventions for reaching these goals[4]. Only 22(5.5%) of the cases were positive for measles IgM. Indicating that, measles vaccination is one of the most cost-effective interventions

available; especially if the achievements reached over 90% coverage on the first dose of measles [5]. Close to 3599(39.6%) of the total cases were from rural; this might be due to large susceptible population in the rural areas than in the urban due to closeness to health facilities and lack of awareness. Beside that large numbers 2982(32.6%) of case were remained untreated. That was in converse to supportive care that ensures good nutrition, adequate fluid intake and treatment of dehydration to avoid complication of the illness; prescription of antibiotics to treat eye and ear infections, and pneumonia [6]. All children in developing countries, diagnosed with measles should receive two doses of vitamin A supplements, given 24 hours apart to restore low vitamin A levels. Because of Vitamin A supplements have been shown to reduce the number of deaths from measles by 50% and severe measles is more likely among poorly nourished young children, especially those with insufficient vitamin A, or whose immune systems have been weakened by HIV/AIDS or other diseases [6, 7].

Limitation

Because of the nature of the study and source of the data for analysis was from secondary data, it was not possible to correct it during analysis and unable to state appropriately about the missed variables under study.

Conclusions

In conclusion; this study was conducted with the objective of providing the basis for eliminating and controlling measles outbreak in SNNPR and evaluate the surveillance status of measles. Even though limitations on the quality of the data collected from the Region, this study found that age groups, rural residency and vaccination appeared to be related with the occurrence of measles outbreak. Measles problem in the Region is still highly burdensome with highest CFR especially during 2011. Under five populations were highly affected; also indications that there is a disease shift to adult ages. Although measles is among VPDs, most the cases did not take optimal doses of vaccination. From this it is possible to conclude that EPI coverage is far away from what is expected to create herd immunity. The result of this study gives a clue on the factors contributing to measles problem in the Region and provides base line information for other investigators and program considerations.

Recommendations

- Primarily the Region has to enhance its surveillance activities to easily detect all possible measles cases for appropriate responses
- The Region should address routine immunization with the target of reaching more than 90% of infants 9 to 11 months of age and children up to the age of 15 years
- As the Region/Ethiopia has not reached over 90% coverage on the first dose of measles, the Region should focus on options of SIAs and catch-up and follow-up campaigns to increase measles immunity and break the vicious cycle of measles outbreak and
- The Region has to continuously make aware the communities to come to facilities during measles illness for the betterment of the outcome

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CHAPTER III – EVALUATION OF SURVEILLANCE SYSTEM

3.1 Surveillance system evaluation- Oromo Nationality Administrative Zone, Amhara Region, August 2013

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Abstract

Introduction: A surveillance system is useful if it contributes to the prevention and control of adverse health events, including an improved understanding of the public health implications of

such events. Surveillance system can be useful if it helps to determine that an adverse health event previously thought to be unimportant is actually important. System evaluation should include recommendations for improving quality and efficiency. Ethiopia instituted new Public Health Emergency Management (PHEM) system since 2009; although level of performance varied among Regions. Oromo Nationality Administrative Zone is malariaous, although, presently not serious public health problem. Therefore, to evaluate system performance needs.

Methods: A purposive sampling technique and a cross sectional study design were utilized. Questionnaire was administered to focal persons; documents and reports were observed; and data was analyzing using MS-Excel.

Results: All offices had PHEM and malaria guidelines in place. Case definitions for priority disease under PHEM were distributed. PHEM system is more sensitive through active community participation. The Zone believes that the new PHEM system is appropriately handling malaria surveillance; and averted malaria outbreaks. However, there might be resurgence of malaria; due to worn-out of ITNs. PHEM trainings were given; though variations to exist. Frequent supervisions were conducted on quarterly, monthly, weekly or daily basis Zonal to facility levels. The Zone achieved about 80-90% completeness and an average of 86% reporting rate for the last three years. The PHEM system is useful and easier for early detection, prevention and controlling any health events or outbreaks; the formats are simple, it takes an average of 45 minutes to record and send surveillance data. The system helped them to create multi-hazard and multi-sectoral approaches.

Conclusions: The surveillance system is sensitive and effectively detects an apparent disease increase including malaria. Malaria problem is decreasing year to year. However, possibility of malaria resurgence since ITNs coverage was worn-out. Surveillance officers have enough awareness on PHEM system though staff turnovers. There should be refresher training and ITNs replacement, and conduct root cause analysis for the reduction of malaria problem.

Kew Words: surveillance, officers, system, evaluation, Zone

Introduction

Program evaluation can be defined as "the systematic collection of information about the activities, characteristics, and outcomes of programs to make judgments about the program, improve program effectiveness, and/or inform decisions about future program development [1]. A surveillance system is useful if it contributes to the prevention and control of adverse health events, including an improved understanding of the public health implications of such events. A surveillance system can also be useful if it helps to determine that an adverse health event previously thought to be unimportant is actually important. The best recognized use of public health surveillance data is the detection of epidemics and other health problems in a community; but there are many other uses that are critical to public health practice. These data are used to estimate the scope and magnitude of a problem, including the geographic and demographic distribution of health events that will facilitate public health planning. Surveillance data also can be used to detect changes in health practices, monitor changes in infectious and environmental agents, evaluate control measures, and describe the natural history of a health event in a community that will generate hypotheses and stimulate applied research. In short, public health surveillance is the foundation for decision making in public health and empowers decision makers to lead and manage more effectively by providing timely, useful evidence [2].The evaluation of surveillance systems should promote the best use of public health resources by ensuring that only important problems are under surveillance and that surveillance systems operate efficiently. Insofar as possible, the evaluation of surveillance systems should include recommendations for improving quality and efficiency, e.g., eliminating unnecessary duplication. Most importantly, an evaluation should assess whether a system is serving a useful public health function and is meeting the system's objectives. Because surveillance systems vary widely in methodology, scope, and objectives, characteristics that are important to one system may be less important to another. Efforts to improve certain attributes--such as the ability of a system to detect a health event (sensitivity)--may detract from other attributes, such as simplicity or timeliness. Thus, the success of an individual surveillance system depends on the proper balance of characteristics, and the strength of an evaluation depends on the ability of the evaluator to assess these characteristics with respect to the system's requirements. In an effort to accommodate to these objectives, any approach to evaluation must be flexible [3].

In the context of Ethiopia, the Federal Ministry of Health has a dependable new system to ensure rapid detection of any public health threats, preparedness related to logistic and fund administration and prompt response to and recovery from various public health emergencies. The system is fully integrated, adaptable, multi-hazard and multi-sectoral of proactive system [4]; with the objectives of:

- To detect epidemics/outbreaks so that they can be controlled in a timely manner,
- To predict epidemics so that health services can plan to respond, prevent where possible, treat and control priority diseases,
- To monitor trends of priority diseases in order that changing trends inform policy decision,
- To evaluate an intervention so that effective and efficient actions/policies are identified and supported.

Malaria is a major public health problem in Ethiopia and has been consistently reported as one of the three leading causes of morbidity and mortality. Approximately 52 million people (68%) live in malaria-endemic areas in Ethiopia, chiefly at altitudes below 2,000 meters. Malaria is mainly seasonal in the highland fringe areas and of relatively longer transmission duration in lowland areas, river basins and valleys [5].

Rationale

With the purpose of early detection and prompt response to Public Health Emergencies, the sector re- designed its IDSR approach to a new proactive system, Public Health Emergency Management (PHEM). The new PHEM system is being implemented since 2009. Nevertheless, our level of surveillance accomplishment across regions, zones, Woredas and Health facilities is varied; due to many factors. Oromo Nationality Administrative Zone is among the Amhara Region Zones in which surveillance reports are on Woreda basis; not facility based to the maximum expectation. The Zone is totally malarious area with frequent malaria outbreak to the very near past. But, these days, although frequent malaria outbreak episodes across the Region, in converse to the previous profile, the issue of malaria is no more serious public health problem as it was before. To understand what the reality is at the ground, it was important to assess and evaluate performance status of the surveillance system as a whole, and malaria surveillance in the Zone that could help to know the facts that there was no malaria outbreak episode; and critically identify gaps to recommend corrective actions.

Objectives

General Objective

To evaluate surveillance system performance of the Oromo Nationality Administrative Zone that could guide government health sector and potential partners in order to improve system performance needs.

Specific Objectives

- To evaluate the surveillance system of the Zone
- To assess how current surveillance system shape malaria control and prevention undertaking
- To evaluate system performance and factors influencing system attainment
- To identify which elements of the system can be enhanced more in improving the quality of surveillance

Materials and Methods

Study area selection

A purposive sampling technique was used to conduct system evaluation. This surveillance system evaluation was conducted in Oromo Nationality Zone of Amhara Region;

Study design and period

A descriptive cross sectional study design was utilized; and the study was conducted through 01-11June, 2013.

Sampling and data collection

Health and health related data was collected from ZHD, three Woreda Health Offices, and under these Woredas, three accessible health centers plus one their referral units across the Zone. Semi-Structured questionnaire was administered to collect primary and secondary data; Interviews were conducted with relevant officers of the above specified offices/facilities and department as per the tool. Different related documents and reports were also checked. Then, obtained data were cleaned, analyzed using MS-Excel and interpreted as to explain the system.

Results

Sensitivity and Reporting

All the assessed offices had PHEM guidelines that base their routine tasks. The Zone, up-to the lowest facility units (health posts) had enough confirmatory tests for malaria. The offices and facilities have all expected case definitions for all priority disease under PHEM and distributed up to the expected level, as stakeholders can understand. In this regard, there was no any shortage of these materials at all levels. Due to that, the Zonal Department, Woreda and Facilities believe that the system addresses malaria surveillance; that is, they have malaria guideline in place. There is a new system to make the surveillance system is more sensitive enough by active community surveillance to report any illness using cards of different color formats as per the disease type; red card was used for immediately reportable diseases like measles, AFP/polio, AWD, Anthrax, Rabies and NNT. Green cards were used during absence of cases while yellow cards were used to report for weekly reportable disease like malaria and SAM case (fig.18 below).

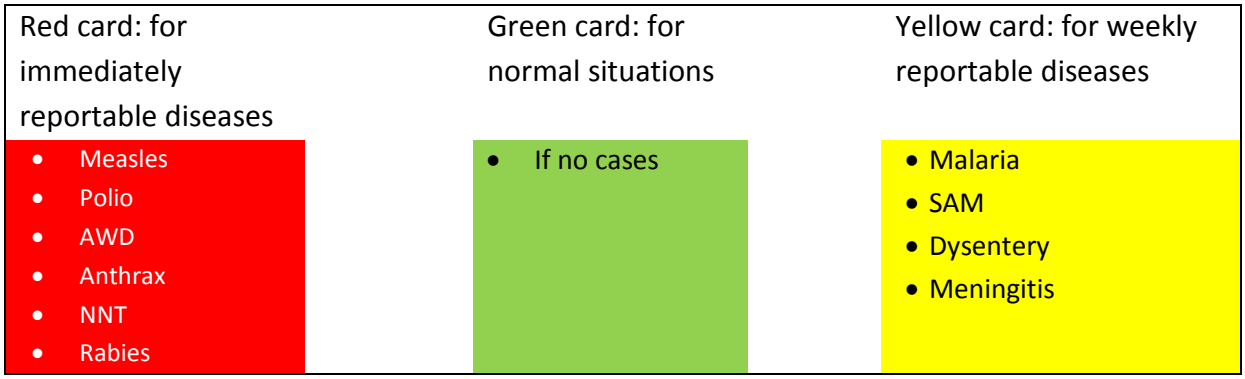

Figure 18: Pictorial Representation of Community Case Specific Reporting Cards, Oromo Nationality Administrative Zone, Amhara Region, 2013

The ZHD, Woreda offices and facilities have equal understanding on the timing of receiving and reporting surveillance reports accordingly. Malaria confirmatory rate of the Zone during 2003 EC was unknown; but, achieved 96 during 2005. Two Woreda health offices and one HC achieved 100 % confirmation rates during 2005(table4 below).

Table 4: Malaria Confirmation Rate Status of Sampled Areas by Year, Oromo Nationality Administrative Zone, Amhara Region, 2013

Institution	2003 EC	2004 EC	2005 EC

ZHD	NA	43	96
Dewa Chefa w.h.o	<50	>50	80
Artuma Fursi w.h.o	<50	95	100
Jile Timuga w.h.o	<50	100	100
Weledi HC	95	95	95
Chefa HC	46	46	95
Senbetie HC	45	100	100

The Zone believes that the new PHEM system was appropriately handling malaria surveillance; and according their evaluation on surveillance reports, there was no malaria outbreak report since the new system established. However, the system at different levels felt that there might be resurgence of malaria; due to worn-out of ITNs that was distributed close to three years back. 43,564; 30,780; 20015 total malaria cases were reported during 2002, 2003, 2004 EC respectively. Exceptionally, there was a slight increment (15%) of cases observed during 2002 from 2001; but there was successive decrement of cases by 29.3% in 2003 and 35% in 2004 from the preceded years (table5 below).

Table 5: Malaria Morbidity Trend by Year, Oromo Nationality Administrative Zone, Amhara Region, 1988 To 2004 EC

Year	Total cases	Difference	PF Count (%)	PV count (%)	Mixed count (%)
1988	43394	17.4	789(1.8)	5046(11.6)	3(0.0)
1989	24902	-42.6	6273(25.2)	3783(15.2)	3(0.0)
1990	21217	-14.8	8590(40.5)	4015(18.9)	8(0.0)
1991	35025	65.1	8500(24.3)	6918(19.8)	10(0.0)
1992	35015	0.0	5504(15.7)	7642(21.8)	228(0.7)
1993	32873	-6.1	7046(21.4)	3829(11.6)	29(0.1)
1994	17506	-46.7	933(5.3)	623(3.6)	0(0.0)
1995	66879	282.0	14423(21.6)	4237(6.3)	206(0.3)
1996	86249	29.0	8624(10.0)	1003(1.2)	0(0.0)
1997	57791	-33.0	10997(19.0)	3576(6.2)	35(0.1)
1998	**107192**	**85.5**	**4169(3.9)**	**10868(10.1)**	**510(0.5)**
1999	46887	-56.3	2816(6.0)	1296(2.8)	348(0.7)
2000	42484	-9.4	3255(7.7)	2008(4.7)	29(0.1)
2001	37880	-10.8	3726(9.8)	1247(3.3)	31(0.1)
2002	43564	15.0	5558(12.8)	2600(6.0)	54(0.1)
2003	30780	-29.3	2588(8.4)	1558(5.1)	77(0.3)
2004	20015	-35.0	4758(23.8)	3368(16.8)	781(3.9)
Total	**749653**	**-**	**98549(13.1)**	**63617(8.5)**	**2352(6.8)**

The highest (107,192) malaria episode was observed during the year 1998 EC; followed by 46,887 in 1999 and 43,564 cases in 2002. Since 1998, caseload was becoming decreased year to

year, with the least (20,015) cases were reported in 2004, though it was nine months' case records, it could be less for the year 20005EC (fig.19 below).

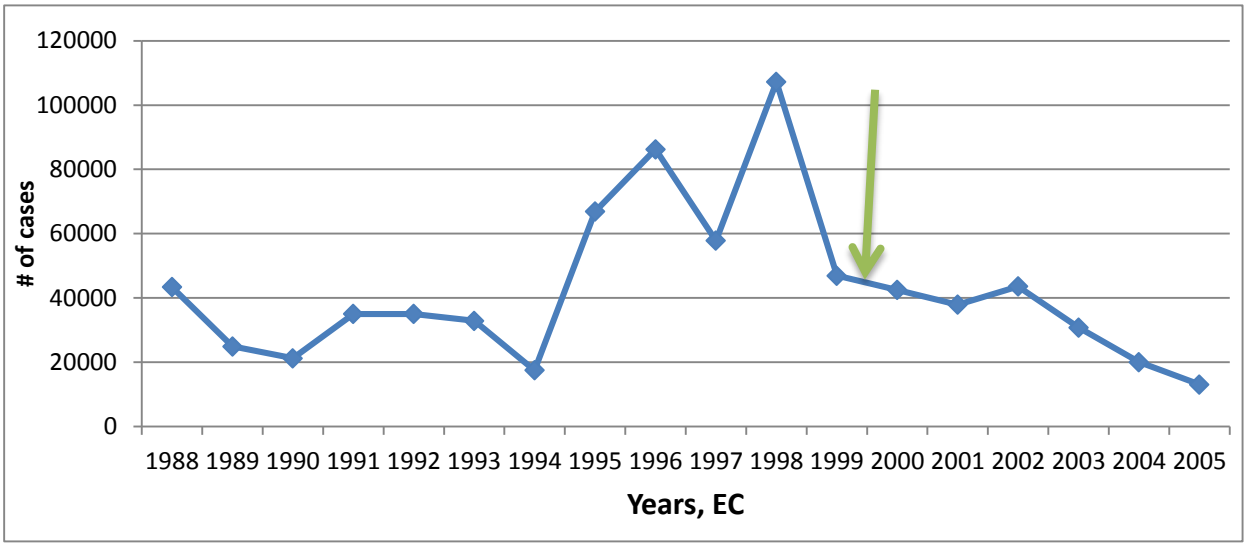

Figure 19: Malaria Prevalence by Year, Oromo Nationality Administrative Zone, Amhara Region, 2013

In 1995, 66,879 cases were reported; with 282% increment of case from the year before. The case load in 1996 decreased by 29% from 1995. Except slight (15%) increment observed in 2002, case trend was decreased; in 2003, it decreased by 29.3% and 35.0 decrement in 2004 from the preceding, and by 34.7% in 2005EC (fig.20 below).

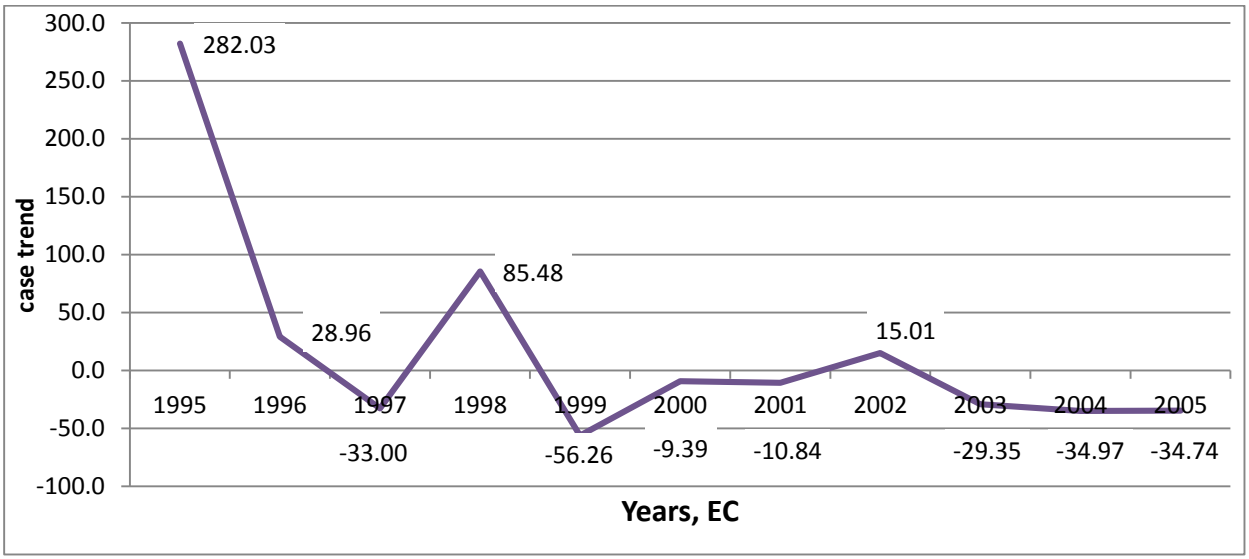

Figure 20: Malaria Case Trend by Year, Oromo Nationality Administrative Zone, Amhara Region, 2013

During the year 1992, PF accounted 15.7% of the cases wile PV 21.8%. Similarly, in 1998 EC, 10.1% of the cases were confirmed to be PV while 3.9% of the cases were PF. Since then, it shifted to the expected trend in which PF is outnumbered. However, since 2003 EC, many mixed case were reported (fig.21below).

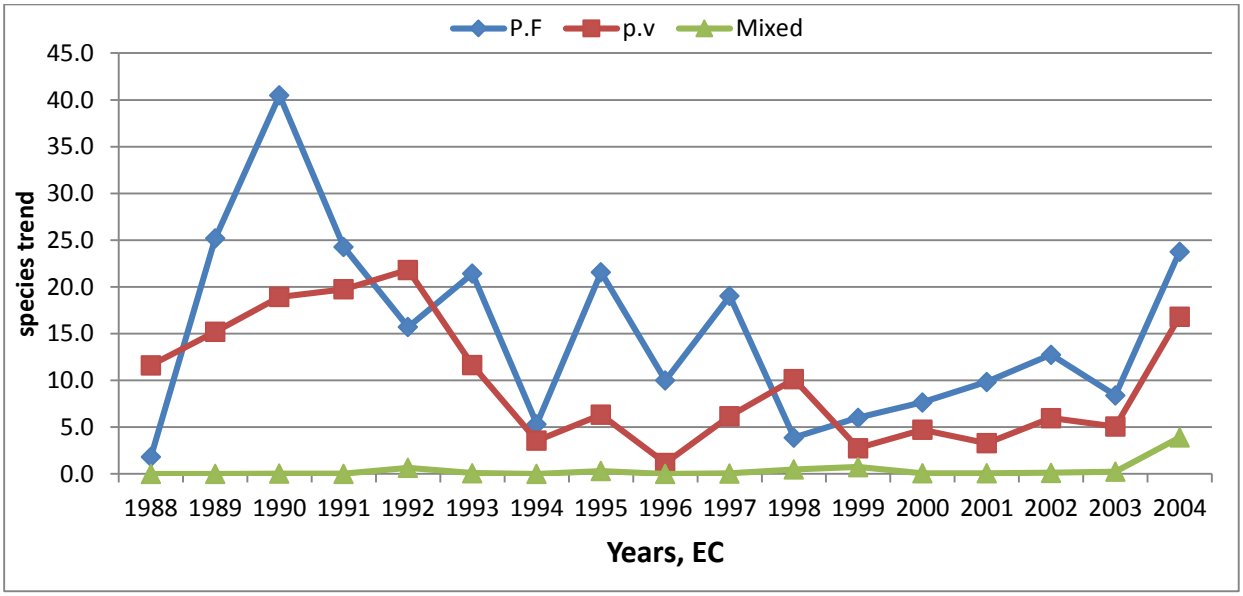

Figure 21: Malaria Species Case Trend by Year, Oromo Nationality Administrative Zone, Amhara Region, 2013

Training and supervision

All the respondents said that they have participated in PHEM trainings within the last three years, although variations on the intensity of trainings, which ranged from as low as one time in Weledi HC to as high as eight times in the Zonal Health Department. In every phase, there were experts who took malaria trainings since 2011; with its implication on malaria prevention and control activities resulted in reduction of malaria morbidity and mortality. Frequent supervisions were conducted in all levels; ZHD to Woredas on quarterly basis; Woredas to Facilities from as low as weekly to as long as monthly basis; Health Centers to Health posts, three days, rarely to a month.

Completeness and Timeliness

The Zone scored about 80-90% completeness for the last successive three years; and with an average of 86% reporting rate. Completeness of sampled Woredas ranged from 80% in Dewa Chefa and 80% in both Jile Timuga and Artuma Fursi. Moreover, reporting rate of the Zone was

86; while Woredas ranged from 80% in Dewa Chefa to 90 in Jile Timuga Woreda. The variation in reporting completeness and timeliness in this regard was, some health post reported their surveillance reports directly rather than to the nearby health center (table6 below).

Table 6: Timeliness and Completeness Status of Sampled Areas, Oromo Nationality Administrative Zone, Amhara Region, June 2013

Institution	Completeness (%)	Timeliness (%)
ZHD	90	86
Dawa Chefa	80	90
Artuma Fursi	90	90
Jile Timuga	85	80
Weledi HC	NA	88
Chefa HC	78	90
Senbetie HC	86	86

Usefulness

All respondents agreed that the new (PHEM) system is useful for early detection, prevention and controlling any health events or outbreaks. It helped them to determine other conditions that were thought to be previously unimportant are actually important, severe acute malnutrition (SAM). They are confident that, the system is useful to stimulate research, intended to prevent and control strategy, especially for malaria. The system helped them to create multi-hazard and multi-sectoral approaches with full consideration of emergency preparedness and response plan (EPRP). Even they are sure to initiate responses in a timely manner. In relation to this, all offices/facilities have emergency stocks of drugs and supplies; and case management protocols for epidemic prone disease including malaria. At most, all levels have conducted epidemiological investigation; the offices/facilities have benefitted from their investigation for early verification and prevention of public health events before they pose an outbreak.

Simplicity and Acceptability of the system

All respondents said that the PHEM system was easier than the previous IDSR. especially to handle malaria; this is because, the case definitions are understandable at all levels; the system allows all professionals to fill data easily; and to record and report surveillance data on time; that

is, the formats are not bulky and burdensome to engage with, and it takes an average of 45 minutes to record and send surveillance data. Professionals at all levels believed that, PHEM system is better than it was before, for early public health intervention. Concerning this, staffs agree that malaria handling under PHEM surveillance is more effective. For that reason, all professionals are supporting the system; the reporting agents across the Zone accept the system and are engaged in malaria surveillance activities; and reporting agents send their reports using the current and appropriate reporting formats.

Data Quality and Representativeness

Except Dawa Chefa Woreda Health office response, the remaining six respondents said that, their reporting formats were properly filed during reporting. Even if they receive poor data quality, they are managing it by communicating back to the sender and through monitoring of reports; so that make the recorded data clear and understandable. The system enables them to detect and follow health related events in the whole community. It is also giving emphasis to special groups, like Children and Pregnant Women mainly for malaria. The system uses different source of data; like facility reports, reports from partners and from the community.

Flexibility and Stability

The current formats can be used for other newly occurring conditions without much difficulty; experts also think that change in the existing procedure of case detection and reporting formats will not be difficult to easily implementing. That is, the system is uncomplicated to add new variables of interest; easy to integrate with other systems; which can smoothly add new diseases on surveillance. Although there was no major restructuring event, the system is stable to minor changes in that, able to continue its routine activities, and operating appropriately this time. There was no any impediment/shortage of resource to stop the surveillance system in all the visited areas and ultimately in the Zone.

Discussion

It is the Ministry's commitment to make the surveillance system proactive in order to detect any potential health consequences; that is, the purpose of evaluating public health surveillance systems is to ensure that problems of public health importance are being monitored efficiently and effectively[6]. When it compared to the national achievement during the same period of

time, which is close to 83%, the Zonal surveillance system attributes are all above 85% of completeness and reporting rate. Even WHO guideline assumed to be 80% and above for completeness and 85% and above for reporting rate is acceptable and reflect the overall public health issue in the jurisdiction. Public health surveillance systems should be evaluated periodically, and the evaluation should include recommendations for improving quality, efficiency, and usefulness. The Zone is 100% malarious, the problem of malaria highly decreased since 1998 EC and there was no outbreak in this Zone although the Region experienced many outbreaks especially in Western Amhara. Malaria is the most highly prevalent tropical disease, with high morbidity and mortality and high economic and social impact [7]. In relation to this, PHEM system gives priority to early prevention and control before it becomes serious public health problem and this days, the disease decreased compared to same malaria endemic Zones in the Region. Although ITNs coverage was worn-out, the Zone in the mean time, gives special attention for more vulnerable groups, pregnant Women and Children; this is because, Malaria in pregnancy is associated with premature labor, low birth weight, anemia, and, in low-transmission areas, the risk of development of severe malaria is high[5]. Acceptability of the system is a reflection of the willingness of the surveillance staff to implement the system, and of the end users to accept and use the data generated through the system [8]. For this reason, surveillance officers willingness in the Zone play a great role in generating data, and using it to early identify potential health consequences like malaria outbreak in the Zone. There was no interruption in surveillance activities whatever the approach is changing; this aligned with the fact that, an early warning system may need to be adapted from time to time to meet additional case detection needs[8, 9].

Conclusions and Recommendations

Through all questions and my observations, the surveillance system was noted to be sensitive and effectively detects any unusual health events and an apparent disease increase in the community. In this regards, since 1998 EC, malaria problem decreased on average by about 65% caseload. Nevertheless, there was possibility of malaria resurgence due to ITNs coverage was worn-out. There was good willingness of the surveillance staff to implement the system which helped the Zone for early detection of malaria incidences before it poses an outbreak; that is probably why the there was no any malaria outbreak for the last three years. This could be

attributed to the strengths of the PHEM system in one hand and due to climatic factors in the Zone. Even the surveillance personnel across the Zone are aware enough about the PHEM system and engaged in as expected to early detect and prevent any public health consequences. Although the Zone is in a better situation, there are still some gaps need to be addressed:

- All health posts have to be managed under HC, rather than direct reporting to the Woreda,
- More surveillance staffs have to be provided with refresher training to fill staff turnover observed in few facilities,
- It is good if partners involved especially in Artuma Fursi Woreda, to strengthen more malaria surveillance and prevention,
- There is a need of ITN replacement in some Woredas like Jile Timuga, to prevent merely any possibility of malaria outbreak as equal as the environmental management,
- It is very good to conduct root cause analysis for the reduction of malaria morbidity for future planning.

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Annex 3: Questionnaire for Surveillance System Evaluation in Oromo Nationality Administrative Zone, May 2013

Introduction: My Name is Getaneh Abrha; I have been working in EHNRI. I am here to conduct surveillance system evaluation of the Zone and would like to converse with people who are engaged in surveillance activities. The aim of the evaluation is to understand how the system is functioning and whether the intended objectives are being met. Finally, as per the findings, recommendations will be forwarded to improve the system.

No.	Question	Response/ coding
1. Background Information		
	Region: _____ Zone: _____ Woreda: _____ Facility name: _____	
	Respondent Name: _____ Address(phone)_____	
	Total Population of the catchment/administration: _____	
2. Case Detection/Sensitivity		
a	Do you have National Guide line for PHEM?	1.Yes 2.No
b	Do you have confirmatory tests for malaria at all levels?	1.Yes 2.No
c	Have the office had recent failure for detection of outbreak?	1.Yes 2.No
d	If yes, mention the outbreak, and its implication/s	_____
e	Do you have standard case definition for all PHEM priority diseases?	1. Yes 2.No 3. Other__
f	If yes, is it distributed to all facilities as professionals aware it?	1.Yes 2.No
g	If no, for which disease still the office /department have not?	_____
h	Do you think PHEM system properly address malaria?	1.Yes 2.No
i	What is your malaria confirmation rate for the last 3 years?	_____
j	If so show me species trend;	_____
k	Do you have malaria guideline in place?	1.Yes 2.No
l	Is there any information about health seeking behavior of the community?	1. Yes 2.No
m	Do you have any setup in the community to report any illness?	1.Yes 2.No

No.	Question	Response/ coding
n	How do you see/ examine the current malaria status from the previous trends that the zone /Woreda were frequently affected?	_____
3. Reporting		
a	When are you expected to receive/send surveillance data from/to next level?	1.receive_____ 2.send_____
b	What communication material do you have?	_____
c	How frequently you communicate; with the Health center PHEM officers on emergencies and other daily activities;	1.routine_____ 2. outbreak_____
d	How do you manage late reports?	_____
e	What gaps are currently affecting your reporting system?	_____
4. Data management and Feedback		
a	Are you trained on disease specific reporting system?	1.Yes 2.No
b	Do you have workable computer?	1.Yes 2.No
c	Do you have computer skill on data analysis, presentation?	1.Yes 2.No
d	Through what material you analyze surveillance data?	_____
e	Which variable/s do you commonly use to describe data?	_____
f	Do you give emphasis to special groups for malaria data analysis?	1.Yes 2.No
g	Were you able to detect outbreak from your analysis result?	1.Yes 2.No
h	Do you have threshold for malaria outbreak detection? Look it	1. Yes 2.No
i	Do you provide Feedbacks of analysis result implications to both next higher and lower level?	1.Yes 2.No
j	If so, do you always include malaria in your feedback?	1.Yes 2.No
k	Through what means do you give feedbacks?	1.Oral 2.Written 3.any_____
l	Please indicate frequency of your data analysis and feedback	_____
5. Training		
a	Did you take training on PHEM system within the last 3 years?	1.Yes 2.No
b	Since you implement the new system, how many times staffs were trained on PHEM activities?	_____
c	Is there any expert currently working in the office take malaria	1.Yes 2.No

No.	Question	Response/ coding
	specific training since 2011?	
d	What is the outcome/implication of that training on malaria control and prevention activities?	_____
6. Supervision		
a	Have you conducted supervision frequently?	1.Yes 2.No
b	If an answer Q 'a' is yes, how often you supervised the Woreda/HF?	_____
c	Do you have supervision checklist including malaria?	1.Yes 2.No
d	Have you done malaria specific supervision? Look interval	1. Yes 2.No
7. Completeness		
a	Is all surveillance data variables completed during reporting?	1.Yes 2.No
b	If answerer for Q 'a' is no, indicate major gaps for malaria:	_____
c	Can you show me your completeness for the last 3years? Observe it;	_____
8. Timeliness		
a	How much of reporting facilities report at expected time?	_____
b	Write your success on surveillance timelines for the last three years:	_____
c	Does the office have surveillance personnel at all levels?	1.Yes 2.No
9. Usefulness		
a	Do you feel the system helps to early prevent and control health events or outbreaks?	1.Yes 2.No
b	Does the system help you to determine previously thought to be unimportant is actually important?	1.Yes 2.No
c	Do you think the system is useful to stimulate research, intended to prevention and control strategy especially for malaria?	1.Yes 2.No
d	Do you have emergency preparedness and response plan? Look it	1. Yes 2.No 3.Other _____
e	Is the system useful in having multi-hazard & multi-sectoral approach?	1.Yes 2.No
f	Is the system practical to initiate responses in a timely manner?	1.Yes 2.No
g	Do you have emergency stocks of drugs and supplies in your context?	1.Yes 2.No
h	Do you have case management protocol for epidemic prone diseases including malaria?	1.Yes 2.No
i	Is there any epidemiological investigation conducted by the office?	1.Yes 2.No

No.	Question	Response/ coding
j	What has the office benefited from epidemiological investigations?	_____
k	For what purposes you usually use the surveillance data? List:	_____
	10. Simplicity of the system	
a	Is PHEM system easier than IDSR to handle malaria?	1.Yes 2.No
b	Do you think, cases definitions are understandable at all levels?	1.Yes 2.No
c	Does the system allow all levels of professionals to fill data?	1.Yes 2.No
d	Is the system easy to record and report surveillance data on time?	1.Yes 2.No
e	Do you feel the formats are bulky and burdensome to fill them?	1.Yes 2.No
f	How much time averagely you spend to fill and report data?	_____
	11. Acceptability	
a	Do you believe the current PHEM surveillance is better than it was before for early public health intervention?	1.Yes 2.No
b	Do you agree that malaria handling under PHEM surveillance is effective?	1.Yes 2.No
c	If no, what points can you justify for your disagreement?	_____
d	Do you think that reporting agents accept and well engage to malaria surveillance activities in the new system?	1.Yes 2.No
e	If no, what is the possible reason of low acceptability and engagement?	_____
f	Are all health professionals supporting the surveillance system?	1.Yes 2.No
g	If No, what do you think that the main gap could be for low participation?	_____
h	Do all the reporting agents send their report using the current and appropriate surveillance reporting formats?	1.Yes 2.No
	12. Flexibility	
a	Can the current reporting formats be used for other newly occurring health event (disease) without much difficulty?	1.Yes 2.No
b	Do you think any change in the existing procedure of case detection and reporting format will be difficult to easily implement?	1.Yes 2.No
c	Is the system uncomplicated to add new variables of interest?	1.Yes 2.No
d	Is the system easy to integrate with other systems?	1.Yes 2.No
e	Do you think the system can smoothly accommodate new disease on surveillance report?	1.Yes 2.No
	13. Data quality	

No.	Question	Response/ coding
a	Are reporting formats in your office properly filled during reporting?	1.Yes 2.No
b	Write percentage of unknown or blank responses to variables from the total reports of 2010-2012(if available):	_____
c	If you receive data with poor quality, how do you manage it?	_____
d	Is the recorded data clear to read and understand? Observation;	_____
14. Representativeness		
a	Does the surveillance system enable us to detect and follow health related events in the whole community?	1.Yes 2.No
b	Does the system give emphasis to Special groups for malaria?	1.Yes 2.No
c	Can you list sources of data in your surveillance task (if any)?	_____
15. Stability		
a	Was any new restructuring affected the procedures and activities of your surveillance activities?	1.Yes 2.No
b	If yes, did the system stop to release/accept data?	1.Yes 2.No
c	Do you think that our surveillance is operating appropriately?	1.Yes 2.No
d	What impediment/ shortage of resources affect the surveillance system?	_____

CHAPTER IV – HEALTH PROFILE DISCRIPTION REPORT

4.1 Health Profile Description Report-Oromo Nationality Administrative Zone, Amhara Region, May 2013

Introduction

A community health profile is a comprehensive compilation of information about a community. The data in a profile reflects the health of a given community from different angles. The information may include data already collected and published about a community or information collected by organizations or individuals creating the profile. A community health profile includes both previously identified health issues and the identification of new, emerging issues. A comprehensive community health profile includes, a narrative description of the given community, community strengths and challenges, demographic and economic data, health status data, community resources, including services, coalitions, and systems and interpretation of data presented, from both the perspective of the health council and the broader community [1].

The in equality of obtaining basic healthcare is a common phenomenon in developing countries is still relatively novice in providing citizens in primary care. This is because they have many fundamental problems on healthcare issues that need to be addressed and which can only be effectively improved by installation or improving of efficacy of PHC. Intergenerational impoverishment, especially in the remote areas of developing courtiers has prevented the poor from accessing basic healthcare services like general diagnosis and medicine provision. Restricted by in sufficient resources and fiscal support rural regions of developing courtiers lack budget to improve the PHC system, establish a healthcare network, and self-sustain the services and systems [2].

Health profile is very imperative for prioritizing high-flying health and health related problems of the community at any level. It is basic for planning and undertaking appropriate public health interventions; and is doorway point for operational public health researches [3]. Stakeholders of health and health related issues would access evidence-based information from well-compiled health profile. However, in our country, Ethiopia, such valuable information is usually not complete and incomprehensive at different levels.

Rationale for the Description

Prior to this assessment, such description/ study did not take place to understand the overall health profile of the area under study. Therefore, conducting this study has created the chance to elucidate the actual and current profile of the area so as to appropriate planning and managing key public health issues in order to improve health and productivity of that community.

Objectives

General Objective

To assess health profile of Oromo Nationality Administrative Zone, Amhara Regional Sate that could guide government health sectors and potential partners to diagnose community's health needs for appropriate public health responses.

Specific Objectives

- To describe health status of communities in Oromia Zone
- To assess health delivery of the Zonal Administration;

- To explore factors influencing the provision of primary health care; and
- To identify problems for priority setting and indicate areas that need acts

Materials and Methods

Study area selection

A purposive sampling technique was used to effectively conduct the assessment. This health profile description was conducted in Oromo Nationality Administrative Zone, Amhara Region;

Study design and period

A descriptive cross sectional study design was applied starting 21st April to 3rd May, 2013.

Sampling and Data Collection

Health and health related data was collected from Oromo Nationality Administrative Zone respective sectoral offices: health, education, Agriculture, plan and finance, Water and energy and communication offices. Additional data were also collected from local partners. Semi-Structured questioners were administered to collect primary and secondary data; Interviews were conducted with relevant officers of the above specified offices and departments based on needed data; as if crucial, different related documents and reports were reviewed. Then, data were analyzed and interpreted using Excel, and GIS as needed.

Administrative background

Background of administrative setup: Oromo Nationality Administrative Zone is among the 10 Zonal Administrations of Amhara Regional State. According to the census result of 2012, the Zone had a total population of 500,267; of which male to female ratio was close to one; or 49.7% of the populations are males, while 50.3% females. Which was the ninth populated and the sixth densely populated Zone, with a density of 144.2 persons per km^2. It shares 2.65 % of the Regional population and 2.24% of the overall land mass of the Region. The Zone first was established in 1986 EC as named as "Oromia Zone Administrative Council". In 1995EC, the Zone renamed as the current one "Oromo Nationality Administrative zone". It comprises of six Woredas, with 113 Kebeles; 102 (close to 90%) of them are rural Kebeles and 11(close to 10%) are urban Kebeles. Overall, land mass area is 3,470.04 km^2 (422,327 hectares according to the

Zone) which is the smallest land mass area of all Zones in the Region, with all the land mass area being dry land. The Zone; bordered by Afar in the North, South Wollo in North and West, North Shoa in South. The Zone is 325 KM far from Addis Ababa and 555 Km from the Regional Capital, Bah Dar. The Zone is situated in 10^0 1'-$25^0$22' North and $39^0$55'-$40^0$12' East; with an average altitude of 1000-2500m above sea level. As well, the average rainfall ranges from 600mm to 900mm; while the average temperature ranges 12-33^{O}C.

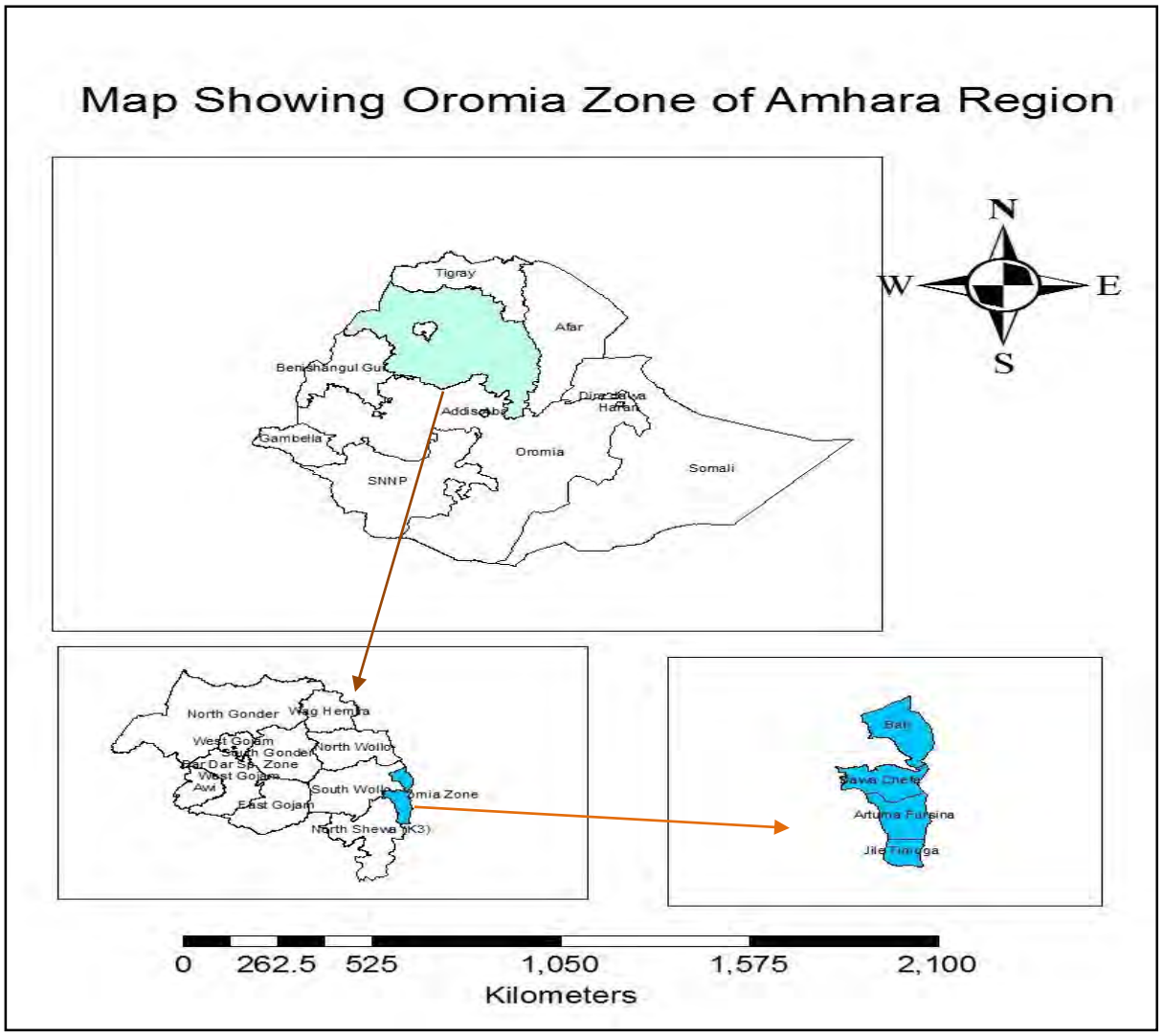

Figure 22: Location of Oromo nationality administrative zone of Amhara region, 2013

Demography: According to current Zonal figure, the Zone has a total population of 510,295; 253,566(49.69%) of them are Males and 256,729(50.31) are females. From this, 66,553(13.04%) of the population are Urban dwellers while 443,742(86.96%) of them are rural community; with a ratio of Rural to Urban community being close to 7.6:1 respectively (Table7 below).

Table 7: Population Distribution by Woreda, Oromo Nationality Administrative Zone, Amhara Region, 2013

Woreda	Male	Female	Total	Share (%)
Dawa Chefa	73,509	73,450	146,959	29
Bati	60,212	60,333	120,545	23.6
Jile Timuga	39,608	41,232	80,841	15.8
Artuma Fursi	45,428	46,488	91,915	18.0
Dawe Harewa	22,572	23,121	45,693	9.0
Kemisie/Town/	12,258	12,085	24,342	4.8
Zone total	**253,587**	**256,708**	**510,295**	**100.0**

Even though child labor is common in rural communities and due to that more than 90% of these Zonal communities are rural dwellers, the dependency or an assumed none productive segment of the population is very high (87.1%) in Amhara and the Zone, compared to the productive age group population. Actual productive population in the Zone was close to 56%. One important thing in this regard is the total fertility rate in this Zone and in the Region currently is the lowest rate compared to the four big Regions and the national level, 4.8%. On top, the pregnancy rate in this Zone and the Region is also the lowest, an advantage for family spacing and productivity in this regard. Generally the older population in the Zone accounts about3%, far more compared to the developed countries, 8% (Table8 below).

Table 8: Population Category by Age and Women Productivity, Oromo Nationality Administrative Zone, Amhara Region, June 2013

Category	Number	Percent
Children<1 years	16,840	3.3
Children<5years	68,890	13.5
Children<15years	209,221	41
Old people>65years	15,309	3
Women child bearing age	60,583	23.5
Pregnant women	1,878	3.1

The Zonal community is composition of different religions; namely:

- Muslim, 443874(97.07%)
- Orthodox, 10,977(2.40%)

- Protestant, 1,974(0.43%)
- Catholic ,155(0.03)
- Traditional, 142(0.03%)
- Others, 156 (0.03%)

Majority of the inhabitants of the Zone are Muslims, 97.07%; followed by Orthodox Christians, close to 2.40%. Of the total current population, about 53017 people are unspecified in religion.

Zonal Health System Description

The ZHD has three main processes; Public Health Emergency Management, Health Promotion and Diseases prevention, and Regulatory parallel directly accountable to the Department Head. The general health system structure of Oromo Nationality Administrative Zone (flow chart)

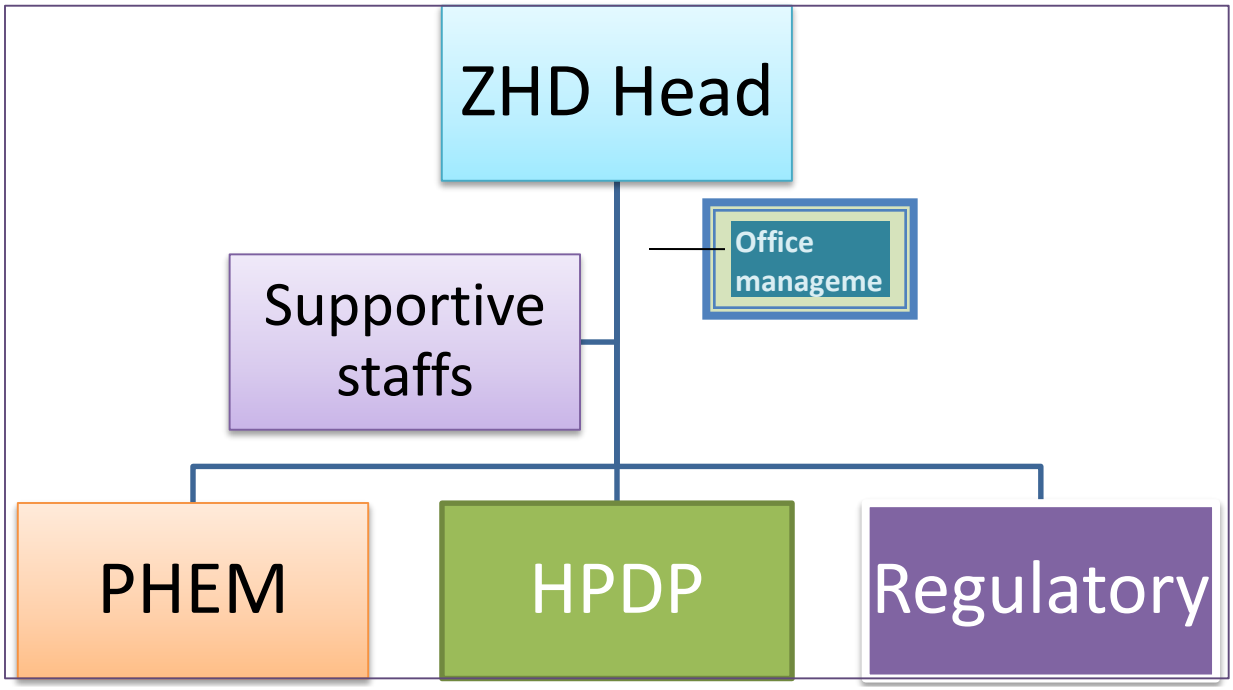

Figure 23: Flowchart of Zonal Health Department, Oromo Nationality Administrative Zone, Amhara Region, 2013

There is functional public health emergency management taskforce (PHEM TF) at Zonal level; at intra sectoral level, it includes (composition of):

- PHEM officer
- Malaria officer
- RH officer

- Hygiene sanitation officer And
- Logistic officer

The overall inter-sectoral coordination is usually being lead by the Zonal Disaster Preparedness and Prevention Office

Functions of the task forces: Conducts the link between the investigation and the selection of response activities for preventing additional cases and saving lives. Likewise, each Woreda in the Zone has similar PHEM TF.

The major endemic diseases in the Zone for instance are Malaria, Diarrhea (non-bloody), acute malnutrition, Typhoid fever.

Health Infrastructures: Overall distribution of health infrastructure of the Zone is fairly equitable and accessible from the HSDPs view points; that is, as in the table below, there is no Hospital in the Zone; as per the assumption one Zonal Hospital to serve for about 500,000, almost equal to this Zonal population; hence, 1 Hospital is mandatory in this regard. The remaining facilities are at the acceptable ranges from what it could be; average is above the target; which mean, 1 HC for about 25,000 people, but here below 20,000; and 1HP in this regard served for less than 5,000 population (Table9 below).

Table 9**:** Number of Health Facilities, Ratio to Population, Oromo Nationality Administrative Zone, Amhara Region, 2012(2004 EC)

Type of Health facility	Number	Facility: population	Ratio
1.Hospital	0	-	-
2.Health centers	26	26:500951	1:19267
3.private clinics	29	29:500951	1:17274
4.Pharmacies	0	NA	-
5.Drug store/Rural drug vender	16	16:500951	1:31309
6.diagnostic Laboratories	7	7:500951	1:71564
7.Neucles health center	NA	NA	-
8.Health posts	105	105:500951	1:4771

Human Power: Generally from the perspective of primary health care points, to assist the well-being of this Zonal community, there is adequate human power in every facility as needed;

in relation to that, there is no Hospital in the Zone, no physician also assigned there (Table10 below).

Table 10: Overall Man Power of Oromo Nationality Administrative Zone Health Sector, And To Population Ratios, 2012(2004 EC)

Profession	Number	Professional: population	Ratio
Physicians	0	-	-
Health officers	26	26:500951	1:19267
Lab. technician/technologist	47	47:500951	1:10659
Pharmacy technician/Pharmacist	47	47:500951	1:10659
Nurses	178	178:500951	1:2814
Midwife	30	30:500951	1:16698
X-Ray technician	0	-	-
EHOs	20	20:500951	1:25048
HEWs	220	220:500951	1:2277
TBAs	NA	NA	NA
Others	NA	NA	NA

* Not Available

Out Patient status: Among the top ten OPD (Adult) problems for the Zone, cumulative malaria disease still stands first, that accounts 20.6% of the overall burden; followed by diarrheal diseases. Major shifts; from previous history of the Zone, in terms of its hyper - endemic to malaria illness (Table11 below).

Table 11: Top Ten OPD Morbidity (Adults › 5 Years) Problems, Oromo Nationality Administrative Zone, Amhara Region, 2012(2004 EC)

Rank	Adult (› 5 years)	Number (%)
1	Diarrhea(non-bloody)	58451 (11.4)
2	Malaria (clinical)	52291 (10.2)
3	AFI	33512 (6.5)
4	AURIs	32949 (6.4)
5	Malaria (confirmed with sp other than PF)	30557 (5.9)
6	Pneumonia	26378 (5.3)
7	Helminthiasis	24428 (4.8)
8	Malaria(confirmed with PF)	23274 (4.5)
9	Disease of the musculoskeletal system and connective tissue	20922 (4.1)
10	Urinary tract infection	20540 (4.0)
Total Morbidity: -		**513,229(**

In terms of severity, the ten top admissions in both cases, malaria (confirmed with PF) is the first in adults, while severe acute malnutrition is the first leading severe problem in less than five populations (Table 12 below).

Table 12: Ten Top Admissions in Both Categories, Oromo Nationality Administrative Zone, Amhara Region, 2012(2004 EC)

Rank	Adult (› 5 years)	Number (%)	Pediatrics (‹ 5years)	Number (%)
1	Malaria(confirmed with PF)	31 (14.6)	SAM	16(16)
2	Diarrhea(non-bloody)	22(10.3)	Dysentery	13(13)
3	Diarrhea(with blood)	20(9.4)	Malaria(confirmed PF)	11(11)
4	Immediately reportable disease	17(8)	Diarrhea(non-bloody)	9(9)
5	Malaria (other than PF)	13(6)	Immediately reportable disease (others)	7(7)
6	Malaria (clinical)	10(4.7)	Trauma	4(4)
7	Urinary tract infection	10(4.7)	UTI	4(4)
8	Typhoid fever	9(4)	*	*
9	Pneumonia	9(4)	*	*
10	Diarrhea with dehydration	9(4)	*	*

* Not determined

Maternal and Child Health promotion activities: As in the table below, the overall MCH, EPI coverage of the Zone is, except PNC and TT2 (for none pregnant) more than 100%. For instance ANC and PNC OF THE Zone were 156% & 77.5%, while Regional 86.2% & 44.5% respectively for 2004EC. In this regard, the problem is common to other parts of the county. If the Zone appropriately identifies each segment of the population in relation to respective activities or programs, in every program the achievement cannot be more than 100%; the reality might be different (Table 13 below).

Table 13: MCH and EPI coverage, Oromo Nationality Administrative Zone, Amhara Region, 2012(2004 EC)

Description	Coverage (%)	Remark
ANC coverage	156	Planning problem
PNC coverage	77.5	
BCG coverage	108.04	Planning problem

Measles vaccine	123	Planning problem
OPV1	134.26	Planning problem
OPV2	127.43	Planning problem
OPV3	132.58	Planning problem
Penta1	134.26	Planning problem
Penta2	127.43	Planning problem
Penta3	132.58	Planning problem
Contraceptive prevalence	*	*
TT2 for pregnant	119.4	Planning problem
TT2 for no pregnant	32	Low

*not known

Mortality rates and other indicators: The Zone has no different figure on both infant and maternal mortality rates apart the Regional status. Here, the Zonal Safe and Clean delivery is very low (9.2%) compared to the Regional level, more than 10% [4]; for this reason, mortality situations in both case might be higher than the Regional status. Indicators for malaria prevention and control at this juncture are not to the maximum level (100%). LLITNs coverage was 88.9% and IRS coverage of 71%. There is no different the achievements in both mortality rate and health indicators of the Zone; the Zone considers the Regional or National coverage rates. TB intervention activities in this Zone are more remarkable compared to the current National attainment; for instance, the National TB CDR is 36%, whilst 45.5% in this Zone; but still very low as stated in global target, 70%. correspondingly, the TB TSR achievement of the Zone currently reach 91.6%, more than the National 84%, and even form the global target 85%. However, the TB CR in this circumstance is not satisfactory as the TSR [5] (Table 14 below).

Table 14: Vital Statistics and Health Indicators, Oromo Nationality Administrative Zone, Amhara Region, 2012(2004 EC)

Indicators	**Coverage (%)**	**Remarks**
Child mortality rate(<5yrs)	76*	As regional
Maternal mortality rate	676**	As national
Safe and clean delivery	9.2	<Regional(10.2)

Contraceptive Acceptance Rate	65.3	Below Regional(84.7%)
Attended Delivery by skilled HWs	16.3	Low
LLINs	88.9	Low at ground
IRS	71	Low
TB CDR	45.5	Better than national
TB TSR	91.6	Better than national
TB CR	77.5	Good
Health Service coverage	100	Excellent

Recent outbreaks/disasters: Health event/Disaster situation in the Zone, luckily, there has not been any unusual major public health problem in the Zone for the last three years; even the most serious public health issue in the Zone. Fortunately, even malaria was not a major health problem compared to diarrhea and malnutrition problems; although not emerging, as we can understand from the morbidity profile, diarrheal disease looks to increase across the Zone.

Acute Malnutrition issue and Nutrition intervention: as explained above in the food security situation of the Zone, malnutrition is prevalent in the Zone; that is, SAM issue is the best indicator to label community's food security status. In relation to this, malnutrition is a prevalent problem in this regard and interventions are currently being implemented (Table 15 below).

Table 15: Ongoing Malnutrition Related Interventions, Oromo Nationality Administrative Zone, Amhara Region, 2013(2005EC)

Type of food intervention program	Number(quantity)	Remark
OTP sites	All Woredas & all health facilities	
TFU program	On six (6) Woredas of health centers	
TSF program	No	
CBN program	On 4 Woreda	
EOS program	On six months basis	
PSNP	146,313 people	
Others	No	

External partners: There are plenty of potential partners taking part in different programs with the sector; these are:

- Engender Health for better life :- Reproductive Health
- Intrahealth :-PMTCT
- Merystops :- private sector
- USAID delver project:-Logistic
- WHO :- PHEM,EPI
- UNICEF :- PHEM, EPI, WASH, and others
- Carter center :- Trachoma and Malaria
- World vision :-Water and sanitation, Health and HIV/AIDS

Zonal WASH Status

The Zonal potable water coverage was, 69.1% in 2003; 77.5% in 2004 EC; though expectation is that the coverage will improve, there was no summarized data for 2005. This coverage is encourage able as compared to the national level; in which courtiers that still have not more than 50% coverage in water supply are almost all in Sub-Saharan Africa[6]. The main sources of water for the zone are:

- Hand dug water
- Shallow wall
- Dip wall water
- Spring water

There is an organized peasant association in all Kebeles of the zone, to take ownership of the water sources by the community. In relation to this, these days, the average time that take to fetch water is 40 minutes and the average distance is 1.5km. In 2005 the government announced highly ambitious targets to increase coverage in its Plan for Accelerated Sustained Development and to End Poverty (PASDEP) for 2010. In 2010, the government presented the equally ambitious Growth and Transformation Plan (GTP) 2011-2015 that aims at increasing drinking water coverage, based on the government's definition, from 68.5% to 98.5%; While donors have committed substantial funds to the sector, effectively spending the money and to ensure the proper operation and maintenance of infrastructure built with these funds remain a challenge.

Latrine coverage of the zone is, 96.6% in 2003; 97.2% in 2004; and 97% in 2005. Moreover, utilization coverage was 70% in 2003; 71.7% in 2004 EC; and as per recent utilization coverage

survey of 2005EC, 60.6% of the communities are assumed to be utilizing latrines; and the functionality of the gross constructed latrines was only 53% so far. In this regard, the highest coverage compared to the Sub-Saharan Africa and the nation, in which sanitation coverage is no more than 50% and open defecation was more than 50% in rural population of Sub-Saharan Africa in 2010[6]. Although all schools in the Zone have WASH clubs, they do not have adequate water supply and latrine.

There was no any water borne outbreaks during the last three years. In this regard, potential partners like Amhara re-habilitation Development Organization (ARDO), World Vision (WV) and Milederma are currently assisting the WASH sector (Table 16 below).

Table 16: Over all Wash Status, Oromo Nationality Administrative Zone, Amhara Region, 2004EC

Description	Number (%)	Remark
Latrine coverage	113,350(97.2)	Excellent
# of house hold with latrine	113,350(97.2)	Excellent
Safe water supply coverage	827(77.5)	Good
# of Kebeles access to safe water supply	all	2-10 units

Zonal Education Enrollment and School WASH

The Zone has all categories of schools; primary, secondary, preparatory and Tertiary (in this context, any learning/ teaching enrollment out of the successive education succession is considered as tertiary; for instance, the TVET and Teachers College in the Zone). Generally, about 21.6% of the Zonal populations are primary education students; while 0.9%s are students of secondary education; with the overall aggregate, 22.5% the general population are students. The gross and net enrollment ratio of primary education is above 100% in this Zone and the Region. In relation to this, pupils to teachers ratio in primary education in this Zone currently is close to 30; better than the Regional ratio, 57.7; and ultimately the national level, 54[7]. As indicated in table below, although they are not permanent residents there and the administration belongs to the Regional Education Bureau; about 1,798 tertiary students are currently in the Zone and that has its own impact on the Zonal host community (Table 17 below).

Table 17: Current Educational Enrollment status, Oromo Nationality Administrative Zone, Amhara Region, 2005EC

School type	# of schools	# of teachers	Students		Tot. students
			M	F	
Primary (1-8)	223	3230	55,013	55,189	110,202
Secondary (9-10)	6	189	2299	1664	3963
Preparatory (11-12)	3	62	457	256	713
Tertiary	2	45	1,251	547	1,798
Total	**234**	**3526**	**59,020**	**57,656**	**116676**

Only 59 schools have adequate water supply. Besides, 167 schools have functional latrines. In addition, 230 schools have HIV/ other health clubs. W.V.E and HAPCO, USAID, UNICEF, ARDO, Save the Children are involved to minimize the problem. The Zonal Education Bureau did not specifically determine literacy ration of its Zonal communities; rather assumes as the same as the Regional achievement to date. Still, the national rate serves for all the regions, that is, 42.7%; which is the 9th least literacy ration from the world. This is among the least from Africa compared to the successful Zimbabwe with 90.5%.

Livelihoods

The predominant livelihoods of the Zone are agriculture, trade, and semi-pastoralist activity. The three most harvesting seasons are Meher, 1,532,821(47.4%) quintals; Belg, 0(0%); and others like irrigation accounts 1,703,505(52.64%). This Zone is among the Zones of the Region which has, large food unsecured community; this is due to many factors, as main impediment is persistent drought due to climatic change. To cope with, Productive safety Net Program has been implemented in all Woredas of the Zone. For instance, in 2004EC, 151,157 eligible populations were food in secured; similarly, in 2005, 146,313 people were food in secured, comparatively less by about 3.2%. In this regards, women are highly vulnerable to the food in security problems, that is, about 62.3% of the overall food in secured communities in the Zone is women due to many factors.

Budgetary and Planning

Budget allocation: The Zonal population considered in planning is supposed to be increasing year to year; during 2004,500,951 people were assumed; in 2005 about 510,295 people (2%), with significant variation in beneficiary number.

Budget allocated by government: In 2005 EC, the Zone allocated about 247,043,136 Birr for the Zone. In this regard, education sector takes the highest slash of the budget, 87,764,834(30%). Annual budget for the health sector in 2005 was 1,091,724 Zonal level and overall 26,310,071 Birr.

Budget allocated other than government: Totality close to 85,431,683 Birr was allocated for Zonal sectors; out of this, 1,057,088 Birr was to Zonal Health Department. From 2003 to the current fiscal year 2005, annual budget is increasing dramatically; in 2003, 136,361,335 Birr; in 2004, 203,951,339(49.6% increment); in 2005, 247,043,136(21.1% increment) as weighed against the preceding year/s.

Employment (based on eligible for employment): Accordingly, the Zone believes 17,543(based on previous census) are employed; conversely, 4,263 people are unemployed. With ratio of employed to unemployed this time is 4 to 1.

Income: Agriculture is the main source of income in this Zone, which account close to 90% of the overall livelihood of the Zonal community; to less extent specifically, civil servant and livestock have their contribution. And the average income per capita of the Zonal community is close to 412 USD (almost similar with World Bank estimation).

Communication and utilities: Nearly 56.4% of the health facilities in the Zone are accessible for transportation; similarly, the telecommunication coverage is 94.1%; where as 29.4% of the facilities have electric power.

Conclusions and Recommendations

The Zonal PHEM System was organized as a standalone and proactive with task forces in place. Health infrastructure is equitable; but no hospital in the Zone to the maximal of PHCU expectation. Malaria was the leading cause of morbidity though declining year to year.

Limitations on MCH and EPI activities were observed. Safe and clean delivery was very low. The highest slash of budget was allocated to the Education Sector. Therefore, to improve more the health delivery status of the Zone, the Government and potential partners have to pay attention and allocate resources accordingly.

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Annex 4: Questionnaire for Zonal Health Profile Description, Oromo Nationality Administrative Zone, April 2013

Region: _____ Zone: _____ Woreda _____Contact *perso*_____, *phone*_____, *optional*_____

1. **Background information:**
   - The origin of the name of the Zone _____
   - When the Zone was established? _____
2. **Administrative setup:** Total no. of kebelles: rural _____Urban_____
   Overall Land mass area_____; Dry land,_____, Water body_____
   - Zonal Boundaries_____East_____West_____North_____South___
3. **Geography and Climate:**
   - Area of the Zone _____
   - Distance from Addis and Bahir Dar _____

- Altitude _____
- Latitude_____
- Average Annual rain fall _____
- Average Annual temp _____

4. Demographic information:

- Total Population size_____
- male_____
- female_____
- urban_____
- rural_____
- Sex ratio_____
- Age structure: - percentage of children < 1yrs_____. <5yrs____< 15 yrs
- Percentage of old people >65 years_____
- Women child bearing age_____
- Percentage of pregnant women_____
- Population composition by religion;
  Orthodox_____Catholic_____Protestant_____Muslim_____
  Others_____

5. Zonal health system

- The general health system structure of the Zone (flow chart) _____
- Is there functional public health emergency management taskforce (PHEM TF) at Zonal level?
  Yes___, No___, If yes, describe the PHEM TF in detail (composition, functions, etc)
  _____
  _____
- What about Woreda level? Yes/no_____; how many of them have PHEM TF? _____
- What are the major endemic diseases in the Zone? List_____
  a) List number of health facilities, and put ratio of facility to population, as given below

Table 1: Number of health facilities, ratio to population, Oromiya Zone, 2012(2004 EC)

Type of Health facility	Number	Facility: population	Ratio
1.Hospital			
2.Health centers			
3.private clinics			

4.Pharmacies			
5.Drug store/Rural drug vender			
6.diagnostic Laboratories			
7.Neucles health center			
8.Health posts			

b) List human power of the Zone by profession, profession to population as given the format in the table

Table 2; Overall Man power of Oromiya Zone health sector, and to population ratios in 2012(2004 EC)

Profession	Number	Professional: population	Ratio
Physicians			
Health officers			
Laboratory technician/technologist			
Pharmacy technician/Pharmacist			
Nurses			
Midwife			
X-Ray technician			
EHOs			
HEWs			
TBAs			
Others			

c) What are the ten top OPD (Adult) problems for the Zone? And what about ten top admissions in both cases; Fill the tables below;

Table 3; Top ten OPD morbidity (Adult) problems, Oromiya Zone, 2012(2004 EC)

Rank	Adult	Number (%)
1		
2		
3		
4		
5		
6		
7		
8		
9		
10		

Table 4; Ten top admissions in both categories, Oromiya Zone, 2012(2004 EC)

Rank	Adult	Number (%)	Pediatrics	Number (%)
1				
2				
3				
4				
5				
6				
7				
8				
9				
10				

d) What is the overall MCH, EPI coverage of the Zone? fill as if below;

Table 5; MCH and EPI coverage, Oromiya Zone, 2012(2004 EC)

Description	Coverage (%)	Remark
ANC coverage		
PNC coverage		
BCG coverage		
Measles vaccine		
OPV		
Penta1		
Penta2		
Penta3		
Contraceptive prevalence		
TT2 for pregnant		
TT2 for no pregnant		

e) What look like the achievements in both mortality rate and health indicators of the Zone? put your answer in the table provided;

Table 6; Vital statistics and health indicators, Oromiya Zone, 2012(2004 EC)

Indicators	Coverage (%)	Remarks
Infant mortality rate		
Maternal mortality rate		
Safe and clean delivery		
Contraceptive Acceptance Rate		
Attended Delivery by skilled HWs		
LLINs		
IRS		
TB CDR		
TB TSR		
TB CR		
Health Service coverage		

a) Health event/Disaster situation in the Zone;
   - Was there any disaster (natural or manmade) in the Zone in the last one year? Yes/No_____, if yes, specify,_____
   - Is there any recent disease outbreak/other public health emergency? Yes/No, _____, if yes specify either **emerging** or **re-emerging**, _____, if so number of cases_____ and deaths_____

b) Nutrition intervention; is there any intervention that is **going on**? Yes/no__, If so, fill the table accordingly;

Table 7; ongoing malnutrition related interventions in Oromiya Zone

Type of food intervention program	Number(quantity)	Remark
OTP sites		
TFU program		
TSF program		
CBN program		
EOS program		
PNSP		

Others		

c) Is there potential partners taking part with the sector? Yes, ___No___, if yes, list them and area of support;_____
_____
_____

6. Zonal WASH status

a) What looks the Zonal potable water coverage for the EFY; 2003_____, 2004_____ 2005_____
b) What is/are the main source of water? _____Is there an organized PA in all kebeles of the Zone? _____,
c) What about latrine coverage? 2003_____, 2004_____2005_____, in relation to this, have you done utilization coverage survey? Yes/no _____, if so how much is it? 2003_____, 2004_____, 2005_____
d) What is the average time that takes to fetch water now? _____; how many of the schools in the Zone have WASH clubs? _____
e) Do you think the schools in the Zone have adequate water supply and Latrine? yes_____, No_____

Note; to say yes, consider totality of latrines separately for male /female, and number of seats or sitting room ;example, 1 sitting room for 20 students.

f) What waterborne diseases have you experienced? , if so, list them_____
g) What potential partners are take part in the sector? _____

Table 8; Summarized WASH status in Oromiya Zone, 2004 EFY

Description	Number (%)
Latrine coverage	
Number of house hold with latrine	
Safe water supply coverage	
Number of Kebeles accessed to safe water supply	

7. School WASH

Table 9; please summarize as in the table the current education enrollment status of Oromiya Zone;

School type	# of Schools	# of teachers	Male Students	Female students	Tot. students
Primary(1-8)					
Secondary(9-10)					
Preparatory					

Tertiary					
Total					

a) School WASH/ health activities:

- schools with water supply_____
- Schools with functional latrines _____
- Schools with HIV/other Health clubs_____
- Literacy ratio_____

b) Mention potential partners and their specific assistance to the sector?

_____
_____
_____

8. Agriculture;

c) What are the main livelihoods of the Zone? List orderly_____

d) . What are the main production/harvesting season and how much does account? , Meher (%) _____Belg (%) _____other (%) _____

e) What production impediment/s have encountered? _____, is there widespread malnutrition problems this days in relation to that? _____

9. Budget allocation;

a) What is the Zonal total population considering in your planning? 2004_____2005_____

b) Budget allocated by government

- Annual budget allocated for the Zone (birr) _____
- Which sectorial office takes the highest slash of the budget? _____
- Annual budget for the Zonal health Department (birr) _____
- Annual budget allocation increment (%) compared to the previous year _____

c) Budget allocated other than governmental:

- Annual budget allocated for the Zone (birr) _____
- Annual budget for the Zonal health Department (birr) _____
- Annual budget allocation increment (%) compared to the previous year _____

d) Employment(based on eligible to be employed);

- Number of people employed_____
- Number of people un employed_____

- Ratio of Employed to un employed_____

e) Income;

- Main source of income: Agriculture_____ Civil servant___ Others (specify) _____
- Yearly income per house hold_____
- Average income per capita _____

f) **Communication and Utilities;**

- How many of the health facilities have access to transportation_____ (%) telecommunication_____ (%) Electric power_____ (%)

10. Observations: Mention the overall weakness and strengths observed in all sectors of the Woreda:

a. strengths_____
_____
_____

b. weakness_____
_____
_____

c. What do you think the major Health problem/s of the Zone?
_____
_____
_____

d. What do you think solutions of the abovementioned problems? _____
_____

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

CHAPTER V – SCIENTIFIC MANUSCRIPTS FOR PEER REVIEWED JOURNALS

5.1 Investigation of poliomyelitis- Doolo Zone, Ethiopian Somali Region, January 2014

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Abstract

Introduction: When World Health Assembly launched Global Polio Eradication Initiative (GPEI) in 1988, polio was endemic in an estimated 125 countries, with more than 350,000 cases compared to 2010 of fewer than 1,500 cases. GPEI has reduced the global incidence of polio by more than 99.9%. In the African Region, the Polio Eradication Initiative launched its wide-scale activities in 1996 with a slogan "Kick Polio out of Africa by 2000". In 2013, poliomyelitis was detected in Doolo Zone, Ethiopian Somali Region. Investigation was conducted to identify risk factors.

Methods: A cross-sectional study design was employed; Acute Flaccid Paralysis (APF) surveillance activities were reviewed; and assessed local Oral Polio Vaccine (OPV) coverage.

Results: Nine cases with one death (CFR=11.1%) Wild Poliovirus1 (WPV1) were reported between July and November 2013 from Doolo Zone of Somali Region. The index case was on July 10, 2013 from Boreyal village of Galadin Woreda. Amongst 55.6% (5/9) of them were males. Their age ranged from13 months to 15 year olds; with mean ages of 6 year. Families of all cases are pastoralists with limited basic services. Cases had fever at the initial stage; then manifested with acute paralysis. Only one case had right limb paralysis; the rest had involvement of left limbs. Most cases had no OPV exposure, with travel history to Somalia.

Conclusion: The poliovirus imported from Somalia; entered Ethiopia through mobile and vulnerable communities across the border. All cases and their peers had not OPV exposure and surveillance system was very weak. Polio eradication strategies should be implemented.

Key Words: polio, polio cases, vaccine, paralysis, Doolo Zone

Introduction

The words polio (grey) and myelon (marrow, indicating the spinal cord) are derived from the Greek. It is the effect of poliomyelitis virus on the spinal cord that leads to the classic manifestation of paralysis. Michael Underwood first described a debility of the lower extremities in children that was recognizable as poliomyelitis in England in 1789[1].

In 1988, the World Health Assembly launched the Global Polio Eradication Initiative (GPEI). In the first year of the GPEI, polio was endemic in an estimated

125 countries; and there were more than 350,000 cases compared to 2010 when fewer than 1,500 cases were reported. Since 1988, the GPEI has reduced the global incidence of polio by more than 99.9%, three of six WHO regions have been "certified" polio-free (the Region of the Americas in 1994, the Western Pacific Region in 2000 and the European Region in 2002), and one of the three WPV serotypes (type 2) has been eradicated[2, 3]. In the African Region, the Polio Eradication Initiative launched its wide-scale activities in 1996 with a slogan "Kick Polio Out of Africa by 2000". Unfortunately, a number of previously polio-free countries were re-infected through polio importation from Nigeria and other polio reservoirs [4]. Importation of WPV is related to frequent contacts between the receiving area and the wild virus reservoir by at least part of the population and low population immunity in the receiving area [4].

The last indigenous case of wild poliovirus (WPV) reported in Ethiopia was in December 2001. However, Ethiopia was affected by six separate WPV importations from neighboring countries between 2004 – 2013 [5]. Ethiopia was polio free for almost three years prior to the first importation of a wild poliovirus (WPV) from Sudan in December 2004. In the following years (December 2004 to November 2006), Ethiopia reported four different importations (from both Somalia and Sudan) totally 40 WPV cases (1 in 2004; 22 in 2005, 17 in 2006 and 3 in 2008) affecting four of the eleven regions of the country (Tigray, Amhara, Oromia, Gambella and Ethiopian Somali Region). In the history of polio eradication in Ethiopia, in 2006 16 wild poliovirus type1 were detected in Somali Region, an importation from Somalia. With one case each in Afder, Degahabour and Kebridahar, while in Doolo zone 13 cases were identified. All reported cases were type 1, and nearly all were identified in Bookh (6) and Galadin Woredas (6) where the current outbreak is going on. The routine immunization is most critical part of the challenge in polio eradication. In the most recent coverage survey conducted in 2012, significant regional disparities were observed in Somali persistently low compared to Addis Ababa or Tigray. To address these gaps the country has developed a two years routine immunization improvement plan. Galadin, Warder and Bookh woredas have been reporting Polio cases since July 2013. A team from the Ethiopian Public Health Institute (EPHI),

Somali Regional Health Bureau (RHB) and WHO was deployed to investigate the risk factors and recommend appropriate control strategies to prevent the continuation of the outbreak.

Methods and Materials

Investigation area and population

The Ethiopian Somali Region is located in the eastern and southeastern part of Ethiopia. It is the second largest Regional State which contributes to 30% of the total land mass of the country with an estimated area of about 250,000 square kilometers. The Regional Capital is Jigjig, 630 Kilo Meters from Addis Ababa. The Somali Region has a population of approximately 5 million; 85% of the population is pastoralist and agro-pastoralist. Administratively, the Somali Regional State is sub divided in to nine administrative Zones; which comprised of 68 Woredas and 4 Towns. The current hotspot, Doolo Zone also comprised of five Woredas and a population of 328,696(CSA 2007 projection for 2013). Averagely the Zone is far by some 650 Km from Jigjiga and 1280 Km from Addis Ababa. The Region has common boundaries with the Afar and the Republic of Djibouti in the north, Kenya in the south, Oromia Region in the west, Somalia Republic in the east and South.

Study design

A descriptive –cross sectional study was employed to investigate the outbreak.

Data Collection and Analysis

First, we collected the case based and lab results from EPHI polio laboratory, and then we made situational updates with RHB, Public Health Emergency Management (PHEM) Office about intervention made so far, gaps and challenges of polio surveillance in the hot spot areas, mainly Doolo Zone. Next, we made similar briefing with Woreda Administration and Health offices concerning the progress of the outbreak. Then, we traveled to the Zonal Administration and made similar briefings about; and how to move within the Zone due to security problem; especially in Warder Woreda where the latest case was reported. After the Zone dispatched police officers to escort us during our travel to Nagardale Village, where the case is living, and then did our investigation accordingly. We conducted a descriptive cross-sectional study employing quantitative and qualitative data collection techniques. Persons in close contact to the confirmed polio cases were interviewed and epidemiologic investigation

was carried out on all confirmed WPV cases.

To elucidate causes and determinants of the polio outbreak, we conducted a rapid epidemiological assessment in the villages; routine immunization and cold chain status were assessed at nearby health institutions. Active case search was conducted for cases of acute flaccid paralysis. Attitudes and practices of health care providers and child caretakers were assessed in affected communities. We conducted assessment of the Expanded Program on Immunization (EPI) coverage in the affected districts for both routine and Supplementary Immunization activities (SIA) coverage, by considering under five year olds children nearer to the confirmed cases. In each surveyed community, a focus group discussion (FGD) was organized to assess the awareness and attitudes of the community members toward conditions of poliomyelitis illness. Each focus group consisted of more than 15 members representing various community groups. Separate semi-structured questionnaires were developed to assess the awareness of health workers and child caretakers. Records were reviewed in all nearby health facilities. The investigators inspected and took notes on the status of the cold chain system in all health facilities of the affected communities. During our investigations, we conducted these assessments: Clinical and physical evaluations were completed on all confirmed polio cases. To do so, we used the National Acute Flaccid Paralysis (AFP) case definitions as stated below;

Suspected AFP*:* Any child less than 15 years of age with sudden onset of weakness or floppiness of one or more limbs or any person of any age in whom a clinician suspects poliomyelitis;

Community AFP definition: Any weakness or paralysis;

Hot AFP case: An AFP case likely to be paralytic polio, either on clinical grounds (Age less than five years, asymmetric paralysis, fever at the onset, incomplete OPV doses, rapid progression of paralysis) and/or AFP case with direct contact to a confirmed case or a case from endemic area.

Confirmed Polio case: A suspected case with wild poliovirus isolation from stool sample;

Finally, we convened debriefings with the Woreda administrations and RHB/PHEM on what we observed from our assessments and actions suggested to be taken correspondingly at different levels.

All the quantitative data collected were checked and analyzed using simple MS-Excel and Pivot table.

Results

Nine confirmed polio cases and one death (CFR=11.1%) were reported from Doolo Zone of Somali Region between July and November 2013; the index case was on week 28, while the latest case was on week 45, 2013(fig.24 below).

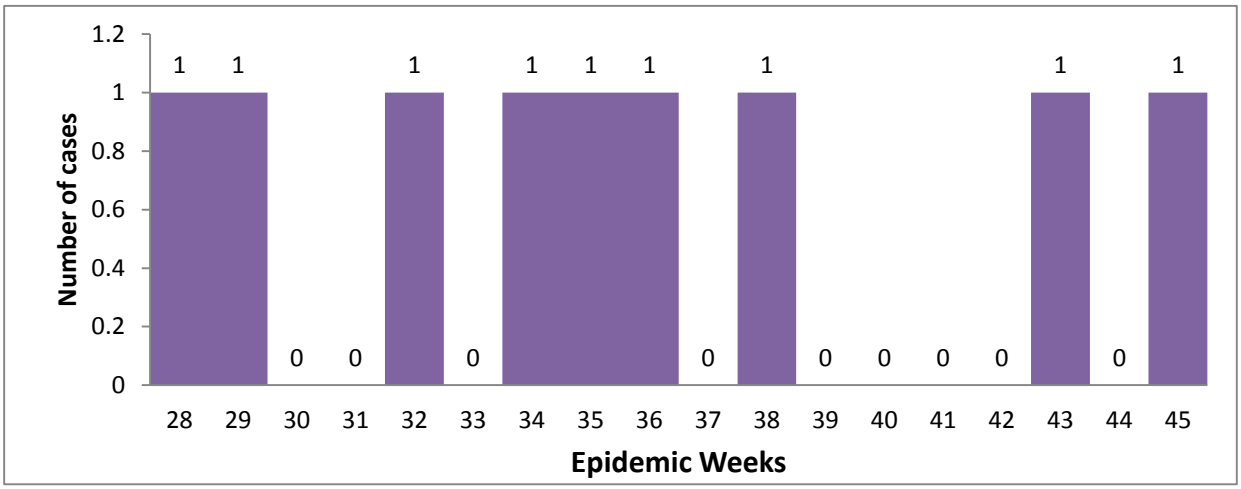

Figure 24: Incidence of Poliomyelitis Cases by Epidemic Week, Doolo Zone, January 2014

Cases were four from Galadin, four from Bookh and one from Warder Woredas in Doolo Zone. The outbreak was first detected on July 10, 2013 in Boreyal village of Injiro Kebele of Galadin Woreda; next three cases from Dagafur village of Barisacde Kebele of Galadin Woreda; adjacent Mirfadle and Goderwahis Kebeles of Bookh Woreda. Four consecutive cases were confirmed in two villages of Bookh Woreda, in which two cases from Goderwahis Kebele, one from Mirfadle and one from Bookh Kebeles. The latest (case 9) was reported on 5 November 2013 from Nagardale village, Mire Kebele of Warder Woreda of Doolo Zone (fig.25 below).

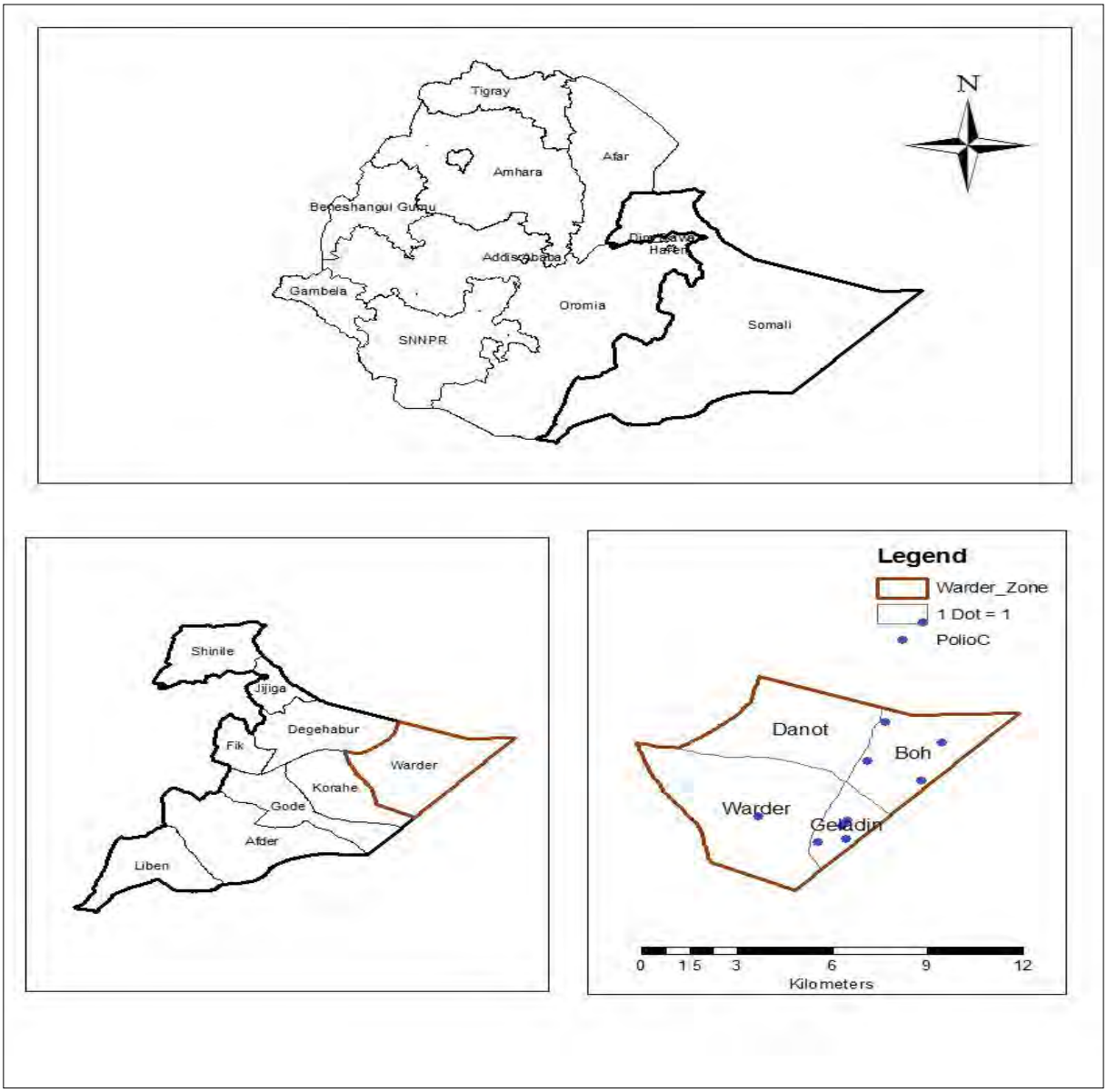

Figure 25: Distribution of Polio Case reported by Woreda, Doolo Zone, Ethiopian Somali Region, January 2014

Among the nine cases, five (55.6 %) of them were males. The age ranged from 13 months to 15 years old; with the median age of 4 years, while their mean age was 6 years.

The families of all cases are pastoralist; frequently moving from Ethiopia to Somalia as situations prevail; and since they belong to the same clan, Darood Majerteen or Lalkesie.

The main symptoms were fever in all cases and vomiting in some of them; and then resulted in acute paralysis; in which three cases with upper extremities, while six with lower extremities. Only one of them had

right limb paralysis, while the rest with left limbs. Seven of the nine cases were notified from Kenyan polio lab after crossing the border to seek medical care; six to Goldegob and one to Galkayu Hospitals in Somalia. The first case was managed in Galkayu General Hospital in Somalia; the next successive six cases in Goldegob Hospital; specimen was collected and sent each to Kenyan Medical Research Organization (KEMRO) lab, confirmed and reported back to Ethiopia. Only the recent two (22%) cases of the nine were attended in Ethiopian facility; designated as "case 8" in Bookh HC and "case 9" in Nagardale HP; then experts from each facility took specimens and send to EPHI National Polio laboratory; and all specimens were adequate and the result is confirmed to be WPV1. After alert warnings were made on May 2013 due to polio case report in neighboring Somalia, fortunately the NP-AFP rate was 14 per 100, 0000 population of under 15 years old as compared to the previous year 1.4. Generally, the NP-AFP rate of the Region is far low from the National level except slight improvements after the outbreak was declared (Fig.26 below).

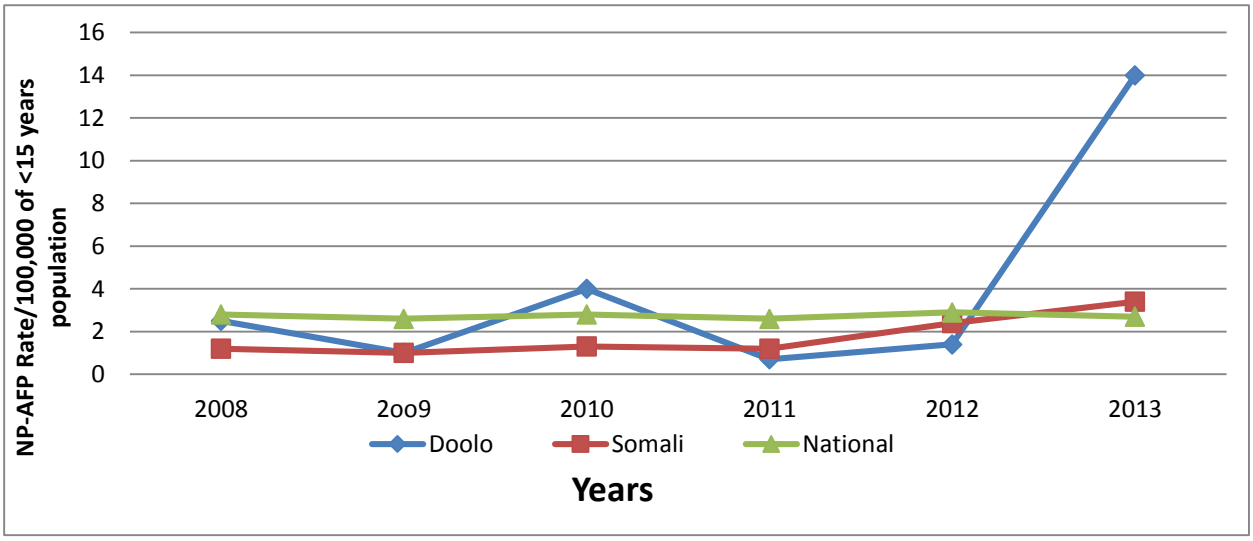

Figure 26: NP-AFP Surveillance Status of Doolo Zone, Somali Region by Year, January 2014

The Region is so vast with limitations on transportations to take specimens and reach effectively to the National laboratory. For instance, it was only in 2008 that the stool adequacy rate reached 100%. In 2013, stool adequacy rates were 57%, 64% and 88% for Doolo Zone, Somali Region and the National Respectively (Fig.27 below).

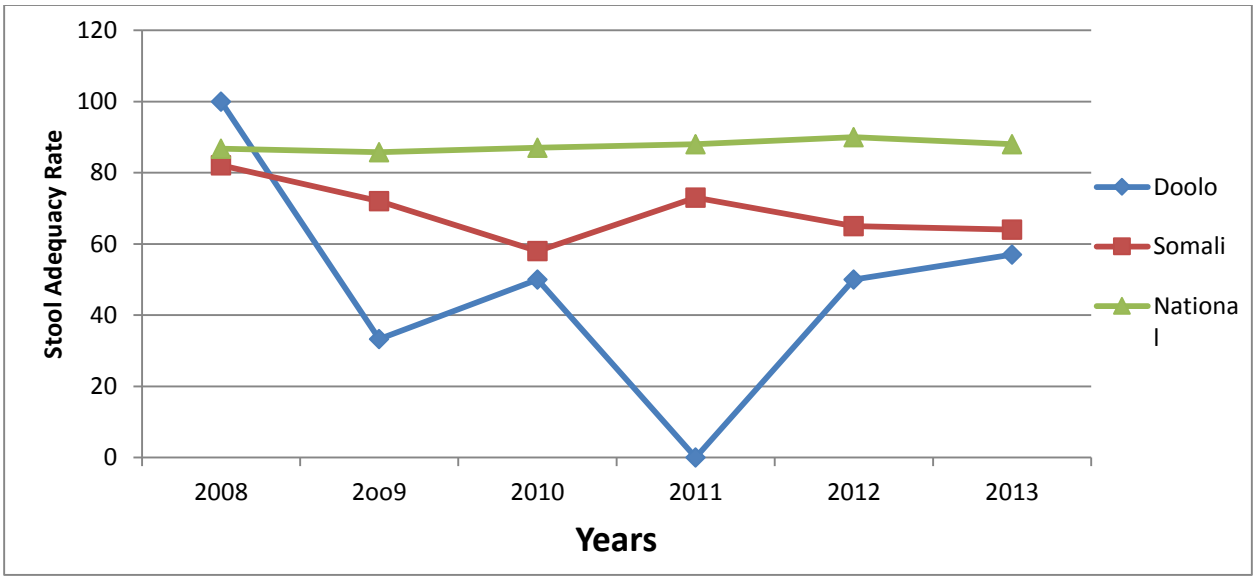

Figure 27: Stool Adequacy Rate of AFP Surveillance by Year, Doolo Zone, Somali Region, January 2014

Two of the cases, case 6 and 7 were in the same Village; probably 300-400 meters away each other but claimed never had history of contact between them. However, most of the cases had travel history to Somalia. While "case 2" travel history was not able to establish, and they claim they never travelled and no visitors came in before paralysis. Of the cases no children completed or started routine EPI immunization schedule; even they had never taken any doses of OPV during supplemental immunization activities; due to lack of information and accessibility. To control the transmission and stop the outbreak, recent mop-up vaccination was conducted throughout the Woreda that covered fewer than 15 populations.

Case1: Was a 3 years old boy, reported as a confirmed polio case, has been living in Boreyal village of Injiro Kebele, Galadin Woreda, Doolo zone of Ethiopian Somali Region.

The child was relatively healthy before he developed fever, vomiting and cough for 3 days; then had sudden onset of muscle weakness on the left upper arm on July 10, 2013. The child had no history of falling, trauma, injection and animal bite prior to muscle weakness. The mother gave birth at home by Traditional Birth Attendant with no difficulty and the child has no vaccination history.

The clan of family is Darood-Majerteen, sub-clan Omar Mohmud- Reer Khalaf and

the members of household are 12 including three under five children. The family is pastoralist living in Boreyal Village which is 6 kilometer away from Injiro Kebele. Injiro is the Market place where the family purchases food and household goods which come from Galkayu (Somalia). The patient had also a contact history with someone who came from Bursalah, border town of Somalia on June 29, 2013. His grandmother took him to Galkayu General Hospital of Somalia, 180 kilometers away from Injiro Kebele, to seek medical care for the child. She mentioned two stool samples were taken. No history of falling, trauma, and injection, animal bite prior to muscle weakness and no vaccination history, but had contact history. The clan of family is Darood-Majerteen, sub-clan of Omar Mohmud- Reer Khalaf. Water Source is from unprotected Brikas (water reserved during rainy season to utilize it at dry season) and the family utilizes it without boiling and treating. No latrine utilization in the village and people simply use open field.

Case 2: Was a 9 years old male; and he is the second siblings in his family. He was not registered as a case in Ethiopia so the team considered as a missed case. His family from a clan of Majerteen and a father of 11 children from two wives one in Somalia and one in Ethiopia Somali. His father is pastoralist and illiterate. They live in Mirfadle Kebele of Bookh Woreda. The child developed acute onset of fever followed by vomiting and paralysis of right upper extremity in the proximal arm. His father took him to Goldegob Hospital in Somalia before three months. The date of onset of paralysis was on 15 July 2013; parents took him to health facility. The paralysis was acute which affected only right upper proximal arm and the case is alive. He did not take any intramuscular injection.

During physical examination it was found that the bulk of the right upper arm muscle was not equal and the power was weak and muscle tone decreased while the child had normal bowl function. He did not take any polio vaccine during routine or SIA as his father has no information. He had no travel history outside of his village before onset of paralysis within 3-35 days. He did not have any contact history with AFP/Polio suspected or confirmed case. Also he had no any contact history with someone else within 10 days before or after onset of symptoms. He did not go to school within 10 days before or after onset of symptoms

and his father do not know mode of transmission of polio and no any history of paralysis in their family. The community takes their children to prayer in such type of disease. The nutritional status of the child was normal. They used to fetch water from pond and use open field defecation. They did not use soap always to wash hands after toilet. There is no any sick person with paralysis in their family. The source of information is from other people and he never heard about polio eradication and AFP surveillance. The first stool sample was collected and the second stool sample was collected after one month and the stool sample was investigated in Somalia and unknown for adequacy and the final classification was confirmed WPV1. His contacts were assessed and found to be normal and they took zero to two doses of polio vaccine during SIA.

Case 3: Was 13 years old female from Dagafur Village, Barisacde Kebele of Galadin Woreda of Doolo Zone. She is the first among her seven siblings and from a clan of Lalkesie; in which family members are pastoralists; her father is a teacher and with a middle income according to the local context. The first symptoms were, fever, vomiting and progressive paralysis. As per discussion with her parents, we understood that clinically it was asymmetric and very severe ones; her father told us, that after the onset of fever on 9 August 2013, immediately half of her left body from forehead to extremities changed the color; her eyes became tilted down; and she was unable to move her body parts. Then, her father took her to Goldegob Hospital in Somalia; some 30 Km from her village. After five days of paralysis, she passed away.

Although her father has little knowledge on the mode of transmission of poliovirus; she had not any history of vaccination; including her seven siblings. But, she had no any travel history 3-35 days prior to the onset of paralysis from her village; although her parents did not know whether she had contacts with AFP cases; she had contacts with other children before and after she developed the disease. There was no any history of paralysis in her family; but the family exercised a prayer when such kind of illnesses happened. Community in the Keble had not access to clean potable water; simply they used water from pond, Brikas. Her father decided that, he took first the child to Goldegob Hospital in Somalia; for treatment due to his recent information on

polio diseases from HEWs there; specimen was taken and the result was WPV1.

Case 4: Was a 4 years old female who was living in Dagafur village of Barisacde Kebele, Galadin Woreda, Doolo zone of Ethiopian Somalia Region. She has lived with her parents in the same village for the last 20 years. The Family of the child is Pastoralist, Muslim by religion and her clan is "Darood-Lelkase with the sub-clan of "Mohammed Muumin". The child has been living in the same village with her parents since she developed paralysis. The child developed fever and diarrhea for 3 days; then developed sudden onset of paralysis on the left lower leg on 23 August 2013, the family sent the child crossing the border of Ethiopia to Somalia of Goldegob District on August 26, 2013 to seek medical care, as the family stated two stool samples were taken.

The child had no history of falling, trauma, injection and animal bite prior to muscle weakness. She had a contact history before 15 days of her onset of paralysis with a case already passed away due to a typical and symmetrical poliovirus that lived in the same Village. She has no vaccination history during routine, SIA or NID.

Case 5: Was a 15 years old female who was living in Dagafur village of Barisacde Kebele, Galadin Woreda, Doolo zone of Ethiopian Somalia Region. The Family of the child is Pastoralist, Muslim by religion and her clan is "Darood-Lalkesie with the sub-clan of "Mohammed Muumin". The child has been living in the same village with her parents until she developed paralysis on 30August 2013. Prior to the paralysis the child developed fever for 3 days, and then had sudden onset of muscle weakness on the left arm (weak limp at the time of onset) and now she has no symptomatic residual paralysis. The patient crossed the border on 31August 2013 to seek medical care in Goldegob District (Border town of Somalia which is 15 Km far from Border of Ethiopia). Family said that the Goldegob Hospital Somalia took two stool samples. The child had no history of falling, trauma, injection and animal bite prior to muscle weakness. She and her family had no travel to or from country 30 days prior to paralysis and no vaccination history due to lack parental awareness of NID campaign and inaccessibility of Immunization service.

Case 6: Was a 3 years old male and he is the second sibling in his family. His father has 3

children. He was pastoralist by occupation and had primary school education. They lived in Goderwahis village of Bookh woreda, which is 30 kilometer away from Bookh Town. The child developed acute onset of fever followed by paralysis of left lower extremity in the distal leg. The date of onset of paralysis was on 5 September 2013; then seen at Goldegob Hospital in Somalia that is some 17 Km away. The paralysis was acute and developed after 3 days of fever. He did not take any intramuscular injection. The paralysis affects only left leg distal and the case was alive. During the physical evaluation, it was found that the bulk of the muscle was not equal and the power was weak and muscle tone decreased while the child had normal bowl function. He took polio vaccine during SIA. He had travel history outside of his village to Goldegob Hospital for other case treatment before onset of paralysis within 3-35 days. Contact history with AFP/Polio suspected or confirmed case was unknown. But, by proxy he had contact history with someone else within 10 days before or after onset of symptoms. He went to school after he took polio vaccine and his father did not know mode of transmission of polio before his child developed and no any history of paralysis in their family. The community takes their children to health facility in such type of disease. The nutritional status of the child was normal. They used to fetch water from pond and use open field defecation. They did not use soap always to wash hands after toilet. There is no any sick person with paralysis in their family. The source of information is from other people and he never heard about polio eradication and AFP surveillance. The first stool sample was collected and sent to Kenya and confirmed for polio and there was any information regarding the collection of the second stool sample. The first stool sample was adequate and the final classification was confirmed as WPV1. His contacts were assessed and found to be normal and they took 2 to 4 doses of polio vaccine during SIA.

Case 7: Was 2 years old female who was born and brought up in Goderwahis village in Bookh woreda of Doolo Zone from a pastoralist family, and lived there since birth. Child was born normally and no major problems reported until that time. Based on parents history child was not immunized against polio (zero dose until onset of paralysis), and Zero dose currently since they stayed over two months in Somalia after onset. Parents were advised to get the child vaccinated in the coming

round. The child was apparently healthy until 17-septmber 2013, on the following two days she developed high-grade fever and on 19 September 2013 she developed weakness/floppiness of lower left extremity (LL)). Her father took her to Goldegob Hospital in Somalia, which is 18 Km away for medical care, where she was detected as AFP and gave two stool specimens on 24 and 25 of September 2013; which were shipped to the polio laboratory in Kenya. The specimen condition upon arrival was adequate and the lab results were positive for Wild poliovirus type1 (WPV1). The child was unable to move extremities as previous, had decreased power, decreased muscle tone, decreased deep tendon reflex of the affected limb; but was able to withdraw to painful stimuli (pinch/prick).

Child did not have history of past illness and history of similar illness in the family or neighborhood. Even there was no recent history of childhood illnesses like measles, mumps, sore throat, chicken pox, dysentery and no history of injection priori to onset of paralysis. Her father had history of travel frequently before and after onset of paralysis to Somalia, and she traveled to Somalia after onset paralysis for medical consultation. There was no similar illness in the family. The family is poor and used unprotected rain harvested water, with poor quality and unhygienic conditions. She had no any vaccination exposure prior to the onset of paralysis; but, at time of investigation, she had one dose of POV. The OPV for routine vaccination was not available, but the SIA rounds (1-4) indicate a coverage range of a maximum of 90%. There was decreased tone, reflex and power in affected extremities; but had intact sensation. There was no muscle bulk atrophy or deformities. However, she developed residual paralysis of left extremities.

Case 8: Was a 13 months old male and he was the sixth sibling in his family. His father was married and a father of six children. He was a merchant by occupation and with primary school education. They lived in Bookh Town. The child developed acute onset of fever followed by paralysis of left lower extremity in the distal leg. The date of onset of paralysis was on 21 October 2013 and they went to Bookh Health Center that is less than one KM away from their village. The paralysis was acute and developed after 1 day of fever. He took intramuscular injection in both right and left glutei region.

The paralysis affected only left leg distal and the case was alive.

During neuromuscular examination, it was found that the bulk of the muscle was equal and the power was weak and muscle tone decreased while the child had normal bowl function. He took polio vaccine during SIA before six months. He had travel history outside of his village to Galkayu Kebele one month before the onset of paralysis. He had travel history before onset of paralysis within 3-35 days to Galkayu area. Contact history with AFP/Polio suspected or confirmed case was unknown. He had contact history with someone else within 10 days before or after onset of symptoms in Galkayu Kebele. He was in preschool age; his father did not know mode of transmission of polio before the child developed. Moreover, there was no any history of paralysis in their family. The communities take their children to health facilities in such type of diseases. The nutritional status of the child was normal. They fetch water from pipe; but used communal latrine. They did not use soap always to wash hands after toilet. There was no any sick person with paralysis in his or her family. The source of information was from other people and he never heard about polio eradication and AFP surveillance. The first stool sample was collected on 22/10/2013 and the second stool sample was collected within 24 hours. The stool samples were adequate and the final classification was confirmed as Wild Polio1. His contacts were assessed and normal and they took 5 to 7 doses of polio vaccine during SIA.

Case 9: Was a 4 years old Female who lived with her parents, some 3 Km west of Nagardale village of Mira Kebele of Warder Zone. We investigated the case on 23 January 2014. Her clan is Darood /Majerteen and the sub clan of Omar Mohamoud. The date of paralysis was on 5 November 2013. She was investigated by the local Health Extension Worker (HEW) and notified to the next higher level on the same day. Sample was collected on 8 November 2013 and sent to EPHI, which was adequate and positive for WPV1. She has been living since four years back; and had no travel history with her parents and they are pastoralists and illiterate; but middle class in livelihood. The area is rural, had not access to routine EPI. Though not well organized, the nearest facility is Nagardale Health Post (HP), 3Km away from their house. Moreover, there was a suspected AFP case within the same Keble.

The case developed an asymmetrical paralysis of her lower left leg. The muscle tone was already decreased/ floppy. The case had not any history of trauma or injections prior to the onset of paralysis. The case also had no travel history during the last 30 days prior to the onset of her paralysis; and family members did not travel to other hot spots; and was not visited by any relatives assumed to be susceptible for AFP. Similarly, the case did not travel out of her residence after the onset of paralysis. The case did not have any vaccination history; one reason the parents raised was vaccinators did not come to their home. But now, the family is eager about immunization when to take and where to go if they are told by the trusted clan and community leaders to vaccinate their children.

Woreda Task force was established; with strong communication with local HP workers; however, there were gaps on micro planning for SIA; like team supervisors, number of vaccinators, identification of appropriate denominators, transportation, duration to cover the area in addition to that there was no fridge in the nearby HP to store the vaccine. Although there was EPI trained staff. Moreover, there were many problems like community resistance, lack of transport for outreach programs, lack of per-diem, shortage of manpower, kerosene shortage for cold chain that affected the routine EPI activities. There is gap on active case search in the Woreda; since the Woreda focal person had not done it regularly. This was in general due to shortage of budget for surveillance.

As per the WHO recommendations, we assessed the EPI coverage of Polio Case Contacts in the hot spot villages**.** We identified age groups neighboring the current cases under investigation and assessed their routine OPV and SIA coverage; we found that only five(8.2%) of the 61 contacts had history of routine vaccination specifically in Bookh Kebele; but the recent SIA coverage was 85.2%. Majority, 39(63.9%) of the 61 contacts were males; in which 30 (76.9%) out of 39 had two and above doses of OPV. In addition, 22 (36.1 %) out of 61 children were females; amongst 14(63.6 %) of the 22 contacts had an exposure of two and above doses during the recent campaign (Fig.28 below).

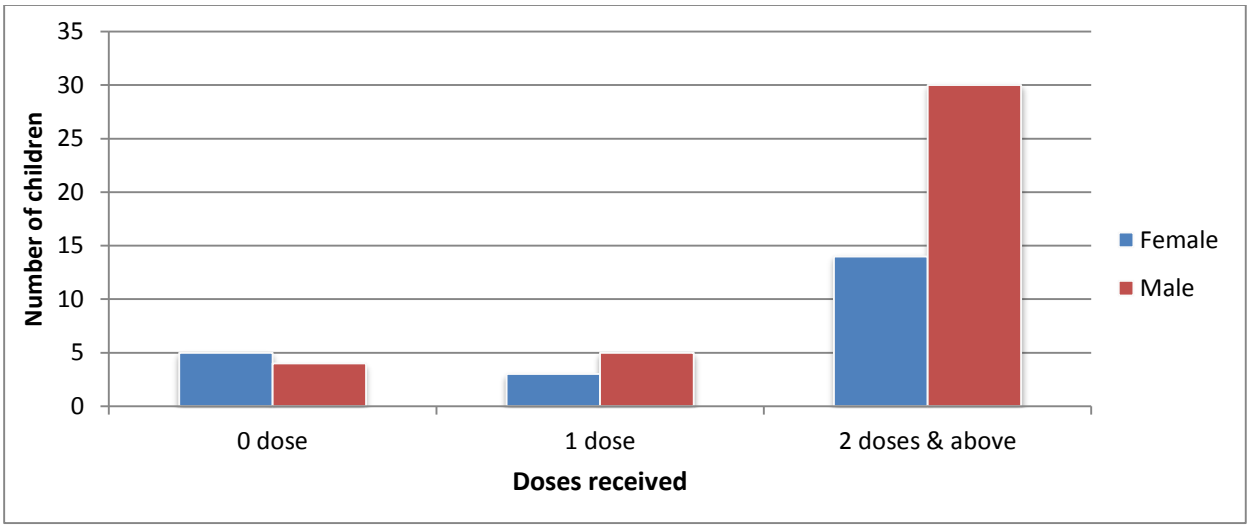

Figure 28: Polio Case Contacts by Vaccination Status and Sex, Bookh Woreda, Somali Region, January 2014

Among children aged 12 months and below, 10(52.6 %) out of the 19 contacts had two and above vaccination history while 34 (81%) of the 40 children between 13 and 60 months age took two and above OPV doses during the recent campaigns (Fig.29 below).

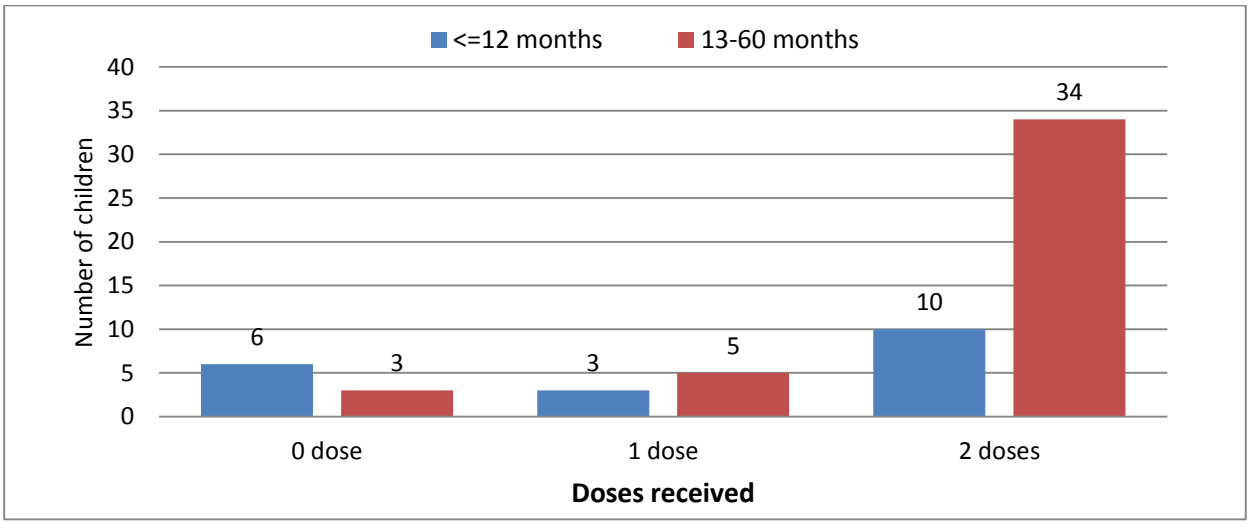

Figure 29: Polio Case Contacts by Vaccination Status and Age, Bookh Woreda, Somali Region, January 2014

Likewise, we conducted a mini oral polio vaccine (OPV) coverage assessment in Nagardale Village where the latest, "case 9" was living; we included 14 males 13 females; then found that 21(77.8%) out of 27 the assessed contacts received two and above OPV doses; and three (11.1%) of the 27 children had no OPV history during any of the SIA campaign (fig.30 below).

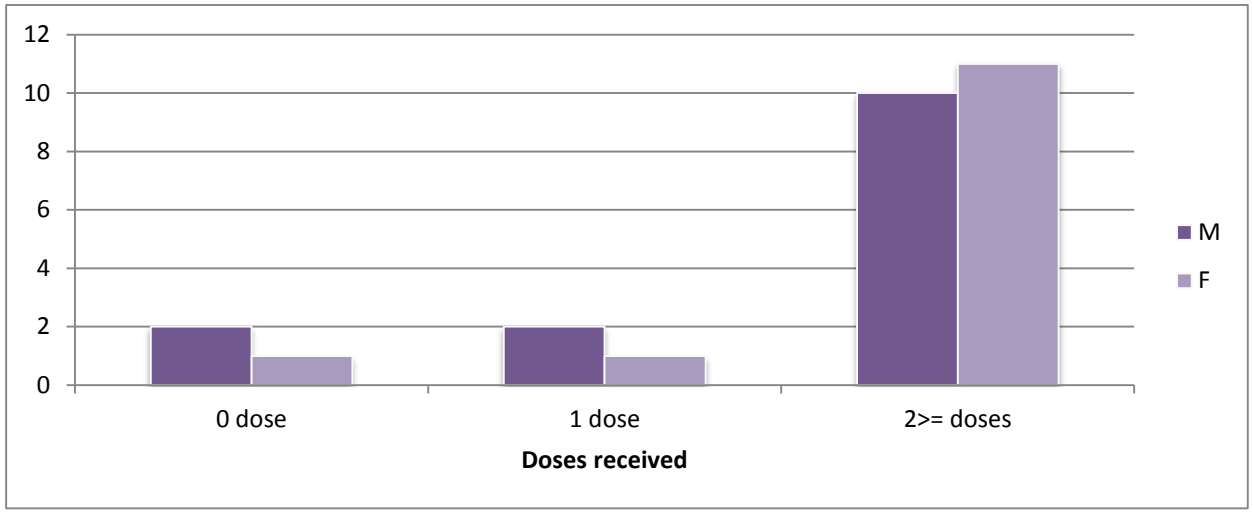

Figure 30: Polio Case Contacts by Vaccination Status and Sex, Warder Woreda, Somali Region, January 2014

Among the assessed 27 children, 19 (70.4 %) of them were under 2 years while eight (29.6 %) were 2 to 5 years old. Close to 79% of under 2 years had taken two and above doses; similarly 75% of aged 2to 5 years also had it (Fig.31below).

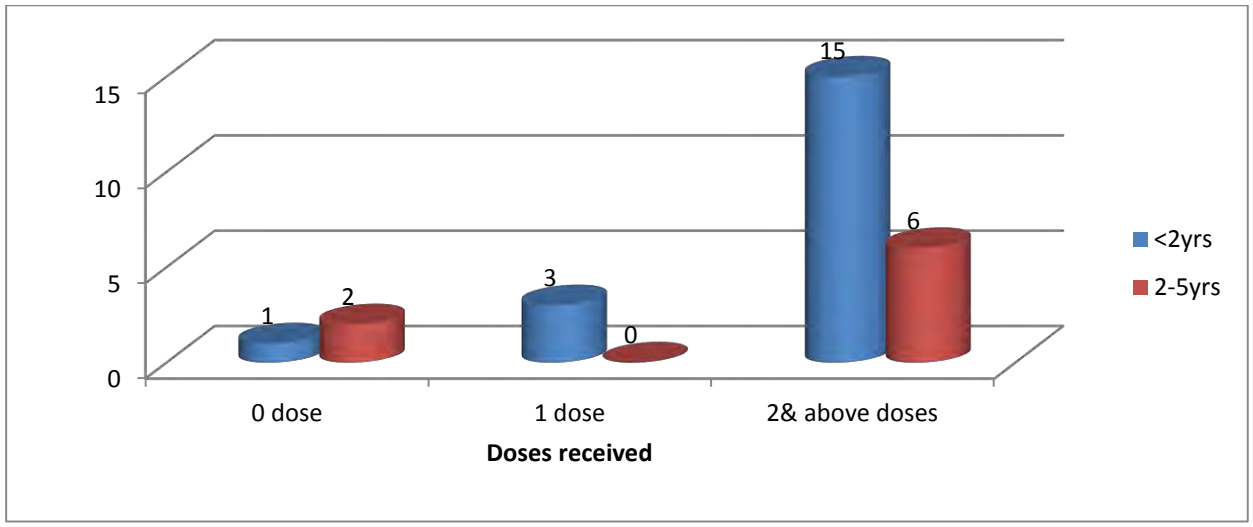

Figure 31: Polio Case Contacts by Vaccination Status and Age, Warder Woreda, Ethiopian Somali Region, January 2014

Furthermore, we understood that most of the communities in Doolo Zone claimed that they had not any awareness about poliomyelitis prior to the current outbreak. Even communities across the assessed Woredas previously believed that taking vaccination may sterilize people and limit their generation. Very few people also said

they had no any information on when and where the vaccination is provided.

Discussions

The index case was from Galadin District and emerged during the month of July 2013. The virus is presumed to be to Somalia origin. There were nine confirmed polio cases between July and December 2013. But, since the disease is mostly asymptomatic; there could be many silent cases in the Bordering areas of the Region. This is because; Poliomyelitis is a highly infectious viral disease, mainly affecting young children with catastrophic effects including acute flaccid paralysis and sometimes death. It is estimated that for every reported case, there are 200 asymptomatic carriers [4].

The latest case identified was in December 2013; which means we are in outbreak; or ongoing event for which the last wild poliovirus detected was within the last 6 months [4]. As we understand from the investigation activities, there were no functional outreach sites in the Woredas. Likewise, there was no weekly surveillance report in the Woredas. Because of those gaps, most of the confirmed cases had no history of OPV and were detected in a neighboring Country. possible to say the pillars of GPEI of high immunization coverage in routine, supplementary immunization activities (SIAs), surveillance of acute flaccid paralysis and mop-up activities; and with primary strategy for GPEI; strong routine immunization program that delivers at least 3 doses of OPV to all children from birth and within one year [2, 5] have not been achieved in the study locality. It is evident that if a population is fully immunized against polio, it will be protected against the spread of both wild and vaccine strains of poliovirus [6]. Across the border especially in Doolo Zone, our service delivery is still limited; given that the mobile and vulnerable community. Furthermore, large areas of south-central Somalia that borders the Ethiopian Somali Region have not conducted immunization campaigns since 2009 due to insecurity, leaving as many as 500,000 children particularly vulnerable in this area [6]; which could continue to exacerbate the problem.

From the FGDs, some people think that vaccination may compromise their fertilities. This attitude is in agreement with the study conducted in India [7].

Conclusions

We conclude that the origin of the Polio outbreak is from Somalia; imported to Ethiopia due to the high mobility of the vulnerable community across the border. The index case of WPV1 was reported on 10 July 2013; which designated as "case 1" from Galadin Woreda of Doolo Zone. All cases were under 15 years old, and developed full paralysis. All cases and their peers had not any routine OPV exposure. There was no any circulation of poliovirus during the investigation period; that is the total caseload remains to be nine. There was strong response during the outbreak period, mobilizing the communities, awareness creation activities, and SIA program. However, still many gaps exist concerning full implementation of Polio eradication strategies.

Recommendations

- Given that detection of WPV in a polio-free country is a public health emergency, the Federal Ministry of Health of Ethiopia and in particular the Somali RHB in collaboration with WHO, UNICEF and other partners should continue implementing a sensitive surveillance, undertaking quality immunization campaign, coordinated nationwide in general and Somalia Region in particular to conduct house- to-house campaign strategy and should continue until the interruption of WPV spread is documented
- The Federal Ministry of Health and Somali Regional Health Bureaus and WHO, UNICEF and other partners should strengthen the routine immunization program in the areas affected areas and in the Region at large; reaching Every Child approach (REC) to all districts in Doolo zone and the Region.
- The RHB should take action and put extra efforts to strengthen the cold chain system in the hard to reach areas; particularly in affected Woredas of The Zone
- Revitalized the OPV vaccination at all transit points and make sure that all coming from and going to Somalia get two drops of OPV.
- Regular cross-border meeting should be strengthened on both sides to improve the information exchange, Surveillance and EPI activities through static or mobile facility
- Strengthen social mobilization for community based surveillance

system; considering the pastoralist nature of the population and the available traditional network of information sharing mechanism.

- Provide serious attention to the water, sanitation and hygiene in the epidemic areas as the poliovirus is transmitted through faecal-oral route.

Acknowledgement

Primarily, we will be grateful to the Ethiopian Somali RHB/PHEM Core process, for their active communication and WHO country offices, especially the Regional surveillance officers for their valuable engagement during the outbreak period on detecting all cases in communication with the Regional WHO officers. We also acknowledge Doolo Zonal Administration Office, Bookh Woreda officials, health centers and health posts in the woreda for their unreserved cooperation on verifying of the Polio cases. Then, we would like to thank all the Kebele leaders and community of the Bookh, Galadin and Warder Woredas for their assistance and cooperation for the achievement of this mission.

Last but not least, we thank the EPHI for its permission and availing of vehicle, CDC and EPHA for their technical and logistical support to conduct this outbreak investigation.

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5.2 Measles Surveillance-South Nations Nationalities and Peoples Region, Ethiopia, 2008-2012

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Abstract

Background: In developing countries, up to 75% of patients may have complications. One out of four died where malnutrition and vitamin A deficiency are common. Outbreaks of measles are reported in the South, Nations, Nationalities and Peoples Region (SNNPR) each year. Therefore, describe five years (2008-2012) measles data by person, place and time.

Methods: A retrospective descriptive study design was employed; data was analyzed using MS-Excel and SPSS Version 16 software.

Results: Totality 9143 cases with1189 deaths were recorded (CFR=13.0). Amongst, 4717(51.6%) and 3503 (38.3%) of the cases were under five (AR=37/100,000) and under 15 (AR=23/100,000) while 923 (10.1%) of them above 15 years. About 4742 (52%) of the cases were males. Also 3599 (39.4 %) and 534 (5.8 %) of the cases were rural and urban dwellers respectively while 5010 (54.8 %) cases were unknown their dwelling. Ninety five (18.02%) and 540(15.0%) of the cases from urban and rural dwellers were IgM positive. Cases of 245 (5.4%), 161(6.4%), 22(5.5%) and 198(16.7%) which had no vaccination history; that had one dose, two and above doses of vaccine and with unknown their vaccination status were positives for measles IgM correspondingly. Majority 2986(32.7%) of the cases were reported during 2012; the highest 2904(31.8% cases on January from all Zones.

Conclusions: Age groups, residency and vaccination appeared to be related with the occurrence of measles outbreak. Caseload with severe fatality had increased seasonally among unvaccinated groups. The Region should enhance surveillance, address immunization activities to the age of 15 years.

Key word: measles, case, age groups, vaccination, residency

Introduction

Measles is an infection of the respiratory system caused by a virus, specifically a paramyxovirus of the genus Morbillivirus. Morbilliviruses are enveloped, single-stranded, negative-sense RNA viruses. Measles is a highly infectious viral disease for which humans are the only reservoir. Transmission is primarily person-to-person via aerosolized droplets. The average incubation period for measles is 10 – 12 days. The clinical syndrome is characterized by rash, prodromal fever, conjunctivitis, coryza, cough and the presence of Koplik's spots in the mouth. In developing countries, up to 75% of cases may have complications of pneumonia, diarrhea, otitis media, croup or encephalitis. Measles can also lead to lifelong disabilities including blindness, brain damage and deafness [1].

In developing countries, where malnutrition and vitamin A deficiency are common, measles has been known to kill as many as one out of four people. It is the leading cause of blindness among African children. Measles kills almost 1 million children in the world each year [2]. Ongoing analysis of surveillance data is important for detecting outbreaks and unexpected increases and decreases in disease occurrence, monitoring disease trends, and evaluating the effectiveness of disease control programs and policies. This information is also needed to determine the most appropriate and efficient allocation of public health resources and personnel. Analyses should be performed at regular intervals to identify changes in disease reporting. These analyses can be performed using standard approaches (tabulating reports manually and filling in a summary data sheet, for example, or running a standard computer program to generate a summary report). Findings of these analyses should be reviewed regularly, and provided as feedback to medical providers and others in the community who are asked to report cases. Additional special analyses are often needed to answer specific questions that arise; these analyses may require additional customized approaches beyond what are routinely performed.

Analyses looking at delays in reporting, completeness of reporting of critical variables, and applying case definition criteria also are useful in evaluating the quality of case investigation and reporting, and should be undertaken regularly. Missing or inaccurate data may limit the usefulness of any analysis. Erroneous or incomplete data cannot be corrected through statistical

procedures. Analyses of surveillance data should be regularly performed as routine task. By person; Describe the persons (cases) with vaccine-preventable diseases who were identified by your surveillance system; attributes of the cases include age group, sex, and race or ethnicity and may be appropriate to divide age groups based on recommended ages of vaccine administration as well as the age distribution of reported cases. By place; Describe the persons with vaccine-preventable diseases (cases) detected by your surveillance system by geographic location; the place where the case was first reported, place of residence of the case, or place of hospitalization. By time; Describe the distribution of cases over time; look for changes in the number of cases over time, intervals may be in years, months, weeks, or other unit of time. Date may be defined as date of onset of illness, date of diagnosis, or date of report to health department. Analysis by date of onset gives the most accurate representation of disease occurrence [3].

Rationale for the Analysis

Although surveillance reports are collected with many factors, affect its frequency and completeness of reporting on routinely basis, still there had not been surveillance data analysis conducted as it can help in revealing factors associated with persistent measles disease occurrences in the Region. Therefore, this case based and line list data analysis was conducted in an organized manner as it could describe measles epidemiology within the region, characterize the disease burden, and develop guidance to improve measles control efforts in revealing main factors associated with the repeated occurrence of measles disease in the Region. Moreover, hope fully that necessary measures will be taken by collaborates in every system as to minimize the overall measles prevalence across the Region. Therefore, to describe measles prevalence in the Region.

Methods

Study area and population

SNNP Region is among the nine regional states of Ethiopia, comprised of 15 Zones and 4 Special Woredas, with a total population of 17,353,928; with a sex ratio of 50.7% male and 49.3% female to date. The vulnerable age groups for the measles are, 2,707,213(15.6%) are under five, while 7,601,020(43.8%) of the population are under15 years of age [4]. The Region had a total of 4432 Government health facilities (19 Hospitals, 639 Health Centers and 3774

Health Posts); which are expected to report all priority disease under surveillance on immediate and weekly basis. Outbreaks of measles are reported in the SNNP Region of Ethiopia each year.

Study Design and Data Analysis

A retrospective descriptive surveillance data analysis took place, between February and March 2013. Data from PHEM center, which were collected from SNNP Regional Health Bureau for the last successive 5 years (2008-2012), was used with permission of EHNRI. Cases were classified as:

Suspected measles case: Any person with fever and maculopapular (non-vesicular) generalized rash and cough, coryza or conjunctivitis (red eyes) OR any person in whom a clinician suspects measles; and **Confirmed measles case:** A suspected case with laboratory confirmation (positive IgM antibody) or epidemiologically linked to confirmed cases in an outbreak. Data were first filtered and edited to make it easy for use. Then, using EXCEL sheet and SPSS version 16.0 were applied to enter, filter and analyze the data; so as to ease for data interpretation and summarization.

Result

During the years 2008 to 2012, 9143 cases were reported from SNNP Region; of which 1189 deaths were recorded (CFR=13.0). Among the total 9143 cases, 4717(51.6%) of the cases were under 5 years (AR per 100,000=37), 3503 (38.3%) of them were under 15 years (AR per 100,000=23); while 923 (10.1%) of them were above 15 years old. Similarly, close to 4742 (52%) of the cases were males whilst 4379(48%) of them were females. 3599 (39.4 %) and 534 (5.8 %) of the cases were rural and urban dwellers respectively; while 5010 (54.8 %) of the cases were missed or unknown their dwelling address.

Among the age groups identified, 310 (6.6%) of under 5 populations and 263(7.6%) of aged five to15 populations were positive for measles IgM. As well, 98(11.1%) cases, aged 15 to 44 years were positive. Ninety five (18.02%) and 540 (15.0%) cases urban and rural dwellers were positives respectively. One hundred sixty one (6.4%) of the cases which had taken one dose and 22(5.5%) cases with two doses and above vaccination history were positives; whilst 198(16.7%) of the cases with unknown on their vaccination status were positives for measles IgM (Table Below).

Table 18: Classification of Cases by Measles IgM and Some Demographic Variables, SNNP Region, 2008-2012

Indicators	Classification		
	Positive, n (%)	Negative, n (%)	Totals, n (%)
Age Group			
<5yrs	310(6.6%)	4359(93.4%)	4669(100)
5-14yrs	263(7.6%)	3206(92.4%)	3469(100)
15-45yrs	98(11.1%)	788(88.9%)	886 (100)
45+yrs	0(0.0%)	29(100%)	29(100)
Totals	**671(7.4%)**	**8382(92.6%)**	**9053(100)**
Sex			
M	352(7.5%)	4341(92.5%)	4693(100)
F	318(7.3%)	4020 (92.7%)	4338(100)
Missing	1(4.5%)	21(95.5%)	22(100)
Totals	**671(7.4%)**	**8382(92.6%)**	**9053(100)**
Vaccination status			
Not vaccinated	245(5.2%)	4488(94.8%)	4733(100)
1dose	161(6.4%)	2344(93.6%)	2505(100)
>=2doses	22(5.5%)	377(94.5%)	399(100)
Unknown	198(16.7%)	989(83.3%)	1187(100)
Totals	**626(7.1%)**	**8198(92.9%)**	**8824(100)**
Residency			
Urban	95(18.0%)	433(82.0%)	528(100)
Rural	540(15.0%)	3055(85.0%)	3595(100)
Missing	36(0.7%)	4894(99.3%)	4930(100)
Totals	**671(11.4%)**	**5238(88.6%)**	**9053(100)**

Four hundred ninety four (5.4%) of the total cases were treated in an inpatient wards while 5667(62.0%) of the cases were treated in outpatient. But, 2982(32.6%) of the cases were missed untreated. Specifically, 173(35.0%) under 5 years, 135(27.3%) 5 to 15 years and 186(37.7%) of the cases aged 15years and above were treated in inpatient wards. Similarly, 3356(59.2), 1819(32.1) and (492(8.7%) of the cases aged under 5, 5 to 14 and 15 years and above were treated in outpatient whilst the rest missed untreated (Table 19).

Table 19: Treatment status of cases by age groups, SNNP Region, 2008-2012

Age group	Inpatient	Outpatient	Missed	Totals
<5 years	173(35%)	3356(59.2%)	1188(39.8%)	4717(51.6%)
5-14 years	135(27.3%)	1819(32.1%)	1549(51.9%)	3503(38.9%)

15+ years	186 (37.7%)	492(8.7%)	245(15.8%)	923(10.1%)
Totals	**494(5.4%)**	**5667(62.0%)**	**2982 (32.6%)**	**9143(100%)**

The Measles case load varied from year to year; with 803,904, 1908, 2542 and 2986 cases in the years 2008 to 2012 respectively. Proportion of reported cases investigated through 2008 to 2011 was 100% and 97 during 2012. And percent of laboratory confirmations were; 9.7, 9.4 12.8, 6.1, 3.7 throughout the successive 5 years respectively. Additionally, numbers of confirmed cases were; 78, 85,245, 154 and 109 in the years 2008 to 2012 respectively. Considering the population projections (CSA 2007), incidence of confirmed cases per 100,000 populations were 0.5, 0.53, 1.49, 0.91 and 0.63 throughout the reporting period as well (Table 20).

Table 20: Measles Surveillance Performance Status, SNNP Region, 2008-2012

Indicator	**2008**	**2009**	**2010**	**2011**	**2012**
Total number of suspected cases reported	803	904	1908	2542	2986
Proportion of reported cases investigated with blood specimens (target: >80%)	100.0	100.0	100.0	100.0	97
% of lab confirmed cases (target :< 10%)	9.7	9.4	12.8	6.1	3.7
Total number of confirmed measles cases	78	85	245	154	109
Incidence of confirmed measles per 100,000 Population	0.5	0.53	1.49	0.91	0.63

During the reporting period of 2008 to 2012, majority 2986(32.7%) of the cases were reported during 2012, followed by 2542(27.8%) and 1908(20.9%) during the years 2011 and 2010 respectively (Fig.32 below).

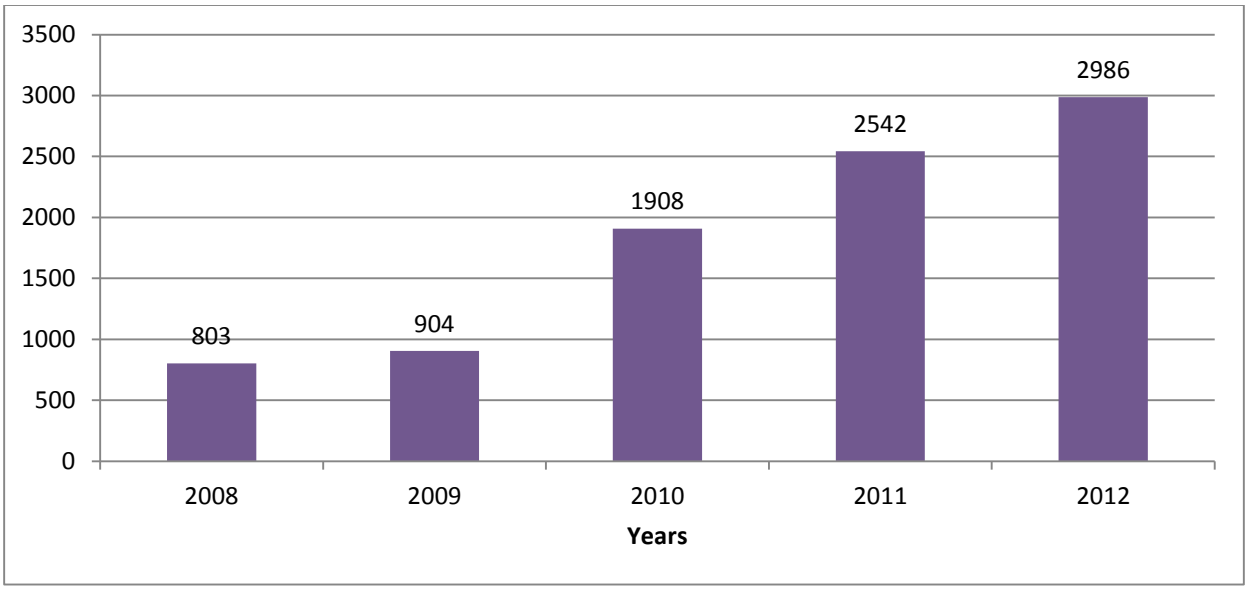

Figure 32: Measles Case Trend by Year, SNNP Region, 2008-2012

When we aligning similar months together through 2008 to 2008, the highest 2904(31.8% cases were reported on the month of January; followed by 1434(15.7%) and 770(8.4%) cases on the months of December and February throughout the years respectively. Conversely, the least of cases were reported during July, August and September with 260(2.8%), 275(3.0%) and 255(2.8%) cases respectively (fig.33 below).

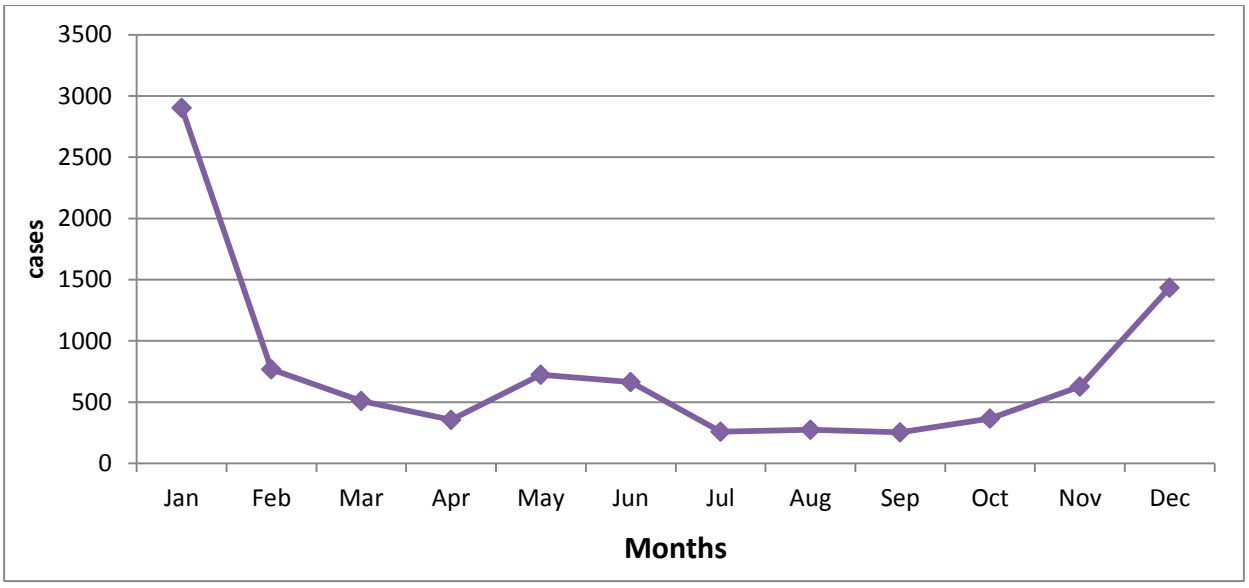

Figure 33: Measles Case Trend by Months, SNNP Region; 2008-2012

Specifically, during 2008, 192(23.9%) of the cases were reported on the months of December. 270(29.9%) in the months of January 987(38.8%) in the months of December and 1883(63.1%) of the cases were reported on the month January through 2009 to 2012 years likewise.

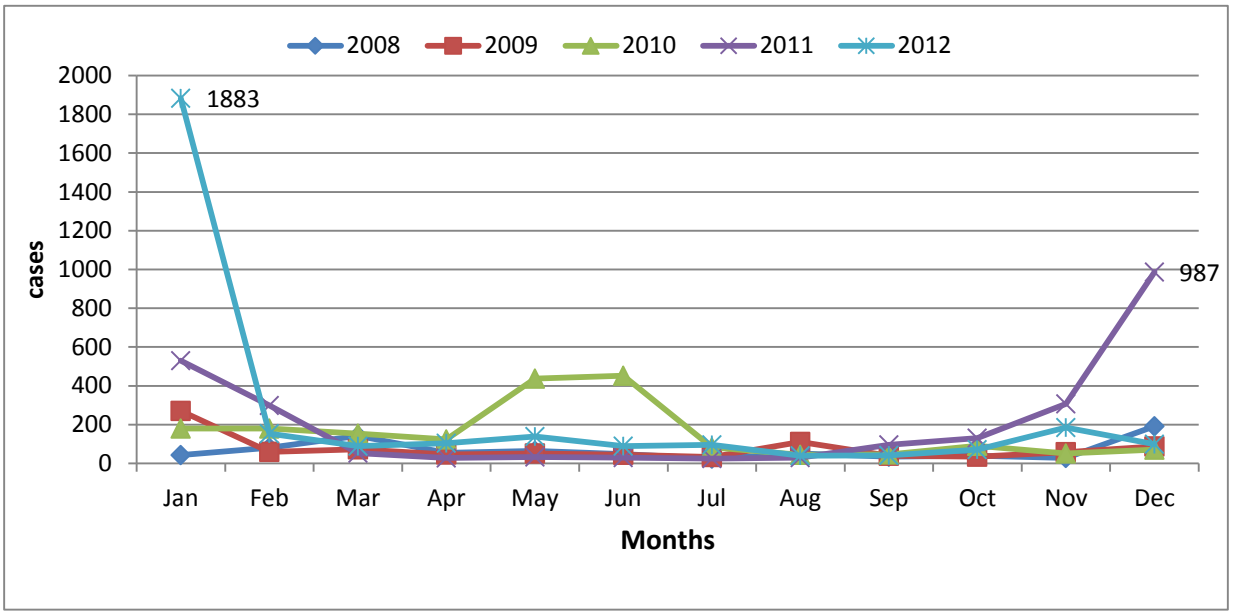

Figure 34: Measles Case Trend by Month and Years, SNNP Region, 2008-2012

In the years 2008 and 2009, there was no report from Basketo and 2008 from Yem Special Woredas. But, even though their case loads were varied, all Zones and or Special Woredas had reported measles cases. Throughout the reporting period, majority 3593(39.3%) of the cases were reported from Kefa Zone; followed by 1947 (21.3%) and 568(6.2%) of the caseloads by Sidama and Guraghie Zones respectively (Fig.35 below).

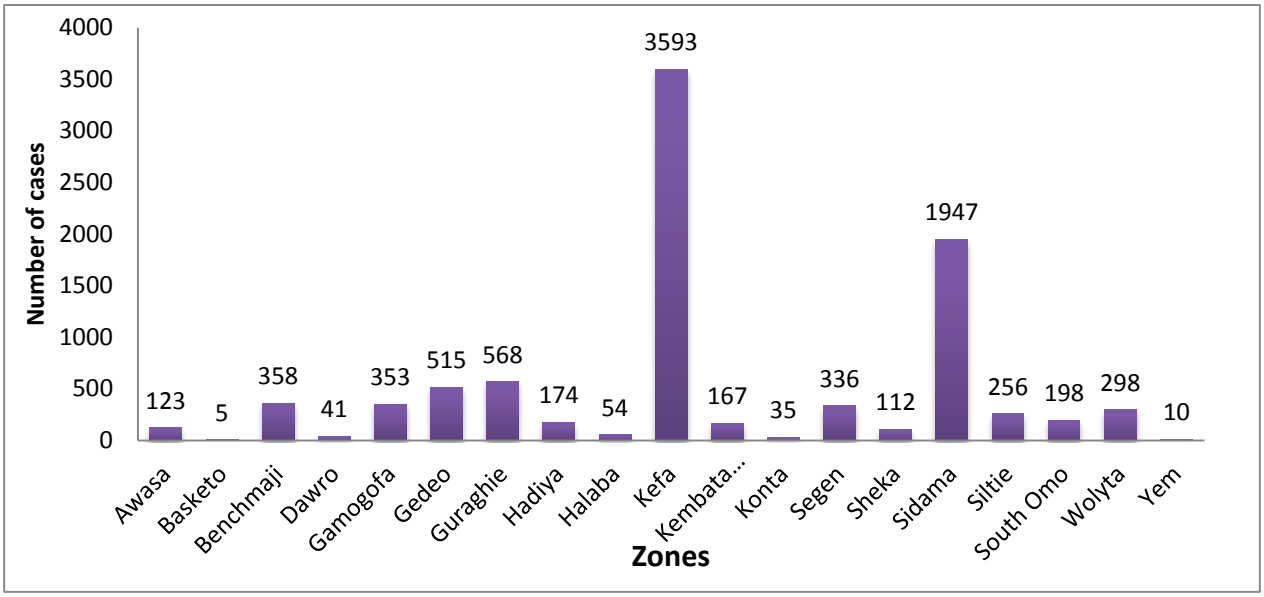

Figure 35: Measles Cases Load by Zone, SNNP Region; 2008-2012

Discussions

Regardless of limitations of the study design, relying on already collected data, the study revealed a number of important results. These were relating to quality of data collected by the surveillance system, populations still at risk of contracting measles in SNNP Region and how the Regional measles case- based surveillance system has been performing in the period under review. Close to 1189 deaths with a CFR of 13.0% were reported during the successive five years; specifically 1166 cases with CFR of 45.8% in 2011. The fatality was very high as compared to; in Ethiopia, the expected case-fatality rate is between 3% and 6%[5]. Most deaths, 1176(98.9%) of them occurred in under five years population. The result was related to the fact that the highest case-fatality rate occurs in infants 6 to 11 months of age, with malnourished infants at greatest risk [5].

Close to 3599 (39.4 %) of the cases were from rural area as compared to 534 (5.8 %) of them being urban dwellers. while 5010 (54.8 %) of the cases were missed or unknown their dwelling address. Additionally, only 228(2.5%) of the case from both Rural and Urban took more than two doses; while majority, 4810(52.6%) had not vaccine history and 1415(15.5%) of the cases were unknown their status. This contradicted with immunization coverage is one of the indicators used to monitor progress towards the achievement of MDG4 and the reduction of child morbidity and

mortality, as it is one of the most cost-effective public health interventions for reaching these goals[4].

Only 22(5.5%) of the cases were positive for measles IgM. Indicating that, measles vaccination is one of the most cost-effective interventions available; especially if the achievements reached over 90% coverage on the first dose of measles [5]. Close to 3599(39.6%) of the total cases were from rural; this might be due to large susceptible population in the rural areas than in the urban due to closeness to health facilities and lack of awareness. Beside that large numbers 2982(32.6%) of case were remained untreated. That was in converse to supportive care that ensures good nutrition, adequate fluid intake and treatment of dehydration to avoid complication of the illness; prescription of antibiotics to treat eye and ear infections, and pneumonia [6]. All children in developing countries diagnosed with measles should receive two doses of vitamin A supplements, given 24 hours apart to restore low vitamin A levels. Because of Vitamin A supplements have been shown to reduce the number of deaths from measles by 50% and severe measles is more likely among poorly nourished young children, especially those with insufficient vitamin A, or whose immune systems have been weakened by HIV/AIDS or other diseases [6, 7].

Conclusion

In conclusion; this study was conducted with the objective of providing the basis for eliminating and controlling measles outbreak in SNNP Region and evaluate the surveillance status of measles. Even though limitations on the quality of the data collected from the Region, this study found that age groups, rural residency and vaccination appeared to be related with the occurrence of measles outbreak. Measles problem in the Region is still highly burdensome with highest CFR especially during 2011. Under five populations were highly affected; also indications that there is a disease shift to adult ages. Although measles is among VPDs, most the cases did not take optimal doses of vaccination. From this it is possible to conclude that EPI coverage is far away from what is expected to create herd immunity. The result of this study gives a clue on the factors contributing to measles problem in the Region and provides base line information for other investigators and program considerations.

Recommendations

- Primarily the Region has to enhance its surveillance activities to easily detect all possible measles cases for appropriate responses
- The Region should address routine immunization with the target of reaching more than 90% of infants 9 to 11 months of age and children up to the age of 15 years
- As the Region/Ethiopia has not reached over 90% coverage on the first dose of measles, the Region should focus on options of SIAs and catch-up and follow-up campaigns to increase measles immunity and break the vicious cycle of measles outbreak and
- The Region has to continuously make aware the communities to come to facilities during measles illness for the betterment of the outcome

Acknowledgement

My sincere thanks go to the Ethiopian Health and Nutrition Research Institute; Public Health Emergency Management Center that allowed me to access to the database of PHEM surveillance data collected from SNNP Region. Finally, I would like to be grateful to Addis Ababa University, School of Public Health for providing me the chance to conduct this activity.

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CHAPTER VI – ABSTRACTS FOR SCIENTIFIC PRESENTATIONS

6.1 High Measles Prevalence – South Nations, Nationalities and Peoples' Region, Ethiopia, 2008-2012

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Background: Measles is an infection of the respiratory system due to a virus, genus Morbillivirus; humans are the only reservoir. In developing countries, up to 75% of patients may have complications. One out of four died where malnutrition and vitamin A deficiency are common. Outbreaks of measles are reported in the South Nations, Nationalities and Peoples Region (SNNPR) State of Ethiopia each year. Hence, this is to describe measles prevalence and recommend possible interventions.

Methods: Five years (2008-2012) data was officially received from Public Health Emergency Management Center; then retrospective descriptive analysis was made using MS excel and SPSS version 16.0.

Results: Totality 9143 cases, with1189 deaths were recorded (CFR=13.0). Amongst, 4717(51.6%) and 3503 (38.3%) of the cases were under five (AR=37/100,000) and under 15 (AR=23/100,000), while 923 (10.1%) of them were 15 and above years. About 51.8% of the cases were males. Also 3599 (39.4 %) and 534 (5.8 %) of the cases were rural and urban dwellers respectively while 5010 (54.8 %) cases did not have registered dwelling. Six hundred seventy one (7.4%) of the cases were positive for measles IgM. Two hundred forty five (5.4%), 161(6.4%), 22(5.5%) and 198(16.7%) which had no vaccination history; that had one dose, two and above doses of vaccine and with unknown their vaccination status were positives for measles correspondingly. Majority 2986(32.7%) of the cases were reported during 2012. Collectively 3593(39.3%) of the cases were from Kefa Zone.

Conclusions: Age, residency and vaccination appeared to be related with the occurrence of severe measles prevalence. Thus, enhanced surveillance with strong immunization activities that target of reaching 90% of infants 9 to 11 months and cover to age of 15 years.

Key word: measles, case, age groups, vaccination, residency

6.2 Investigation of poliomyelitis outbreak- Doolo Zone, Ethiopian Somali Region, January 2014

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Introduction: Global Polio Eradication Initiative (GPEI) has reduced the global incidence of polio by more than 99.9%. Three WHO regions have been "certified" polio-free. In the African Region, the Polio Eradication Initiative launched its wide-scale activities in 1996 with a slogan "Kick Polio out of Africa by 2000". In 2013, poliomyelitis was detected in Doolo Zone, Ethiopian Somali Region. We investigated the outbreak for appropriate interventions.

Methods: We used a descriptive cross-sectional study design; using the national Acute Flaccid Paralysis (APF) case definitions, physical evaluations, Medical records and AFP surveillance activities were reviewed; and assessed local Oral Polio Vaccine (OPV) coverage. Case caretakers were interviewed and focus group discussions were held.

Results: Nine cases with one death (CFR=11.1%) Wild Poliovirus1 (WPV1) were reported July to November 2013 from Doolo Zone of Somali Region. The index case was on July 10, 2013 from Boreyal village of Galadin Woreda; subsequently three cases from Galadin, four cases from Bookh and one from Warder Woredas were reported. Amongst 55.6% (5/9) of them were males. Their age ranged 13 months to 15 years old; with the median and mean ages of 4 and 6 years. Families of all cases are pastoralists with limited basic services; frequently move from Ethiopia to Somalia. Cases had fever at the initial; then manifested acute paralysis. Only one case had right limb paralysis while the rest with left limbs. Seven of the nine cases crossed to Somalia Hospitals to seek medical care; then reported back to Ethiopia as WPV1. Most cases had travel history to Somalia and had no OPV exposure.

Conclusion: The poliovirus imported from Somalia; entered to Ethiopia through mobile and vulnerable communities across the border. All cases had developed paralysis. All cases and their peers had not OPV exposure and surveillance in the area was very weak. Polio eradication strategies should be implemented.

Key Words: poliovirus, cases, vaccine, paralysis, Doolo Zone

6.3 Investigation of Measles outbreak-Aleta Chuko, Sidama Zone, South Nations, Nationalities and Peoples Region January 2014

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Introduction: In 1980, before the launch of the EPI program, measles caused an estimated 2.6 million deaths each year. Measles is one of the leading causes of death among young children even though a safe and cost-effective vaccine is available. In 2011, there were 158 000 measles deaths globally – about 430 deaths every day or 18 deaths every hour. More than 95% of measles deaths occur in low-income countries with weak health infrastructures. Measles vaccination resulted in a 71% drop in measles deaths between 2000 and 2011 worldwide. On 8 November 2013, Aleta Chuko Woreda reported suspected measles outbreak. Following that team was deployed to investigate risk factors of the outbreak.

Methods: Both descriptive and case control study designs were applied. Collected line lists from the Woreda Health Office; surveillance reports were reviewed and data was analyzed using MS-Excel and Epi-Info 7 software.

Results: Totally 478 cases were reported from Aleta Chuko Woreda. Close to 129(27 %) of the cases had conjunctivitis, 410(85.8 %) had cough; 61(12.7 %) of them had diarrhea. Two hundred four (53%) of the cases were Males. Cases were aged 3 month to 60 years old, with mean and median ages of 9 and 8 years. Ninety four (19.6 %) of the cases were under five, while 384(80.3 %) of them were five and above years old. Only 186 (38.9 %) of the cases had one dose vaccination history; while 262(54.8%) and 30 (6.3 %) of the case were unvaccinated and did not known their status respectively.

Conclusions: Age groups five and above years old were highly affected. There was no outreach site and functional Cold chain system in the affected Kebeles. Low vaccination coverage, low community awareness and non-functional cold storage likely contributed to the outbreak. Community awareness and enhancing quality vaccination coverage are crucial to reduce measles incidence in this Woreda and in the Region.

Key Words: Measles cases, age group, Vaccination, Aleta Chuko

CHAPTER VII – NARRATIVE SUMMARY OF DISASTER SITUATION VISITED

7.1 Belg Season Humanitarian Needs Assessment Verification Report- N/Wollo and Wag Himra Zones, Amhara Regional State, June 2013

Executive Summary

Belg Season Emergency Needs Assessment was conducted in N/Wollo and Wag Himra Zones between 15th and 30th June/2013. Primarily the assessment covered Belg producing areas and secondly in the current hot spot areas (areas that reported measles) of Wag Himra Zone; with the objective of identifying existing and or potential emergencies/threats that could be related to seasonal rainfall performance during the "Belg period" and other causes. Water borne disease outbreaks or other health emergencies including wide spread malnutrition, usually follow emergency events and could lead to increased illness and deaths. During emergency conditions, access to safe water and sanitary facilities are major challenges. If proper measures are not undertaken, the lack of safe water and sanitary facilities could lead to adverse effects due to water borne diseases like AWD and BLD resulting in high morbidity & mortality related to the problem.

Semi-structured checklists were used, and observations and discussions made with Zonal Departments and PHEM officers up to Woreda Sectoral Offices. The assessment covered N/Wollo Zone (4 Woredas- R/Kobo, Meket, G/Lafto and Wadla), and Abergele Woreda of Wag Himra Zone. The total population for the assessed four woredas is 788,481 of which 105,413 children less than five years of age. There was no special population that may need additional focus during emergencies. Close to 176,000, people were estimated to be in need of food aid due to drought and other causes.

Public health situation of the assessed woredas was more or less stable; except recent suspected measles outbreak in Meket. The major epidemic prone diseases that were reported in the last four months were malaria in all visited Woredas (2,554-cases with no deaths), with the high caseload of malaria in R/Kobo. Diarrhea was the leading cause of morbidity in under five while AFI in adults. However, there was no recent history of AWD and meningitis outbreak in the visited Woredas. In view of the existing factors, the most anticipated diseases that could occur as an

outbreaks were malaria, measles possibly SAM and waterborne disease due to malaria endemicity, low replacements of LLITNs, food insecurity situation and WASH situations.

Although not in required amount, most of the drugs required for outbreak prone diseases were available in stock. Majority of the Woredas had multi-sector emergency committee and EPRP plans. Availing of anti malaria drugs, rapid diagnostic test reagents, monitoring of insecticide residual spray (IRS), and strengthening surveillance and environmental management were in position.

Main public health issues that need emphasis were; Measles problem, severe acute malnutrition, malaria and water borne disease outbreaks. To deal with, totality USD 398, 433 was required for the second half of 2013.

Introduction

The Amhara Regional State is one of the nine National Regional States of Ethiopia. This is located in North West pat of the country. Its capital is Bahir Dar, some 565 Km away from Addis Ababa; and particularly near Lake Tana and close to Blue Nile River. The Region is bounded by, Sudan in the North-West; Tigray in the North; Afar in East and Oromia in South. It comprises of 10 administrative zones and Town administrative, 129 rural and 39 urban districts; and further divided in to 3126 rural and 331 urban Kebeles; structurally and functionally decentralized. The Region covers an area of 20,650,420 km2.

The total population of the Region as of 2005 EFY was estimated to be 19,267,617; of which, 16,378,141(85%) reside in rural area and 2,889,475(15) live in urban area.

To cope with any humanitarian crisis, the government together with partners conduct frequently assessments; in areas of public health concern and hot spot areas; comprising of N/Wollo (R/Kobo, Meket, G/Lafto and Wadla) and Wag Himra Zone (Abergele). The estimated projected population of the region (CSA 2012) is close to 19,267,617. N/Wollo accounts 1,639,151(6.68%) while Wag Himra Zone contributes 463,505 (2.46%). All zones in Amhara have rainy season once a year; on top of this, almost all Woredas in East Amhara get major and minor rainy seasons twice in a year.

This assessment was took place as part of the Belg season Emergency Needs Assessment; if situations of threats are prevailing and to fill gaps for the period of July to December 2013. That was conducted between 15 and 30 June 2013. whether disease outbreaks or other health emergencies including wide spread malnutrition, usually follow after emergency events due to natural or manmade disasters. During emergency conditions, access to safe water, Nutrition and sanitary facilities are major challenges. If proper measures are not undertaken, the lack of Nutrition, safe water and sanitary facilities could lead to undesirable effects in fulfilling daily needs; and could lead to increased morbidity and mortality due to SAM, food and water borne diseases.

The assessment was crucial to learn and anticipate and assess the magnitude of the emergency threats and accordingly to make necessary interventions, plans and preparations so that to early prevent unnecessary life and socio-economic damage. Accordingly, emergency needs assessment was performed primarily in Belg producing Woredas of the Region; with the objectives to identify existing or potential emergencies or threats that could be related to rainfall performance during the recent "Belg" and other seasonal causes.

Objectives

- To identify existing resources and the capability to cope with circumstances
- To identify major public health concern, potential outbreaks and at risk population
- Assess the magnitude and likelihood of the emergencies in the Belg producing hot spot Woredas and some hot spot areas.
- To early plan and prepare for public health emergency responses for existing and or anticipated emergency conditions and to set priorities.

Methods

Belg Season Emergency Needs Assessment in Amhara Region, N/Wollo and Wag Himra Zones of different Woredas was carried out between 15th and 30th June 2013. The assessment was conducted using a checklist format and semi structured questionnaire for rapid emergency needs assessment on existing and or potential emergencies on health, nutrition, water –sanitation situations. In addition to the formatted checklists, observations and discussions (brief and debrief) with stakeholders, and concerned experts of respective sectorial offices also made. Data

were collected from Regional, Zonal and Woreda Health Offices using semi-structured checklist, observations and discussions. In addition, information was considered from Zone Administrations, Woreda Administrations and Woreda Agriculture and Rural Development Offices.

Findings

Regional PHEM status

The Region has functional multi-sectoral co-ordination forum, in which all potential partners are taking part, with a frequency of meeting on monthly basis. The Region is prone to many epidemic prone diseases; for instance, during the last three months, anthrax (19 cases); measles (131 cases with 2 deaths) and dysentery (65 cases and 4deaths) were reported March through April of the current year. In order to manage such threats, the RHB prepared EPRP although it was not funded as expected. All staffs in both RHB/ZHD took PHEM training; similarly, there is Regional trained Rapid Response Team (RRT).

Anti malaria drugs like coartem, chloroquin and artesunate IV available in Regional store. However, there is no quinine PO and IV. There is critical shortage of anti meningitis drugs like ceftriaxon, CAF oil, IV fluids for medication and resuscitation. Similarly, drugs for dysentery like ceftriaxon, or ceprofloxacilline are nearing to nil in stock; and minimal stock of ORS in Regional stock (table 21 below).

Table 21: Regional Drugs and Medical Supplies Status, Amhara Region, June 2013

Drugs and medical supplies		Requirements	Available	Gap	Remark
i. Meningitis vaccine		-	-	-	
ii. Drugs:	Coartem	944,452 does	85,440	859,012	
	Artesunate (rectal)	22,569	0	22,569	
	Artesunate (Inj)	15,704	2,086 vials	0	
	Artemether IM	0	0	0	
	Quinine (PO)	35,000 does	0	35,000	
	Quinine (IV)	16,667	0	16,667	

	Chloroquine	129,050	10 tin of 100	29,050	
	Ceftriaxione	125 does	0	125 does	
	Oily CAF	0	0	0	
	Doxcycline	450 box	0	450 box	
	Ringer lactate	-	0	-	NA
	ORS	614 box	5 box of 50	609 box	
	Vit A.	-	236 of 100 capsule	-	
iii. Lab supplies	RDT (Malaria)	9396 box	9396 box	9396 box	
	Pastorex (Meningitis)	-	0	-	NA
	LP set	125	0	125	
	TI bottle	125	0	125	
CTC Kit (AWD)		17	0	17	Argent need
Medical Supplies	Gloves, box	1413	5 box of100	1408	
	Syringe	367	0	367	
	PPE	-	0	-	

Assessment Population Profile

The total population of the assessed woredas was788, 481: of which, 105,413 were children less than five years of age. In this regard, there was no special population that may need additional focus during anticipated emergencies (Table 22 below).

Table 22: Population Distribution of Rapid Belg Needs Assessed Woredas, Amhara Region, June 2013

Zone	Woreda	Population				Special Population			
		M	F	<5 yr	Tot	Pastoralists	Refugees	IDPs	Migrant Workers
N/Wollo	Meket	125,124	125,125	33,784	250,249	-	-	-	-
,,	R/Kobo	113,735	113,736	30,708	227,471	-	-	-	-
"	G/Lafto	89,169	80,522	21,877	169,691	-	-	-	-
"	Wadla	69,124	71,946	19,044	141,070	-	-	-	-

Wag Himra	Abergele	23,664	22,845	6,278	46,509	-	--	-	-
"						-	-	-	-
"						-	-	-	-

Note: dash meant, no special population by the time of the assessment period

Assessment Findings

Five top diseases: In the visited drought hot spot Woredas, the three top leading causes of morbidity were mainly diarrheal disease in under population; and AFI in adults, except R/Kobo Malaria in adults, acute respiratory infections, and diarrheal diseases in the order given. Fourth and fifth top causes of morbidity vary from skin infection are commonly ranked (annexed).

Malaria: Still malaria prevalence is very high in many of visited woredas of which R/Kobo takes the lead among assessed woredas of N/Wollo zone; followed by Meket Woreda (fig.36).

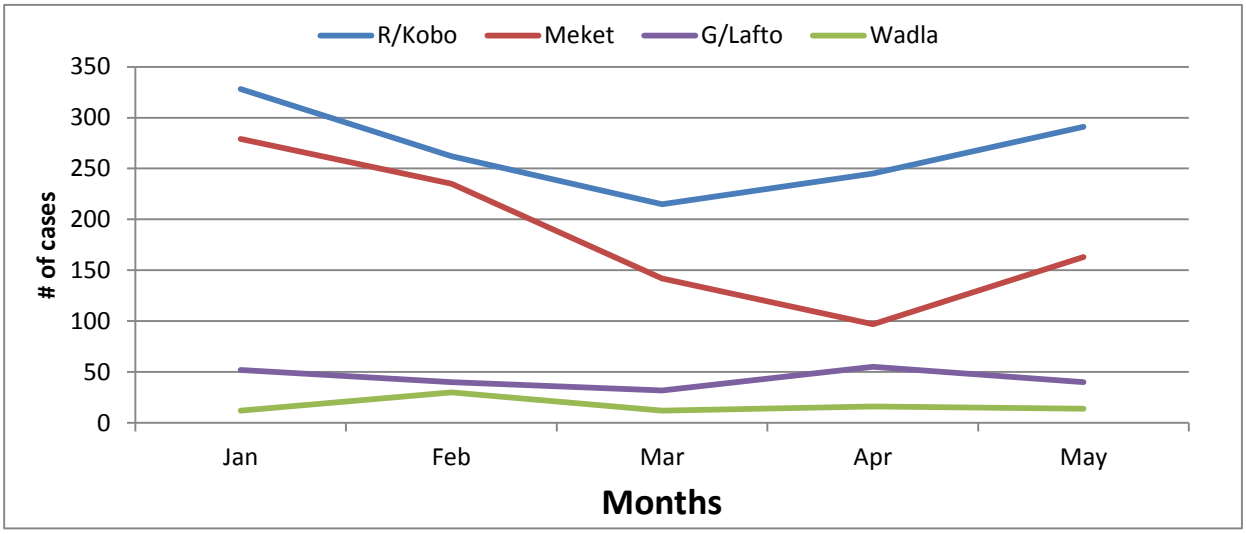

Figure 36: Malaria Prevalence by Month and Woreda, N/Wollo Zone, Amhara Region June 2013

As per briefings from the ZHD, still malaria case is the leading public health problem in the Zone. Data collected from the four Woredas indicated that, caseload seems to be increasing starting from April to May (Fig.37 below).

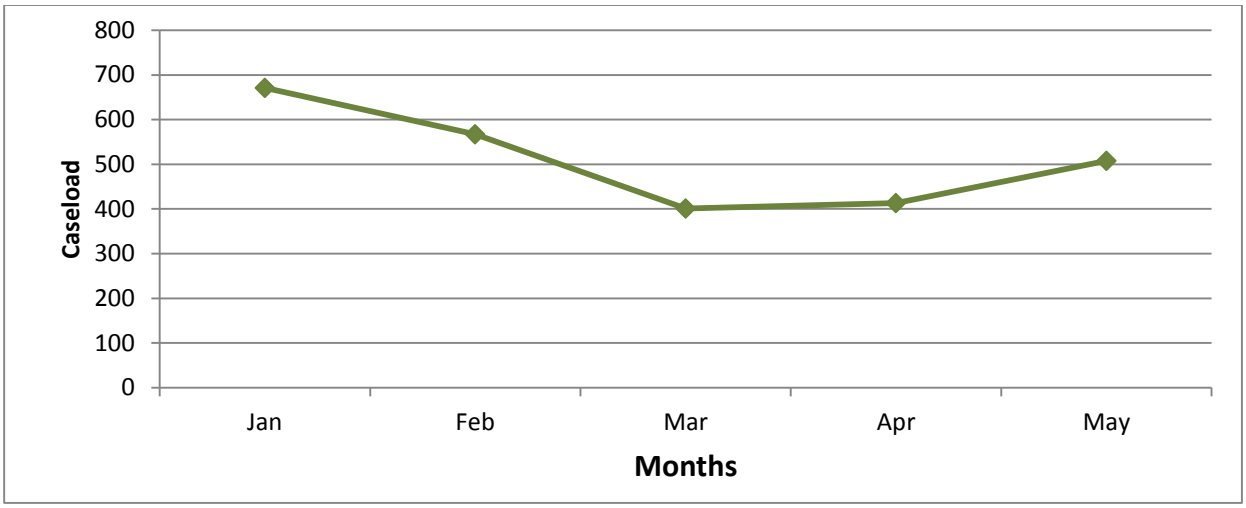

Figure 37: Malaria Case Trend by Month, N/Wollo Zone, Amhara Region, June 2013

Measles: 34 measles cases without death were reported from Meket, and five from Wadla Woredas. There was an outbreak in Meket February through April with total cases of more than 34; while R/Kobo encountered with, sporadic cases (table 23 below).

Table 23: Case/Death Trend Of Outbreak Prone Diseases By Month, Belg Season Assessed Woredas, Amhara Region, June 2013

Zone	Woreda	Malaria						Measles					
		Jan	Feb	Mar	Apr	May	**Total**	Jan	Feb	Mar	Apr	May	**Total**
N/Wollo	**Meket**	279	235	142	97	163	**916**	0	32	2	0	0	**34**
	R/Kobo	328	261	251	245	291	**1341**	2	1	0	0	1	**4**
	G/Lafto	52	40	32	55	40	**219**	0	0	0	0	1	**1**
	Wadla	12	30	12	16	14	**84**	0	0	5	0	0	**5**
Wag	**Zonal**	887	867	879	620	680	**3933**	2	1	0	2	0	**5**
Total		**1558**	**1433**	**1316**	**1033**	**1188**	**6493**	**4**	**34**	**7**	**2**	**2**	**49**

Note: 1. there is no malaria death reported in the last five months.
2. Pocket outbreak recorded from Meket during the months of February
3. There was no any AWD or meningitis report in the last 5 months

Nutrition status: Based on information obtained from Woredas and existing Therapeutic Feeding Programs (TFP) data, the nutrition situation in both N/Wollo and Wag Himra Zones is

more or less stable. However, there is a fear that, due to chronic food insecurity situation, the problem may get bigger.

Potential Public Health Threats

The most anticipated diseases that could occur as outbreaks were malaria, measles, and waterborne diseases, including Acute Watery Diarrhea (AWD). However, Meningitis outbreak may slightly occur as outbreaks, because of the unfavorable upcoming rainy season**.**

Malaria: The risk factors for malaria are that all the visited Woredas are malaria endemic and have risk factors for malaria transmission, such as, favourable mosquito breeding sites like interrupting rivers, and water wells. Woredas also in need of LLINs replacement, and if not replaced there could be risk of increment or outbreak of malaria cases. Apart that LLNs coverage is low in few woredas, still in many of the assessed woredas, there is a need of LLNs to be replaced even though the coverage is close to 100%.

Measles: The risk factors for measles outbreak are that because many woredas have reported sporadic measles during the last five months. Moreover, Woredas like R/Kobo has less than 80% EPI measles coverage; even in those with in the standard (more than 85% coverage) have been reporting. The regional Measles coverage stands at 106% for EFY 2005; which is overstated, since appropriately planned activity cannot be beyond 100% achievement; but comfortable for what it could be, in order to create herd immunity. In 2013, many woredas reported measles cases. Majority of the cases were adults and that the increased cumulative susceptible adult population is a challenge for measles control. All these indicators and factors increase the risk of measles transmission in the Region.

Food and Water Borne Diseases: In all the visited woredas, access to safe water supply was relatively low. Safe water coverage in the visited Woredas ranges from 57% in G/Lafto to 85% in Meket Woreda. Reduced hygiene and sanitary practices could also contribute to the risk of transmission of food and water borne diseases. Similarly, the household's latrine coverage in the visited woredas ranges from 6.7% in G/Lafto to 96% in Wadla woreda; although utilization is questionable. In the current drought affected and Belg producing woredas, the risk of food and water borne diseases is higher. The current availability of safe water is low; due to reduced ground water, drying of water schemes, and sanitary and hygienic conditions could be very much

compromised during the upcoming rainy season; relating to the probability of water borne conditions since people by then are forced to use nearby ponds.

AWD: In Amhara Region, there was no AWD report for the last three years. However, the Region has experienced outbreaks of AWD in the years 2007 – 2009. The most favorable conditions for AWD transmission is poor hygiene and sanitation and existing indicators that is as far diarrhoeal diseases are among the top leading causes of morbidity. Therefore, attention shall be given to AWD risk prevention and control; as the disease is highly communicable and could be transmitted from other neighboring Regions.

M. Meningitis: For the last three years to the assessment time, there was no meningitis outbreak or report in the visited Woredas; and not expected such illness for the upcoming rainy seasons. However, surveillance during the window period has to strengthen in case of sporadic seasonal meningitis cases. Hence, it needs close follow up; for an early notification and response of any outbreaks according to the WHO guide; for the reason that, mass vaccination activity had not applied for many years, and recent episodes in some parts of the Country, still the is a risk to occur in the assed Zones (Table 24 below).

Table 24: Risk Factors for Epidemic to Occur In Belg Season Assessed Areas, Amhara Region, June 2013

Zone	Woreda	Malaria endemic Y/N	ITNs coverage	Ongoing measles outbreak	Measles vaccine coverage (%)	AWD outbreak last 3 years	Meningitis profile last 3 years
N/Wollo	Meket	Y	85	N	79.6	N	N
	R/Kobo	Y	<80	N	57	N	N
	G/Lafto	Y	100	N	89	N	N
	Wadla	Y	>80	N	100	N	N
Wag Himrara	Zonal	Y	<80	N	81	N	N

Risk Characterization

Generally, we summarized assessment findings as; the likely hood occurrence of Health and Nutrition emergencies and degree of threats, observed immediate risk factors and population at risk for the upcoming season (Table 25 below).

Table 25: Summary of Risks/ Public Health Threats, Belg Season Assessed Areas, Amhara Region, June 2013

Public health threat	Identified Immediate Risks	Likelihood to occur	At risk population	Remarks
Measles outbreak	• Low measles vaccination coverage in some Woredas and high accumulation of susceptible population groups in the community • Chronic and Possible Worsening of malnutrition as a result of food shortage • Recent experience of measles outbreak in some Woredas, current cases	Very High	Mostly, children aged 6 month -14 years	Due to recent outbreak in Meket, Abergele, and current sporadic cases
AWD & BLD outbreak	• Shortage of water for drinking, personal hygiene and other domestic use resulting from the dry up of sources of water, or • Absence safe water source at places where communities are likely to emigrate for pasture land • Low sanitation (latrine) coverage • Overcrowded living condition (farm camps) • Previous year repeated attacks and currently ongoing AWD outbreak	High	All population	Due to WASH problems, food insecurity and high diarrheal disease morbidly
SAM	• Food shortage as a result of drought and lose of /unproductiveness of animals • Current ongoing malnutrition problem • Measles outbreak, diarrheal diseases	High	Children Under five years of age, lactating and pregnant women	Most of the Woredas, in the visited Zones
Malaria outbreak	• Poor utilization of LLINs • No replacement of LLINs in all endemic areas • Increased number of less immune population groups as a result of LLITBs use for the last 3-5 years, and non-replacement	High	Pregnant women, Children under-five years of age	No LLINs replacement
Meningitis outbreak	• No vaccination has been conducted in the past more than 8 years • The region located within meningitis belt • Rainy season • Recent report of suspected cases and window period	Low	Age-group 2-30 years	All Woredas of the region

Availability of Drugs and Medical Supply for initial Emergency Management

Most of the drugs required for outbreak prone diseases are available in stock in all Woredas. However, all visited Woredas do not have meningitis diagnostic test reagent and kit for AWD

Case Treatment Centers (CTC) (Annex).The drugs with likely shortage are Amoxicillin suspension and Tetracycline eye ointment for measles cases treatment, ORS and Doxcycycline if many cases of AWD, Coartem if many malaria outbreaks, and IV fluids. Generally, the Woreda Health Offices think that they have put drug stocks for possible disease outbreaks, and would be able to manage limited cases at initial stages of outbreak. However, N/Wollo ZHD said they have plenty of medical supplies in their respective Woredas, as in table below.

Table 26: Availability of Emergency Drugs in Belg Season Assessed Areas, Amhara Region, June 2013

Zone	Woreda	RL	ORS	Doxycycline	Amoxicillin suspension	Tetracycline eye ointment	Vit. A	Coartem	RDT malaria
N/Wollo	Meket	Y	Y	Y	Y	Y	Y	Y	Y
	R/Kobo	Y	Y	Y	N	Y	Y	Y	Y
	G/Lafto	Y	Y	N	N	N	N	Y	Y
	Wadla	Y	Y	N	Y	Y	N	Y	Y
Wag Himra	Abergele	Y	N	N	Y	N	Y	Y	Y
	Zonal	Y	Y	Y	Y	Y	Y	Y	Y

Note: If there is minimum stock, respondents replay, "yes" the gap is identified using the stock estimation matrix; no minimum resource for meningitis during assessment time

Malnutrition Situation

The malnutrition status in the current hot spot area is stable. However, due to food insecurity problems in the Belg producing areas, some Woredas need close monitoring of the nutrition situation for early detection and response particularly those drought prone Woredas/pocket areas so that to avoid severe consequences of malnutrition. The drought affected woredas/pocket areas are at risk of shortage of food, if adequate food support is not provided, and consequently could lead to increased level of malnutrition and its adverse effects and probability of deaths (Table 27 below).

Table 27: TFP Status of Assessed Areas by Month, Amhara Region, June 2013

Woreda	month	Tot. **SAM**	Tot # of **TFP(OTP/SC)**	# **SC**	**#OTP**	Tot # of **OTP/SC** reported	Whether supplies enough. (For next 1 month)			Children discharged from **TFP** referred
							RUTF	**F100**	**F75**	**Yes/no**
Meket	Jan	38	60	2	58	60	Y	Y	N	Y

	Feb	142	60	2	58	60	Y	N	N	Y
	Mar	52	63	5	58	63	Y	Y	N	Y
	Apr	54	63	5	58	63	Y	Y	N	Y
	May	56	63	5	58	63	Y	Y	N	Y
R/Kobo	Jan	25	56	5	26	NA	Y	Y	N	Y
	Feb	31	56	1	55	NA	Y	Y	N	Y
	Mar	43	56	1	55	NA	Y	Y	N	Y
	Apr	23	56	1	55	NA	Y	Y	Y	Y
	May	37	56	1	55	NA	N	N	N	Y
G/Lafto	Jan	54	36	1	35	36	Y	N	N	Y
	Feb	30	36	1	35	36	Y	N	N	Y
	Mar	64	36	1	35	36	Y	N	N	Y
	Apr	53	36	1	35	36	Y	N	N	Y
	May	37	36	1	35	36	Y	Y	Y	Y
Wadla	Jan	18	30	1	29	30	Y	Y	Y	Y
	Feb	23	30	1	29	30	Y	Y	Y	Y
	Mar	12	30	1	29	30	Y	Y	Y	Y
	Apr	16	30	1	29	30	Y	Y	Y	Y
	May	28	30	1	29	30	Y	Y	Y	Y
Wag Himra	Jan	NA	19	-	19	NA	Y	N	N	Y
	Feb	NA	19	-	19	NA	Y	N	N	Y
	Mar	NA	20	-	20	NA	Y	N	N	Y
	Apr	NA	20	-	20	NA	Y	N	N	Y
	May	NA	20	-	20	NA	Y	N	N	Y

Note!

- ✓ Y/N- Yes/No
- ✓ NA- not available
- ✓ The SAM caseload is very high in Meket followed by G/Lafto Woreda.

Although malnutrition problem is chronic problem in both N/Wollo and Wag Himra Zones, but, conversely, in all assessed areas of the zones have similar feature with the region except for N/Wollo, which its admission decreased from April to May in 2013 even if a major peak hunger season(Fig.38 below).

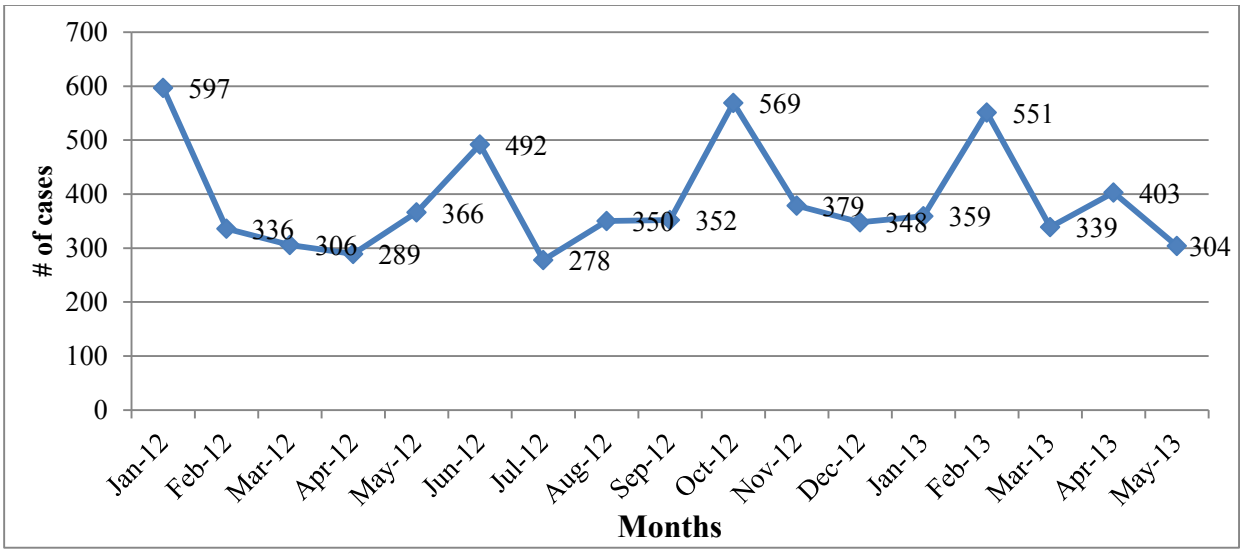

Figure 38: TFP Admission Trend by Month, N/Wollo Zone, Amhara Region, June 2013

Public health emergencies coordination forum

Overall, the emergency coordination system in the visited Woredas is relatively strong. All Woredas have functional Public Emergency Multi Sector Committees. Majority of the Woredas have no Emergency Preparedness and Response Plans (EPRPs) in place. All report on regularly bases based on the national PHEM guidelines. All Woredas also report that they have reserve medical stocks for possible emergencies. Moreover, the data management, and timely reporting is better than any time before. The emergency committees need to more proactive than it currently does, only reactive when any incidences happen. Therefore, reactivation was assumed as in table below.

Table 28: Training, Supportive Supervision for Health Emergencies, Amhara Region, June 2013

Key Preparedness Activity	Time line 2013				Budget (assumed value)USD		
	Q1	Q2	Q3	Q4	Required	Available	Gap
Refresher Training on Surveillance, case management and communication, for respective Woreda PHEM foci persons for 3 days			X	X	2,024	0	2,024
Supportive supervision in selected hotspot woredas			X	X	12,862	0	12,862
Total					**14,886**	**0**	**14,886**

Note: the intended activities during the second half of the year (Quarter 3&4)

Minor limitations/challenges

- Staff turnover of trained on health emergencies and EPRP in Woreda health Offices
- Problems data management; screening, management of SAM and somewhat deprived reporting systems compare to weekly surveillance
- Absence of focal person; by the time when the assessment team arrived at the respective office,
- Poor documentation on logistical supplies in few Woredas
- Different documentation system of those using and do not use HMIS software in the same office

Conclusions and recommendations

There is no proactive PHEM coordination forum; almost in all assessed areas; and limitations on early preparation of EPRP in case to mobilize resources during emergency. Diarrheal diseases is the first leading cause of morbidity in under five population, while AFI is the major burden in adult population of the assessed areas, with exception of malaria in R/Kobo Woreda. Therefore, WASH interventions in needed and special attention needs to be given to strengthen malaria control activities especially in those endemic areas; such include, making available anti malaria drugs a proficient d rapid diagnostic test reagents, Insecticide residual spray (IRS), replacement of LLITNs to increase update the coverage, strengthening surveillance and environmental management.

Vaccine preventable diseases, particularly, like measles, are the predicted diseases to occur as outbreaks because measles of sporadic Outbreaks across the visited areas of the Region. The regional measles coverage currently is 106%**;** relatively better due to the recent measles SIA. Measles outbreak and its consequences is also a risk in the drought prone Woredas/pocket areas. Adult measles would be a challenge, as majority of the measles cases reported this time prevails.

Strengthening routine immunization is also required in the main hot spot Woredas. In addition, early detection, reporting, and effective case management of the likely outbreak prone disease should be in enhanced. Budget for operational cost and Capacity building also required. Finally, it is necessary that the Health at different levels to proactively participate in key sectoral task

forces; aware and actively participate in the multi-agency Humanitarian Needs Assessment on top of:

- Strengthen the surveillance preparedness for the identified risk
- Prevention and control of malaria should be enhanced
- Trainings for PHEM staffs in epidemic for close monitoring , investigations and interventions
- Pre-positioning of emergency drugs and supplies
- Risk analysis & fund allocation for emergency preparedness should be considered at all level
- There has to be proactive EPRP coordinating forum at all level
- Measles vaccination coverage should be increased
- Response immediately to the household food security gaps though all possible modalities at hand and request additional supports for relief and other responses
- Capacitate and closely support TFP and other nutritional programs at all levels specially Woreda and Kebele level health facilities for appropriate response of caseloads
- Reserve adequate Nutritional supplies and routine drugs forecasting upcoming admissions and monitor stocks at facility level and respond accordingly
- Strengthen nutrition cluster coordination and work closer with all concerned sectors and partners and make use of all possible support from potential partners.
- Contingency funds be reserved to mitigate WASH related emergency problems
- Improve WASH: Maintain non functional water supply schemes and avail provision of potable water to the needy communities.

References

1. Central Statistical Agency. Population and Housing Census of Ethiopia; July 2012
2. Amhara Region Health Bureau. Public Health Emergency Management and response activities, 2013
3. N/Wollo and Wag Himra Zonal Health Departments. Weekly Surveillance reports, 2013
4. N/Wollo Zonal DPPC. Routine Early Warning and response reports, 2013
5. N/Wollo Water Resource Desk. Water Supply Coverage Assessment Reports, 2013

Annex 5: Belg Season Humanitarian Needs Assumptions, June 2013

Table 29: Population at Risk for Emergency during the Second Half of 2013, Belg Season Assessed Areas, Amhara Region, June 2013

S.N	Emergency condition	At risk population/ Beneficiaries	Expected cases	Remark
1	AWD	834,999	1,670	
2	Measles	116,899	4,676	
3	Malaria epidemic	143,618	4,309	
4	Meningitis	Nil	Nil	minor
5	SAM	3,273	654	
	Total	**1,098,789**	**11,309**	

Note: -malaria requirement to be discussed with its program.
-At risk population mean, the population in which respective cases emanated from

Table 30: AWD Outbreak Prone Woredas & Expected Cases in the Second Half of 2013, Amhara Region, June 2013

Zone	Woreda	Population(2012)	Cases (AR, 0.2%)	Sever cases (20%)
N/Wollo	Meket	250,249	500	100
	R/Kobo	227,471	455	91
	G/Lafto	169,691	339	68
	Wadla	141,070	282	56
Wag Himra	Abergele	46,509	93	19
	Tot	**834,990**	**1,670**	**334**

Table 31: Measles Prone Woredas & Expected Cases in the Second Half of 2013, Amhara Region, June 2013

Zone	Woreda	At risk population (2012)	Expected cases (AR, 5%)
N/Wollo	Meket	35,035	1,401
	R/Kobo	31,846	1,274
	G/Lafto	23,757	950
	Wadla	19,750	790
Wag Himra	Abergele	6,511	260
	Total	**116,899**	**4,676**

Table 32: Malaria Epidemic Prone Areas & Estimated Cases during Second Half 2013, Amhara Region, June 2013

Zone	Woreda	Pop at risk (2012)	Target (attack rate 3%)	Remarks
N/Wollo	Meket	43,043	1,291	
	R/Kobo	39,125	1,174	
	G/Lafto	29,187	876	

	Wadla	24,264	728	
Wag Himra	Abergele	8,000	240	
Tot		**143,618**	**4,309**	

Annex 6: Belg Season Humanitarian Needs Assessment Checklist, June 2013

- Health Sector Region/Zone

Interviewer name_____		Institution:_____	
Interview Date: (dd) ____/(mm)_____/2013		Region:_____Zone:_____	
Main contact at this location:	Name:_____	Position:_____	Tel:_____
1. COORDINATION			
A. Is there a functional multi-sectoral coordination forum for the health sector?			Yes□ No□
B. Are all relevant government, NGOs and UN agencies represented?			Yes□ No□
C. Frequency of regular meeting? (Weekly, Every 2 weeks, monthly…..)_____			
2. Outbreak?			
Was there any outbreak in the last 3 months? If so, specify it_____			Yes□ No□
Disease outbreak _____# of cases : _____Deaths _____(time period)_____			
Disease outbreak _____# of cases : _____Deaths _____(time period)_____			
Disease outbreak _____# of cases : _____Deaths _____(time period)_____			
3. **Mention anticipated epidemics**_____, if so, please indicate Zone/Woreda at risk and risk population per anticipated risk: *(Use the back side)*			
4. Public Health emergency Management			
A. Is there a Public Health Emergency Preparedness and Response plan?			Yes□ No□
If yes, is the plan budgeted/ funded?			Yes□ No□
B. Is there a trained staff on PHEM (Regional/Zonal/Woreda/HFs)			Yes□ No□
If yes specify number of trained personnel per level: **Region:** Female ____Male___**Zone:** Female____Male____**Woreda**: Female____Male____			
C. Is there a Regional trained Rapid Response team (RRT)?			Yes□ No□
D. Are there trained staff on Minimum Initial Service Package for RH			Yes□ No□
If yes specify number of trained personnel per level: **Region:** Female ____Male____**Zone:** Female_____Male____**Woreda**: Female____Male____			

	Drugs and medical supplies	Total requirement	Available	Gap

	i. Meningitis vaccine				
	ii. Drugs:	Coartem			
		Artesunate (rectal)			
		Artesunate (Inj)			
		Artemether IM			
		Quinine (PO)			
		Quinine (IV)			
		Chloroquine			
		Ceftriaxione			
		Oily CAF			
		Doxcycline			
		Ringer lactate			
		ORS			
		Vit A.			
	iii. Lab supplies	RDT (Malaria)			
		Pastorex (Meningitis)			
		LP set			
		TI bottle			
	CTC Kit (AWD)				
	Medical Supplies	Gloves,			
		Syringe			
		PPE			
	Clinical Delivery Assistance kit PART A: Reusable Equipment				
	Clinical Delivery Assistance kit PART B: Drugs & Disposable Equip.				
	Mgt. of Complications of Abortion kit (Manual Vacuum Asp. Set)				

Comments:_____
_____
_____
_____

Belg assessment- Health Sector: Woreda level Questionnaire 2013

Serial No.

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

Region:_____ Zone:_____Woreda_____

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

SECTION I: SOCIO- DEMOGRAPHIC PROFILE				
1.1. Woreda total population:	M:_____F:_____		Under 5_____	Total:____
	No. of women of reproductive age (age 15-49 yrs.):_____			
	No. of pregnant women :_____			
	No. of lactating women:_____			
	Total no. of PLW :_____			
1.2. Special Population *(if any)*	Pastorals:	Refugees:	IDPs:	Migrant Workers:

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

2.2. Morbidity (List top 5 causes of Morbidity) in the year 2005 EC (Tir-Ginbot)

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

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

Month	AWD		Malaria		Measles		Meningitis		Other(specify)	
	Cases	Deaths	Cases	Deaths	Cases	Deaths	Cases	Deaths	Cases	Deaths
Jan 2013										
Feb 2013										
Mar 2013										
Apr 2013										
May2013										

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

2.4. Outbreak?	
Was there any outbreak in the last 3 months? (March- May)	Yes□ No□
If yes, specify the disease: Disease outbreak _____# of cases : _ ___Deaths _____(time period DD/MM/YY))_____	
Disease outbreak_____# of cases : _____Deaths _____(time period DD/MM/YY)_____	
Is there any ongoing outbreak of any disease?	**Yes□ No□**
Disease outbreak _____# of cases : _____Deaths _____(Start date)_____	
Disease outbreak _____# of cases : _____Deaths _____(Start date)_____	
Disease outbreak _____# of cases : _____Deaths _____(Start date)_____	
2.5. Preparedness: Is there emergency drugs and supplies enough for 1 month? Or easily accessible on need? *(NB: Use the stock matrix to calculate this)*	
Ringer Lactate (to treat AWD cases)	Yes□ No□
ORS (to treat AWD cases):	Yes□ No□
Doxycycline *(to treat AWD cases)*:	Yes□ No□
Consumables : Syringes, Gloves *(for AWD management):*	Yes□ No□
Amoxil susp (measles)	Yes□ No□
Tetracycline ointment (measles)	Yes□ No□
Vit A (measles)	Yes□ No□
Coartem for Malaria	Yes□ No□
Artesunate (rectal) for Malaria	Yes□ No□
Artesunate (Injection) for Malaria	Yes□ No□
Artemether IM for Malaria	Yes□ No□
Quinine (PO) for Malaria	Yes□ No□
Quinine (IV) for Malaria	Yes□ No□
Chloroquine for Malaria	Yes□ No□
Ceftriaxione (Meningitis)	Yes□ No□
Lab supply: RDT for Malaria	Yes□ No□
Lab supply: RDT (pastorex) for M eningitis LP set	Yes□ No□ Yes□ No□
Number of CTC kit available: (for AWD)	Yes□ No□
Clinical Delivery Assistance kit PART A: Reusable Equipment	Yes□ No□
Clinical Delivery Assistance kit PART B: Drugs & Disposable Equip.	Yes□ No□

Mgt. of Complications of Abortion kit (Manual Vacuum Asp. Set)			Yes□ No□	
Main shortage (if any): Specify				
Is budget allocated for emergency Rapid response by the Woreda Health office?			Yes□ No□	
Is PHEM guideline distributed to all Health institutions			Yes□ No□	
Is there a trained Woreda Rapid Response Team?			Yes□ No□	
If " Yes" please state the number of trained personnel: Male : ____ Female : ___ Total : ____				
Weekly Timeliness and Completeness (%) of Surveillance report for August – October, by week				
Month	T/C (%)	T/C (%)	T/C (%)	T/C (%)
August 2012				
September 2012				
October -2012				

SECTION III: RISK FACTORS

Diseases	**Risk factors for epidemics to occur**		
Malaria	Malaria endemic area	Yes□ No□	
	Presence of malaria breeding site	Yes□ No□	
	Interrupted or potentially interrupting rivers	Yes□ No□	
	Unprotected irrigation in the area	Yes□ No□	
	LLINs coverage <80%	Yes□ No□	
	Indicate the coverage of IRS 2005_____		
	Depleted prevention and control activities	Yes□ No□	
	Malaria Guideline (new)distributed to all Health facilities	Yes□ No□	
	Health workers trained on the new Malaria guideline	Yes□ No□	
	Number of malarious Kebeles and total population in these Kebeles	Keb ____ Pop(F)____(M)____	
Meningitis	Was there Meningitis epidemic in the last 3 years (If yes specify year)_____		
	Has vaccination been conducted in the past 3 years	Yes□ No□	
	If yes : Indicate the date and number of people vaccinated	Date___	#____
	Is there Meningitis outbreak control Guideline	Yes□ No□	
	Are health workers trained on Meningitis outbreak management	Yes□ No□	
AWD	Was there AWD epidemic in the last three years (If yes specify date)_____	Yes□ No□	
	Latrine coverage		
	Latrine utilization		
	Safe water coverage		
	Is Cholera outbreak control Guideline distributed to all HFs	Yes□ No□	
Measles	Is there ongoing measles outbreak	Yes□ No□	
	What is the measles vaccination coverage of 2004, less than one		

	year (Hamle 2003-Sene 2004)	
	Is Measles Guideline distributed to all Health facilities?	Yes□ No□
	Are health workers trained on Measles	Yes□ No□
	Has SIA been conducted in 2004 EFY	Yes□ No□
	If yes, Indicate the month and number of children vaccinated including the age group	Month_____
		#Vaccinated____
		Age group_____

Any other observations you made or any risks of epidemics?

_____

_____

_____

What were the major challenges in your Epidemic response experience?

_____

_____

_____

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

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

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

Any comment

_____

_____

CHHAPTER VIII – PROTOCOL/PROPOSAL FOR EPIDEMIOLOGIC RESEARCH PROJECT

8.1 Assessment of Knowledge, Attitude, Practices and other determinant factors towards malaria prevention and control strategies- Raya-Kobo Woreda, Amhara Region, May 2014

Introduction

Malaria is caused by Plasmodium parasites, spread to people through the bites of infected Anopheles mosquitoes, which bite mainly between dusk and dawn. According to the latest estimates, released in December 2013, there were about 207 million cases of malaria in 2012 (with an uncertainty range of 135 million to 287 million) and an estimated 627 000 deaths (with an uncertainty range of 473 000 to 789 000) [1]. Malaria mortality rates have fallen by 45% globally since 2000 and by 49% in the WHO African Region. Most deaths occur among children living in Africa where a child dies every minute from malaria. Malaria mortality rates among children in Africa have been reduced by an estimated 54% since 2000 Vector control is the main way to reduce malaria transmission at the community level. It is the only intervention that can reduce malaria transmission from very high levels to close to zero [1]. The most malaria cases and deaths occur in sub-Saharan Africa [2]. This region has some of the poorest countries of the world with 90% of deaths occurring (approximately 3,000 deaths each day)**.** The disease remains one of the leading causes of morbidity and mortality in the tropics. It is the most important and widespread of the tropical deadly diseases. Human Malaria is a parasitic disease caused by apicomplexan protozoan (single celled) coccidian. These parasites are haematozoans or haemosporinas of the family plasmodiidae. A contributing factor to the malaria problem in sub-Saharan Africa is the diversity of the parasite that infects humans. Four species infect man of which Plasmodium falciparum is the most virulent. In sub-Saharan Africa, P. falciparium poses the greatest threat because of its high level of mortality and the complications arising [2].

Malaria is a leading cause of death for children, who represent 86% of all malaria deaths [3]. Children are at risk because they lack developed immune systems to protect against the disease. Moreover, Pregnancy reduces immunity to malaria, increasing the risk of infection, severe illness, and death for the woman; other adverse outcomes include spontaneous abortion,

stillbirth, low birth weight, and neonatal death. Other high-risk groups include travelers, refugees, displaced persons, and migrant workers entering endemic areas [3]. Furthermore, malaria remains inextricably linked with poverty. The highest malaria mortality rates are being seen in countries that have the highest rates of extreme poverty (proportion of population living on less than US$ 1.25 per day). The number of LLINs delivered to endemic countries in sub-Saharan Africa dropped from a peak of 145 million in 2010 to an estimated 66 million in 2012[4]. This will not be enough to fully replace the LLINs delivered 3 years ago; indicating that total bed net coverage will decrease unless there is a massive scale-up in 2013. A decrease in LLIN coverage is likely to lead to major resurgences in the disease. Moreover over, Studies indicated that despite these bitter facts, communities are not well aware of the multi-dimensional challenges of malaria in our country. The knowledge of the community is far from perfect, and misconceptions are rampant. There have been a considerable number of reports about knowledge, attitude, and practice relating to malaria and its control from different parts of Africa. These reports concluded that misconceptions concerning malaria still exist and that practices for the control of malaria have been unsatisfactory [5].

Statement of the problem

In Ethiopia, malaria is one of the most important public health problems, with more than three-quarters of the landmass of the country and an estimated 68% of the total population is considered at risk of malaria infections [6, 7]. Ethiopia is implementing a range of malaria control interventions that aim to improve access and equity to preventive as well as curative health services, which include prompt and effective malaria treatment, selective vector control using insecticide treated nets (ITNs) and indoor residual spraying (IRS). Effective and timely prevention and control of malaria epidemics is also part of the main strategies. The need for developing comprehensive and high impact communication strategies for malaria control is imperative [6]. The National Five year Malaria Control Strategic Plan (2006-2010) for Ethiopia was to achieve 100% coverage of all ITNs targeted areas with two ITNs per household by 2014. However, the national Malaria Indicator Survey (MIS) carried out from October to December 2007 indicates that in areas below 2000m, only 36.6% of the study households owned more than one LLINs [6].

In Africa today, malaria is understood to be both a disease of poverty and a cause of poverty. Annual economic growth in countries with high malaria transmission has historically been lower than in countries without malaria. Economists believe that malaria is responsible for a 'growth penalty' of up to 1.3% per year in some African countries. In Ethiopia, malaria is at the forefront among the health problems of the country. The actual number of malaria cases that occur annually throughout the country are estimated to be about 4-5 million. Due to climatic and geographic factors, the disease occurs in different parts of the country in epidemic form [5]. Malaria is the number one public health problem in Ethiopia and a major cause of illness and death [8]. Due to the high population pressure and depletion of agricultural land in highland areas, there has been a massive population movement to the lowlands, particularly in the last two decades. Most of the population movements are from malaria free or places of moderate endemicity to highly malarious areas [8], like Raya Kobo Woreda.

Rationale

Although the government did tremendous efforts, still malaria episodes in the country remain to be the highest burdensome. I select the Woreda purposively since the Woreda is among the main hot spots from the country with frequent outbreaks; and among the biggest contributors of malaria burden in the Region. The Woreda is almost 100% malarious; the main transmission follows unstable pattern that follows the two rainy seasons (Belg and Meher rainy seasons), and given that the area is currently in growth corridor with large-scale coverage of dripping irrigation throughout the year. The Ministry of Health in collaboration with the Regional Health Bureaus and other partners has been distributing bed nets so far; though the prevalence remains high and still seeks additional efforts to know the main risk factors. Generally, KAP surveys can be used to improve the design of community-based malaria control programs, and help identify indicators of program effectiveness [9]. Therefore, the study of Knowledge, attitude and practices about common diseases like malaria is a cost effective way to create awareness in the community.

Objectives

General objective

To assess Knowledge, Attitude and Practices of communities and other determinant factors towards malaria prevention and control strategies in Raya Kobo Woreda of North Wollo Zone.

Specific objectives

- To assess knowledge of the communities towards malaria disease transmission
- To assess communities attitude towards malaria prevention and control activities
- To determine communities practice in malaria prevention and control responsibilities
- To identify main shortcoming in malaria prevention and control strategies in the area

Methods and Materials

Study area and period

The study area, Raya Kobo Woreda is the main lowland of North Wollo Zone, which is 570 Km north of Addis Ababa and far from the Regional Capital Bahir Dar by about 350 Km. Surrounded by Zone 4 of Afar Region in the east, Raya Alamata in the north, Gidan in west and Guba Lafto in the south. Raya Kobo Woreda is among the Woredas listed as the top malaria hotspot Woredas nationally. The population of Raya Kobo Woreda is 21, 7024 with 8,695(4%) urban and 208,329(96%) rural population; of which 110,682 (51%) are males and 106,342(49%) females (Central Statistical Agency 20 2012). There are a total of 7 health centers and 43 health posts in the area. The study will be conducted September through October 2014.

Study Design and Data Collection

A community based descriptive cross sectional study design will be used to assess knowledge, attitude and practice of the community towards malaria prevention and control strategies. Semi-structured questionnaire will be administrated to conveniently selected HH in seven rural Kebeles; and document reviews will be used to collect data.

Source Population: All households living in Raya Kobo Woreda of North Wollo Zone;

Study population: Households in the selected Kebeles of the Woreda;

Sampling and Study Units

Selection of Households for the quantitative study and individuals in the selected household will be calculated as follows;

Sample size calculation and sampling technique: Sample will be calculated based on other studies on KAP; with Regards, a study result on Knowledge, Attitude and Practice of the Community towards Malaria Prevention and control options conducted in Anti-Malaria Association Intervention Zones of Amhara National Regional State, Ethiopia will be used. The levels of knowledge and attitude of study participants regarding to causes, transmission, prevention clinical manifestations of malaria indicated that 65.6% of the study participants had been regarded as knowledgeable. Hence, by considering this;

- 65.6% of knowledge, attitude and practice to get the required sample size
- 95% confidence level (CL)
- Maximum tolerable error of 5% (d)

Then, the sample size will be calculated as:

$$n=\frac{Z^2*p\,(1-p)}{d^2}$$

Where:

n= sample size

p= 0.66 (proportion of HH that have KAP on the malaria prevention and control activities)

Z=1.96 (Z=score corresponds to 95% confidence interval.

d= 0.05 (Precision desired)

$$n=\frac{(1.96)^2\,(0.66)\,(0.34)}{(0.05)^2}=344\text{ HH}$$

Adding 10% non-response rate, sample size will be 378 HH.

Data Analysis: Data will be analyzed using Microsoft Excel and SPSS version 16 and geographic information system (GIS) to display the study area.

Quality Control

Training will be given for all data collectors prior to data collection period. Close supervision will also be conducted during data collection. The investigator will check missed and incorrect data and revisiting will be conducted to fill missed information.

Ethical Considerations

Primarily this proposal will be submitted to IRB for approval. After all written consent will be given for each study participants; their willingness will be asked before interview will begin. Any personal and political related information will be kept and used confidentially only for study purpose (annexe1).

Work plan

Table 33: Gantt chart showing of the Epi-Project Activity, Raya-Kobo Woreda, Amhara Region, June 2014

Phase	Activity	Time period for each task in 2014																			
		March (week)				April (week)				May (week)				September (week)				October (week)			
i	Proposal preparation																				
ii	Submit draft proposal to mentors, RAs for comments																				
iii	Accept and incorporate comments and suggestions from mentors, RAs																				
iv	Submit proposal to the school for approval																				
v	Data collector selection, training																				
vi	Data collection																				
vii	Data analysis																				
viii	Present draft complied result for comment																				
ix	Present compiled work																				

Budget break down

This will encompass all costs for travel to the study area; principal investigator; also for data collectors and facilitator from the region throughout the period.

Table 34: Cost Breakdown of Epi-Project Activities, Raya-Kobo Woreda, Amhara Region, June 2014

Item	**Cost/item, ETB**	**Number/ quantity**	**Duration**	**Sub total**
Transport				
Transport for local personnel(within Kebeles)	80	7	**7**	3,920
Transport for local guiders(within Kebeles)	80	7	**7**	3,920
Transport for supervisor(Addis Ababa to the study area, back Aides Ababa)	800	1	4	3,200
Transport for supervisor(between Kebeles of the study area)	200	1	**7**	1,400
Logistics				
Stationery(1 pack papers hit)	110	1	-	110
Pen (1 pack, bic)	6	12	-	72
Refreshment(for orientation time)	150	17	1	2,550
Hall rent, for orientation	250	1	1	250
Personnel				
Per diem for supervisor(including travel, recruitment, orientation, data collection and edition)	550	1	22	12,100
Daily allowance for data collectors	290	7	8	16,240
Daily allowance for data guiders	150	7	7	7,350
Totals				**51,112**
Contingency (10%)				**5,111.2**
Grand total				**56,223.2**

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Annex 7: Questionnaire for KAP of Communities towards Malaria Prevention and Control Strategies, Raya-Kobo Woreda, Amhara Region, June 2014

Hello, my Name is Getaneh Abrha; I have been working in EPHI. I am here to conduct a study on malaria determinants in this Woreda. The aim of the study is to know how malaria is more important for addition measures to take. Finally, as per the findings, recommendations will be forwarded to improve the health of the community in this Woreda. Whatever you respond to the questions, it will be kept confidential. Then, kindly respond accordingly: Agree___ Disagree_____

Name_____ Region_____ Zone_____ Woreda_____ Kebele_____

Date data collection _____ Area location/Latitude_____ longitude: _____

I. SOCIO –DEMOGRAPHY		
s/n	**Questions**	**Classifications/response**
1	Age	_____
2	Sex	1. Male 2. Female
3	Education	1. Illiterate 2. Primary 3. Secondary 4.Other ___
4	Occupation	1. Farmer 2. Merchant 3. Other___
5	Marital status	1. Single 2. Married 3. Divorced 4. Other__
6	House hold size	_____
7	Religion	1. Christian 2. Muslim 3.Other___
8	Income source	_____
9	Average income(ETB)	_____
10	Respondent position	_____
II.	**Determinants**	
1	Has anyone sprayed your house in the last one year?	1. Yes 2. No 3. Other__
2	If yes, how many times sprayed?	1. Twice 2. Ones 3. Other__
3	Do you have mosquito nets for the household to be used while sleeping?	1. Yes 2. No
4	If yes, do you use always	1. Yes 2. No
5	When was the last time you obtained the ITNs?	_____
6	Was it packed or impregnated by the time you got it?	1. Yes 2. No 3.Don't know____
7	How many pieces do you have at this time?	_____
8	From whom did you get it?	1. Woreda health 2. From market 3. Other (specify)_____
9	When was the latest time the net was impregnated?	_____
10	Who is using the net mostly?	
11	Did you asleep under ITN last light?	1. Yes 2. No
12	How far is the nearest health facility from your house?	1.5KMs 2. 5-10Km 3. Other__
13	Is there swampy area near your residential area?	1. Yes 2. No
14	Is there ditch near to your house?	1. Yes 2. No
15	Is there any irrigation practice near to this village?	1. Yes 2. No
16	Are you practicing irrigation yourself?	1. Yes 2. No
17	What advices you got from health personnel?	_____
III.	**KNOWLEDGE**	
1	What is the cause of malaria?	1. Anopheles mosquito 2. Adaes mosquito 3. Other ____
2	Where is the preferable site that malaria can breed?	_____
3	What is the mode of transmission for malaria?	1. person to person 2. From food 3. through mosquito 4.fly

		5. Don't know
4	How it can be prevented malaria?	_____
5	What are the symptoms of malaria illness?	1.Fever 2.Rigors 3.Fever + Rigors 4. Fever + Rigors + Headache 5. All (Fever + Rigors +Headache + Confusion) 6. Fever + Headache
6	What is the possible treatment for malaria illness?	1.Quinine 2.Artemether + Infusion 3. Other Anti Malarials 4.Paracetamol 5.Quinine + Other Anti Malarials 6.Quinine + Paracetamol 7. Quinine + Paracetamol +Artemether 8.any(specify)_____
7	Do you think that malaria can kill if un treated?	1. Yes 2. No
8	How soon after suspected malaria would you seek treatment?	_____
9	Have you ever heard about malaria prevention and control strategies?	1. Yes 2. No
10	If yes from whom	_____
11	Who is the most susceptible for malaria?	1. <5 years 2. Pregnant 3.All ages 4.Other(specify)_____
IV.	**ATTITUDE**	
1	Do you think malaria can be prevented by controlling the vector from reaching us?	1. Yes 2. No
2	Do you think that environmental management can avoid malaria?	1. Yes 2. No
3	Do you think that IRS can help to avoid malaria?	1. Yes 2. No
4	Do you believe that constant use of ITNs can avoid malaria?	1. Yes 2. No
5	Do you believe taking prophylaxis can avoid malaria?	1. Yes 2. No
7	What sort of believes you have to prevent malaria other than the above?	_____
V.	**PRACTICE**	
1	Where is your most Place of stay during night?	_____
2	Do you always use ITNs at night	1. Yes 2. No
3	Do you allow for spray of your house	1. Yes 2. No
4	If someone from your household gets sick, where do you take first?	1. HF 2. Stay home 3. Other(specify)____
5	Have you participated in environmental management against malaria?	1. Yes 2. No

6	If not, why not?	_____
7	If so, what is your experience in preventing malaria?	_____

General:

1.what do you understand from our interview_____

2. What do you want to add? _____

3. Do you have any suggestions with regards? _____

Annex 8: Dummy Tables for KAP of Communities towards Malaria, Raya-Kobo Woreda, Amhara Region, June 2014

Table 35: Demographic Characteristics of Enrolled Subjects, Raya Kobo Woreda, North Wollo Zone, June 2014

Characteristics	Category	Number	Percent
Sex	Male		
	Female		
	31-40		
Age	18-30		
	41-50		
	51-60		
	Above 60		
Education	Illiterate		
	Primary		
	Secondary		
	Tertiary		
Occupation	Employed		
	Unemployed		
	Housemaid		
Source of income	Agriculture		
	Live stock		
	Any		
Household size	1-3		
	4-6		
	Above 7		
History of malaria in family the last six months	Yes		
	No		
	Don't know		

Table 36: Knowledge Assessment Level on Malaria Symptoms, Raya Kobo Woreda, North Wollo Zone, June 2014

Main symptoms	**Number**	**Percent**
Fever		
Fever +Rigors		
Fever +Rigors+ Headache		
Fever +Rigors+ Headache+ Confusion		
Fever +Headache		

Table 37: Knowledge of Subjects on Causative Agent of Malaria, Raya Kobo Woreda, North Wollo Zone, June2014

Causes	**Number**	**Percent**
Plasmodium		
Mosquito		
Bacteria		
Mosquito +virus		
Mosquito + fly		
Virus		
Total		

Table 38: Knowledge Level of Subjects on Malaria Treatments, Raya Kobo Woreda, North Wollo Zone, June 2014

Type of treatment	**Number**	**Percentage**
Quinine		
Paracetamol		
Quinine + Paracetamol		
Artemether+ infusion		
Other		
Total		

Table 39: Knowledge Level of Communities on Malaria Transmission, Raya Kobo Woreda, North Wollo Zone, June 2014

Mode of transmission	**Number**	**Percentage**
Person to person		
via food		
Via mosquito		

Via flies		
Via mosquito+ fly		
Other		
Total		

Table 40: Attitude of Communities towards Malaria Prevention, Raya Kobo Woreda, North Wollo Zone, June 2014

Do you think malaria can prevent by controlling the vector?	Category	Number	Percentage
	Yes		
	No		
Do you think environmental management can avoid malaria?	Yes		
	No		
Do you think IRS can help to avoid malaria?	Yes		
	No		
	Yes		
Do you believe constant use of ITNs avoid malaria?	Yes		
	No		
	Yes		

Table 41: Practices of Malaria Prevention among Communities, Raya Kobo Woreda, North Wollo Zone, June 2014

Practice	Number	Percentage
Nothing		
Nets		
Clean non-stagnant water		
Ditching		
Prophylaxis		
Any		
Total		

CHAPTER IX – OTHE OUTPUTS

9.1 Post Meningococcal Meningitis outbreak Assessment Report- Wolyta Zone, SNNPR, 26 August to 04 September 2013

Introduction

Communicable diseases particularly epidemic prone have been commonest causes of severe illness, deaths and disabilities in the world particularly in developing countries. Meningitis particularly meningococcal meningitis is among epidemic prone diseases affecting social groups of communities who are within age groups between 2 to 30 years of age irrespective of sex groups and it occurs predominantly in males. It (meningococcal meningitis) is inflammation of the meninges (of the brain) and is caused by bacteria called Neisseria Meningitides. It occurs in cyclic form (at least every 10 years) and cause epidemic in the Region of Africa called "Meningitis Belt", African countries situated in Sub-Saharan area that extends from Mali in the west to Ethiopia and other countries in the East meningitis is an acute infection of the meniges and transmitted via respiratory secretions. More than 450 million African people are at risk. Case fatality rate is estimated to be 70% in untreated cases and 10-15% in treated. There were over 250,000 reported cases with 25,000 deaths in Africa in 1996. An estimated 45,000 cases and 1,686 deaths occurred in Ethiopia in 1989. There were a total of 12,910 reported cases of which 12,279 outpatient and 631 inpatient cases with 19 deaths (CFR=0.15%) in SNNPR from the year 2010- 2012. During the recent epidemic in the Region, 276 cases and 5 deaths (CFR=1.3) were reported from Wolyta Zone. Even though epidemic involving wider area of SNNPR and the country at large outbreaks of meningitis have been occurring in sporadic form throughout last decade, however was not documented appropriately. Unreserved and relentless efforts have been made Regionally as well as nationally to detect and manage active cases, prevent and control ongoing sporadic outbreaks and considerable attempts were made to prevent and control future reemergence of and spread of outbreaks in SNNPR Region in particular, and the country at large. However, since January through June 2013, Meningococcal Meningitis epidemic occurred in three Regions of the country including SNNPR, Oromia and Tigray where its magnitude was predominantly higher in SNNPR and Oromia respectively. Comprehensive prevention strategies were implemented involving all affected, vulnerable and concerned to deal with the problem. Coordination of concerned and conjoint collaborative efforts of all involved, affected and concerned groups was made to escalate response thereby enhance and strengthen the levels of intervention measures taken to contain the epidemic. Intervention was effected through deploying and implementation of various prevention and control strategies. Prevention strategies adapted in intervention measures taken included preparedness activists undertaken as per the guidelines, coordination of efforts, active case search, detection and management, maintaining

activation/reactivation and function of task forces(command posts), technical committee involving representative of various sectors, social groups and associations. RRT formed by members of various categories of health system managers (Zonal and Woreda health offices heads, epidemiologists, laboratory technologists, environmental health officers, PHEM focal persons at different levels, pharmacy technicians, emergency case team officers in facilities, supportive staffs and the like). Lab investigation, provision of reagents, drugs and logistics, and other materials required for intervention to those vulnerable, undertaking monitoring and evaluation activities and use of finding in intervention measures taken which led to eventual containment of the epidemic. The purpose of this assessment (Meningococcal Meningitis post epidemic assessment) was to determine magnitude and find out extent of prevention efforts made to contain the epidemic and give guidance (direction) for future prevention and control to be taken.

General objective

To determine the magnitude and find out levels of response of involved and affected Zones of the Region

Specific objectives

- To determine magnitude of Meningococcal Meningitis in the Region
- To learn more the level of responses/efforts made to contain the epidemic
- To give guidance for future prevention and control measures to be taken

Methods

Cross-sectional survey was conducted using reports, records and documents of surveillance data of meningococcal meningitis in the affected Zones and Districts under it. Data was reviewed using semi-structured checklist, as it can address to PHEM system responses at various levels of the system and facilities of the affected areas of the Region. Undertaking situational analysis (SWOT) activities on the levels of performance underwent during the response period as per set criteria for evaluation to seek additional information on top of investigation findings revealed through use questionnaire. Information was also gathered from concerned key informants to

address/seek missed information that may incorporate to the results of the investigation made. Data collected using the checklist was analyzed using Excel and SPSS version16.

Regional Public Health Emergency Management Situation

Coordination

There is epidemic preparedness and response committee/ taskforce established during previous outbreaks was reactivated prior to meningitis outbreak. The committee had meeting but was not regular and no minute most of the time. The main issues the committee discussed on were resource mobilization, planning, response and result information sharing. The committee had no shared responsibility.

Table 42: Coordination Summary of Visited Areas, Wolyta Zone, 2013

Institution	Specify	Activation	Meeting status	Minute	Main issue discussed	remarks
ZHD	EPRC	Yes	Frequent	prepared	Intervention	Good
Humbo w.h.o	EPRC	Yes	Not	prepared	Intervention	Weak
Offa w.h.o	EPRC	Yes	Not	prepared	Intervention	Weak
S/Zuria w.h.o	EPRC	Yes	Not	prepared	Intervention	Weak

Challenges

- In adequate community mobilization
- Absence of vaccine coverage for longer period of time
- Limitations on timely Logistic supply, such as vaccine and diagnostic kits
- Limited capacity at regional lab for immediate confirmatory tests

Action taken

- Community mobilization using different methods
- Request/obtained Supplies from EHNRI
- Alert letter was sent to lower level
- Refresher training given to maximize regional capacity on rapid confirmatory test

Zonal level Coordination

The Zone undertaken very nice task of maintaining meningitis epidemic preparedness and response plan (EPRP) through preparing such a comprehensive plan, which indeed played vital role in overall efforts made to respond the epidemic. The department provided training for health service providers who were involved in geared attempt of enhancing intervention measures taken before spread of the epidemic in the Zone for meningitis epidemic emerged in the Zone after a month or two it emerged in Sidama Zone(Shebedino and Dale Woredas predominantly, and Arba Minch Zuria and other Woredas of Gamogofa Zone). This led the Zone to get prepared earlier for it had sufficient time to early preparedness including coordination. The Zone dispatched alert letters to those suspected and at risk, Woredas for possible preparation to be made beforehand. It availed meningococcal meningitis prevention and control guidelines and case definitions up to facility levels weakness encountered during intervention period was minimal except to that some of intervention committee members working in various committee including that of task force, technical, RRT and the like were not attending regular meetings held which were meant to discharge responsibilities of facilitating , enhancing. Strengthening through increasing level of response made to contain the epidemic. The fact that Wolyta Zone Administration, ZHD, PHEM core process, RHB, Sectors, Religious and cultural groups, partners such as WHO and the public at large actively involved in prevention and control measures taken in dealing with the created conductive atmosphere for implementation of interventions made was no doubt could be considered as golden opportunity from intervention made. Possible increased rate of attrition of trained health providers including PHEM officers working at various levels can anticipate as potential threat in the future.

Surveillance and Documentation

The existence of meningococcal meningitis outbreak was first identified through various means of surveillance data analysis, PHEM notification, clinician report and patient reports. The first case was identified on 8 February 2013 through telephone report. After the rumor received, it was registered on logbook; then, verified through calling and notified to the next higher level. Team deployed to verify the cases in communication with surveillance officers at the hot spot areas and report to the RHB within two hours interval. The outbreak was detected either of through unusual increment of cases, cluster of cases and lab investigation. The Zone considers meningitis outbreak was determined using threshold and unusual increment of cases. The

threshold level 2 to 5 cases for less than 30,000 populations 10 more cases for 100, 0000 population. It is one of a weekly reportable disease and the surveillance activity was accelerated during outbreak and was reported on daily basis. The first 5-10 cases were reported to the next higher level using line listing reporting format for comprehensive information. After the first 5-10 reported cases through case based format then line list reporting format will be used. The daily reports aggregated to weekly summary. There is separate weekly surveillance database for meningococcal meningitis report through line list using Microsoft excel. A total of 117 MM cases were reported through weekly and 231 through line list. Analysis was made on daily basis by person, place and time, and gave feedback to those who send it; similarly they got feedback from higher level verbally.

Challenges

- No written feedback at all level
- Lack of differentiation between meningitis and malaria
- Lack of training for some staffs
- Inadequate supplies
- Contaminated samples sent to regional laboratory
- Lack of skill in sample collection(LP)

Action taken

- Community mobilization was conducted
- Training for some staffs was given
- Supplies were distributed mainly for outbreak hit sites
- Team were deployed from region and woreda to outbreak sites

Outbreak investigation

Rapid response teams were established, and trained on meningitis outbreak management. Their composition includes health officers, Environmental health officers, Lab technologists and PHEM officer, pharmacists. Index case was identified on 8 February 2013 in the zone. Followed notifications, then an immediate deployment of investigative team within 12ve hours of after rumors received. The composition of the team was PHEM officer, clinician and Laboratory officer. The investigation report was prepared and documented by soft and hard copy. Team

from higher level was also deployed and feedback was given at the spot but no written feedback was issued. The investigative team came up with verbal report; RHB team joined the investigation and similarly gave only verbal feedback reports.

Case Management

Close to 93 staffs were trained from all the Woredas under Zone as preparedness prior to the outbreak. There was meningococcal meningitis treatment algorism observed during visit. Treatment before ascertained the outbreak patients were requested to pay for medication. However, immediately after confirmation of the outbreak, waiver system/free treatment instituted in which ceftriaxone was the first drug of choice to treat meningococcal meningitis during the epidemic, and Penicillin in some situation. During the first stage of patient appearance, one dose of 200mg per Kg was prescribed; then repeated after 24 hours as needed based on response development. There is understanding on doing LP before initiation of antibiotics, for antibiotic sensitivity test, serotype identification and vaccine determination. A total of 231 meningococcal meningitis cases and nine deaths (CFR=3.8) were reported during the outbreak; but the total cases at the ground were more than 276.

Table 43: Meningococcal Meningitis Cases Report, Wolyta Zone, SNNP Region, 2013

Woreda/Facility	Weekly reported	Death	CFR (%)	Registered at LL
Humbo	17	1	5.8	24
Offa	73	0	0.0	83
S/Zuria	23	3	13.0	57
S/Hospital	96	5	5.2	112
Zone total (+ others)	**231**	**9**	**3.8**	**276**

Laboratory Investigation

Twenty CSF samples were taken of which 17 transferred to Regional labs for culture from Sodo Hospital. At the disposal, both gram stain and rapid diagnostic test (pastorex) was applied. The remaining samples were sent to Regional/National lab for further confirmation. Negative samples were discarded and positive sample aliquot were stored in cryo tube at -20 ^{0}c. Lab results were received from Regional lab through means of email, fax and or telephone, although there was setback. At various levels, there understands on writing minimum information like,

name, code, sex, age, date of collection even though shortage of lab supplies. Training was give with regard apart to shortage of reagents (TI bottle, Pastorex).

Challenges identified

- Lack of coordination and communication between Zonal PHEM office and Sodo Hospital
- Shortage of supplies such as pastorex and TI bottle, RDT kit
- No timely feedback received on samples sent to Regional/EHNRI on time
- Training on sample collection, transportation and storage, but not adequate

Action taken

- Reinstituted the command system through the Zonal administration
- Mobilize reagents from Regional/Central lab to minimize shortage of lab supplies
- Close communication with Sodo Hospital on obtaining the result sent by the Hospital.
- Using Hospital lab for immediate medication

Vaccination

Vaccination was conducted and 327,000 does received; within 2 weeks of period from the RHB and 1 month from MoH after request made. The vaccine was kept at 2^0 to 8^0 centigrade. Vaccination micro plan was developed and one team consists of 4-5 experts of which 2 vaccinators, one decoder, one crowd controller and one register. One team was vaccinating 5000 people per day on average. The Zonal vaccination coverage achieved was 75.85% with wastage rate of 0.7%. The opened vials were discarded after 6 hours.

Table 44: Meningococcal Meningitis Vaccination Coverage by Woreda, Wolyta Zone, September 2013

Woreda	Total pop	Target pop	Age groups			Total	%	Notes
			2-5	6-14	15-30			
S/Zuria	192,009	83,230	13,980	29,287	23,295	66,562	80	Good
Offa	123,373	70,500	11,303	23,063	26,682	61,048	86.6	Good
Humbo	148,950	22,168	3,256	7,970	11,304	22,530	100	Excellent
Damot Gale	149,823	31,124	3,220	8,090	9,959	21,269	68.3	low
Damot Woyide	108,876	8,353	1,657	4,370	1,747	7,774	93.1	Good
Damot	124,880	19,264	2,985	3,958	23,332	30,275	42.9	Low

Pulassa								
Sodo Town	100,755	70,528	3,589	6,526	8,393	18,508	96.1	Good
Sodo Town(institutions)		52,977	2,326	16,743	24,631	43,700	82.4	Good
Zone tot.	**948,666**	**358,144**	**42,316**	**100,007**	**129,343**	**271,666**	**75.8**	Adequate

Challenge

- Absence of vaccine at hand for remedial
- Vaccine delay after decision made to vaccinate highly at risk groups
- Shortage of operational budget/ running costs
- Energy interruption for refrigerators

Action taken

- Vaccine requested from the RHB/FMoH
- Mobilize running costs from Zonal administration

Logistics and Supplies

There was no adequate antibiotic for case management at the start; but, later through procurement and support from higher level. Support from higher level was received with in two days of request. The amount of antibiotics required was determined based on caseload and population denominator. Some left over vaccines were either shifted to other Woredas or gave back to ZHD, and finally to RHB. In relating to lab, 25 TI bottles and 25 pastorex kits were availed and LP was used from Sodo Hospital.

Challenges

- Shortage of antibiotics(ceftriaxon), IV fluids and other antibiotics
- Problem of target population selection appropriately
- Shortage of lab reagents(pastorex, grams stain), TI bottles

Action taken

- Resource mobilization was conducted through ZHD
- Request made to RHB, it offered antibiotics
- Borrowed from contingency drugs of Sodo Hospital for immediate solution

Preparedness

The ZHD had epidemic preparedness and response plan observed during our field visit with emergency budget secured from Zonal level administration. Case definition and PHEM guideline distributed at each level; but, Woredas had not comprehensives EPRP is it could help to mobilize resources as early as possible.

Monitoring and Evaluation

Outbreak management monitored through daily data analysis, close follow up of intervention and providing supervision. All outbreak s supervised by RHB and other partners although there was no written feedback given and only verbal feedback at a spot. Supportive supervision has been conducted at lower levels; but only on spot and through telephone, feedback was provided. No response evaluation on intervention for feature recommendation was conducted on surveillance, case management and vaccination in the affected areas.

SWOT analysis

Although there was fertile grounds for technical financial and political commitments, there were gasp on securing EPRPs at the start of the epidemic.

Table 45: Status of Preparedness towards Meningitis Prevention and Control Activities, Wolyta Zone, 2013

Level	Particulars	Strengths	Weakness	Opportunity	Treats
Zonal	MM EPRP	Prepared	Initial gap	Political acceptance, partners	No
	Emergency committee	Active	-	>>	No
	PHEM task force	Active	-	>>	No
	RRT	Active		>>	No
Humbo w.h.o	MM EPRP	-	No EPRP	>>	No
	Emergency committee	Active		>>	No
	PHEM task force	Yes	Not specific	>>	No
	RRT	Yes	Not trained	Fertile ground	Staff turn over
Offa w.h.o	MM EPRP		No EPRP	Fertile ground	No
	Emergency committee	Yes	Not active	Fertile ground	No
	PHEM task	Yes	No active	Fertile ground	No

	force				
	RRT	Yes	Not active	Fertile ground	No
S/Zuria w.h.o	MM EPRP	-	No EPRP	Fertile ground	No
	Emergency committee	Yes	No regular meeting	Fertile ground	No
	PHEM task force	Yes	No regular meeting	Fertile ground	No
	RRT	Yes		Fertile ground	No

Comment:

- Facility level data taken as input for the w.h.o SWOT analysis
- There is a fertile ground that promotes the system to be more proactive as it can address PHEM issues.
- The main weaknesses were lack of early preparation by Woredas and facilities to have a minimum stock; and reporting discrepancy between the next higher levels.

Conclusions

Intervention measures taken were led by Wolyta Zone administrator, in which ZHD head served as a secretary of the committee. Other sectors (Agriculture, Education, Emergency preparedness, Water, Women and Youth department) among others involved. Members of the committee together with the task forces attend meetings regularly held twice a week which was meant to solicit resources, avail drug, supplies, logistics and others required to carry out intervention measures taken, played vital role of social and resource mobilization, coordination of conjoin collaborative efforts of all made to contain the epidemic. Undertaking close monitoring and evaluation of intervention measures shall and the like. There was sound communication between members of the taskforce committee, between next higher levels and lower levels as situation demanded. It was possible to share from enriched experience of RHB and partners such as WHO and health service providers working at various levels among others beneficial practices that contributed its part in containing the epidemic.

PHEM task forces were reactivated and did its levels best through maintain its function by meeting every day to bring about or create conductive atmosphere for proper intervention measures taken to deal with emergency encountered. Since vital role is undertaking, epidemiological investigations particularly on epidemic prone ones and event related emergencies (disaster, severe acute malnutrition and the like), production of findings, communicating them to those in need for possible remedial measure to be taken and use of research findings in implementation of intervention PHEM task forces together with RRT

played significant role. Which was indeed dependable to contain the epidemic; and members of the committee used to attend meetings regularly held every other day; which was meant to solicit resources required for appropriate interventions.

RRT was so dedicated and devoted with full commitment in the intervention undertaken to contain the epidemic for it was owner of the response as a result of which it used to be one of most responsible and accountable committee for every intervention measures taken to deal with spread and adverse effects of the epidemic. Committee used to convene very other day and if conditions demanded, every day. Members of the team were represented from different sections of the department/office. Department/Woreda health office head led the team and members included epidemiologist/PHEM officer, lab technologist, pharmacist, and other staffs. Key findings from informal interviews made to representatives of various segments of the communities and sectors were that multispectral efforts were made; different groups including religious leaders and cultural groups and public at large were actively took part during the intervention. The effort as was responded by those few individuals interviewed was indeed encouraging and maintaining such efforts will no doubt will play a very crucial role in attempts made to prevent and control epidemics encountered in the future.

Recommendations

- There should be good plat form for understanding of on surveillance activities
- All cases detected by any facility has to reported to the next level as it serve for any remedial
- Much specimens have to be taken for continuous monitoring of the outbreak strain
- All decisions made at various levels have to be documented
- The sector should have a minimum emergency fund accessible as needed

Annex 9: Meningococcal Meningitis Post Epidemic Assessment Data Collection Questioner, August 2013

Meningococcal Meningitis Post Epidemic Assessment Data Collection Questioners

Region _____ Zone _____Woreda _____

Health Facility _____ Date _____

No.	Question	Coding Classification	Go To
	1. Coordination		
1.	Was epidemic preparedness and response committee activated?	1.Yes 2.No	
2.	When was the epidemic preparedness and response committee activated?	1. Prior to the outbreak 2. At the beginning of the outbreak 3. At the middle of the outbreak 4. others, specify _____	
3.	Was the epidemic preparedness and response committee had regular meeting?	1.Yes 2.No	
4.	How frequently the epidemic preparedness and response committee conducted meeting	1.Twice per week 2.Every week 3. Every two weeks 4. Every month 5. Others, specify _____	
5.	Was there documented meeting minutes?	1.Yes 2.No	
6.	If Yes, how many minutes do you have?	_____	
7.	What were the main issues that the epidemic preparedness and response committee discussed on?	1.Resource mobilization 2.Planning 3. Response 4. Information sharing	
8.	Was there any other technical committees established?	1.Yes 2.No	
9.	If yes, what are they?	1.Case management committee 2.Surveillance committee 3.Community mobilization committee 4. Logistic committee 5. Other, specify	
10.	Was there command post established?	1.Yes 2.No	
11.	If Yes, who had been leading the command post?	_____	
12.	Which organizations were the members of the command post?	_____	
13.	How frequently the command post conducted meeting	1.Twice per week 2.Every week 3. Every two weeks 4. Every month 5. Other, specify _____	
14.	Are there documented minutes for command post?	1.Yes 2.No	
	2. Surveillance and Documentation		
1.	Was Meningococcal Meningitis outbreak occurred in your woreda/zone/region last/this year?	1.Yes 2.No	
2.	If Yes, how did you identify the existence of the outbreak?	1.Through Surveillance data analysis 2.Regional PHEM head/officers notification 3.Clinician Report 4.Patient/community report 5.Other specify _____	
3.	What was the first date that you did notified the existence of the outbreak?	_____	
4.	Through which communication channels you did received the report	1.Telephone (mobile or land line) 2. Email 3. Fax 4. Other	
5.	After you received the report/rumor what you did with the report?	1.Register on the rumor log book 2. Verification through calling 3. Notify MOH and keep verification	

No.	Question	Coding Classification	Go To
		4. Other	
6.	Did you verify the report?	1.Yes 2.No	
7.	If yes, how?	1. Calling to the affected area 2. Sending investigation team 3. Communication with surveillance officer 4. Other	
8.	Did you report to the next higher level?	1.Yes 2.No	
9.	If yes, how quickly you reported to the next level?	1. Within 30 minute 2. Within 2 hours 3. Within 12 hour 4. Within 24 hour 5. Other, specify _____	
10.	How did you determine that meningitis outbreak is occurred?	1. Using threshold 2. Unusual increment of cases 3. Cluster of cases	
11.	What is the threshold for meningococcal meningitis to be said an outbreak?	_____	
12.	Do you know that Meningococcal meningitis is one of the weekly reportable diseases?	1.Yes 2.No	
13.	If yes, did you accelerate the surveillance for Meningococcal meningitis during the outbreak?	1.Yes 2.No	
14.	If yes, when and how you did reported to the next level?	1. Every day 2. Every other day 3. Every three days 4. Every four days 5. Only if there is new cases	
15.	How did you report the first 5-10 cases to the next level?	1. Using case based reporting format 2. Using line list 3. Using daily epidemic reporting format 4. Just through weekly report	
16.	If the answer for question 2.15 is using case based reporting format why?	1. For laboratory investigation 2. To avail detail clinical information 3. Other specify, _____	
17.	After you reported the first 5-10 cases through case based reporting format what kind of reporting format you used for reporting	1. Using case based reporting format 2. Using line list 3. Using daily epidemic reporting format 4. Just through weekly report	
18.	Did you aggregate all the reports that you did report on daily bases into weekly summary report?	1.Yes 2.No	
19.	Do you have separate database for weekly surveillance data and Meningococcal meningitis outbreak report through line list?	1.Yes 2.No	
20.	If yes, how you kept the database?	1. Using Microsoft word 2. Using Microsoft excel 3. Using Microsoft access 4. Manual	
21.	How many Meningococcal Meningitis case reported through weekly report? Observe the database	_____	
22.	How many Meningococcal Meningitis cases did you reported by line list on daily bases? Observe the database;	_____	
23.	If the number of cases reported through line list exceeds the number of cases reported through weekly report, Why?	_____	
24.	Did you analyze outbreak surveillance data?	1.Yes 2.No	
25.	If Yes, how frequently?	1. Every day 2. Every other day 3. Every week, 4. Every month 5. Other, specify _____	
26.	What are your variables of interest for data analysis?	1. Time (day, week, month) 2. Person (sex, age, vaccination status, Clinical picture etc.)	

No.	Question	Coding Classification	Go To
		3. Place (village, kebele, woreda, zone) 4. Other specify	
27.	Did you give feedback on the outbreak to the lower level?	1.Yes 2.No	
28.	If Yes, would you show us copy of it? observe	Comment _____	
29.	Did you get feedback about the outbreak from higher level?	1.Yes 2.No	
30.	If Yes, would you show us copy of it? observe	Comment _____	
	3. Outbreak Investigation		
1.	When was the first date that you received meningococcal meningitis cases?	DD/MM/YYYY _____	
2.	How quickly you made the first call to the affected site for verification?	1. Immediately 2. Within 30 minutes 3. Within two hours 4. Within one day 5. Other, specify _____	
3.	Did investigation team was sent to the site?	1.Yes 2.No	
4.	If Yes, how quickly the team deployed to the site after decision had been made?	1. Within 12 hours 2. Within 24 hours 3. Within 72 hours 4. Other, specify _____	
5.	What is the composition of the team?	1. Epidemiologist (PHEM officer) 2. Clinician (Physician, HO, Nurse) 3.Laboratorytechnologist 4.Other, specify _____	
6.	Was the investigation report prepared and documented?	1.Yes 2.No	
7.	If Yes, show me (observe)	_____+_____	
8.	Was there other investigation team from higher level? Came for investigation?	1.Yes 2.No	
9.	If yes, did they provide the feedback of their finding to your office?	1.Yes 2.No	
10.	Was there any partners participated on the investigation?	1.Yes 2.No	
11.	If Yes, list	_____	
	4. Case Management		
1.	Do you have Meningococcal meningitis case treatment algorism?	1.Yes 2.No	
2.	If Yes, show me? Observe	_____	
3.	Did the patients requested to pay for treatment?	1.Yes 2.No	
4.	What kind of antibiotics you provided for treatment	1. Ceftriaxone 2. Oily Chloramphenicol 3. Penicillin G 4. Ampicillin	
5.	If the answer is Ceftriaxone, how many doses you provided for one patient?	_____	
6.	When is the appropriate time to provide antibiotics?	1. As soon as possible 2. Immediately after Lumber puncture 3. Other, Specify _____	
7.	Why you collected specimen?	1. For confirmation 2. For antibiotics sensitivity test 3. To identify serotype 4. To determine vaccine 5. Other, specify _____	
8.	How many cases were treated for meningitis in your jurisdiction?	_____	

No.	Question	Coding Classification	Go To
9.	How many deaths from Meningitis in your jurisdiction?	_____	
10.	What is the case fatality rate?	_____	
11.	Did you trained on case management?	1.Yes 2.No	
12.	If Yes, how many experts were trained? When?	_____, _____	
13.	When was the training held?	1. Prior to the outbreak 2. At the beginning of the outbreak 3. In the middle of the outbreak 4. At the end of the outbreak	
14.	Who did provide the training?	_____	
	5. Laboratory Investigation		
1.	How many CSF specimens were collected for laboratory analysis?	_____	
2.	How many of them were analyzed and give positive result by any technique	_____	
3.	What kind of laboratory test you did at local level?	1. Gram Stain 2. Rapid Diagnostic test (Pastorex) 3. Culture and sensitivity test 4. PCR	
4.	Have you trained on CSF and TI media storage and shipment	1.Yes 2.No	
5.	How many Lab Tch are tarried on culture technique	_____	
6.	What did you make with the left over sample?	1. Discard 2. Store at lab 3. Sent to regional/national lab	
7.	How did you keep Trans Isolation Media before you inoculate with the sample?	1. In refrigerator 2. At room temperature 3. Other, specify _____	
8.	How many samples did you sent to the regional or national laboratory?	_____	
9.	If the number of samples you collected exceeds the number of samples you sent to the regional or national lab, why?	_____	
10.	How did you transport samples to the regional/national laboratory?	1. Using TI Bottle by keeping in the cold box 2. Using TI bottle at room temperature 3. Other, specify	
11.	Did you received laboratory results from regional/national labs	1.Yes 2.No	
12.	If Yes, within how many days after you sent to the lab	_____	
13.	How you received laboratory results?	1. Email 2. Fax 3. Telephone 4. Other, specify _____	
14.	What minimum information should be written on specimen during shipment? list	_____	
15.	Was there shortage of laboratory supplies during the outbreak?	1.Yes 2.No	
16.	If Yes, what are they? List	_____	
17.	What were the main challenges and weaknesses that you encountered during outbreak management? _____ _____		
	6. Vaccination		
1.	Did you provide vaccination against meningitis?	1.Yes 2.No	
2.	If Yes, how many doses of vaccine you got?	_____	
3.	Within how many hours/days you got vaccine after your request?	_____	
4.	Did you develop vaccination micro plan?	1.Yes 2.No	
5.	During vaccination, how many people were vaccinated by one team per day on average?		

No.	Question	Coding Classification	Go To
6.	What was the wastage rate?	_____	
7.	What was the vaccination coverage that you achieved?	_____	
8.	What were the main challenges that you faced during vaccination?	_____	
	7. Logistics and Supplies		
1.	Did you get enough antibiotics for case management?	1.Yes 2.No	
2.	From where you got antibiotics?	1. Procurement 2. Supplied by woreda, 3. Supplied by zone 4. Supplied by region 5. Supplied by MOH	
3.	If you got from higher level through request, within how many hours/days you received after you r request?	1. Within 12 hours 2. Within 24 hours 3. Within 48 hours 4. Within 72 hours 5. Other, specify _____	
4.	How did you determine the amount of antibiotics that you required?	_____	
5.	Did you receive vaccine?	1.Yes 2.No	
6.	If yes, how many doses?	_____	
7.	How many people were vaccinated?	_____	
8.	Is there any left vaccines?	1.Yes 2.No	
9.	If yes, what did you did with the left vaccines?	_____	
10.	How many TI bottles did you get?	_____	
11.	How many LP set did you get?	_____	
12.	What challenges and weakness you encountered regarding drugs and medical supplies during outbreak management? _____		
	8. Monitoring and Evaluation		
1.	How had you been monitoring the outbreak management?	1. Through daily data analysis (CFR, AR) 2. Close follow up of interventions 3. Providing supervision 4. Other, specify_____	
2.	Have you ever supervised by higher level in the last four months?	1.Yes 2.No	
3.	If yes, did they send you feedback of supervision? Show me (observe)?	1.Yes 2.No	
4.	When was the last time you were supervised by higher level?	dd/mm/yyyy ____/____/_____	
5.	Have you ever provide supportive supervision to the lower level?	1.Yes 2.No	
6.	If Yes, did you send them a feedback? Can I have a copy of it?	1.Yes 2.No	
7.	When was the last time you provided supportive supervision to the lower level?	dd/mm/yyyy ____/____/_____	
8.	Did you evaluate your intervention for future recommendation (Surveillance, Case management, vaccination, etc?	1.Yes 2.No	
9.	If Yes, how?	_____	
10.	Do you suggest single important point to minimize challenges	_____	

No.	Question	Coding Classification	Go To
	which you face during this year out break		

Thank you for your cooperation!

9.2 Public Health Emergency Management Weekly Bulletin

PHEM WEEKLY BULLETIN, WEEK 3, 2013

Highlights of the Week:

- Gambella did not submit surveillance report in week 1 through week2, and Afar for week 2
- The overall reporting rate was 88.4 %,very good as compared to the minimum requirement
- Suspected meningitis outbreaks are reported from SNNP of current week
- Malaria cases have been decreasing since week 46
- An investigation and response of all situations are on going

Introduction

As a quick look, this bulletin is intended to provide current information on public health emergency management activities that are under taken, and summarizes surveillance data and performance on epidemic prone diseases and other public health emergencies management activities. It includes surveillance data of weeks from 49 of 2012 up to week 2 of 2013 and daily phone communication for week 03 of 2013.

Completeness

During this week, epidemic week 3, completeness of reporting was 88.4% at national level with 63.6% of the regions accounted >=80% completeness; with the highest achievement, 99.2% of Tigray and in contrary that of Gambella Region with no report for the expected week. Generally, from the perspective of WHO standard, the overall status is improving and worthwhile; as depicted here underneath.

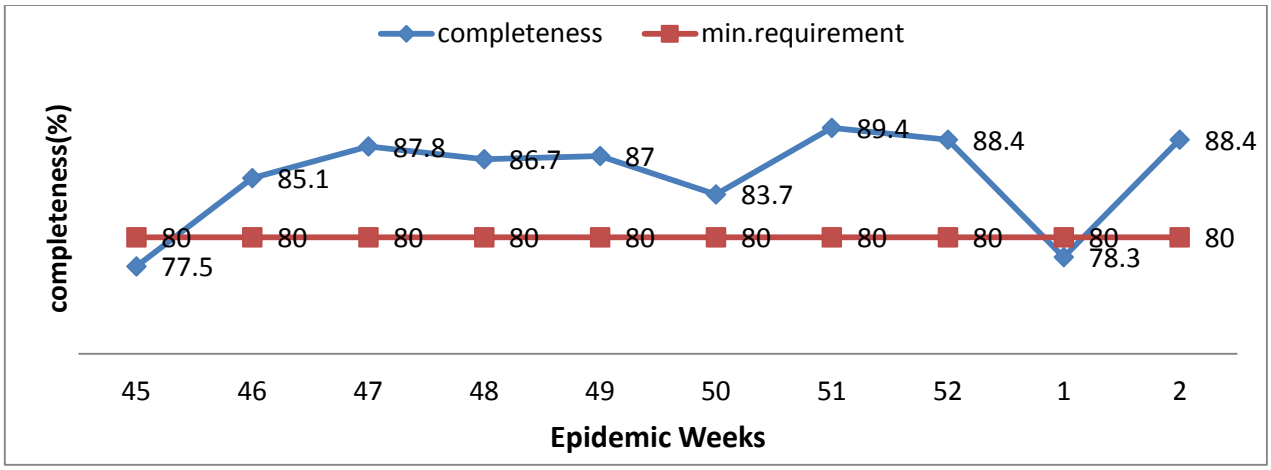


Figure 39: National Completeness of Reporting Status by Epidemic Weeks, Ethiopia, January 2013

As of week 2, 2013, still those emerging Regions are far low compared to the National and the minimum required completeness value to achieve (fig.40 below).

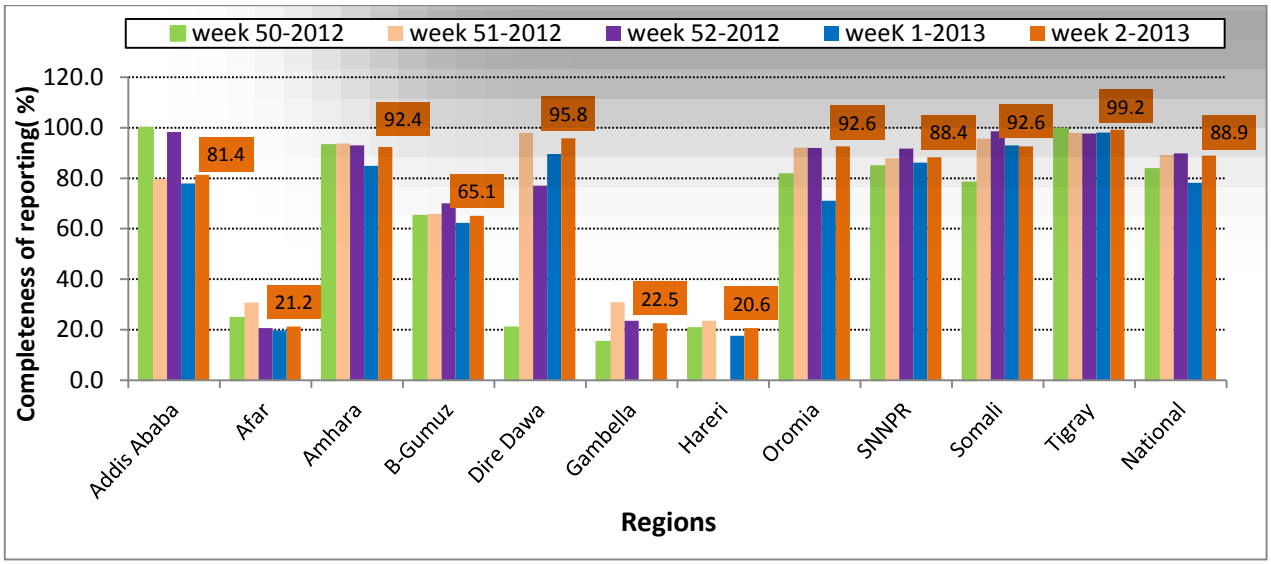


Figure 40: Reporting Completeness Of Regions By Epidemic Weeks, Ethiopia, January 2013

Major Public Health Diseases

Malaria

A total of 64,520 malaria cases (confirmed + clinical) with no death were reported during the second week of January 2013.the case load is significantly decreased by about 48% this time, from what it was during the highest transmission season, week 46 of November(fig.41 below).

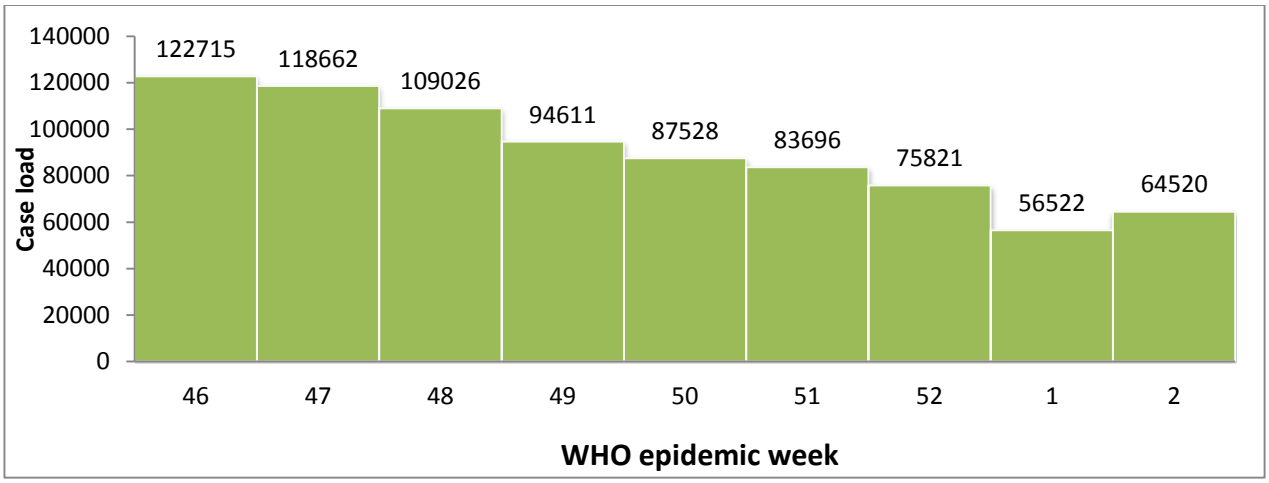


Figure 41: National Malaria Case Trend By Epidemic Weeks, Ethipiaa, January 2013

Of the total cases, the highest 21483(33.3%), cases are reported from SNNPR; followed by Amhara, with 17476 (27.1%) cases during the expected weekly report. malaria trend has been highly decreasing since week 49. No report from both Afar and Gambella region are received for the intended week (fig.42 below).

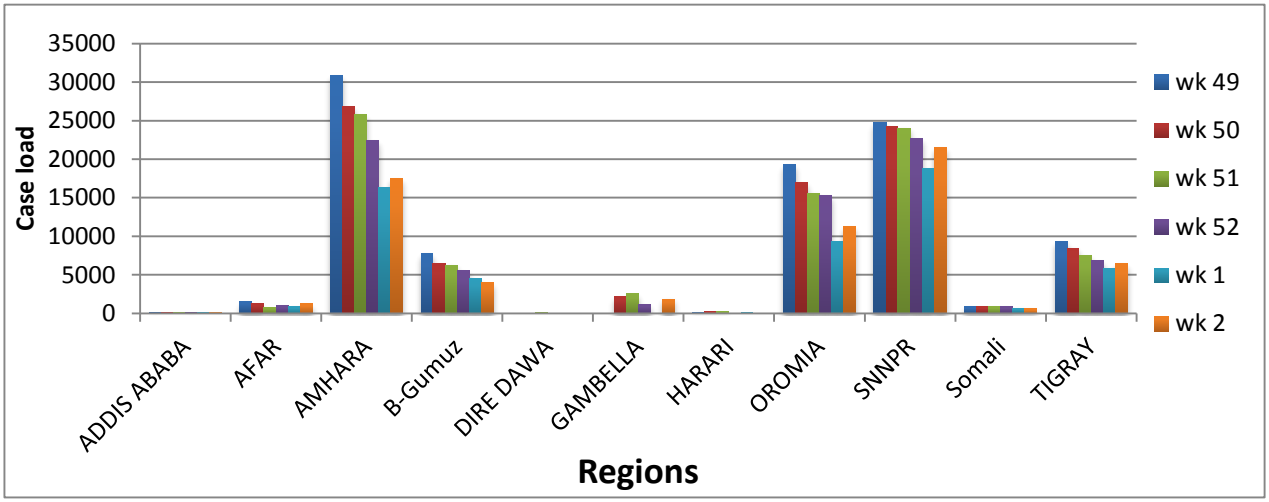


Figure 42: National Malaria Trend by Region & Week, Ethiopia, January 2013

SNNPR

A total of 21483 malaria cases, with slight increase compared to week1 were reported with no death during week 2. Majority 2924(13.6%), 2886(13.4%) and 2339(10.9%) of cases were reported from Sidama, Benchemaji and Wolayta zones respectively. Malaria trend seems to increase in Benchemaji zone; while in the remaining zones somewhat decreased as compared to the previous weeks (fig. 43).

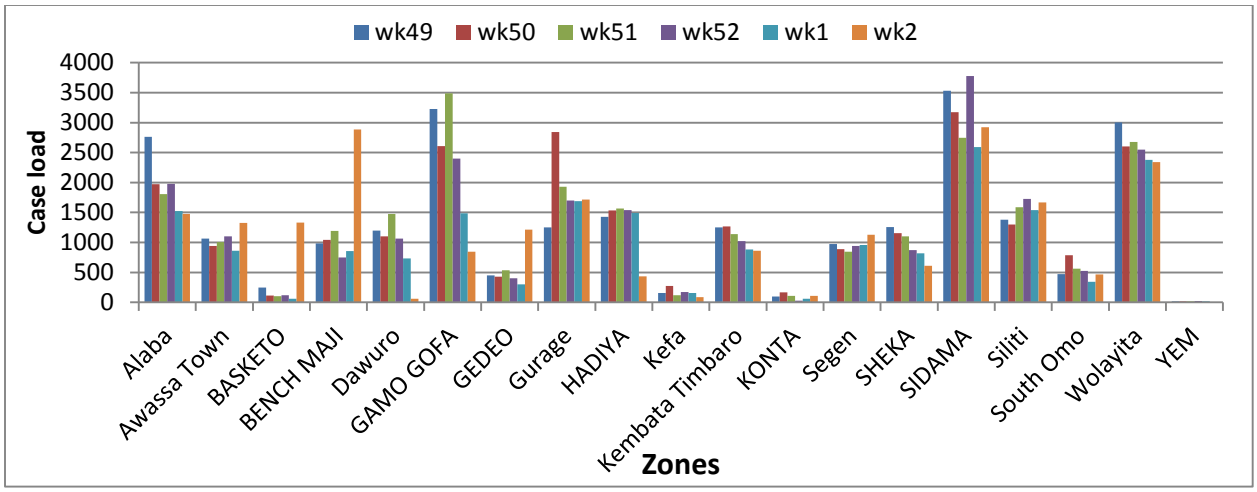


Figure 43: Malaria Case Trend by Zone, South Nations, Nnationalties and Peoples Region, January 2013

Amhara Region

The Region reported 17476 malaria cases for the expected week, almost same with previous week. Majority cases were 4716(27%), 3568(20.4%) and 3196(18.3%) from W/Gojam, N/Gondar and Awi Zones respectively. Generally, when we compare it retrospectively with week 49 of last year, the magnitude is decreased by about 43%; but, still needs attention in those hot spot zones. As described as in figure underneath.

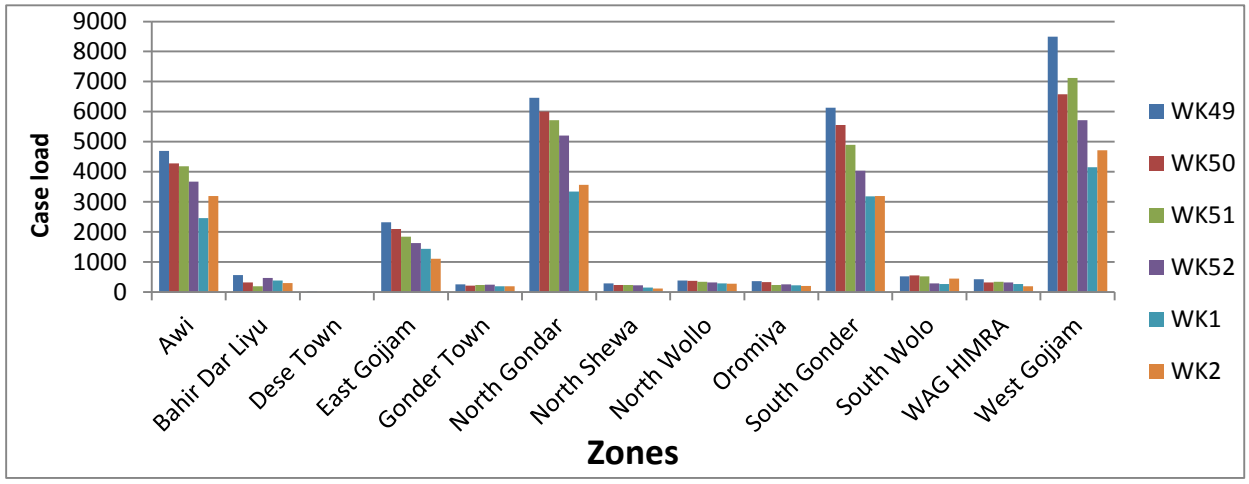


Figure 44: Malaria Trend by Zone and Week, Amhara Region, Januray 2013

Gambella Region

During week 50 to 52 a total of 5806 malaria cases were reported with the highest cases from Gambella town and Abobo Wormed 2493(42.9%) and 1960(33.8%) respectively. Although there is no report for week1, 1839 cases are reported in week 3, still the problem is high as compared to week 52 of 1118 cases reported(Fig. 45 below).

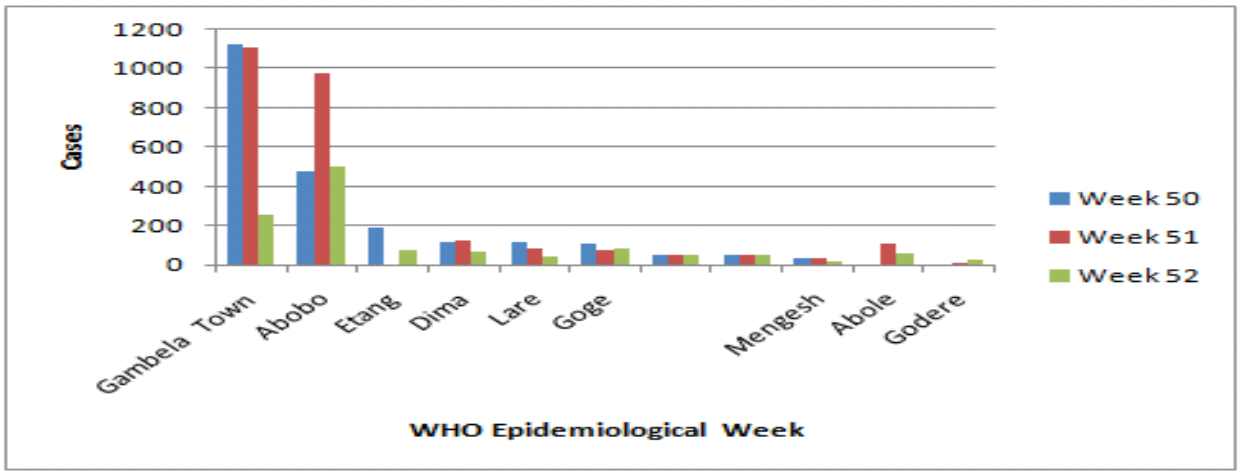


Figure 45: Malaria Cases Load by Week and Woreda, Gambella Region, January 2013

Meningitis

A total of 24 suspected meningitis cases have been reported from SNNP; 13 of them from A/Minch Zuria Woreda of Gamo Gofa Zone and while 11 cases from Shebedino Woreda of Sidama Zone. For the sake of outbreak ascertainment and relating activities, teams are deployed from the Regional and Central PHEM to investigate and ascertain the outbreak; and so as closely intervene and follow the progress.

Measles

A total of 127suspected measles cases with no death were reported during week 2. Among these 39(47.0%), 22(26.5%) and 13(15.7%) were reported from Oromia, Amhara and SNNPR respectively. Measles trend showed decreasing starting from week 48, but, it is reminding that cases are increased compared to the previous week 1(83cases).

Polio

During week 1, 12 AFP cases were reported. Among these Oromia (5), Amhara (5) while Tigray and Benishangul Gumuz reported one case each.

Dracunculiasis (Guinea worm disease)

Regarding the reported case of Guinea worm from Abobo woreda, the worm extracted and specimen sent to CDC Atlanta, Georgia for molecular analysis. While, additional one suspected case was reported in week 2 from Itanga woreda of Gambella region. The Regional Health Bureau is investigating the case.

Rubella outbreak investigation

During week 2, a total of 519 suspected Rubella cases with no death were reported. of which 478 cases were from Wombera while the rest 41 were from Dibate Woreda of Metekel Zone. Since the start of the outbreak 19 out of 39 Kebeles of Wombera Woreda were affected; similarly, 7 out of 23 Kebelse of Dibate woreda were affected. As of phone communication with team onsite, in week 3, there are 529 new reported cases from the two Woredas. Generally, as compared to the previous weeks, the problem seems to decreasing slightly; but, it remained fluid as evaluate to the preceded week 2 (fig.46)

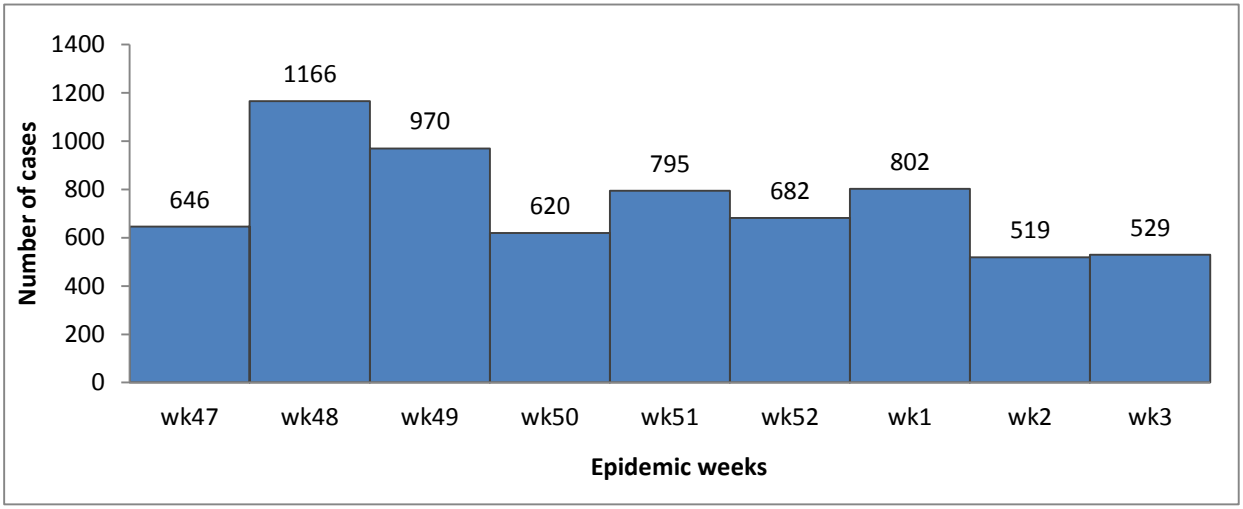


Figure 46: Rubella Outbreak Cases By Epidemic Week, Wombera & Dibate Woredas, Metekel Zone, January 2013

Response Activities

- One team deployed to Metekel Zone, Benishangul Gumuz Region to give technical support to control rubella outbreak.
- Active case search is in place
- Health Education on progress
- Similarly teams are deployed to meningitis reporting areas of SNNP Region

9.3 Supportive supervision Reports

A. Gambella Region

Introduction

For every public health intervention, there should be evidence-based information; through comprehensive surveillance, that can easily detect and direct any shifting from what is being normal or deviated. To come up with, there has to be representative information on the ground, collected from all service providing health facilities in a given jurisdiction. Although this is the fact and what we rely on, the current surveillance performance in Gambella Region is much deviated from what is expected; 80% and above, and even far more from the national achievements which is more than 80% by the time of this mission.

Purpose of the supportive supervision mission

The main purpose is to promotes quality of service at all levels of the health system by strengthening relationships within the system, focusing on the identification and resolution of problems, and helping to optimize the allocation of resources—promoting acceptable standards, teamwork, and better two-way communication. A cornerstone of supportive supervision is working with health staff to establish goals, monitor performance, identify and correct problems, and proactively improve the quality of service. Together, the supervisor and health workers identify and address weaknesses on the spot, thus preventing poor practices from becoming routine. Supervisory visits are also an opportunity to recognize good practices and help health workers to maintain their high-level of performance through; identifying the gaps in terms of supplies, knowledge and other impediments that matters the for the smooth functioning of the task; and then providing a chance on site training and recommend solutions as needed.

Methods

- Brief with regional staffs
- Area selection based on priorities
- Format agreement to use during mission
- Agreement on when and where to go, whom to meet
- Interviews with Woreda and selected facility respective personnel
- Record review and observations

- Interview, discussions and feedbacks at sites

Priority areas covered for this supportive supervision

First hotspot: Generally among the three zones of the region, Nuwer zone is the weakest in terms of weekly surveillance performance; so that automatically it was the first area to focus.Under this zone all except that an interrupted report from Lare woreda, as of this time; there is no any weekly report that was reported from the remaining woredas. That why we gave priority for Wantiwa, Makuey and Jikao Woredas of the Zone.

Second priority: Lare Woreda fof Nuwer Zone and Itang SW; in these area, reporting is comparatively better than the remaining woredas of Nuwer Zone; in that, for instance, Lare woreda has tried to report accordingly; although it is not in a an expected frequency, every week. In this regard, Itag SW is more effective on keeping the frequency even if still not up to the expected level of completeness.

Third priority: Woredas placed here are more accessible with better performance. As we understood from the PHEM data base, majority of the reports are primarily from Gambella Zuria, Abobo and Gambella Town; in due course, we have select among them Gambella Town due to security issue in Abobo direction and tried to appreciate more on what they are doing and recommend to do more that this days.

Surveillance actualities at the ground observed

a) **Wantiwa Woreda**: we assessed the w.h.o, Yawol HC and Mon HP. PHEM structure is not stand alone and mixed with other programs. Generally, the office has a total of seven staffs, four diploma and three certificate levels). Staff knowledge on the system is not as we expect; that is they were not exactly quantify the number of reportable disease; even unable to exactly mention those diseases that are immediately reportable and weekly reportable diseases. The woreda has information on the timing of reporting to the next level, but not beyond that level. They don't know the function of IHR. Most of the materials that we distributed were reached to the woreda. The woreda has two HCs and seven functional HPs for surveillance, and then they are reporting to the woreda frequently. All reports (both timely and late ones) are frequently report to the next level through passengers/cars. To

support with, the focal persons were trained on PHEM concept although not cascaded to the lower levels.

b) **Jikawo Woreda:** our assessment covered w.h.o and one HP in the Woreda; PHEM case team is a standalone with three staffs. Still there is a knowledge gap concerning the quantification and identification of those weekly and immediately reportable diseases. In this regard, no PHEM guideline distributed except some formats like facility reporting formats. To work with, there are four HPs, of which two of them are frequently reporting.

c) **Makuey Woreda:** PHEM is under disease prevention and health promotion process; with only one person in charge of the surveillance activities. Here there is a gap on the overall concept of PHEM and related activities than the above woredas. To some extent, HF formats were reached; but not distribution of the printed guide lines. The office Identified facilities that are expected to report as; three HCs and three HPs; and all of them avail weekly reports to the woreda.

d) **Lare Woreda:** Among Nuwer Zone Woredas, Lare Woreda is the model for its engagement in the surveillance activities as compared to the remaining woredas. But, still the report doesn't satisfy the overall profile of the woreda as the rest facilities haven not involved in the routine tasks; that is only Kurgang Health center is doing all its best in order to secure the expected reports only from the health facility point of view; but not HPs under it.

Common Challenges: More or less all Nuwer Zone Woredas surveillance system has a problem on main issues like:

- Awareness on identification and enumeration of reportable diseases under PHEM
- Almost no information on the purpose of immediate reporting from the IHR points of perspectives
- All supplies were not distributed as much as the expectation
- Still there is low know how on the time frame of the surveillance report flow
- No continuous and constructive supportive supervision has been given as it could improve the system to facilities
- Additional challenge was trained personnel was not obliged to stay in the system

e) **Itang special woreda:** In this Woreda PHEM is stand alone as a case team, with one focal person; there are two HCs and five HPs functional and expected by the Woreda. However, the fact at the ground was not as we expected; that is, only one HC and HP are frequently engaged in sending the surveillance reports. During our visit, the Woreda did not send weekly reports the successive three epidemic weeks, and nor Bazel health center for about seven weeks. As we mention in our discussion, the main limitation for routine activity is mainly finance as the focal person repeatedly said.

f) **Gambella Town**: Which is the most accessible than any of the Woredas in the region for all activities and the beneficiaries' number is the highest of all HCs in the region. If reports are avail on time from this facility it can reflects as well as the best profile in that can justifiable any public health emergency situations as effectively as possible. The main gap what we observed in was no good communication between the facility and the woreda health office. Still there is shortage of formats in the woreda that may facilitate for the surveillance activities in the area. For the town, there is no any functional HP for reporting considerations. Additional challenge is there was the clinicians are not committed in the engagement of the activities as to avail the summarized reports that may help for the completion of the weekly reports.

In all visited Woredas of the Region, there was no fax or internet connection that may assist in facilitation of the surveillance activities. Because of this in accessibility and shortage of transportation, reports are either mainly missed or delayed to reach the expected level. Comparatively, the problem is chronic in Nuwer Zone as compared to others.

Table 46: Summary of Human Resource, Expected Facilities, and Communication Means, Gambella Region, March 2013

Woreda/Facility	# personnel	# functional facility	Communication means	Information on PHEM
Wantiwa w.h.o	7	9	mobile	good
Mon HP	3	1	no	little
Yawol H.C	4	1	no	good
Jikawo w.h.o	3	4	mobile	good
Nibnib HP	2	1	mobile	little
Makuey w.h.o	1	6	mobile	little
Nyineyang HC	11	4	mobile	good

Lare w.h.o	2	7	Telephone, mobile	Very good
Kurgang H.C	1	5	Telephone, mobile	Very good
Itang w.h.o	1	7	mobile	little
Bazel H.C	1	2	mobile	little
Gambella T.h.o	2	1	mobile	little
RHB	6	122	Telephone, mobile, fax	adequate

Note: as we understand from the table above; there is no as such gap on the number of human resources to actively keeping PHEM activities; rather the issue is commitment.

The knowledge information grading here, is mainly on the basis of; if the PHEM staff didn't explain concepts of PHEM as expected and, relating to this, if unable to quantify the number of reportable diseases and at the same time unable to identify appropriately those conditions which are immediately and weekly reportable once as in the guideline clearly stated.

Solutions attempts by the Woredas and facilities to improve the system

Facility personnel present weekly reports in person or sometimes Woreda focal personas collect the report from the facility. Then, the Woreda said all reports are send via transportation means to the Region by travelers/cars to solve the mentioned limitations, in an attempt to improve the surveillance reports.

Regional Level performance

As repeatedly said the current completeness achievement is close to 17%, which is much deviated from the minimum requirement, 80%. As I understood, still the region may take greater responsibility on the overall performance status.

Strengths: The RHB has been conducting many and compressive trainings on PHEM system for many professionals up to health center level. In addition, almost all printed supportive materials are distributed as much as possible up to health center levels although not complete. Possibly, because of these efforts, since epidemic week 39 of 2012, the Region has been reporting on Woreda basis; better achievement compared to the previous times reports were compiled and sent on Regional basis.

Weakness: In my observation, I found that, all woredas have been starting to report surveillance reports starting from as early as July 2002 EC; and continued in an intermittent manner with improvements that currently the Region has achieved. The main gap regardless of many efforts, weekly reports collected from Wantiwa, Jikabo and Makuey Woredas have been hording in the region starting from July 2002EC as of this epidemic week. Besides, no feedback had been given to those who send the report as the national PHEM do for the RHB. Moreover, supportive supervision that RHB has tried was not in a comprehensive manner as that may re-activate the system. For instance, reports from Wantiwa Woreda since July/2003EC as of this day(February 18/06/2005 EC are kept in the RHB rather than sending to the next level as It has done for other Woredas. In a similar fashion, reports from Jikawo Woreda since 9/12/2002 up to 28//5/2005 EC remained unreported to PHEMC. Makuey Woreda, starting on the second month of 2004 up to 23/3/2005EC, an intermittent reports were reached in RHB; comparatively very weak reporting rate with big intervals between reporting months.

Limitations: The Regional PHEM has no vehicle to frequently conduct supportive supervision missions; even the infrastructure coverage in the Region has matter the overall communication on a timely manner; that is some Woredas; Akobo, Jore, Wantiwa, Jikawo and Makuey have no infrastructures to easily communicate all day to day activities to the next levels.

General input to the system from this supportive supervision mission

As it was proposed to conduct the supportive supervision in which the completeness of the region is bounced between 16 and 19 as of this days; so that to improve by a remarkable increment; PHEMC and Regional PHEM to gather decide to provide this supportive supervision jointly; starting from March 5 to 17,2013. From this mission we had assured the purpose of supportive supervision advantages like onsite training. The team tried to give more elaborative discussions on all aspects of the leading questions of the checklist; also tried to update and create know how information on how to improve the system as it could be more proactive than in place this time. Officers at different levels aware and promised to engage more on surveillance tasks, improve completeness and reporting frequency as to easily detect public health events/outbreaks. For emphasizing, final briefing was made with RHB head and potential partners to attentively look and engage with system tasks.

Conclusion

- Documentation at different level was very poor
- Limitation on compilation of facility reports to make woreda level
- No back report sent when the expected time period passed
- Trained Staffs shifting from PHEM to other programs
- Low and un comprehend supportive supervision from higher level to the next level
- Lack of formative feedback to woredas and zones on their surveillance performance

Overall recommendations

- Primarily, the Regional PHEM should proactively engaged and communicate with Woredas; as it could facilitate the tasks; like conducting comprehensive supportive supervision.
- The regional PHEM office has to be opened to at staffs as to accept any call from the woredas at any time; that is, staffs have to be available throughout the time weight average;
- Staffs have to be dedicated on sending the timely reports; rather than blaming each other.
- We strongly recommend partners who are involved in the health sector of the region to actively take part on the improvement of the surveillance system of the region; as they have great stake in the health of the community; rather than separate way of efforts(in converse to HSDPs)
- As PHEM center, I recommend the region to give attention on the credit of feedback to the lower level from the principle of feedback concepts;
- Like the one we did in this mission an integrated supportive supervision shall take frequently as to bridge the gap and make acceptable completeness value in a subsequent manner;
- We finally recommend and request for the concerned body to facilitate and make use of the mainly identified infrastructure limitations (land line phones, fax machine, electricity) in the mentioned areas;

B. Amhara Region Supportive Supervision Report

Introduction

For every public health intervention, there should be evidence-based information; through comprehensive surveillance, that can easily detect and direct any shifting from what is being normal or deviated. To come up with, there has to be representative information on the ground, collected from all service providing health facilities in a given jurisdiction. Although this is the fact and what we rely on, the current surveillance performance across Regions at different levels is much-deviated one from the other; from what is expected to be 80% and above completeness levels and 90% and above timeliness; as it would help timely basis decisions.

Purpose of the supportive supervision mission

The main purpose is to promotes quality of service at all levels of the health system by strengthening relationships within the system, focusing on the identification and resolution of problems, and helping to optimize the allocation of resources—promoting acceptable standards, teamwork, and better two-way communication. A cornerstone of supportive supervision is working with health staff to establish goals, monitor performance, identify and correct problems, and proactively improve the quality of service. Together, the supervisor and health workers identify and address weaknesses on the spot, thus preventing poor practices from becoming routine. Supervisory visits are also an opportunity to recognize good practices and help health workers to maintain their high-level of performance through; identifying the gaps in terms of supplies, knowledge and other impediments that matters the for the smooth functioning of the task; and then providing a chance on site training and recommend solutions as needed. Supportive Supervision is a process by which the public health emergency management representatives at different levels are supported by working together to review, progress, identify problems, decide what has caused problems and develop visible solution. However, the PHEM center was not conducted PHEM specific supportive supervision activities until recently. Nevertheless, the center is in a position by conducting the task in all regions uniformly at this time. With the main objective of enhancing the surveillance system completeness and timeliness of reporting as it can detect public health threats.

Objective

General Objective

To strengthen Public Health Emergency Management system functions as to detect and respond public health threats.

Specific objectives

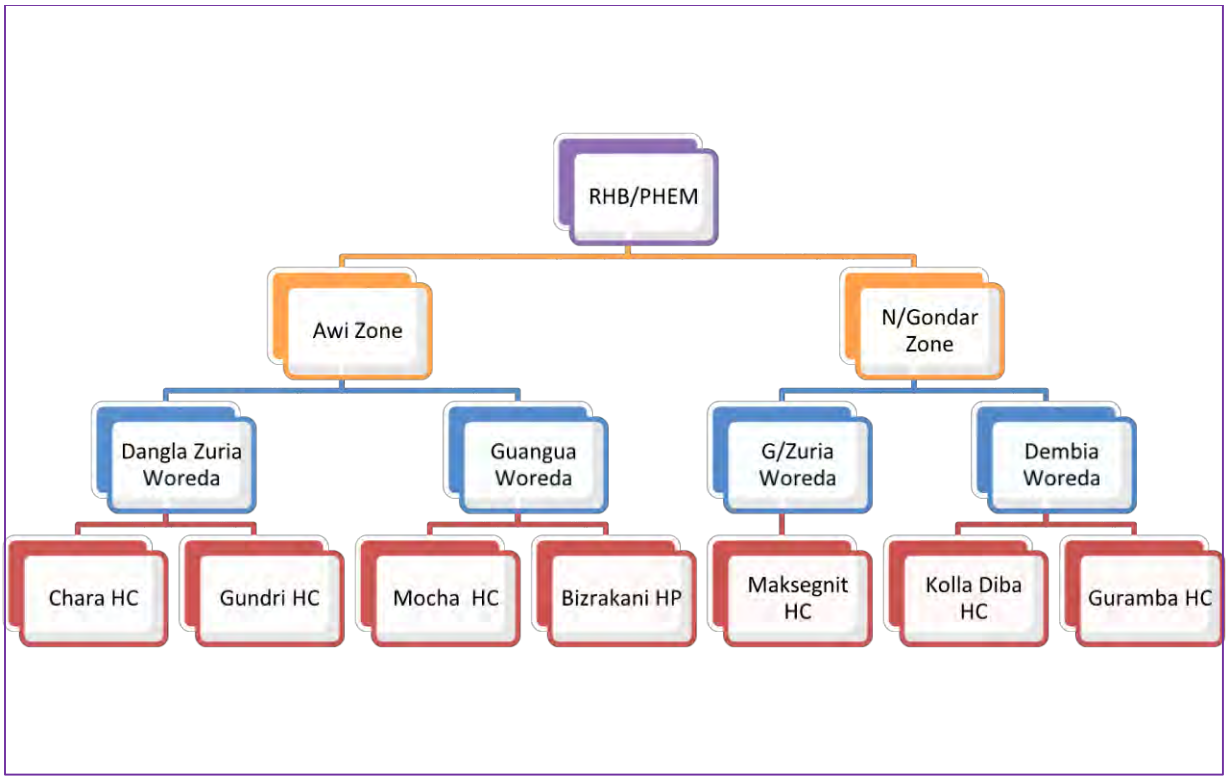
- To observe PHEM system structures and functions to the facility levels
- To assess knowledge levels of surveillance officers on PHEM reportable diseases
- To assess documentation of surveillance reports at different levels
- To support technically relating to registration, reporting, analyzing and data management
- To assist PHEM officers at the spot through awareness creation as per the gaps identified
- To enhance surveillance completeness and timely communication

Methods and Materials

The supportive supervision mission was conducted between 30th March to 10 April 2014in Amhara Region. At arrival in every hierarchy, primarily we briefed the objective of the supportive supervision mission; then followed by interviews using checklist with PHEM coordinators, focal persons/staffs and responsible body of the health office heads at all levels. We also observed their documentation based on the questioner developed by PHEM/EPHI, discussion and awareness creation as well as technical support in recording, reporting and analysing surveillance data was provided as per the limitations identified. Generally, we preceded our approach as follows:

- Brief with regional PHEM heads and staffs
- Area selection based on priorities
- Format agreement to use during mission
- Plan on when and where to go, whom to meet
- Interviews with Woreda and selected facility respective personnel
- Record review and observations
- Awareness creations, discussions and feedbacks at spots

Diagrammatically, the hierarchy of covered areas is depicted here below;



Findings/observations

System structure and function

PHEM is structured as a core process and executes responsibilities Regional down to the Woreda levels; the structure is a standalone similar to the central level; but Malaria is also under PHEM core process in Amhara Region rather than in HPDP at the federal level. Along with, all experts act as a whole, with some vertical approach towards malaria prevention and control program. Accordingly, the RHB and Zonal PHEM core process are well staffed by appropriate experts; however, only one person is assigned at Woreda level. At health center levels, there is one PHEM focal person who works interchangeably with HC head and HMIS data manager while all HEWs are responsible to multiple activities including PHEM, EPI and the like.

Knowledge of PHEM staffs

At regional level, there is an outstanding awareness among staffs about public health emergency management system, its core functions, number of diseases under public health emergency management (weekly and immediately) including priority diseases and criteria for selecting priority diseases is . They also know on how and when to report the immediately and weekly

reports and outbreak investigation team deployment time. But, disparities Zonal down to the facilities to exist on knowing the reasons why diseases are classified as immediately and weekly reportable ones.

Logistics and Supplies

At regional level, there are desktop computers, laptops, landline telephone, functional internet connection and fax machine; to ease communications. Similarly, at Zones they do have appropriate communication means including good connection access. However, at Woreda level, there are desktop computers and land line phones although not connection and functional faxes. On the other hand, the region has PHEM guideline and reporting formats, though there is shortage of reporting formats at all health facility level, but they are continuing reporting by copying formats. The Region distributed all important case definitions for all PHEM reportable disease and adequate emergency drugs for outbreaks response used at least for three months. Similarly at all assessed Zones, Woredas and facilities, guidelines on PHEM, AWD and measles were availed. However, there is shortage of reporting forms observed mainly the weekly summary ones. In all assessed health facilities there is no computer delegated for PHEM and internet connection.

Reporting

At all levels, number of health facilities that are expected to report surveillance data were well identified. Regionally, there are 3340 Health Posts, 817 Health centers and 19 Hospitals, with totality of 4176 facilities expected for PHEM reports. The average completeness of all the assessed health facilities and the region is above 85%. The region receive late report from health facilities however they did not the report to the next level. The Region receives surveillance report from lower level through email from the Zones and sends to the next higher level through email. In addition, they know for whom to send the surveillance data to the next level and how and when to send all immediately reports during an outbreak like when to use case based, line list and daily epidemic reporting. They also know about major data validation checks in weekly and immediately reporting and they check it before sending the report to the next level.

Surveillance database and data management

There is PHEM surveillance Microsoft Excel database at regional level. Weekly written as well as verbal feedbacks are common to Zones by Regional PHEM. Analyzing surveillance data bulletin was prepared but it was not consistently .At health facility level there was no surveillance data base, they collected and documented surveillance data on paper, in addition, ePHEM was not implemented at all levels.

Training and Supportive Supervision

There are more than 10 trained staffs currently working in public health emergency management system at regional level; and two to three staffs who were trained on PHEM are currently working at the Zonal PHEM levels. Likewise, in all assessed Woredas and health facilities PHEM officers/focal persons had got training although disparities to exist. The Region was supervised by higher level although not specific to PHEM activities; even feedback was not issued accordingly. In the past one year, the region and health centers also conducted supportive supervision to lower levels; verbal and written feedbacks with regards was provided.

Outbreak management and Response

There was an outbreak of Measles, Typhoid, Malaria, Anthrax and mass Hysteria in the past one year in the region .They did not have an outbreak investigation checklist for different public health problems. The common public health threats mentioned by the region were Malaria, Measles, Anthrax, Rabies and AWD. To avoid and minimize the identified risks, the region have prepared EPRP and has been working on the prevention and control activities in collaboration with other case teams, sector offices and partners. In addition, the region collected laboratory specimen during outbreaks when it is necessary; but gaps on the laboratory feedback still affected the communication system and timely responses. Moreover, the PHEM Center as expected does not usually respond supply requests made by the Regional PHEM.

Strengths and Weakness Identified

- PHEM structure at different levels very strong; specially at the Regional level with and down wards accordingly
- An excellent documentation of written communications made with different stakeholders
- Continuous feedbacks and weekly bulletin preparations and communications with respective stakeholders, including the Regional Officials

- Shortage of weekly reporting formats at all levels
- Inadequate PHEM guideline utilization and training gaps
- Gaps on database management and analysis using computers Zonal down to the Woreda levels
- Limitations on appropriately registering of rumors using the Rumor Log Book
- Gaps in all inclusive data analysis and continuous written feedbacks in all assessed Woredas and facilities
- No functional ePHEM at all level
- Shortage of transportation especially in N/Gondar Zone with a share of approximately 30% the Region in all aspects of contributions

Solutions attempted by the Team

- awareness creation at spots to all visited sites as per the gaps driven
- demonstrate and discuses on how to enter, filter and analyze PHEM data using computers by having the actual data in which Zones has sent previously
- Support technically to have their own database by availing their previous data on their computer and to build up on it in the future
- Take note of the main gaps and updating to take action by the responsible bodies at different levels

Conclusions

PHEM structure at different levels is well organized as a standalone and organized by the required number and mix of health professionals. However, gaps remain at Woreda levels. An awareness level on PHEM at Woreda and facility levels was below our expectations. This may be due to in adequate and infrequent trainings on the matter. In addition, absence of logistics and supplies like computer, landline telephone, fax machine and internet connection impacted officers on their continual reporting systems were observed in all visited Woredas and health facilities specific to PHEM focal persons. There was no PHEM database available; Zonal down to facilities and no functional ePHEM at all level. In addition, the expected written supportive supervision and laboratory result feedback was not in place.

Recommendation

The PHEM basic level training should be cascading as soon as possible on top of other trainings to fill the gaps observed among PHEM officers. To strengthen the PHEM surveillance reporting and database management (Regional to lower levels), basic computer skill training should be given; as well as computer and CDMA should be availed for focal persons. In addition, there should be support to PHEM process with training and budget to print and distribute formats. Frequent supportive supervision shall be conducted periodically to Central to the lowest levels; and provide feedbacks of supervisory activities in a written note; also timely laboratory feedback should be given to health facilities. There should be strong follow up on eHMIS/ePHEM.

Annex 10: Public Health Emergency Management Supportive Supervision Check List 2014

Public Health Emergency Management Supportive Supervision Check List

Region _____ Zone _____Woreda _____

Health Facility _____ Date _____

No.	Question	Coding Classification
	A. System Structure and function	
1.	Is there Public Health Emergency Management structure in your office?	1.Yes 2.No
2.	If yes is it stand alone or organized under disease prevention and health promotion department?	1.Stand alone as department/core process 2. Orginazed under disease prevention and health promotion department?
3.	How many experts are working on public health emergency management?	_____
	B. Knowledge	
1.	What are the core functions of public health emergency management system?	1._____ 2._____ 3._____
2.	How many diseases are under public health emergency management system?	1.Yes 2.No
3.	How many of them are immediately and weekly notify able diseases?	
4.	Can you list all immediately notifiable diseases?	1.Yes 2.No
5.	If Yes what are they? ***Note to the interviewer:*** *briefly explain disease under surveillance and provide them if they have no lists of the diseases*	_____
6.	Once you report immediately notifiable diseases, do you aggregate and report on weekly bases? ***Note to the interviewer:*** *briefly tell them as they have to resend immediately reportable diseases by aggregating on weekly report*	1.Yes 2.No

No.	Question	Coding Classification
7.	When do you expect the health facility is report weekly surveillance data to Woreda?	1.Every Monday 2.Every Tuesday 3.Every Wednesday 4. Other(specify)___
8.	When do you expect the Woreda is report weekly surveillance data to zone/ region?	1.Every Monday 2.Every Tuesday 3.Every Wednesday 4.Every Thursday 5.Other(specify)___
9.	When do you expect regional health bureau report weekly surveillance data to Federal? ***Note to the interviewer:*** *tell them the expected day and time to send report at each level.*	1.Every Wednesday 2.Every Thursday 5.Every Friday 6.Other(specify)____
10.	Once you received immediately reportable diseases reports within how many times you report to the next level? ***Note to the interviewer:*** *tell them the expected day and time to send report at each level.*	1.30 minutes 2.45 minutes 3.3 hours 4.12 hours 5.24 hours 6.Other, specify ___
	C. Infrastructure and Supplies	
1.	Do you have PHEM/AWD/MEASELS guideline? Do you have rumor logbook	1.Yes 2.No
2.	Could you show me? Observe	___
3.	Do you have reporting formats?	1.Yes 2.No
4.	Could you show me? Observe	_____
5.	List types of reporting formats that you have;	_____
6.	Do you have printed standard/community case definitions for all 20 reportable diseases?	1.Yes 2.No
7.	Could you show me? Observe	___
8.	Do you have computer (either desktop or laptop)?	1. Yes 2. No
9.	Do you have basic computer skill (XLs, Word, Access…)	1. Yes 2. No
10.	Is there internet service in your office?	1. Yes 2. No
11.	Is there land line telephone in your office?	1. Yes 2. No
12.	Do you have fax machine?	1. Yes 2. No
13.	Do you have EPRP	1. Yes 2. No
14.	Is the plan funded(is there contingency/emergency response fund)	1. Yes 2. No
	D. Reporting	
1.	Did you identify the number of health facilities those expected to report surveillance data?	1.Yes 2.No
2.	If yes, how many hospitals, health centers and health posts do you expect to report to you surveillance report on weekly bases?	1.Hospital ___ ___ 2.Health Center__ 3.Health posts ___
3.	How many of them are reporting to you regularly?	1.Hospital ____ 2.Health Center __ 3.Health posts ___
4.	Do you Know the reason why the rest of health facilities did not report surveillance data	1.Yes 2.No
5.	If yes, what could be possible factors?	_____
6.	Do you use appropriate reporting format during outbreak?	1.Yes No

No.	Question	Coding Classification
7.	If yes, what type of reporting format do you use?	1. Line list 2. Daily epidemic summary 3. Weekly 4. other(Specify)___
8.	Have you ever receive late report after you sent surveillance report to the next level?	1.Yes 2.No
9.	If yes, what do you do with that data?	1.keep it separately 2.keep it with surveillance data bases 3.Report to next level as late report
10.	Have you insist the Woredas to report late report if they did not report on timely?	1.Yes 2.No
11.	How do you receive surveillance report from lower level?	1.By telephone 2.By e-mail 3.By fax 5.Other,____
12.	How you sent surveillance report to next higher level?	1.By telephone 2.By e-mail 3.By fax 5.Other,___
13.	Did you distribute PHEM/AWD/Measles guideline, reporting formats, and case definitions to all of them?	1.Yes 2.No
14.	How do you calculate completeness of reporting? what is the completeness of your Region/Zone/Woreda	_____
	E. Surveillance database and data management	
1.	Do you have data manager or data clerk	1.Yes 2.No
2.	Do you have surveillance databases/EPHEM	1.Yes 2.No
3.	If yes, what kind of software do you use?	1.MS-Eexcel 2.WS-Word 3. Access 4. Epi-info
4.	*Show me your data base?* ***Note to the Interviewer:*** *Please check the database and compare with the database we have at federal level. If it is different from our database provide him/her our database with their data. Give him/her brief orientation on how to fill and utilize the database*	_____
5.	*Did you analysis surveillance data?*	1.Yes 2.No
6.	*If yes, show me last week surveillance data analysis?* ***Note to the Interviewer:*** *Please give him/her brief orientation on how to use pivot table for simple data analysis*	
7.	Do you sent feedback to the next lower level?	1.Yes 2.No
8.	If yes, show me last week feedback that you sent to the lower level? ***Note the Interviewer:*** *Please provide hi/her weekly feedback template*	_____
9.	Have you ever prepared weekly bulletin by analyzing surveillance data?	1.Yes 2.No
10.	If no, why ***Note to the Interviewer:*** *Please provide him/her our weekly bulletin and insist them to start preparing weekly bulletin*	1.Technical problem 2.Less attention 3.Time constraint 4.human power
	F. Training and Supportive supervision	
1.	Have you ever trained on public health emergency management system?	1.Yes 2.No

No.	Question	Coding Classification
2.	If yes, when was the last training you received?	dd/mm/yyyy ___/___/___
3.	Is there any other experts trained on public health emergency management system in your office?	
4.	If yes, how many experts?	_____
5.	Did you train the lower level experts on public health emergency management?	1.Yes 2.No
6.	If yes, do you have the roster of them?	1.Yes 2.No
7.	Have you ever supervised by higher level? If yes how frequently	1.Yes 2.No
8.	If yes, did they send you feedback of supervision? Show me?	1.Yes 2.No
9.	When was the last time you were supervised by higher level?	dd/mm/yyyy __/___/___
10.	Have you ever provide supportive supervision to the lower level?	1.Yes 2.No
11.	If Yes, did you send them a feedback? Can I have a copy of it?	1.Yes 2.No
12.	When was the last time you provided supportive supervision to the lower level?	dd/mm/yyyy __/___/___
13.	Was there any rumor reported in 2103? If yes was it recorded in rumor log book? Check, was the rumor verified within 3 hours?	_____
14.	Was there any outbreak in 2013?	1.Yes 2.No
15.	If yes, what type of outbreak?	_____
16.	Did you do any Post out break assessment?	1.Yes 2.No
17.	Is there any recovery/rehabilitation activities conducted?	1.Yes 2.No
18.	Any Challenges? Solution given to challenges?	_____
19.	Any comment?	_____

Thank you for your cooperation!

Declaration

I, the undersigned, declare that this is my original work output 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: Getaneh Abrha Estayew

Signature _____

Place: Ethiopian Public Health Institute

Date of Submission: 16 May 2014

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

Name of advisor:

Professor Ahmed Ali

Signature: _____

Date _____