Ethiopia Field Epidemiology Training Program (EFETP)

Compiled Body of Work in Field Epidemiology Training

By

Abdifatah Tahir

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, 2015

Addis Ababa

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

Abdifatah Tahir

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

Advisor 1: Mr. Alemayehu Bekele

Advisor 2: Dr.Ayele Belachew

May, 2015

Addis Ababa

Addis Ababa University School of Graduate Studies Ethiopian Field Epidemiology Training Program (EFETP)

Compiled Body of Works in Field Epidemiology

By:

Abdifatah Tahir

Ethiopian Field Epidemiology Training Program (EFETP)

School of Public Health, College of Health Sciences, Addis Ababa University

Approval by Examining Board

_____ _____

Chairman, School Graduate Committee

_____ _____

Advisor

_____ _____

Examiner

_____ _____

Examiner

Acknowledgment

I would like to thank and appreciate my mentors Mr. Alemayehu Bekele and Dr.Ayele Belachew for their continuous support and guidance throughout the execution of all my outputs. I also want to sincerely appreciate the contributions made during outbreak investigation, health profile, and surveillance system evaluation by Ethiopian Public Health Institute, Regional Health Bureaus and District Health Offices and the community members. Finally I extend my gratitude to the Ethiopian Public Health Association for the financial and logistic support.

Table of content

LIST OF TABLES

List of Figures

List of Annex

List of Abbreviation

AFENET_____ African Field Epidemiology Network

ANC_____ Antenatal Care

AWD_____ Acute Watery Diarrhea

AFP_____ Acute Flaccid Paralyses

ART _____ Anti-Retroviral Therapy

CI_____ Confidence Interval

CSA_____ Central Statistics Agency

CDC_____ Center for Disease Control

DRMFS_____ Disaster Risk Management Federal Sector

EPH_____ Ethiopian Public Health Institute

EDHS_____ Ethiopian Demographic and Health Survey

EIS _____ Emergency Intelligence Service

EPI_____ Expanded Program of Immunization

EPHA_____ Ethiopian Public Health Association

EC_____ Ethiopian Calendar

EFETP _____ Ethiopian Field Epidemiology Program

EPRP _____ Epidemic Preparedness and Response Plan

EVD _____ Ebola Virus Disease

FMOH_____ Federal Ministry of Health

HEW_____ Health Extension Worker

HC _____ Health Center

HMIS _____ Health Management Information System

HIV _____ Human Immunodeficiency Virus

HP _____ Health Post

IDSR_____ Integrated Disease Surveillance Response

IMNCI_____ Integrated Management of Neonatal and Childhood Illness

ITNs_____ Insecticide Treated Mosquito Nets

IgM_____ Immunoglobulin M

LLINs_____ Long Lasting Insecticide Nets

MHNTs _____ Mobile Health and Nutrition Teams

MDG_____ Millennium Development Goal

MCV _____ Measles Containing Vaccine

NGO_____ Non-Governmental Organization

OTP_____ Outpatient Therapeutic Feeding Program

OR _____ Odd Ratio

PHEM_____ Public Health Emergency Management

PNC_____ Postnatal Care

PMTCT_____ Prevention of Mother to Child Transmission

PITC _____ Provider Initiative Counseling and Testing

RRT_____ Rapid Response Team

RI _____ Routine Immunization

SRHB _____ Somali Regional Health Bureau

SAM_____ Severe Acute Malnutrition

SIA_____ Supplemental Immunization Activity

Kmsq _____ Kilometer Square

TBAs_____ Trained Traditional Birth Attendant

TEPHNET _____ Training in Epidemiology and Public Health Network

UTI_____ Urinary Tract Infection

VCT _____ Voluntary Counseling and Test

VVM _____ Vaccine Vial Monitoring

WoHo_____ Woreda Health Office

WHO _____ World Health Organization

WPV_____ Wild Polio Virus

Executive Summary

Field Epidemiology Training Program (FETP) is a two years in-service training program adapted from the United States Centers for Disease Control and Prevention (CDC) Epidemic Intelligence Service (EIS) program and curriculum. The program is designed to assist the Federal Ministry of Health and Regional Health Bureaus in strengthening health systems preparedness and response against major public health problems, more specifically epidemic prone diseases by creating competent health professionals through basic class room as well as on-the-Job mentorship and training.

This compiled body of works has nine main sections which all of them were done during the residency schedule of the program. This include outbreak investigation, surveillance data analysis, evaluation of the surveillance system, health profile report, writing of finalized scientific manuscript for peer review journals, abstracts submitted to scientific conferences, ,summary of disaster situation visited/risk assessment writing protocol/proposal of epidemiologic research project and other additional works.

The document is organized in to nine chapters;

Chapter one deals with outbreak investigation. there were two outbreak investigations conducted:; one was measles outbreak investigation conducted in Hamaro woreda of Fik Zone, Ethio-Somali Region, with a follow up case control study. The second outbreak investigation was a case series study conducted in polio disease in the Ethio-Somali Region, Warder Zone of Bookh and Geladin Woreda.

Chapter Two explains about Measles case based disease surveillance data review and analysis which was conducted at regional level. The ten year data, from 2004-2013, was analyzed in the Region by place, person and time.

Chapter three describes the AFP and measles surveillance system evaluation conducted in Shabeele Zone, Ethio-Somali Region. In this chapter, purpose and objective of surveillance system, progress towards the objective and also attributes of the surveillance system were discussed.

Chapter four is about health profile of kebribayah Woreda, Jigjiga Zone, Ethio-Somali Region, where health and health related data of the woreda were reviewed, analyzed and presented.

Chapter five is manuscript for peer reviewed journal on Measles outbreak investigation. Chapter six is Abstract on measles outbreak investigation in Hamaro District which, in fact, was submitted to the TEPHNET International Conference.

Chapter seven presents narrative summary of disaster situation in Jerar Zone in Ethio-Somali Region; as part of early warning and vulnerability assessment, conducted in partnership with experts working on health and nutrition unit. The assessment was conducted to identify potential problems which need humanitarian assistance in the Meher need assessment season. The report of the assessment was used to produce the regional humanitarian requirement document which was latter was shared with potential partners for response.

Chapter Eight is Project proposal entitled ―Factors affecting utilization of insecticide treated Bed Net in Erer District, October/2014 and ―Routine immunization coverage and associated factors among children aged between 12-23 month in a rural pastoral community of Gashamo District, Somali Regional State ―Ethiopia factors contributing to low utilization of vaccine in children between 12 and 23 months in Gashamo District of Ethio-Somali Regional State: A descriptive cross-sectional study", and chapter nine comprises of other outputs like training report of IMNCI, Public Health Emergency weekly bulletin etc. The bulletins is prepared on weekly basis and in this chapter WHO week twenty 27 bulletin is presented.

Different trainings and conferences have been attended in different places at different times, to mention some of this: - I have attended the 5th AFENET Scientific Conference held in Addis Ababa between 17-21, Nov, 2013. I have attended the 7th International Symposium sponsored by AFENET on Ebola in West Africa and recent development held in Washington DC, USA March 24-28/2015. I have presented supportive supervision of Mobile Health Teams in the review meeting held in Jigjiga. I have attended woreda based national plan conducted in Jigjga Town Training for HWs on EVD, in Regional state and Ferfer woredas on 11 October 2014 Training was given for a total of 40 Health Workers working in Togwajaale HC and Regional Health Bureau staff. Those mentioned above and others are included as additional outputs.

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

Chapter 1: Outbreak Investigation

1.1: Investigation of Measles Outbreak in Hamaro District, Somali Region, Eastern Ethiopia, April 2014.

Abdifatah Tahir[1], Alemayehu Bekele[2,] Dr.Ayele B.[3]

[1]*Ethiopian Field Epidemiology Training Program Cohort 5, Somali Field Base*

[2]*Ethiopian Public Health Association -FETP Coordinator*

Abstract

Introduction: Measles remains to be a common disease in many parts of the developing world and is the most common cause of morbidity and mortality in Ethiopia. On April 13, 2014, the Somali Regional Health Bureau received report of a suspected Measles outbreak in Hamaro Woreda of Somali Region. Investigation was launched to confirm the outbreak, identify risk factors and implement control measures.

Methods: A 1:2 unmatched case-control study was conducted, with 44 cases and 88 controls. A suspected measles case was defined as any person with fever, rash, cough, and coryza in Hamaro District from April 6 to April 27, 2014. Health center records and line lists were reviewed. Furthermore, cases and controls were interviewed using questionnaire appropriate for the purpose. In addition to that, five blood samples were taken for laboratory confirmation. Data were entered excel and analyzed using Epi-Info version 7.

Result: A total of 43 suspected Measles cases with one death were reported from April 6 to April 27, 2014. 27(62%) were male. 24 (55%) were aged below five years, while mean age was 11 years (8 months to 35 years).The overall attack rate (AR) was found to be 6.1/10,000 with one death (CFR:2.2%) are identified). The outbreak occurred in four kebele out of the 5 kebeles in the Woreda, the most affected kebele was Hardhagax 30/10,000 population. All five blood sample were positive for measles IgM. In the case control study being illiterate AOR: 15.0 (3.78-59.68) and travel history AOR: 34.8 (3.83-316.26) was associated with contracting measles.

Conclusion: An outbreak of measles was confirmed in Hamaro affecting primarily under 5 children. Low vaccination coverage, mother‘s illiteracy and travel history were associated risk factor identified. Strengthening routine immunization is recommended.

Key word: Measles: Outbreak: case control: Hamaro.

Introduction

Measles is a highly infectious viral disease that can cause permanent disabilities and death that affects mostly children and the virus is transmitted via droplets from the nose, mouth or throat of infected persons through coughing, sneezing or close personal contact or direct contact with infected nasal or throat secretions(1). The virus remains active and contagious in the air or on infected surfaces for about two hours that can be transmitted by an infected person from 4 days prior to the onset of the rash to 4 days after the rash erupts and can be prevented by immunization(2).

The World Health Organization (WHO) and United Nations Children's Fund (UNICEF) comprehensive strategy for measles mortality reduction is focused on 47 priority countries (3). Components include 1) achieving and maintaining high coverage (greater than 90%) with the first dose of measles vaccine by age 12 months in every district of each priority country through routine immunization services(3). In 2010, the World Health Assembly endorsed the following measles objectives for 2015: 1) raise routine coverage with the first dose of MCV (MCV1) for children aged 1 year to ≥90% nationally and ≥80% in every district or equivalent administrative unit (3). In 1980 before the widespread global use of measles vaccine, an estimated 2.6 million measles deaths occurred worldwide (3). In January 2007, WHO/UNICEF reported that implementation of measles mortality reduction strategies had reduced measles mortality by 60%, from an estimated 873,000 deaths in 1999 to 345,000 deaths in 2005(4). This reduction exceeded the goal of 50% measles mortality reduction by 2005 (compared with 1999 levels) that had been set in 2002 (11).

Measles remains a common disease in many parts of the developing world in which an estimated 10 million cases and 164,000 deaths from measles occur worldwide each year Measles is a leading cause of vaccine-preventable deaths among young children worldwide (12).

In Ethiopia, Recently measles has been occurring with increased frequency in several areas of the country, in 2014, widespread outbreaks occurred with 16,028 cases of measles reported from all the 11 regions (13). During 2009-2010, Ethiopia was one of the countries in the world that

experienced large outbreaks with 4,235 reported cases (14). Such widespread outbreaks indicate accumulation of susceptible population for different reasons.

Ethiopia is adopting strategies to control and ultimately to eliminate measles by 2020 strategies include routine immunization >= 90% of children aged 9 to 11 months (14).

Woreda Health Office surveillance focal person reported to the Regional Health Bureau Public Health Core Process an Outbreak of measles in Hamaro Woreda of Fik Zone in April 13, 2014. To investigate the extent of outbreak and to identify possible risk factors responsible for the occurrence of the outbreak and to institute preventive and control measures a team from RHB was organized and deployed to the area.

Objective

General objective

To describe and identify risk factor associated with the Measles Outbreak in Hamaro Woreda and recommend corrective measures, April, 2013.

Specific Objectives

- To verify existence of outbreak
- To describe distribution of the outbreak by person, place and time
- To identify the risk factors and propose control measure of measles infection in Hamaro Woreda
- To assess the clinical characteristics of cases

Method and Materials

Study area and period

The investigation was carried out between 22 April - 5 May, 2014 in Hamaro Woreda of East Nogob Zone which is located about 170 km away from the South east of the capital city of the Region Jigjiga. Hamero population is estimated to be 72,063 (36,752 male and 35,031 females). The Woreda is surrounded with 3 District of Nogob Zone (in east with Sagag, in North with Fik, in West with Salahad & Kubi).

Hamaro Woreda is one of the 67 districts in Somali Regional State which is around 200 km far from the capital city of Somali Regional State of Ethiopia. The district has five kebeles.

According to the Woreda report Health coverage is around 50% and the health delivery system was given using 2 Health Centers, 9 Health Posts and 1 MHNTs facility which is providing primary and secondary health service to the unreached population.

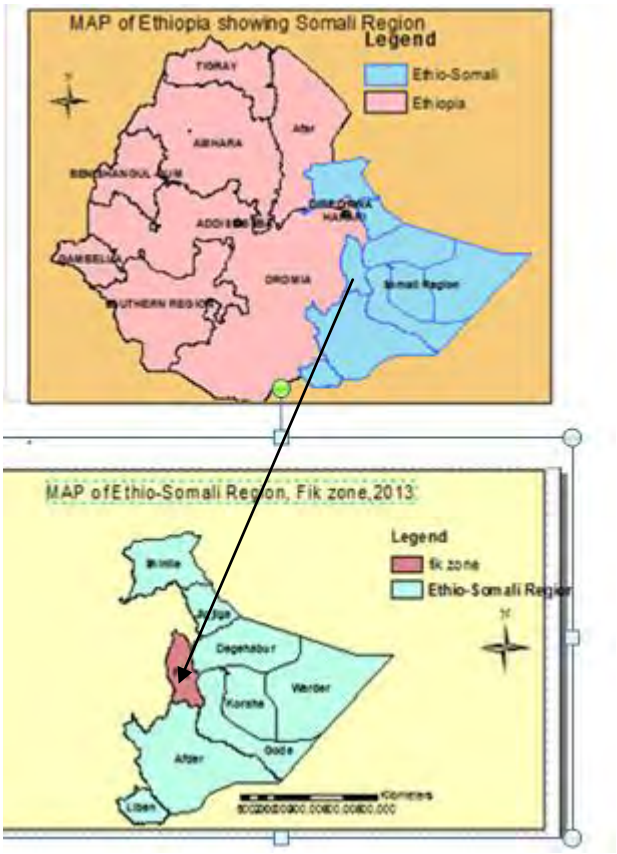


Figure 1: Map of Ethio-Somali Region, Hamaro District, 20114

Study Design:-

Unmatched 1:2 case control study design was used. A total of 44 cases and 88 controls were selected.

Study Population:-

Study populations of the investigation were all measles cases/death in Hamaro District that fulfilled standard case definition.

Operational definition:-

A laboratory confirmed case is a suspected case which has laboratory results indicating infection (IGM positive or isolated for a measles virus.

Epidemiologically linked case is a suspected case, which has contacts (possibly got the virus) with laboratory confirmed case or another epidemiologically confirmed case.

Measles-related death is a death in an individual with confirmed (clinically, laboratory, or epidemiologically) measles in which death occurs within 30 days of rash onset and is not due to other unrelated causes Example: A trauma or chronic disease.

Data collection method:

Structured questionnaire were used in order to collect basic epidemiological information: symptoms, date of onset of disease, age group affected, religion of the family, Vaccination history, vitamin A supplementation, parent educational level, travel history 7 days prior to the onset of paralyses, contact history with suspect or confirmed measles cases, knowledge on measles for transmission of measles and prevention measure taken when measles occurred,.

Laboratory investigation

Five blood samples from patients were taken and sent to EPHI on 5 April, 2014.

Data analyses and clearance

The data collected were entered into Excel software and imported to EPIinfo 7. The entered data were analyzed by Epi-info (version7) and SPSS version 16.0 software were employed. Descriptive statistics were used to determine the frequency of different variables. Both multi variate and bivariate analysis was applied and Results were displayed using tables and graphs. 95% confidence interval (CI) for OR (odds ratio) were used in judging the significance of the associations.

Ethical Consideration:-

Ethical clearance was obtained orally from the respective Zone and Woreda. Oral consent from the study participants identified and confidentiality assured and no personal details were recorded or produced on this documentation.

Dissemination of the result:-

There were meeting to debrief the finding of the investigation to the Woreda, Zone and Region. Written report of the investigation was submitted to the Region, resident advisor and to the EFELTP Program Coordinator of Addis Ababa University.

Inclusion and Exclusion criteria

Inclusion Criteria

Cases

Any resident of Hamaro Woreda who had symptoms of measles (generalized Maculopapular rash and fever plus one of the following: cough or coryza (runny nose) or conjunctivitis (red eyes) from April 6- April 27, 2014 and who agreed to participate in the study was included.

Controls

Any resident of Hamaro Woreda during the study who was a neighbor to a case and who did not developed signs and symptoms of measles and agreed to participate was included.

Exclusion criteria

Cases

Those who refused to participate or were unconscious were excluded.

Controls

Those who refused to participate were excluded as well as family members from the same household.

Result

Socio-demographic Characteristics:-A total number of 44 cases who fulfilled standard case definition for measles were included for study. We interviewed 122 (85%) of mother and 9 %(12) father and the remaining were older cases affected by measles. Total respondent's we interviewed, farmer were accounts for 2% (3) for soldier, 3% (4) for daily labor and House wife 85%.

We recruited a total of 44 cases and 88 controls. All of the cases and controls were Muslim community, more than half of the cases 37(84%) and controls 73(83%) fathers were pastorals by occupation.

Descriptive epidemiology

We identified for an epidemiological association with hypothesized potential risk Factors. According to the Woreda administration report, Measles vaccination coverage in the woreda is around 42% which is much lower than standard. A measles case in the district is high in people who are not vaccinated. There was no any outbreak in the District for the last 4 year.

Distribution by person

A total of 43 suspected measles cases and 88 health control and 1 death that fulfill standard case definition were identified from April 6 – 27, 2014. Out of total cases 27(62%) were in male with the mean age of 11 year (range from 8 month to 35 year) and Median age of 5 year (range from 8 month to 35 year) and median age for control group were 4 year (7month to 20 year) .

Table 1**:** Distribution of measles cases by sex in Hamaro Woreda, Ethio-Somali Region, April, 2014

Sex	Population	No. Cases	Percent (%)	AR per 10,000	No. Death	CFR%
Male	36752	27	0.61	7.34	0	0
Female	35311	17	0.39	4.81	1	6
Total	72063	44	100	6.1	1	2.2

The overall attack rate was 6.1/10,000 and CFR account 1(2.2%) of the total cases. The attack rate was lower in female 4.81/10, 000 than male 7.34/10,000.

Majority of cases were aged below five year. The age specific attack rate is higher (16.5/1000) under 5 years of age groups (table 2).

Table 2: Distribution of Measles cases and Death by Age group in Hamaro district of Fik zone, Ethio-Somali Region, April, 2014

Age group	population	No of cases	Age specific AR per 10,000	CFR per 100
1-4 year	11530	19	16.5	5
5-14 year	23060	8	3.5	0
>= 15 year	38914	17	4.4	0
total		44	6.1	

Index case

The first case was seen in Hardhagax kebele on April 6th , 2014 GC , the case was 2 years old of unvaccinated female child that had travel history out of their houses to karamara hospital for other medical problem during their arrival in Hardhagax kebele the child start fever and after three days started to have rash ,cough, coryza and conjunctivitis and after she went the kebele

so many visitors visit her immediately after 3 days spread to other kebeles in the woredas namely Hamaro, Dabala and Gasangas.

Distribution of cases by place

The outbreak was occurred in four kebeles of the district namely: Hardhagax, Gasangas, Dabala and Hamaro kebele. The most affected kebele in this outbreak was Hardhagax. Out of the 43 measles cases and 1 death in the four kebeles: Hardhagax 21(47.7%), Hamaro 12(27.3%), Dabala 8(18.2%) and Gasangas 3(7%) cases occurred between February 6-27th.

Table 3: Distribution of Measles cases by places in Hamaro district, Fik zone, Ethio-Somali Region, April, 2014

Kebele	**population**	**cases**	**AR/10,000**	**death**	**CFR%**
Hamaro	20,000	12	6	0	0
Hardhagax	6800	21	30	0	0
Dabala	6700	8	12	1	12.5
Gasangas	10000	3	3	0	0

Distribution of cases by time

A total of 44 and one death with CFR 1(2.2%) were registered from April 6-27, 2013. Among the total reported cases 5 were confirmed positive for measles specific IgM antibody at EPHI National measles and polio laboratory and 39 cases were suspected cases. The first index case was reported to the woreda health office on 9, 2014 and subsequently additional cases were being reported on 11 April 2014 and progressively cases were increased.

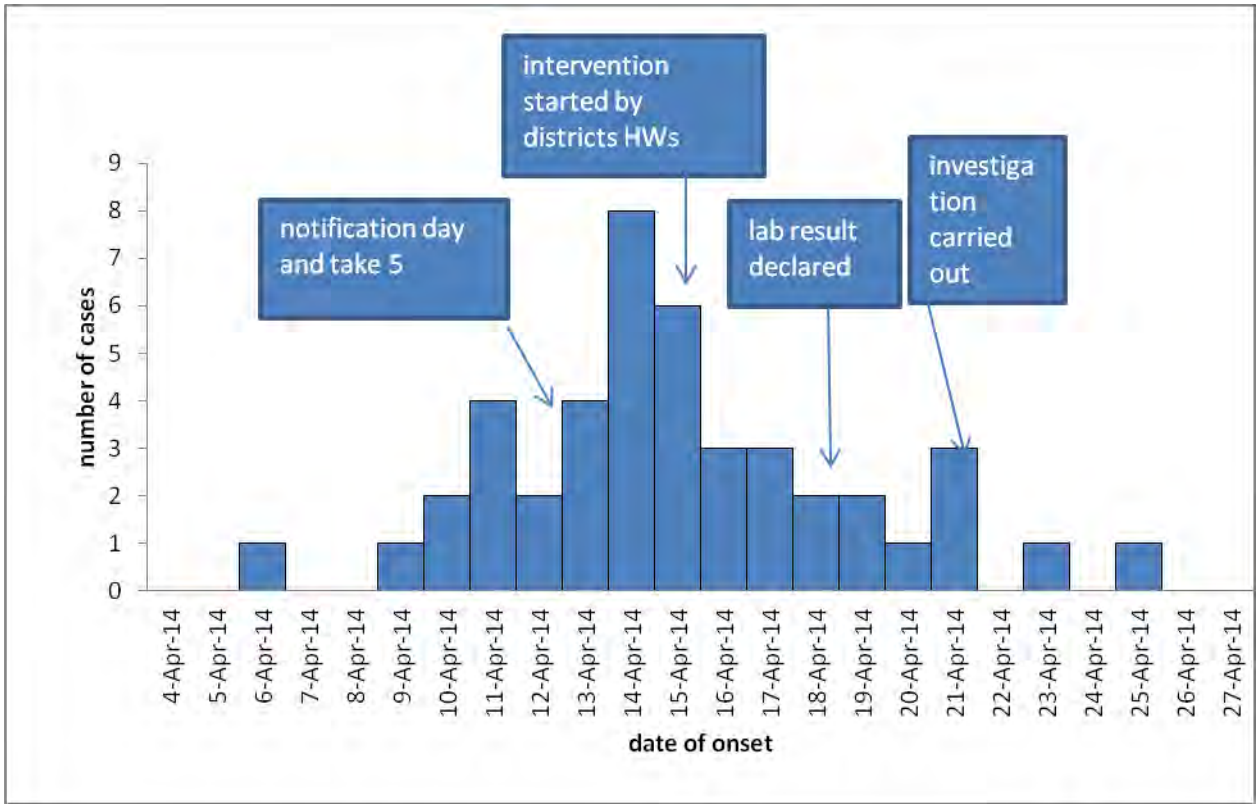


Figure 2: EPi-Curve indicating onset of measles among cases in Hamaro district, Fik Zone, Ethio-Somali Region, April, 2014

Clinical characteristics of cases

Major symptoms among interview person were fever (100%), rash (100%) and Coryza (100%) with the presence of cough (100%) and conjunctivitis (100%). Eighty percent of cases Complication were seen in: pneumonia, diarrhea and ear discharge (table 4).

Table 4: Sign and symptoms of measles cases in Hamaro district, Fik zone, Ethiopia, April/2014

Symptoms	Frequency	%
Fever	44	100
Cough	44	100
Rash	44	100
Coryza	44	100
Conjunctivitis	44	100
Diarrhea	10	23%
Ear discharge	20	45.45%

Risk factors for being cases of measles

Analytical investigation

We recruited 44 cases and 88 controls (1:2) on multi variate and Bivariate analysis: having being illiterate AOR: 15.0 (3.78-59.68), and travel history AOR: 34.8 (3.83-316.26) is statistically associated with measles cases. (Table 5*)*.

Table 5: Independent predictors of measles in Hamaro district, Somali Region, 2014

Variable	COR(95%CI)	AOR(95%CI)
Measles Transmission		
Through air	1:00	1:00
Oral/Fecal	0.5(0.21-1.55)	0.1(0.02-0.91)
Unknown	3.4(1.08-11.13)*	0.4(0.06-3.43)
Contact with case	2.1(0.73-5.95)	2.8(0.60-13.83)
Mothers Education		
Literate	1:00	1:00
Illiterate	5.4(2.25-12.93)*	15.0(3.78-59.68)*
Travel History		
Yes	6.1(1.81-22.04)*	34.8(3.83-316.26)*
No	1:00	1:00

Laboratory investigation:

Five blood samples from patients were taken and sent to EPHI on April 13, 2014. All Specimens were tested positive for measles IgM during the specified outbreak period. We found all other cases occurred in the districts were epidemiologically linked with laboratory confirmed cases.

Intervention

Cases were managed with appropriate medication by MHTs and Health workers, Mop up Vaccination campaign were conducted in the affected kebeles of targeted children between the age group 6month-15 years. Health education was given for the community members to prevent the transmission of the disease, to motivate health seeking behavior and to vaccinate their children.

Discussion

The investigation shows that the overall attack rate of measles was 6.1/10,000 lower than the attack rate reported in Nylon District Cameron which was 34/10,000(3). Our study also showed that male was more affected than female which was similar in case control study in Nylon District, Cameron (3).

Our study revealed that children whose mothers has no education were 15.0 times more likely to develop illness than those born to educated mothers and we got similar finding with case control study conducted in India which showed that children whose mother has no education were more likely to develop illness than those born to educated mothers (4) also EDHS 2011 survey indicated children whose mothers have secondary education are more likely to be fully immunized than those born to mothers with no education (6).

Majority of the cases were not vaccinated and according to the informal Woreda Health Office report Measles vaccination coverage in the woreda was around 42% that can be attributed to measles outbreak and this is in line with the findings of Arsi zone of Oromia Region (5). Measles is one of the first diseases to reappear when Vaccination coverage falls (12).

Our study revealed that children who had travel history with suspected or confirmed cases were 6.1 times more likely to develop measles cases than those who had no contact history this is in line with the evidence generated by the Ministry of Health of Zimbabwe (9).

Study limitation

- ✓ The control group were selected based on not having sign and symptoms of measles, later they may develop sign and symptoms of measles.
- ✓ Some of the cases communities mention that there is a measles case in the rural areas of Hamero District which is not accessible to reach on foot or by car even we asked to go there but they said it is not possible to go there for security reason.
- ✓ There was no woredas shape files nor ARC GIS.

Conclusion

An outbreak of confirmed measles cases occurred in Hamaro affecting primarily the age group under 5 year. Low vaccination coverage, Mothers being illiterate and travel history was likely contributing factors for measles outbreak in the Hamaro Woreda.

Recommendation

1) Should improve routine immunization and social mobilization activities in all kebeles
2) Mothers should be encouraged to be educated i.e. women empowerment
3) Health workers should educate and communicate mode of transmission of measles disease.

Reference

1) Federal Ministry of Health and WHO Ethiopia. National Guideline for measles surveillance and outbreak Management. July 2012

2) Mishra a et al. Practical observations from an epidemiological investigation of a measles outbreak in a district of India. Indian J Community Med 2009; 34:117

3) . The US Centers for Diseases Controls (CDC). Progress in measles control, 2000-.*MMWR* 2012;61(4):73-78

4) . Wolfson L, Strebel P, Gacic-Dobo M, et al. Has the 2005 measles mortality reduction goal been achieved? A natural history modeling study. Lancet 2007; 369:191—200

5) I.A Adeoye, M.D.Dairo, L.V.Adekunle, H.O. Adedokun and J.Makanjuola:. Investigation of a measles outbreak in a Rural Nigerian Community. African Journal of Microbiology Research, March 2010

6) FMOH, Central Statistics Agency (CSA).Demographic and Health survey, 2011.

7) Ministry of health and child welfare,zimbawe,immunization practice: practical guideline for health worker,

8) Kufakwanguzvarova W Pomerai[1*], Robert F Mudyiradima[2] and Notion T Gombe[1] Measles outbreak investigation in Zaka, Masvingo Province, Zimbabwe, 2010

9) New York, NY, United Nations Children's Fund Estimates developed by the UN Inter-agency Group for Child Mortality Estimation. Levels & trends in child mortality report :, 2011

10) EHNRI-PHEM. A Guideline on Measles Surveillance and Outbreak Management. Addis Ababa : Draft Document, 2012

11) . Gerald Etapelong Sume1, , André Arsène Bita Fouda1, Marie Kobela2, Salomé Nguelé3, Irène Emah2, Peter Atem1, Daddy Mbida1, Kondé Njock3. Measles, line listing, outbreak, Cameroon, Nylon Health District, pan African medical journey. November/2011

12) WHO report, Reported measles cases and incidence rates by WHO Member States 2013, 2014 as of 11 February 2015

13) The US Centers for Diseases Control (CDC), progress in measles control, 2000-2006. MMWR November 30, 2007 / 56(47);1237-1241

14) . Daba M. et al. Measles Outbreak Investigation and Response in Arsi Zone, Oromia region. Paper presented at AFENET 5th annual conference. Addis Ababa, Ethiopia.

15) Mer'Awi Aragaw1, Tesfaye Tilay2, Measles outbreak in Simada District, South Gondar Zone,Amhara Region, May – June,2009.

1.2. Outbreak Investigation of Polio virus in Warder and Bookh districts, Somali Region, Ethiopia, February 2014.

Abdifatah [1], Alemayehu B.[2] Dr.Ayele B.[2] Abebe [3]. Dr.Huseen[4]

Abstract

Background: Globally an estimated 350,000 Polio cases were reported in 1998 which then reduced to 223 in 2012(12). Ethiopia has not reported a case of WPV from April, 2008 to July, 2013. According to the laboratory result recent threat of importation of WPV to the country was linked to the recent detection of confirmed WPV in the Somalia Republic (14). Ethiopian Somali-Region remains at substantial risk (14) according to the Somali Region PHEM surveillance report: The current imported case of Doolo Zone of Ethio-Somali Region was reported on October, 2013 by Bookh and Geladin woreda by surveillance officer based on this report, the rapid response team composed of the Minister of Health, RHB including Field Epidemiology resident and WHO were organized and deployed to investigate the possible risk factors, assess immunization status, hygiene and sanitation and to take appropriate control measures.

Methods: case series study design was employed between January 1–23, 2014 in Doolo Zone. Structured questionnaire was used to collect Clinical, Epidemiological, Environmental and vaccination status of cases and sample of 25 children that live in the case settlement places aged under five years from affected villages by doing convenient survey in the reported area. Discussion was undertaken with community and health workers. Cold-chain management practice and surveillance records were observed in the affected villages.

Results: Two WPV1 cases were confirmed in Negardile and Godarhays villages of warder and Bookh District of Ethio-Somali Region. Both cases were 3 years old males who received only one dose of polio vaccine. Date of onset of paralyses was on the 21th and 22nd of October, 2013 respectively, with fever followed by sudden onset of paralysis that affected the left lower limbs. A child in Warder gave no history of contact with AFP cases but the one from Bookh gave history of travel to Somalia Republic for other treatment 30 days prior to the onset of paralyses. During observation, it was found that the Woreda cold chain temperature monitoring chart were not properly filled in Bookh and warder woredas, Vaccine was not properly arranged and some of the VVM (vaccine vial monitoring) entered second stage. Furthermore, routine immunization

was not provided in the affected kebeles, there was high population mobility, open defecation was common among elders and children and there was SIAs immunization interruption in the affected kebeles of the 50 children, where 22(44%) were not vaccinated, 14(28%) took only one dose, 6(12%) two and more dose and 8(16%) their vaccination status were unknown.

Conclusion: The investigation confirmed the existence of paralysis case and low levels of OPV immunization both in routine and SIAs in the area, poor sanitation and poor cold chain management was the possible cause of the case.

Recommendation: There is an urgent need for high quality supplemental immunization activities in the District. A thorough assessment is needed to establish a more accurate estimate of OPV coverage in the districts.

Keywords: Polio, wild polio virus outbreak, warder and Bookh District, Somali Region, Ethiopia

Introduction

Polioviruses are viruses that are transmitted from person to person following excretion in feces and pharyngeal Secretions, mainly via the hand-to-hand to mouth route because the poliovirus receptor is only expressed the infectious agent (1).

Globally From an estimated 350,000 cases in 1998 then to 223 reported cases in 2012(2).The reduction is the result of the global effort to eradicate the disease (2). In 2013, only three countries (Afghanistan, Nigeria and Pakistan) remain polio-endemic, down from more than 125 in 1988 (2).As long as a single child remains infected; children in all countries are at risk of contracting polio (3). Failure to eradicate polio from these last remaining strongholds could result in as many as 200,000 new cases every year within 10 years all over the world (3). In most countries, the global effort has expanded capacities to tackle other infectious diseases by building effective surveillance and immunization systems (14).

Ethiopia was polio free for almost three years prior to the first importation of a wild poliovirus (WPV) from Sudan in December 2004 (15). In the following years (Dec 2004 to Nov 2006), Ethiopia reported four different importations (from both Somalia and Sudan) totally forty three WPV cases (1 case in 2004; 22 in 2005, 17 in 2006, 3 in 2008) affecting four of the eleven Regions of the country (Tigray, Amhara, Oromia and Ethiopian Somali, Gambela) (15). A single detected case of poliovirus infection would be considered as an outbreak and would initiate activation of the response plan the last of this series of importations confirmed WPV was reported from Korahey zone of Somali Region in November 2006 (16).

On 9 May, 2013, the Somalia Ministry of Health reported the first confirmed case of type 1 wild poliovirus (WPV1) in a 32-month old girl from Mogadishu with onset of Acute Flaccid Paralysis (AFP) on 18 April 2013, two months later case of WPV1 from a child living in Ethiopia with date of onset July 2013 was confirmed by WHO national laboratory (16).

Woreda Health Office detected two suspected AFP cases in Negardile and Godarhays villages of Warder and Bookh district respectively of Ethio-Somali Region. Two adequate samples were collected from each case on 27th and 28th on the first case and 28th and 29th on October, 2013 the second case respectively.

The case was reported to the Federal Ministry of Health and identified as WPV Meanwhile, FMOH and RHB deployed one team to clarify and investigate the possible source of infection and risk factors like assess immunization status, environmental sanitation. The investigating team consisted of two EPHI PHEM officers, 1 from Somali Regional Health Bureau/ PHEM, 1 WHO surveillance officer, Bookh woreda health office head and deputy head of Warder Woreda Health Office.

Background of Somali Region

The Somali Region has a population of approximately 5 million, the majority of whom are pastoralists and agro-pastoralists. When Ethiopia established a Federal Government and decentralization system, the Somali National Regional State was one of the Federal states of the country. It is the second largest Regional state which contributes to 25% of the total land mass of the country and it has an estimated area of about 250,000 square kilometers. The State of Somali is located in the eastern and south eastern part of Ethiopia. The State has common boundaries with Afar and the Republic of Djibouti in the north, Kenya in the south, the State of Oromia in the west, and Somalia in the east and in the South. The capital is Jigjga located in the eastern part of the country. Administratively, Somali Regional State is sub divided in to nine administrative zones namely Fafan, Sitti, Nogob, Jerar, Korahey, Doolo, Shebelle, Afder and Liben zones. These nine zones are further divided into 68 woredas and 4 towns. The majority of the populations around 85% are pastoralists and agro-pastoralists. Population densities are highest in agro-pastoral zones, including Shebelle, Fafan and Liben. Most of the people in the Somali Region lead pastoral - nomadic lifestyle. The main source of income of the Region‘s population is driven from livestock rearing and petty trading, Small scale farming, which meet some of the consumption needs. The Region is severely under developed with poor infrastructure its population is underserved. There are areas greatly underserved and this is worsened by Hard to reach areas with some areas with no roads, areas of insecurity and porous border. The live style is more nomads and pastoralist population which moves from place to place for searching water and grass. This has created difficulties for polio eradication at present and in the past.

Literature review

In 1988, the World Health Assembly of the World Health Organization (WHO) resolved to interrupt Wild Polio Virus (WPV) transmission worldwide, and in 2012. The World Health Assembly declared the completion of Global Polio eradication a programmatic emergency for public health (*1*). By 2013, the annual number of WPV cases had decreased by >99% since 1988, and only three countries remained that had never interrupted WPV transmission: Afghanistan, Nigeria, and Pakistan. This report summarizes global progress toward polio eradication during 2013–2014 and updates previous reports(1), In 2013, a total of 416 WPV cases were reported Globally from eight countries, In 2014, as of May 20, a total of 82 WPV cases had been reported worldwide compared with 34 cases during the same period in 2013(14). To achieve polio eradication in the near future, further efforts are needed to 1) address health worker safety concerns in areas of armed conflict in priority countries, 2) to prevent further spread of WPV and new outbreaks after importation into polio-free countries, and 3) to strengthen surveillance Globally. Based on the international spread of WPV to date in 2014, the WHO Director General has issued temporary recommendations to reduce further international exportation of WPV through vaccination of persons traveling from currently polio-affected countries (1).

According to study conducted China that Surveillance among contacts of AFP cases and healthy populations, as well as serological surveys showed circulation of WPV and gaps in population immunity(8) this epidemiological findings and low immunity in young adults justify vigorous interventions(8). Children <5 years of age, particularly children <1 year of age, were most vulnerable as they had the highest WPV incidence, which was also supported by the serological surveys (8).

In Ethiopia, the CORE Group Partnership for Polio Eradication was commenced in 2000 and since then different activities in relation to polio eradication activities have been implemented (16). Currently, 12 partners of which eight PVOs and four local NGOs are agreed to implement in 52 woredas of seven Regions in the country namely Gambella, Southern Nation Nationalities People Regional State (SNNPRS), Amhara, Oromiya, Afar, Somali and Benshangule-Gumuze. They managed to reach a total of 4,717,044 people of which 2,217,010 are under fifteen while 849,067 are under five years of age and 179,247 are under one child(16). Recently CORE

awarded fund from USAID Global Bureau for Core Group Polio project for five years(16). In this connection, it was planned to conduct baseline survey for the new project which will serve for the monitoring and evaluation purpose (13).

Rationale of the study

The 59th World Health Assembly adopted a resolution on polio eradication that urged all poliomyelitis-free Member States to respond rapidly to the detection of circulating polioviruses by (a) conducting an initial investigation, (b) implementing a minimum of 3 large scale rounds of immunization campaigns so Ethiopia is one of the free member states in poliomyelitis so Teams deployed to the area with the objective of identifying possible risk factors for the occurrence of the outbreak and to institute prevention and control measure.

General Objective:

To investigate polio virus outbreak occurred two children and to describe the public health response, Doolo zone, Ethio-Somali Region, January, 2014

Specific objectives

- To assess the immunization status of under five children in the settlement
- To assess any gaps in program performance (Immunization, AFP surveillance) that may have contributed to case occurrence
- To describe intervention implemented to control this out break
- To describe environmental and social factors associated with the case

Method and Material

Study area and period

The investigation was carried out between January 11 and 23, 2014 in Warder and Bookh District in Doolo zone, Doolo Zone is one of the nine zones of Ethiopian Somali Regional State and composes of five woredas namely Warder, Danot, Galadin, Bookh and Doratole woredas. According to the CSA 2007 Housing and Population Census projection total population of the Zone for 2013 was estimated to be 328,696. Bookh and Warder woredas are among two of the woredas that have reported Polio cases and based on 2007 census, the total population of this two woredas was estimated to be 120,236 and 39,777 Respectively its population are pastoralist looking always pasture and water for their livestock. The woredas are lying in the eastern part of the zone and having long border to east central Regions (Mudug, Galgadud and Ungula) and North West Region (Sool) of Somalia Republic.

Warder Woreda has 10 kebeles with the total population of 39,777. It has 3 functional health centers and 23 health posts of which only ten health posts are functional. All health centers and 2 health posts provide routine EPI. Has also 1 Zonal Hospital in the town.

The health service delivery system of the Bookh woreda is composed of health centers and health posts. A total of 3 health centers and 18 health posts exist (13 are currently functional) with severe manpower shortage in the health centers.

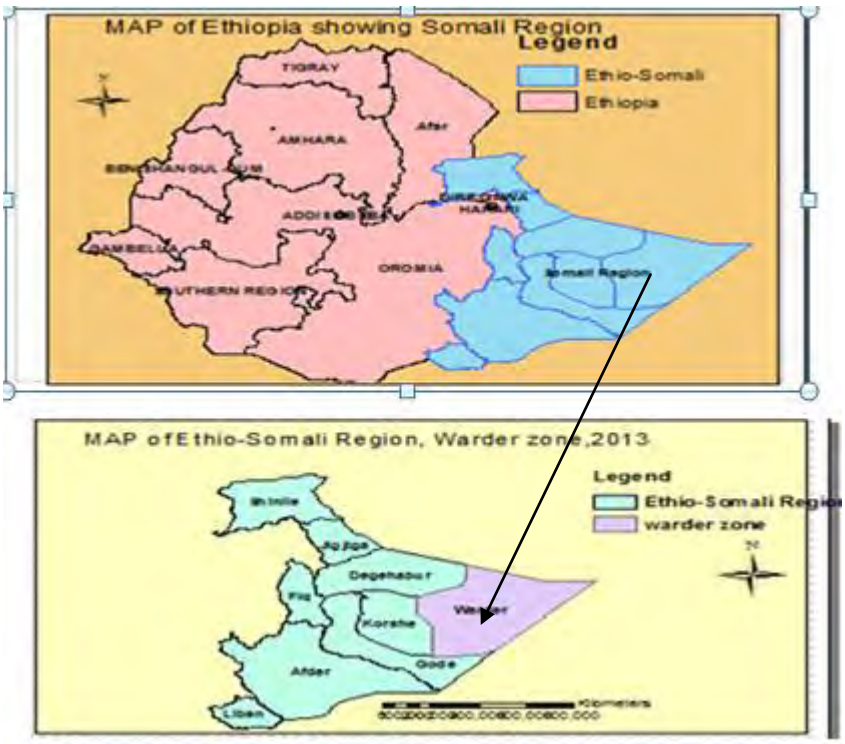


Figure 3：Map Of Ethiopia, Somali Region and Warder Zone, 2013

Data collection method

We conducted case series study. Suspected cases were defined as any child under 15 years of age with AFP or any person with paralytic illness at any age in whom the clinician Suspects poliomyelitis. A structured questionnaire was used to interview the two patients. Information was collected regarding age, gender, history of vaccination before illness, travel history, clinical presentation and socio economic status in addition to this 50 children were reviewed their immunization status(both routine and SIAs).

Case definition used.

Suspect cases: Any child under 15 years of age with AFP or any person with paralytic illness at any age in whom the clinician Suspects poliomyelitis.

Confirmed cases: A suspected case with wild poliovirus isolation in WHO accredited laboratory stool.

Epidemiological linked cases: is case which has contact with laboratory confirmed cases.

Probable poliomyelitis-any suspected case for which an alternative diagnosis is not found following clinical and epidemiological investigation.

Study design

- Case series study design was employed.

Major component of case investigation

- ✓ Case series
- ✓ Date onset, date on stool collection and date of lab confirmation
- ✓ Personal information
- ✓ Vaccination status of cases and sample 25 children in each case that live in the case settlement places aged under five from affected villages by checking health facilities records or immunization cards for caregiver if available
- ✓ Clinical history
- ✓ Travel history
- ✓ Review of immunization, routine and campaign both
- ✓ Assess surveillance performance – past and present
- ✓ Community attitude towards vaccination and paralysis (FGD)
- ✓ Environmental sanitation of the outbreak settlement kebeles.

Results

Case 1

1.1. Personal detail: 3 year old child who was confirmed as polio case in Negardale rural kebeles 10km away from the main town Warder woreda, Doolo zone of Ethiopian Somali Regional State has developed fever persisted for one day followed by sudden onset of muscle weakness of left lower leg on 21 October, 2013. The progression was maximal at onset which was involved concurrently after they make traditional massage treatment with leaves mixed with oil as result of this paralyses has decreased. The woreda health office with the help of WHO surveillance officer collected first and second stool samples on 27 October, 2013 and 28 October, 2013 respectively and sends to national polio laboratory. The stool arrived at the national lab on 29 October, 2013 and it was adequate at the time of arrival and national lab confirmation result were positive For further conformation and virus strain characterization, the specimens were sent to South Africa. The confirmed result of virus DNA sequencing from South Africa was WPV1.

The child was born from his mother Darka Abdurrahman 45 years old, she is housewife by occupation and she is illiterate and a mother of 5 children of which 3 are male. The father of child is Quranic teacher as well as cattle keepers he can read and write Arabic and he knows Quran. Both of his parents are pastoralist, the child has not been living other than in his kebele. The lab confirmation result send from federal on 22 December, 2014.

Socio economic status of the family is medium and leads pastoralist nature of living, moving from place to place for searching water and grass they fetch water from a distance place with their camel and donkey, water supply is not protected rain harvesting pond well, there was no child similarly affected in the family or neighborhood.

Figure:??????????????

The child has no any history of trauma, injection and animal bite before the onset of muscle weakness.

1.2. Contact history

There was no history of AFP travel in the 30 days prior to the onset of paralyses/weakness, there is no any close family member that travel outside of the local area but the first imported index case of Geladin woreda are close to this cases around 10 km away from this kebeles.

1.3. Vaccination history

The child has borne in warder hospital that he got one doses of immunization after one month birth, the child have never received further vaccination both SIAs and routine before the onset of paralyses and the mother told us that the nearest health facility is Negardale HP around 3km away from town but does not provide any routine immunization.

1.4. Physical examinations

During physical examination, the bulk of the muscle was unequal and the power of left lower leg was decreased while the others are normal. Thigh Muscle tone and deep tendon reflex decreased, while sensation was intact and Babinski (plantar) reflex in the left side downward. No other abnormality was detected.

Assessment: The patient has residual paralyses in the left lower limp distal and limping while walking

Case 2:

2.1. Personal detail: A 3 years old male and he is the second siblings in his family. His father is married and a father of 3 children. He is pastoralist by occupation and primary school in his education while his mother is illiterate. They live in Goderhays village of Bookh woreda which is 30 kilometer away from Bookh Kebele. The child developed acute onset of fever persisted for 3 days followed by paralysis of left lower extremity in the distal leg on 22 October, 2013.

The woreda health office with the help of WHO surveillance officer after investigation collected first and second stool samples on 28 October, 2013 and 29 October 2013 respectively and send to national polio laboratory. The stool arrived at the national lab on 31 October 2013 and it was adequate at the time of arrival and national lab confirmation result come on 22th December,2013 for further conformation and virus strain characterization, the specimens were sent to South Africa. The confirmed result of virus DNA sequencing from South Africa was WPV1.

Socio economic status of the family is low and leads pastoralist nature of living, moving from place to place for searching water and grass. They fetch water from pond rain harvesting well which is not protected, there was no child similarly affected in the family or neighborhood.

2.2. Travel history

He had travel history outside of her village to Goldegob Hospital in Somalia for other case treatment before onset of paralysis within 30 days prior of onset of paralyses. Contact history with AFP/Polio suspected or confirmed case was unknown during in Somalia country there is no any sick person with paralysis in their family.

2.3. Physical examinations

During neuromuscular examination it was found that the bulk of the muscle was not equal and the power was weak and thigh muscle tone decreased. He did not take any intramuscular injection. The paralysis affects only left lower distal leg.

Assessment: The patient has residual paralyses in the left lower distal leg and limping while walking

2.4. Vaccination history

The child have got one doses of immunization during SIAs campaign on 4th round and the mother told us that the nearest health facility is Godarheys HP around 8km away from town but does not provide any routine immunization**.**

Vaccination coverage survey

After confirmation of WPV 1 case, the OPV coverage and supplementary Immunization activities were assessed for samples of 50 children aged under five years from affected village. OPV immunization status was determined by checking health facilities records or immunization cards and related information from caregivers was also collected.

Of the 50 children, 22(44%) were not vaccinated, 14(28%) taken one dose, 6(12%) two and more dose and 8(16%) were unknown status.

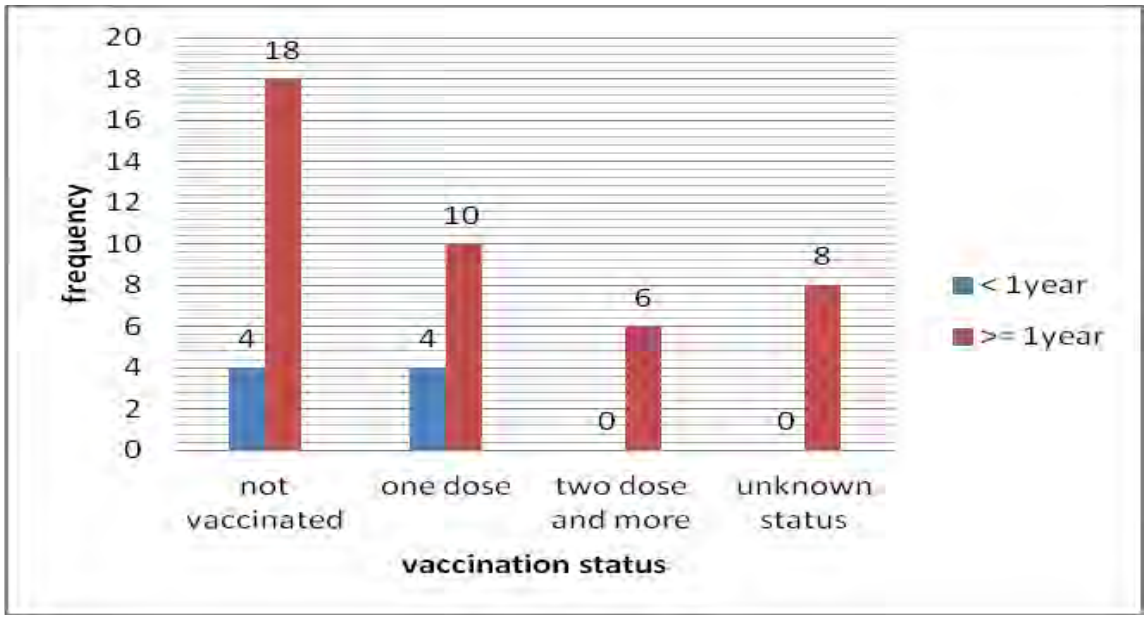


Figure 4: Age and SIA distribution of children in Negardale and Godorhays village Doolo zone. Ethio-Somali Region, 2014

All surveyed parents with zero doses gave a reason that because of absence of RI service unable to vaccinate their children and distance as an issue since there is no routine immunization service in the near village.

AFP Surveillance

Surveillance performance indicators in the zone and in the affected districts in particular have shown improvement in case detection during this outbreak

The Somali Region surveillance sensitivity particularly the detection rate has a remarkable progress. The number of zones achieved the minimum detection rate particularly the Doolo Zone has achieved more than two.

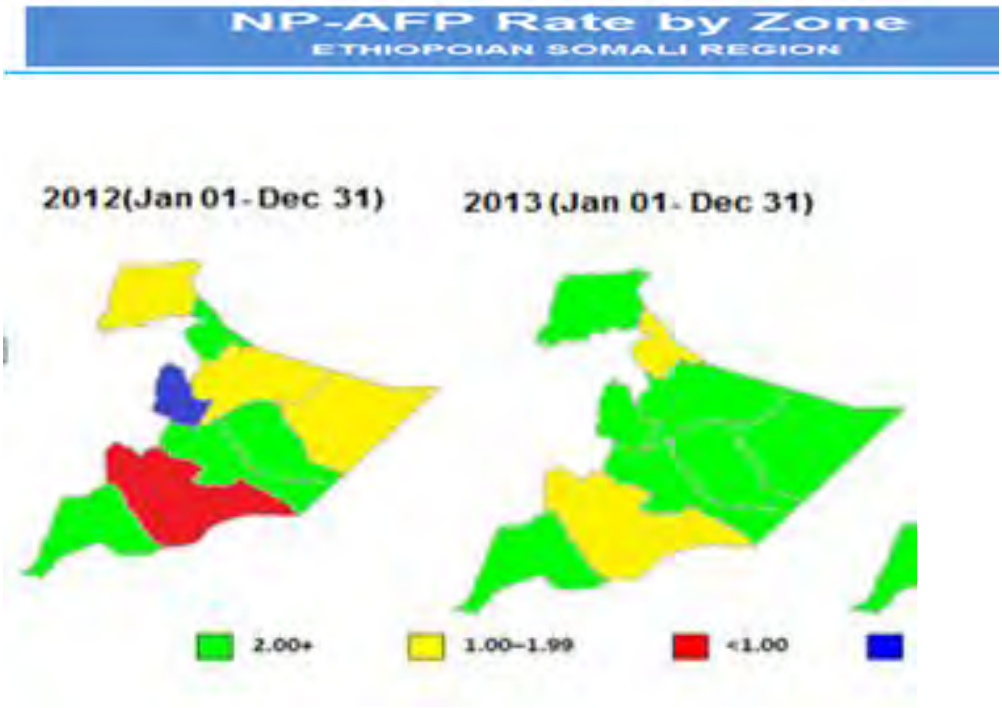


Figure 5: non polio AFP rate by zone Ethiopian Somali Region

There is persistent low stool adequacy rate at Regional and Zonal level, and the progress in this regard is slow. The achievement in 2012, 2013, Doolo woredas have not achieved the stool adequacy rate and based on this surveillance sensitivity it is difficult to exclude undetected circulation of WPV and VDPV. From the map below, it is possible to depict the improvement of stool adequacy rate compared to 2012 but the progress is very slow given the current circumstances (WHO report).

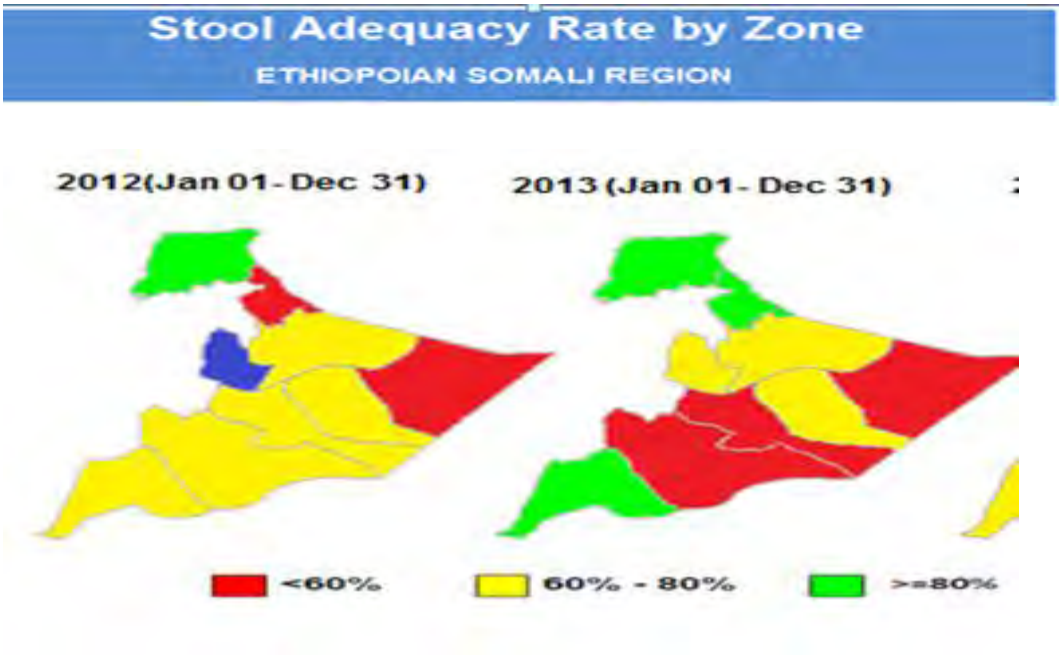


Figure 6: stool adequacy rate by zone Ethiopian Somali Region

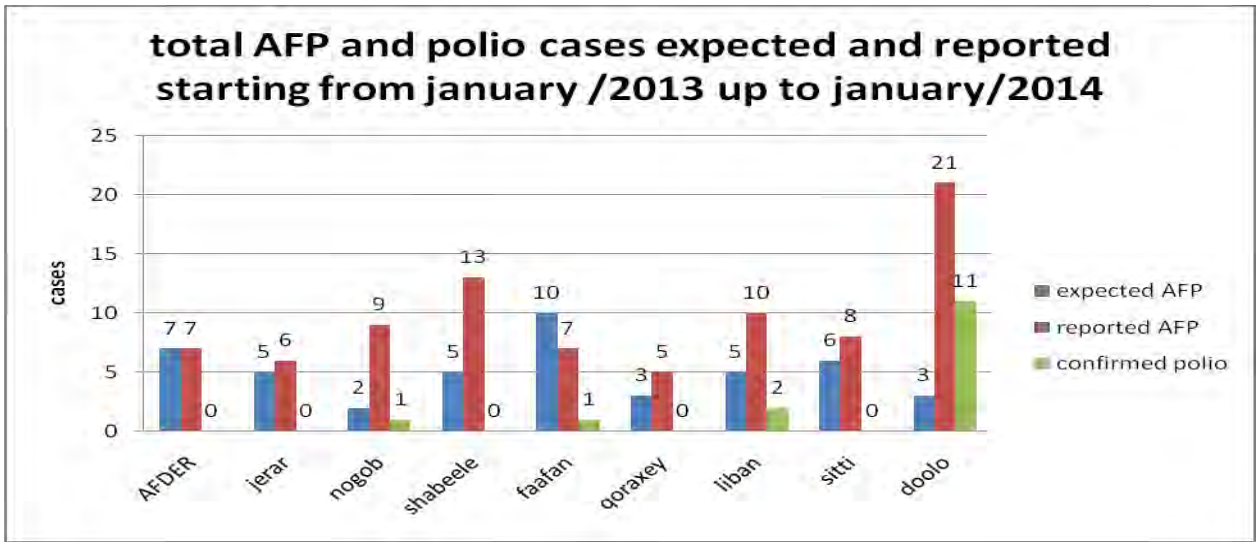


Figure 7 Total AFP and polio cases expected and reported starting from January /2013 up to January/2014.

Hygiene and environmental sanitation

Polio affected kebeles has Poor sanitation where they not have latrine. Children and elders both use to defecate outside and there is no HEWs who educate pastoral community on the advantage on hygiene and sanitation in the polio affected villages.

Public Health Intervention

A total of 5 rounds of SIA were conducted in the Ethiopian Somali Region from June 2013 to December 2014 which including preventive SIAs in response to confirmed cases in Somalia and Kenya. In that polio affected kebeles there was no RI. The SIA were carried out only in limited area of warder and Bookh district due to scattered nature of the community.

Community awareness

From the discussion extracted that the people had understood the importance of immunizing their children due to the current outbreak which they clearly stated that children are crippled because of not vaccinating their children. The opinion leaders of the community also added that the community's understanding and attitude towards vaccination of the children is in its highest peak because they have seen the impact of not vaccinating their children. However, they added "for that to sustain, there must be routine health service delivery facility which can provide routine immunization service and other health related problems because the nearest health service is too far for our community. Even further more women group asked why only polio? Where are other childhood vaccines? and women and children should be given priority.

The community elders also informed that they are ready to vaccinate their children. One of the elders told to the team that he is 90 years old and vaccinated while he was in Somalia Republic, and said this shows that we are ready for the service when it's available.

The women groups also showed similar response and they said that they and their children are those mainly affected by the lack of immunization and other services, and they go to traditional healers when they met with this condition. In the discussion it was learned that they are ready to support the surveillance by notifying child with paralysis. Once they found an AFP case first they massage. The second focus group has also the same opinion and they are willing to have their children vaccinated but they said their health post was not providing EPI service for three years and they are asking the woreda health office to establish the immunization service.

Discussion

3 year male child in Bookh district may acquire the disease during his visit for other medical treatment in Somalia countries.

Both of the two cases are less than 5 years according to study conducted in china in 2011 indicate Children <5 years of age, particularly children <1 year of age, were most vulnerable as they had the highest WPV incidence, which was also supported by the serological surveys (8).

There is no Routine immunization all children in the affected areas not taken any dose of routine which may be due to in accessibility of areas similarly an outbreak investigation in china revealed that routine immunization may be related to transit inaccessibility(8). Who live in poor and remote villages are hard to reach for immunization due to transit inaccessibility (8).
Warder and Bookh villages that Polio may affected due to their poor sanitation similarly epidemiology guideline indicate that Polioviruses are viruses that are transmitted from person to person following excretion in feces and pharyngeal Secretions, mainly via the hand-to-hand to mouth route (12) because of their defecation in the open may exacerbate the situation.

high cases of the current outbreak of paralytic poliomyelitis occur in the nomadic area of pastoral community due to the low vaccination status in rural areas and the pastoral community at rural areas are highly mobile than urban which makes favorable to import new virus to the countries This is greatly aggravated by the fact that over 85% of the population is pastoralists and lives in the forest and move from place to place searching for their animal water and grassing land. In addition to that lack of strong network of surveillance system dawn to community level coupled with weak health service in the area that are capable of capturing cases as early as possible (14).

High-quality surveillance is the key for early detection and timely response to WPV cases. AFP surveillance should satisfy the international criteria for sensitivity and timeliness with appropriate geographic representation according to the Somali Region is populated with a pastoralist population and high migration rates to and from neighboring Somalia where the current importation occur .The challenges faced the high risk areas (15). AFP surveillance is the foundation that guides and directs immunization activities and the tool to determine the extent of virus circulation and the impact of control measures (13). While in Somali Region have not

achieved standard for surveillance at District level, gaps still exist especially in hard-to-reach and border areas like Doolo District.

According to our finding immunization is very low in Bookh and Geladin district according to the EDHS indicate that the pastoralist communities in Bookh and Geladin have very low Routine immunization coverage and the traditional static are not working well in these Woredas (15).

Until the transmission of wild poliovirus is interrupted globally, it will remain possible for poliovirus to be reintroduced into a European country, as well as into other Regions of the world already free from poliomyelitis (14) as well as the previous importation has occurred in this zone therefore in order to prevent future importation of cases.

Limitation of the study

- ✓ Every household interviewed was not having any evidence for their SIAs vaccination.
- ✓ they may not remember if visitors from somewhere also come within 30 days onset of paralyses which can cause recall bias.
- ✓ No documented data in district health service on the number of AFP sample sent to the Regional Health Bureau,
- ✓ Limited study of polio outbreak investigation in Ethiopia.

Conclusion and Recommendation

The WPV outbreak occurred in two of the kebeles in Rural areas of Bookh and Geladin, male population is affected, in addition to this Risk factors that may have facilitated spread of this outbreak are gaps in vaccination coverage and lack of routine immunization , high population mobility, poor environmental sanitation therefore recommend Somali Regional Health Bureaus, Federal Ministry of Health and EPI partners should strengthen the routine immunization program in the areas affected and in the Region at large. The Region vaccination program should adopt and expand the Reaching Every Child approach (REC) especially the pastoral community to all districts in Doolo Zone within the RI improvement plan and health education to the community and sensitize health workers to consider AFP in their differential diagnosis.

Reference

1. Landiwe Siphumelele Khuzwayo[1, 2, &], Lazarus Rugare Kuonza[1, 2], Ntombenhle Judith Ngcobo[3]: Evaluating the acute flaccid paralysis surveillance system in South Africa, 2005-2009 - an analysis of secondary data

2. WHO-UNICEF Joint Strategic Action Plan for the Polio Outbreak Response in the Horn of Africa Nairobi, November 2013

3. CORE Group Ethiopia Filimona Bisrat, MD, MPH Alemayehu Worku, PhD, Core Group Polio Project Baseline Survey, September 2008

4. Jenkins HE, A.R., Gasasira A, et al. , *Implications of a circulating vaccine-derived poliovirus in Nigeria.* New Engl J Med 2010;. **362:**: p. 2360–9.

5. Mary M. Alleman,1 Kathleen A. Wannemuehler,1 William C. Weldon,2 Jean Pierre Kabuayi,3 Felly Ekofo,3 Samuel Edidi,3Audry Mulumba,4 Albert Mbule,5 Renée N. Ntumbannji,5 Tiekoura Coulibaly,5 Nadine Abiola,6 Minlangu Mpingulu,6 Kassim Sidibe,6 and M. Steven Oberste2., Factors Contributing to Outbreaks of Wild Poliovirus Type 1 Infection Involving Persons Aged ≥15 Years in the Democratic Republic of the Congo, 2010–2011, Informed by a Pre-Outbreak Poliovirus Immunity Assessment

6. Sana Ullah1*, Ghulam Nabi1, Usman Khan2, Khaista Rahman3, Fawad Aziz1., POLIOMYELITIS: A STILL PERSISTENT CHALLENGE, volume 1/November/2014

7. Varun Malhotra Army Medical Corps Colonel Medical, HQ 1 Armoured Division, C/O 56 Army Post Office, India. Poliomyelitis Eradication: Achievements and Challenges, June/2012

8. Hai-Bo Wang1,2, Wen-Zhou Yu1, Xin-Qi Wang3, Fuerhati Wushouer3, Jian-Ping Wang4, Dong-Yan Wang5,Fu-Qiang Cui1, Jing-Shan Zheng1, Ning Wen1, Yi-Xin Ji5, Chun-Xiang Fan1, Hui-Ling Wang5, Gui-Jun Ning1,Guo-Hong Huang5, Dong-Mei Yan5, Qi-Ru Su1, Da-Wei Liu1, Guo-Min Zhang1, Kathleen H Reilly6, Jing Ning3,Jian-Ping Fu4, Sha-Sha Mi4, Hui-Ming Luo1* and Wei-Zhong Yang1., An outbreak following importation of wild poliovirus in Xinjiang Uyghur Autonomous Region, China, 2011.

9. WHO, recommended standard for surveillance of selected vaccine preventable disease: vaccine and biological.geneva WHO 2003.

10. Heyman DL. Polio eradication finishing the job and protecting the investment. Bull WHO, 2004

11. Landiwe Siphumelele Khuzwayo1,2,&, Lazarus Rugare Kuonza1,2, Ntombenhle Judith Ngcobo3. Evaluating the acute flaccid paralysis surveillance system in South Africa, 2005-2009 - an analysis of secondary data, 2013

12. New York Review. *Syria's Polio Epidemic:* , in *The Suppressed Truth"*Retrieved 23 January 2014:

13. South Africa Dept of Health. EPI (SA). EPI disease surveillance field guide: guidelines for detecting, reporting, investigating and responding to EPI priority diseases. 2nd Ed. 1998

14.. *"Polio in Somalia, Kenya, Ethiopia"*, January 22, 2014. , Centers for Disease Control and Prevention.

15.Federal Ministry of Health Addis Ababa ETHIOPIA NATIONAL EXPANDED PROGRAMME ON IMMUNIZATION, COMPREHENSIVE MULTI-YEAR PLAN 2011 - 2015 December, 2010.

16.. ″ Neal Nathanson* and Olen M. Kew, From Emergence to Eradication: The Epidemiology of Poliomyelitis Deconstructed, August 24, 2010

Chapter 2: Surveillance data analyses

Measles case based surveillance data analyses, Ethio-Somali Region, 2013-2014 GC

Abdifatah[1], Alemayehu B[2]. Dr.Ayele B[3]

Author's contacts: daahir-2057@hotmail.com

Abstract

Introduction: Measles is one of Ethiopia's priority diseases selected for case based surveillance. Case-based surveillance system had not been analyzed before in Ethio-Somali Region. Therefore, in order to determine the progress made towards the National Elimination of Measles in 2020 and to determine the burden and geographic distribution of the disease measles case based data should be analyzed.

Method: The ten years (2004-2013) measles data of PHEM and WHO were retrospectively reviewed and analysis using Microsoft Excel., All confirmed measles case based data by using WHO standard measles case definition were described by persons, place and time..

Result: Out of the total of 450 confirmed measles cases reported, 308 (49.3%) were confirmed by laboratory and 142(22.6%) by Epi-link. The majority of confirmed cases, 12/100,000 were reported from urban areas. Annual prevalence rate ranged from 1.5 cases per million populations in 2004 to 18.5 cases per million populations in 2011. The median age of cases was five years. 47% of cases were unvaccinated while 31% unknown their vaccination status. Highest measles ages were seen in the age group 1-4 years 138/350,800 (39 per 100,000.).There was no seasonality seen in the reported measles cases.

Conclusion: there is a need for regular vaccination campaigns to provide higher degree of coverage as well as to improve the herd immunity in the population.

Introduction

Public health surveillance has been defined as the ongoing, systematic collection, analysis, interpretation and dissemination of data regarding a health related event for use in Public Health action to reduce mortality and to improve health [1-5]. Data generated from such public health surveillance systems is used for guiding immediate public health action, program planning and evaluation, monitor trends in the burden of disease and formulating research hypotheses (1, 3). As an essential to public health action and for surveillance purposes, the public health information systems involved need to include a variety of data sources [1,4].

Measles is one of the five major causes of childhood illnesses, which contribute to 70% of under-five morbidity and mortality (2). According to the WHO measles burden estimator, the annual cases are estimated at 1.45 million and the deaths at 69,000. According to this estimate Ethiopia contributes to 46% of the cases and 51% of the deaths from measles among eight eastern African countries (2).

In countries where the main objective is to completely interrupt measles transmission, an intensive case-based surveillance to detect, investigate and confirm every suspected measles case in the community is recommended in order to achieve measles pre-elimination, detailed analysis is recommended looking into all cases of measles that are confirmed by Laboratory or by epidemiologic linkage or are clinically compatible (3). Analyses should aim at Understanding the reasons for the occurrence of measles and obtaining clues to guide appropriate control strategies (3).

In Ethiopia, one of the pre-elimination strategies is establishing case-based measles surveillance since 2002, Ethiopia adopted these Regional goals and a strategy has been taking important steps to control measles (4). The Africa Region as well as Ethiopia is working towards measles elimination by 2020(4). One of the four important strategies is to quickly identify cases and respond to suspect outbreaks involves case-based measles surveillance (4). The primary objectives of measles surveillance are to: Detect continuing measles transmission in an area; Identify, investigate and manage outbreaks; Predict outbreaks by identifying geographic areas and age groups at high-risk and Evaluate vaccination strategies in order to improve measles control(5). Measles case-based surveillance is part of the national PHEM system and a key

component of the measles control program . Where by every a suspected measles case should be detected, reported and undergo laboratory investigation (or the first five cases in the case of outbreaks (5). The case should be investigated with serum specimen collection at first contact with the health worker, but within 28 days of rash onset (5).

The primary objectives of Measles case based surveillance data analysis are to: Detect continuing measles transmission in an area; proper planning, monitor trends in the burden of disease and formulating research hypotheses, investigate, and manage future outbreaks; Predict outbreaks by identifying geographic areas and age groups at high-risk; and Evaluate of vaccination program in order to improve measles control (6).

Rational for the analyses

Analysis of Data generated from this Measles case based surveillance system is useful for public health authority because is used for guiding immediate public health action, program planning and evaluation and monitor trends in the burden of disease in order to have proper planning in the future outbreak (12). Measles is one of the preventable diseases still causing preventable morbidity and mortality despite achieving and sustaining global measles vaccination coverage of about 80% over the past decade, worldwide measles remains the fifth leading cause of mortality among children aged less than 5 years [5] Due to lack of documented evidence, measles case based data analyses is One of the four important strategies to eliminate measles Predict outbreaks by identifying geographic areas, monitor vaccination interventions and age groups at high-risk, and measures towards progress achieving measles elimination in 2020 (1) therefore in Ethiopian Somali Regional State case it is important to carry out this data analyses.

Problem of statement

Measles is a highly contagious, serious disease caused by a virus. In 1980, before widespread vaccination, measles caused an estimated 2.6 million deaths each year (12). The disease remains one of the leading causes of death among young children globally, despite the availability of a safe and effective vaccine (1). Approximately 145,700 people died from measles in 2013 mostly children under the age of five (12). Measles is caused by a virus in the paramyxovirus family and it is normally passed through direct contact and through the air, the virus infects the mucous membranes and then spreads throughout the body (12). Measles is a human disease and is not

known to occur in animals, elimination is possible and all regions of the World Health Organization (WHO) except the South-East Asia Region have set an elimination goal to be achieved by 2020 or sooner [1,5].

During 2009-2010, Ethiopia was one of the countries in the world that experienced large Outbreaks with 4,235 reported cases (3) One of the four important strategies to eliminate measles Predict outbreaks by identifying geographic areas and age groups at high-risk; and Evaluate vaccination strategies in order to improve measles control involves case-based measles surveillance (1). In this system, each case is reported using an individual case-report form(3) Besides, epidemiology regarding measles and case based data analyses is not available in the Region ; Therefore, it is essential to carry out this study to describe the epidemiology of measles and provide information for policy maker‘s for appropriate intervention to be taken.

Literature review

Measles is the disease subject to the elimination program coordinated by the World Health Organization(Anthony Nardone 2010). Measles vaccines contain live, attenuated viruses In the African Region, is recommended that the first dose of measles vaccine (MCV1) be administered at 9 months – the age when most children have lost their maternal antibodies, There is virtually no contra-indication to measles vaccination. When correctly administered at 9 months of age, measles vaccine confers life-long protection to approximately 85% of those vaccinated (8). Childhood immunization programs have led to a dramatic decrease in measles morbidity and mortality (2). Vaccination coverage levels of 90% or more might be required before a marked reduction in incidence is seen in younger infants through herd immunity, On the other hand, epidemics of measles occur when the number of susceptible individuals in a population reaches a critical threshold Because the risk of measles outbreaks is determined by the rate of accumulation of susceptible people in the population, programs should use data on vaccination coverage to monitor the accumulation of susceptible people and conduct follow-up SIAs before the number of susceptible children of pre-school age reaches the size of a birth cohort. This approach has been found to be programmatically useful and sufficiently accurate to prevent (WHO AFRO Region guideline).

According to the study conducted in Nigerian field epidemiologists on measles case based surveillance analyses data from 2006-2009 indicate that 13809(51%) laboratory and epidemiological confirmed measles cases were present from year 2006-2009. of this 6520(47.1%) were female age information and 24% were age less than 9 month and 57% were aged 1-4 years in other numerous study the highest measles cases occur in the age less than 15 year(10).

According to study conducted by federal ministry of health in Ethiopia in collaboration with WHO Ethiopia During 2004–2009, of the 17,156 measles cases reported through the measles case-based surveillance system, 8044 (47%) were confirmed. Of the confirmed cases, 2887 (36%) were confirmed by laboratory testing and 5157 (64%) were confirmed by epidemiologic linkage of the confirmed measles cases during 2004–2009, 7958 (99%) had information on age. The mean age of these cases was 7.1 years (median [range], 4.0 years [1 month–65 years]). Of 7958 confirmed cases, 431 (6%) were aged, 9months, 244 (3%) were aged 9–12 months, 3384 (42%) were aged 1–4 years, 2967 (37%) were aged 5–14 years.

In the same study the vaccination status of 2012 confirmed cases (29%) was recorded as unknown, whereas 3022 (43%) were unvaccinated According to the study conducted in Italy Vaccination status was available for 90.3% cases were unvaccinated, 272 (5.5%) had received only one dose of measles-containing vaccine, in this study majority of cases are unvaccinated or partially vaccinated.

Objective

General objective

To asses burden of measles cases in Ethiopian Somali Regional State from 2004-20013

Specific objectives

To describe measles cases and deaths by person place and time

To assess socio demographic characteristics and vaccination status of measles case

To assess magnitude of measles cases in the Region

Method

Study area and period

The data analyses were conducted Regionally through measles case based surveillance for the period between 2-15 March /2013. The Somali Region has a population of approximately 5 million, the majority (85%) of whom is pastoralists and agro-pastoralists. When Ethiopia established a Federal Government and decentralization system Somali National Regional State was one of the Federal states of the country established it is the second largest Regional state which contributes 25% of the total land mass of the country which lies on over 350,000 square kilometers. The State of Somali is located in the Eastern and South Eastern part of Ethiopia. It has common boundaries with Afar and the Republic of Djibouti in the north, Kenya in the south, the State of Oromia in the west and Somalia in the east and in the South. The capital city is Jigjga. Administratively, Somali Region state sub divided in to nine administrative zones namely Fafan, Sitti, Nogob, Jerar, Korahey, Doolo, Shebelle, Afder and Liben zones. These nine zones are further divided into 68 woredas and 4 towns. Population densities are highest in agro-pastoral zones including Shebelle, Fafan and Liben. Most of the people in the Somali Region lead pastoral nomadic lifestyle. The main source of income in the region‘s population is driven from livestock rearing and petty trading and some Small scale farming, which meet some of the consumption needs.

There were 8 hospitals, 152 health centers and 940 health posts in the Region.

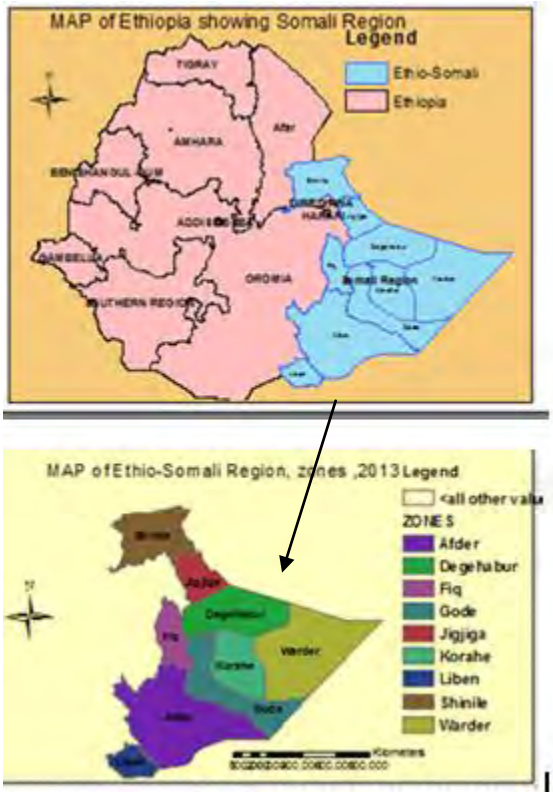


Figure 8: Ethio-Somali Region, Nine Zones, 2013

Study design

We conducted a Retrospective record review of the Regional measles case-based surveillance dataset.

Target population

Confirmed measles cases that were collected from all health facility in the Region, using case based surveillance form and sent to the national that were investigated.

Source of data

Aggregated data of measles case based surveillance reporting format Sent from district was stored at data base of WHO/RHB. The data base includes the variable: age, date of onset, vaccination status, and condition of specimen, laboratory result, in/outpatient, Sex, Rural /urban and final classification of case, suspected and confirmed outbreaks.

Data analyses

A descriptive analysis was made. All suspected measles cases that were filled in case based reporting format obtained from all Somali Districts and reported to the Region and Ethiopian public health institute (EPHI) for laboratory confirmation and those that are epidemiologically linked from the year 2004-2013 was used for analyses. Data cleansing and analyzed were made by excel 2010 software and then prominent findings of the analysis were presented on figures and tables in order to give meaningful sense.

Inclusion criteria

All cases that were sent to the Ethiopian Public Health Institute for laboratory confirmation and those confirmed by epidemiological linkage by case based format.

Exclusion criteria

-All cases suspected for measles cases and have no any epidemiological linkage

- suspect Measles cases report on weekly bases and sampled do not taken or not Epi-linked case are excluded

Population under surveillance

All the population that are living in Ethiopian Somali Regional State

Case definitions:

- Suspected measles case is defined as:

  I. Any person with Generalized maculopapular rash and fever plus one of the

  Following: cough or coryza (runny nose) or conjunctivitis (red eyes)

  ii. Any person in whom a clinician suspects measles

- WHO-AFRO defines **a suspected outbreak of measles:** As the occurrence of 5 or more reported suspected cases of measles in a Health Facility or District in one month.

- **A confirmed outbreak of measles:** is defined as 3 or more measles IgM positive

(Laboratory confirmed) cases in a health facility or district in one month.

- **Laboratory confirmed:** A suspected measles case that is investigated, including the collection of blood specimen has serological confirmation of recent measles virus infection (measles IgM positive) and had not received measles vaccination in the 30 days preceding the specimen collection.

- **Confirmed by Epidemiological linkage:** A suspected measles case that has not had a

Specimen taken for serologic confirmation and is linked (in place, person and time) to lab

Confirmed cases; i.e., living in the same or in an adjacent district with a lab confirmed case where there is a likelihood of transmission; onset of rash of the two cases being within 30 days

Of each other

NB: Confirmation by epidemiological linkage should only be done in the context of confirmed measles outbreaks

Discarded/ not measles : A suspected measles case that has been completely investigated, including the collection of adequate blood specimen, and lacks serologic evidence of recent measles virus infection (IgM negative) or is considered to have IgM positivity due to measles vaccination within the 30 days preceding the collection of a specimen.

Compatible Measles: A suspected measles case that has not had a blood specimen taken for serologic confirmation and is not linked epidemiologically to any lab confirmed case of measles. Suspected measles cases that have no definite proof of recent infection (measles IgM test indeterminate repeatedly) may also be classified as compatible.

Results

A total of 450(64.2%) were confirmed by epidemiological linkage and laboratory reported from 2004-2013 as shown in the figure below. the mean age was 8 years and median age 6 year . Giving Regional Cumulative prevalence in the 10 year period that gives 8 per 100,000 Populations (population of 5,318,000 of 2013).

.

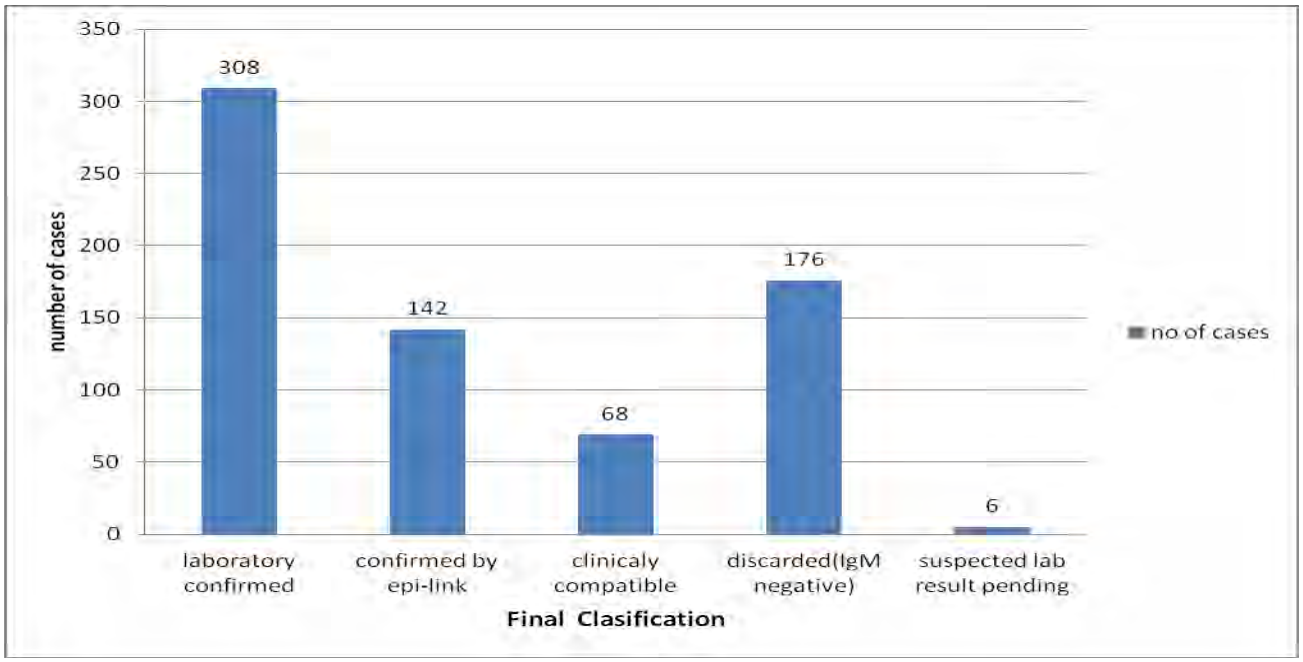


Figure 9: measles cases by final classification, Ethio-Somali Regional state, 2004-2013

Distribution By person:

Age and sex of cases

The highest attack rate was seen in the age group under 5 years which account(42%) followed by the age group 5-14 which account (39%) . The median age was 5 years (range: two months–49 years).

Table 6: Confirmed measles cases based by age Group, Ethio-Somali Region, 2004-2013 GC

Age group (year)	Eligible number	Frequency of cases	Age specific AR per 100,000	sex		Age specific mortality rate per 100
				M	F	
<1	53,200	19	35.7	10	9	0
1- 4	350,800	169	48.7	140	19	
5- 14	1,361,600	176	13	100	76	
>15	3,552,400	86	2.42	46	40	

The proportion of Males and Females among the cases reported for the period 2004 – 2013 was male population is somewhat higher than female population which account 53% of total cases.

Table 7 Distribution of confirmed measles cases by sex, Ethio-Somali Region, from 2004 to 2013 GC

Sex	**Frequency**	%	Cumulative %
F	209	46.4	46.4
M	241	53.6	100
Total	450	100	

A total of 450 who are confirmed by Epidemiological linkage and Laboratory confirmed were reported starting from 2004 up to 2013 to the EPHI from Measles Case Based format , the mean age is 8 years and median age is 5 year and highest frequency age group is 4 year.

Distribution By place

All the Zones were reported cases with prevalence varying from 0.2 per 100,000 populations to 246.6 per 100,000 populations. The highest prevalence rates were reported from two zones namely Jigjiga and Godey which accounted for 168(23.4%) out of 450 cases which are agro pastoral zones that have highest population and the lowest number of cases reported two zones Fik and Korahey which account 7 and 15 cases respectively with prevalence varying from 0.14 per 100,000 population to 0.3 per 100,000.

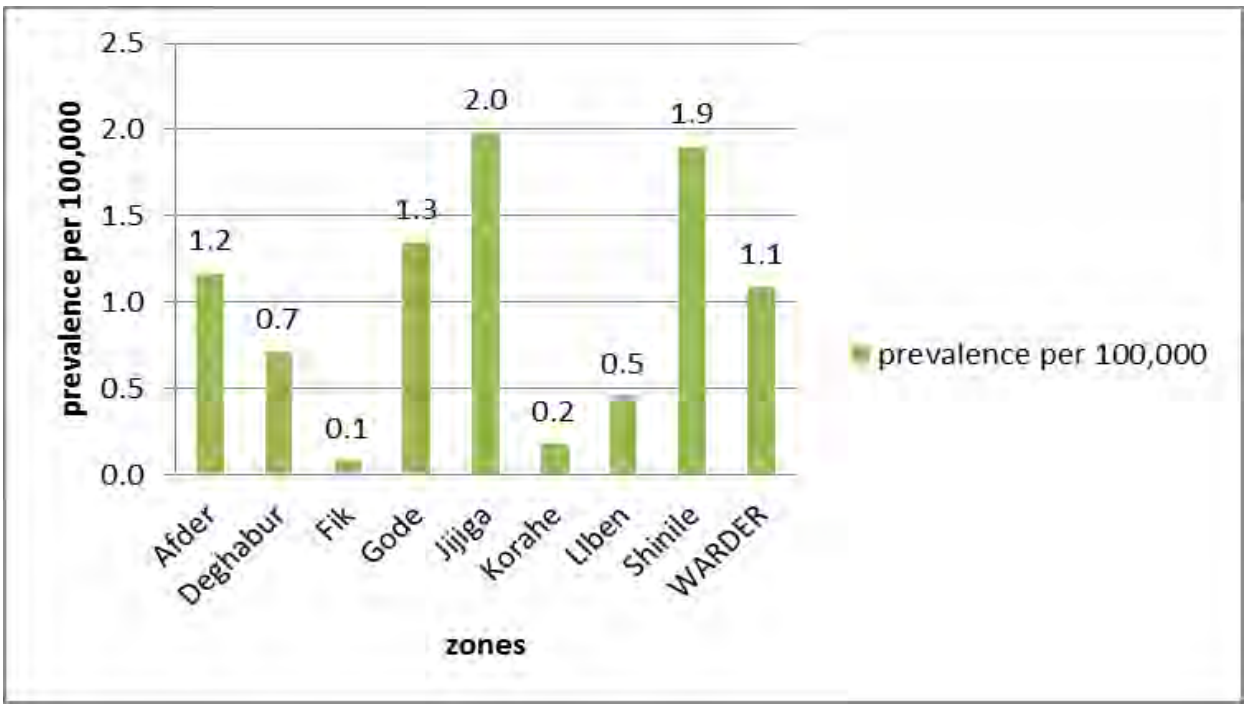


Figure 10: Confirmed Measles cases by zone, Ethio-Somali Regional State, 2004-2013

Out of total of 450 (100%) confirmed measles cases reported where the highest prevalence have seen in the urban areas which account 12 per 100,000 population while rural areas account 6 per 100,000 population of confirmed cases, 89(20%) cases had missing information in Rural and Urban issue.

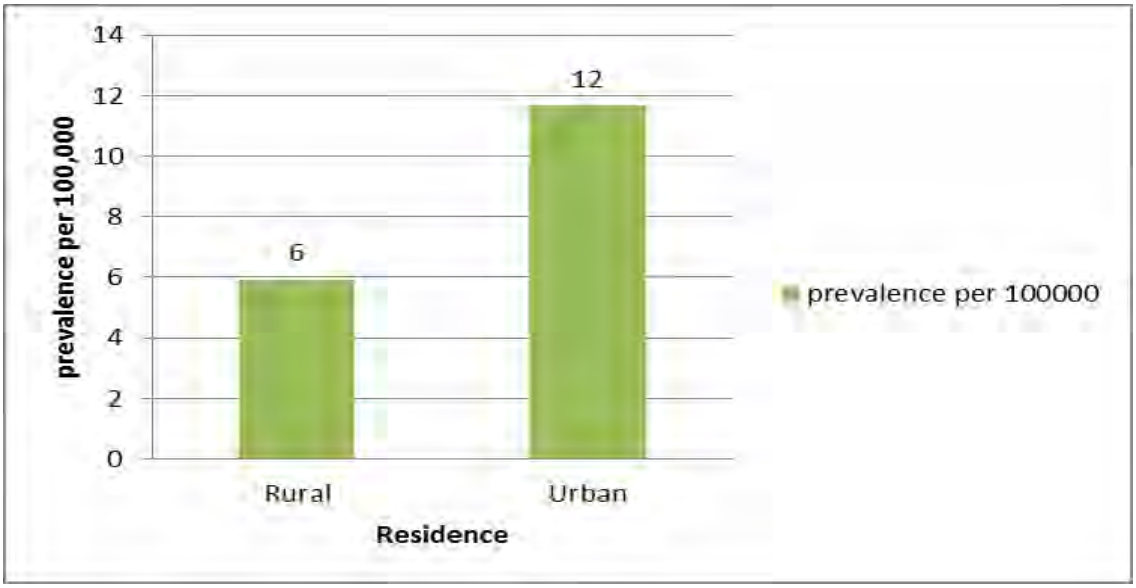


Figure 11: confirmed measles cases by urban and rural, Ethio-Somali regional state, 2004-2013

Distribution by Time

Highest cases in the year 2011 occur in the month of December. The epidemic curve shows that the numbers of cases are increasing in every two year as shown in the figure below.

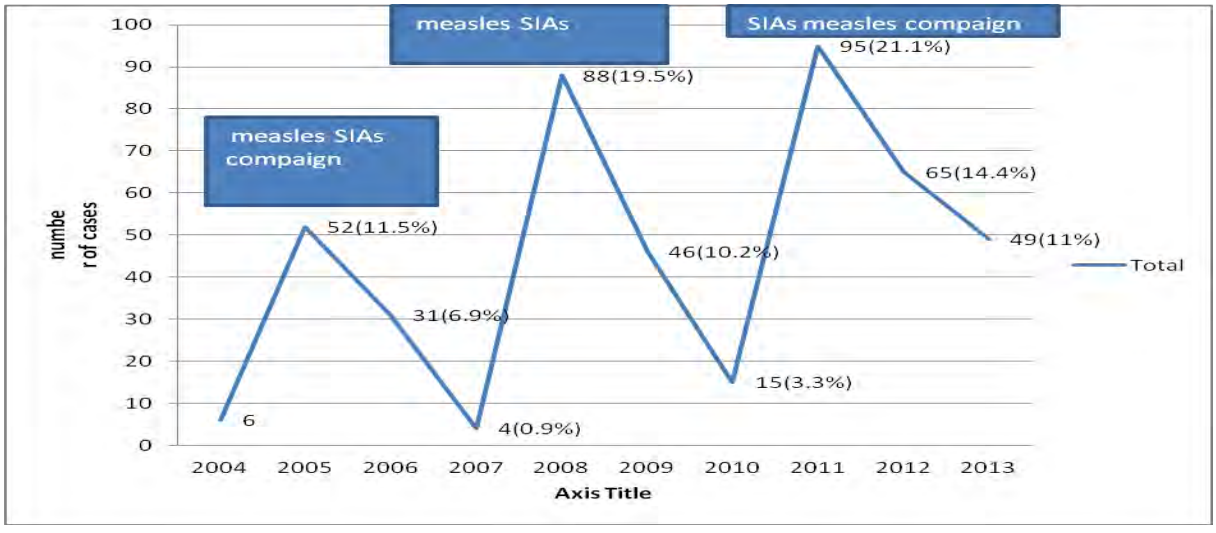


Figure: 12 temporal trends of confirmed measles cases by year, Ethio-Somali Regional state, 2004-2013

The specimen adequacy rate was range from 60% to 100% and timely transport of the specimen from 43 to 95%.

.

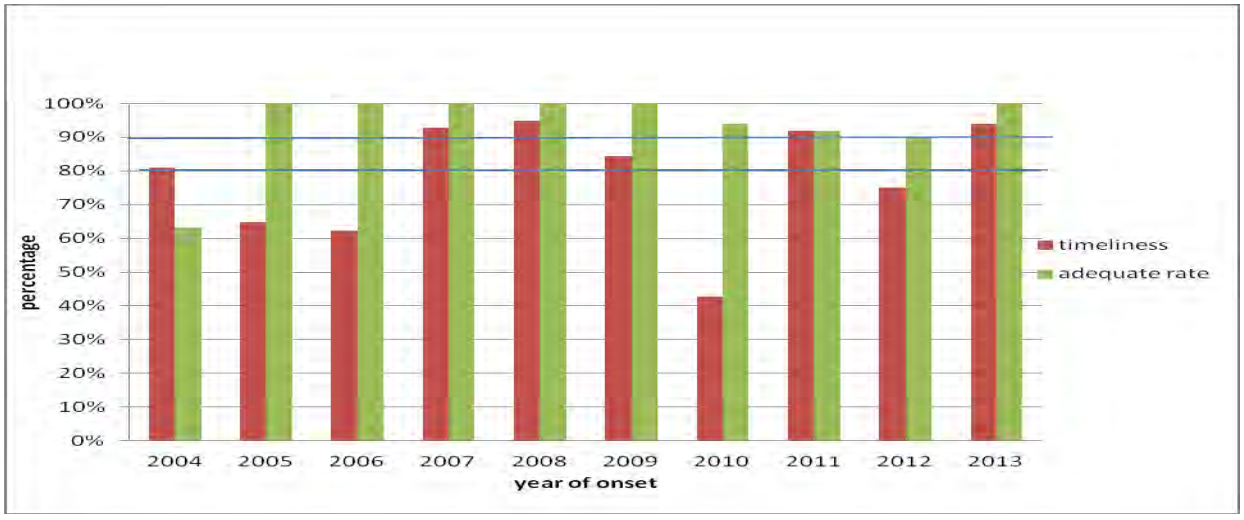


Figure 13 : Specimen adequacy and timely transport of measles by year, Ethio-Somali Regional State, 2004-2013.

From total of 439 (97.5%) confirmed measles cases. Whereas 11(3.5%) of rubella IgM positive cases were reported from 2004 up to 2013 (fig.15).

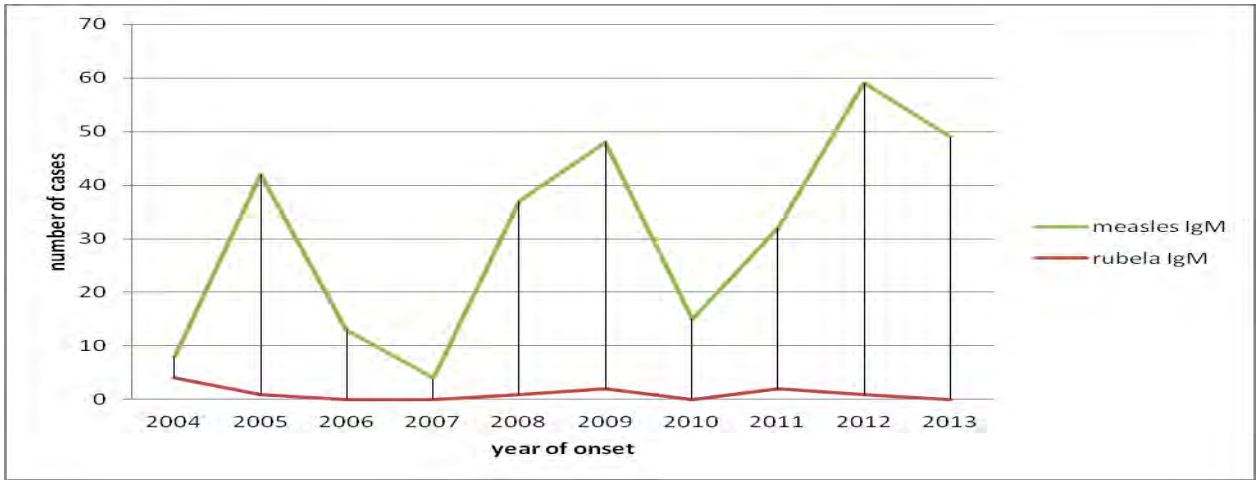


Figure 14: laboratory confirmed cases of measles and rubella, Ethio-Somali Regional State, 2004-2013.

.

Vaccination status

A total of 450 of confirmed measles cases (100%) were reported between 2004 and 2013. Overall, 218 cases (48%) were unvaccinated, 69(15%) had received only two dose of measles-containing vaccine and 1 cases (0%) had received three doses and 141(31%) cases have unknown their vaccination status.

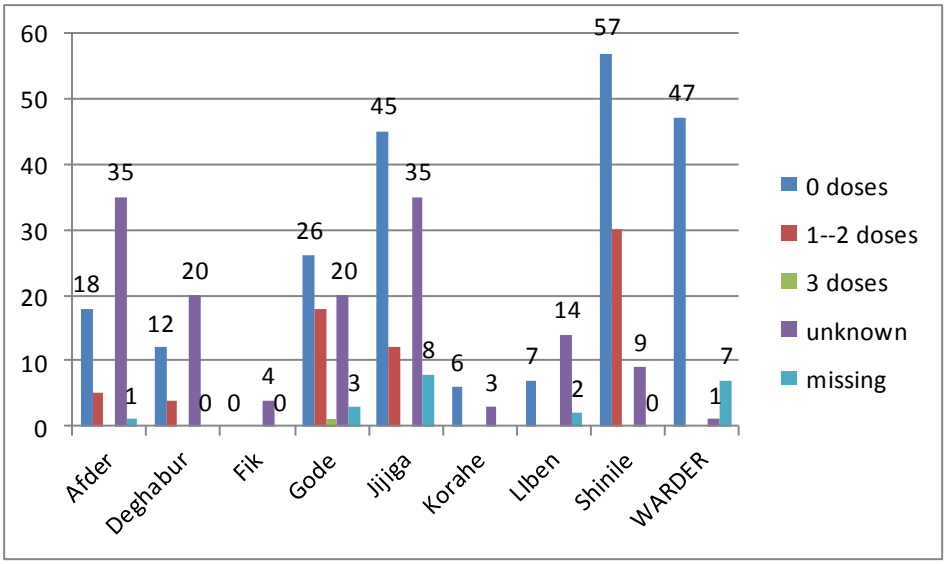


Figure 15 : Vaccination status of confirmed measles cases by Zones , Ethio-Somali Region, 2004-2013

Highest cases occur in the month of November which accounts 64 cases and second month is account 36 cases in the same year.

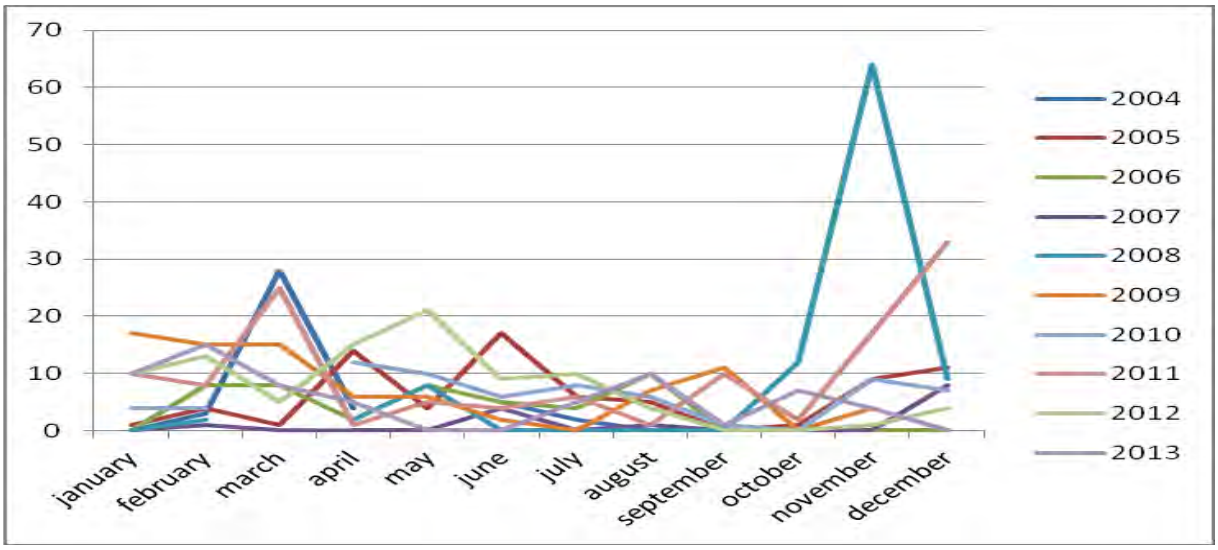


Figure 16: Trend of Suspected Measles cases by month and year, Ethiopian Somali Region,2004-2013.

Table 8: Measles Outbreaks by zone and year in Ethiopian Somali Regional State, 2004-2013

	Frequency of measles outbreak										
Name of zone	**2004**	**2005**	**2006**	**2007**	**2008**	**2009**	**2010**	**2011**	**2012**	**2013**	**Total**
Afder	0	1	4	1	0	0	3	2	8	0	
Deghabur	0	2	0	0	0	3	0	0	0	1	
Fik	0	0	1	0	0	0	0	0	0	0	
Gode	2	1	0	1	1	3	3	2	3	4	
Jijiga	2	2	0	0	0	6	2	0	2	5	
Korahe	0	1	0	0	0	0	0	0	0	0	
LIben	0	2	0	0	0	0	2	1	2	1	
Shinile	0	2	0	0	3	1	0	0	4	0	
WARDER	1	0	0	1	0	1		3	0	0	
total	5	11	5	3	4	14	10	8	19	11	88

Strength

Important variables captured by the dataset include; patient's name, age, sex, vaccination status, area of residence (by province, district), date of rash onset, in/outpatient, urban/rural, week of onset, outcome, date of first investigation (notification, specimen collection and specimen sending), dates of specimen arrival and dispatch of results from the national virology laboratory, specimen condition on arrival at national virology laboratory, Measles IgM test result, Rubella IgM test and final case classification. Feedback of the final case classification is given to the reporting facility through the same channel used for reporting.

Discussion

Majority of confirmed cases were below the age group 15 years our study is similar to study conducted in Zimbabwe that most affected age groups were the under 15 years with 53.4% of them being children between the ages of 5 – 14 were noted in other African countries in which an average 50% of cases occur in children aged 5 - 14 years [7).

Overall, reported case based measles cases has been very low comparing the frequent measles outbreak in Somali Region which may be under reporting of a significant amount of cases and lack of active case search of health professional or not reporting the cases they have treated This is consistent with findings noted by the World Health Organization in its proposal to respond to and control of the ongoing measles outbreak in Zimbabwe in 2009(7).

The specimen adequacy rate was ranged from 63 to 100% and the timely transport of the specimen was 43% to 95%.The national target of timeliness of at least 80% of specimens arriving at the laboratory within three days of specimen collection and >80% of cases with adequate specimen (One blood specimen collected within 28 days of onset of rash) (5).

As calculated according to the national measles surveillance guideline definition of outbreak, during the 10 years there were 88 outbreaks in all zones and 50% of the outbreaks were occurred in two zones Jigjiga and Godey. From total outbreaks the number of epidemiological linkage case based is very small which may be under reporting of same cases.

Measles is higher in Urban setting than Rural setting; this finding is different with the study conducted in Nigeria (11) which shows measles is common in rural setting than urban setting ; however, it may be under reporting from rural areas.

Most of the cases were not received any dose of vaccination However all children who vaccinate for measles could not develop immunity for lifelong because only 85% of children can develop immunity with in good condition of the vaccine (1). The other highest number is unknown vaccination status of measles cases this may be parents or care giver may not differentiate what type of vaccine the child received or not.

This highlights the fact that the 9 months - 15 year age group still remains a risky population for contracting measles in Ethiopian Somali Region in surveys carried out by the WHO showed that

in Malawi, mass campaign targeting at 9 months - 14 years age group was noted to reduce measles morbidity and mortality to near zero [8].

The number of measles IgM positive cases was high in all years comparing to the rubella disease indicating that most of cases who have fever and rash is most likely to be measles than rubella in Ethiopian Somali Regional State .

Most of the cases reported from Shiniile and Jigjga Zone during the 10 year (2004-2013). It needs further study, but may be the possible reasons were increased number of reporting sites, strong surveillance, highest number of population and they have mobile communication as well as majority of Godey and Jigjiga are agro pastoral community which do not move from place to place.

Limitation

Significant proportion of the data had missing information on important variables (i.e. vaccination status, residence of measles) which made meaningful review of some of these records difficult.

All suspected measles cases were not reported due to poor surveillance system so the data is not representative of all measles cases in Ethiopian Somali Regional State. .

The number of measles deaths was likely grossly underreported.

Conclusion

Highest number of measles cases reported in 2008 and 2011. Jigjiga and Shiniile Zone were reported more cases than the other zones during the ten year (2004-2013). Measles affected mostly children between 1-4 four year old are at risk. The number of rubella positive cases is much lower than measles cases. Children who had not got only dose of measles vaccine and unknown vaccination status are mostly affected. All cases of measles were not reported with case based only three to five cases reported for laboratory confirmation at a time and place. So this study does not include all Somali Region cases of measles.

Recommendations

- ✓ Routine immunization should be strengthened especially The age group under 15 years should be targeted for the SIA campaign.
- ✓ All variable should be filled properly in order to analyze all important surveillance indicators properly.
- ✓ A further study is needed why immunization is so low in Ethio – Somali Regional State.
- ✓ A further study is needed why the reporting is not sending timely in most of zones below WHO standard needs another study.
- ✓ A further study is needed why the number of cases in urban areas is higher than Rural needs another study.

Reference

1. Federal Ministry of Health and WHO Ethiopia. National Guideline for measles surveillance and outbreak investigation. April 2011.
2. Guideline for the enhanced outreach strategy (EOS) for child survival intervention-revised version-July 2005
3. German RR, Lee LM, Horan JM, Milstein RL, Pertowski CA, Waller MN; Guidelines Working Group Centers for Disease Control and Prevention (CDC). Updated guidelines for evaluating public health surveillance systems: recommendations from the Guidelines Working Group. . 2001 Jul 27; 50(RR-13):1-35; quiz CE1-7
4. Federal Ministry of Health and WHO Ethiopia. National Guideline for measles surveillance and outbreak investigation. April 2011
5. WHO AFRO (2001).Target age for supplemental immunization. WHO AFRO‘s Accelerated Measles Control Initiative. Accessed 02 August 2011
6. Kassahun Mitiku, 1 Tesfaye Bedada, 1 Balcha G. Masresha, 4 Wondimagegn Kegne, 1 Fatoumata Nafo-Traore´, 1Neghist Tesfaye, 2 and Asnakew Yigzaw3. Progress in Measles Mortality Reduction in Ethiopia, 2002–2009
7. Regis Choto1, Addmore Chadambuka1, Gerald Shambira1, Notion Gombe1, Mufuta Tshimanga1, Stanley Midzi2, Joseph Mberikunashe2. Trends in performance of the National Measles Case-Based Surveillance System, Ministry of Health and Child Welfare, Zimbabwe (1999 - 2008) Published: 11/01/2012
8. WHO Library Cataloguing-in-Publication Data, Global measles and rubella strategic plan ,2012-2020
9. WHO AFRO Measles Surveillance Guidelines, AFRICAN REGIONALGUIDELINES FOR MEASLES SURVEILLANCE, April 2011
10. Euro Surveillance. Priorities for reaching the 2015 measles elimination goal. 2013; 18(20): pi=20480.
11. A. Adeoye1, M. D. Dairo1, L. V. Adekunle1, H. O. Adedokun2 and J. Makanjuola2. Investigation of a measles outbreak in a Rural Nigerian community. African Journal of Microbiology Research Vol. 4(5), pp. 360-366, 4 March, 2010.

Chapter 3: Surveillance System Evaluation

Measles and AFP surveillance system evaluation in Shabeele zone, Eastern Ethiopian Somali Regional state, 2014.

Abdifatah[1], Alemayehu B.[2], Dr.Ayele B.[3]

Abstract:

Introduction: The Ministry of Health in Ethiopia has adopted the strategy for strengthening 20 priority diseases for Integrated Disease Surveillance and Response (IDSR) in the country. There was no any evaluation done that evaluated the AFP and Measles surveillance system in Shabeele Zone before this evaluation; therefore in order to determine whether the objectives of the system are being met so as to generate evidence based information for the improvement of the surveillance system in the zone an evaluation of the system is important.

Methods: cross sectional study was carried out in Shabeele Zone of Somali Region from December 20, 2014 - January 4, 2015, In 18 sites which were selected purposively. From the total of 10 districts, four districts were selected (Mustahil, Ferfer, East-emay and Kelafo). Information on system attributes were collected using semi structured questionnaire.

Results: Among 18 visited sites: 8 (44.4%) of them had case definition of AFP and measles, Rumor log book were not available, data were not analyzed in all of the visited health facilities, 62.5% (100% WoHo, 50% H.C, and 37.5%% H.P) received supervision visits by higher level during integrated supportive supervision, but no written feedback was observed, 3/6 (50%) of Health center had trained health workers on the new approaches of public health Emergency and none of the HEWs were trained. Surveillance scores were well for flexibility, timeliness, acceptability and usefulness, but had poor representativeness, data quality and stability.

Conclusion: - Measles and AFP surveillance system is useful, acceptable and simple. Surveillance is threatened by lack of feedback, knowledge of health worker, poor representativeness and data quality. It is important that to capacitate districts on surveillance to enable them monitor and evaluate their own performance using established indicators.

Introduction

Public Health surveillance is the ongoing systematic collection, analysis and interpretation of health related data essential for the planning, implementation and evaluation of public health interventions (1, 4). Surveillance needs to be linked to timely dissemination of the data so that effective action can be taken to prevent disease. Surveillance mechanisms include compulsory notification regarding specific diseases, specific disease registries (population-based or health facility based), continuous or repeated population surveys (1,4).

Data from a public health surveillance system can be used to guide immediate action for cases of public health importance; measure the burden of a disease (or other health-related event) including changes in related factors, the identification of populations at high risk (2).

IDSR emphasizes on capacity building at district level, integration and coordination of activities at all levels, timely feedback and use of information for action, improve laboratory capacity in support of surveillance, and community participation (3) Lack of strong surveillance system that can detect and respond to public health problem has been a common health problem in the African Region Thus, the African States through the WHO Africa Regional Office (WHO/AFRO) made a resolution (resolution AFRO/RC48/R2) in September 1998 to develop an integrated disease surveillance and response (IDSR) initiative at a Regional strategy to effectively control priority communicable diseases in the African Region (4).

The FMOH adapted a comprehensive strategy recommended by WHO for member states during the 48th Assembly in 1998 for improving communicable diseases surveillance and response through Integrated Disease Surveillance and response (IDSR) linking community, health facility, woreda and national levels. In 1999, Government of Ethiopia introduced the strategy of Integrated Disease Surveillance and Response (IDSR), which aims at controlling infectious diseases through strengthening the disease surveillance system and analyzing the data to identify the causes(5).

The purpose of evaluating this surveillance systems is to ensure surveillance system of two priority disease, Measles and AFP in Shabeele Zone that have public health importance being monitored efficiently and effectively and the evaluation will include recommendations for improving quality, efficiency and usefulness in addition to this the evaluation of this surveillance

systems will include of system attributes including simplicity, flexibility, data quality, acceptability, sensitivity, Predictive value positive, representativeness, timeliness and stability.

PHEM identified 20 top priority diseases 13 are immediately reportable whereas 7 are weekly Reportable) selected to be included into the routine surveillance and selected based on one or more of the following criteria: measles is among diseases which have high epidemic potential while poliomyelitis Required internationally under IHR (2) in addition to this, Poliovirus is among Diseases targeted for eradication (poliomyelitis due to wild-type poliovirus. Diseases that have available effective control and prevention measures for addressing the public health problem they pose (6).

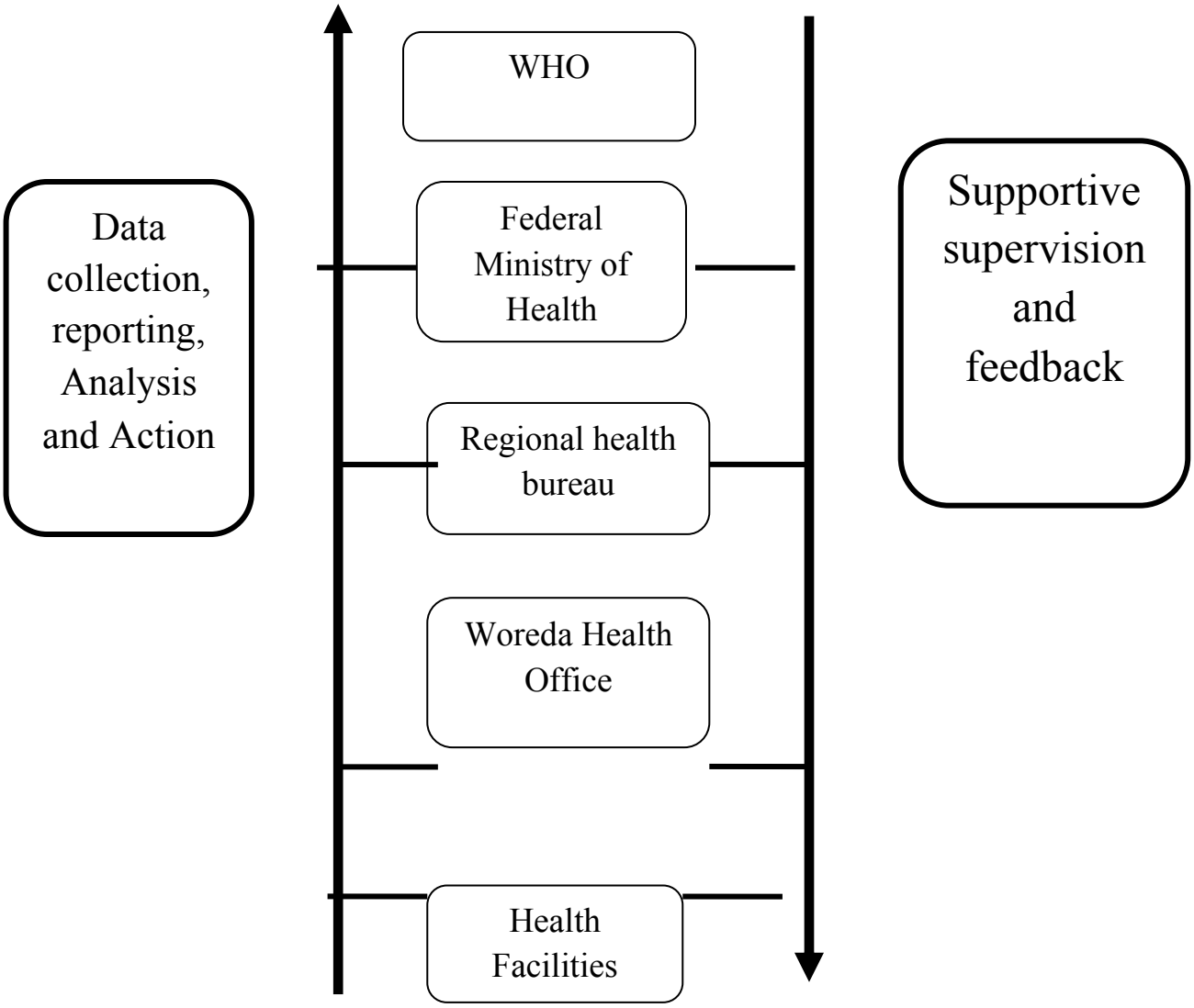


Figure 1: Data and information flow in IDSR indicating varying cycles at various levels

(Source: Ministry of Health, Federal Democratic Republic of Ethiopia. National Technical Integrated Disease Surveillance and Response Guideline, Version 1.1.September 2002).

Rationale of the study

As the momentum to scale up the Regional response to Measles and AFP that required internationally under IHR 2005 that can be prevented by strengthening surveillance system Public Health Emergency core process need to constantly review their performance in detecting and responding to these two diseases. In Shabeele Zone surveillance system evaluation was not done before, and it has long border with Somalia Republic where importation on Polio cases occur in 2006 so in order to know the effectiveness of this surveillance system evaluation, PHEM head recommend me to evaluate AFP and Measles surveillance system.

General objectives

- ✓ To conduct in depth review of the existing of Measles and AFP surveillance system in Shabeele zone, Somali Region Eastern Ethiopia , December 20/2014- January 4/2015

Specific objectives

- To assess the core activities of the surveillance system such as case detection, reporting, analysis and training in Shebelle zone.
- To evaluate the surveillance system attributes of measles and AFP/ polio in Shebelle zone.
- To provide constructive Recommendations based on finding for improvement of measles and AFP surveillance system in Ethiopia, Somali Region, and Shebelle Zone.

Method and material

Study Area and Population

This evaluation was carried out in Somali Regional State, Shabeele Zone; the Zone is located in western part of Somali Regional State at a distance of 1240 KM south east from Addis Ababa. According to the 2012 population projection the zone has a total of 527,286 populations and has 7 Woredas and one administration Council City. The evaluation was conducted in Kelafo, Ferfer, Mustahil and East-emay woredas.

Figure 17: Ethio-Somali Region, Shabeele Zone, 2013

Study subject

The evaluation subjects were Woreda Health Offices and health facilities (health centers and health posts) found in the zone.

Study Design and Period

A cross-sectional descriptive study was conducted from December 20- January 4, 2014 in Shabeele Zone in eastern Ethiopia.

Sample Size and Sampling Technique

First, purposive sampling was used to select one zone on the basis for its low measles cases and bordering with another country compared with other zones of the Region. Then, four woredas, three health center and 8 health posts were selected presenting with good and bad surveillance practice as judged by Woreda Health Offices. All surveillance focal persons in the selected health facilities and office were included in the study.

Evaluation Units

The evaluation subjects were the Woreda Health Offices and health facilities. A total of 18 study sites (four woredas, 6 health centers and 8 health posts) were included in the study, this included governmental Health Centers and Health posts and woreda.

Data Collection Method

Data were collected using semi-structure questionnaire and observation using this instrument woreda head and surveillance officers in the selected woredas and health facilities surveillance officers and at the Regional level PHEM officer were interviewed. Secondary data source, such as surveillance report for the last one year completeness and timeliness of AFP and measles surveillance data, supervision report, surveillance formats minute of meeting, woreda health plan and written feedbacks were reviewed. Review of weekly surveillance report submitted by all selected health facilities was conducted.

Ethical clearance

This evaluation was conducted to assess the functionality of the surveillance system for measles, and AFP Where the study subjects were health institutions which were found in the zone. Therefore, Ethical clearance was not necessary for this study, because there is no direct contact with patients or community.

Dissemination of study result

The evaluation result was disseminated to AAU School of Public Health, Department of Preventive Medicine, Ethiopian Field Epidemiology Training Program (EFETP), EPHA, ESRHB, Shebelle Zonal focal person and visited woreda health offices in hard copy and soft copy.

Standard Cases definition

AFP/ polio

Suspected

Any child under 15 years of age with AFP or any person with paralytic illness at any age in whom the clinician suspects poliomyelitis.

Confirmed

A suspected AFP case with wild poliovirus isolated from his stool.

Measles

Suspected

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

Confirmed

A suspected case with laboratory confirmation (positive IgM antibody) or epidemiological link to confirmed cases in an epidemic.

Method of assessment

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

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

Case registration: is the process of recording the identified cases.

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

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

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

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

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

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

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

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

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

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

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

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

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

Result

Targeted diseases under surveillance and included under this study

Resource is very scarce and it needs prioritization. Due to shortage time and other resources, surveillance could not carried out for all diseases and conditions, for that reason, Federal Ministry of Health of the Public Health Emergency Management core process given prioritization to those diseases that are of interest at national and international levels. Based on this PHEM core process selected 20 diseases to be included into the routine surveillance system. Of those, measles and AFP are reported immediately and weekly. Of those targeted diseases under surveillance: measles and AFP were targeted because of their international concern in this evaluation.

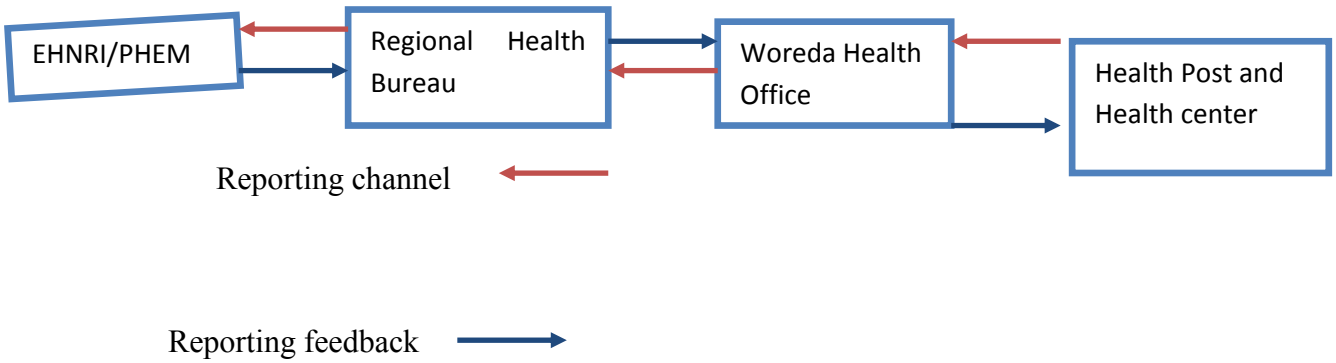


Figure 18: Flow chart of the surveillance reporting system and feedback of Shabeele zone, Somali Region, Ethiopia, 2014.

Population under surveillance

The populations in the catchment area of the selected health facilities, including all health posts under the selected health centers were included. The surveillance system encourages community participation to detect and respond disease epidemics through the Health Extension Program**.**

Availability of case definition, clinical register and surveillance manuals

According to the Ethiopia PHEM guideline, there are two types of case definition: standard case and community case definition.

Table: 19: list of weekly and immediately reportable disease in Ethiopia

Immediately reportable		Weekly reportable	
1	Measles	1	Malaria
2	Acute Flaccid Paralysis (AFP) /Polio	2	Meningococcal Meningitis
3	Yellow Fever	3	Typhoid fever
4	Anthrax	4	Epidemic typhus
5	Guinea warm/ Dracunculiasis	5	Sever Acute Malnutrition
6	Viral hemorrhagic fever (VHF)	6	Relapsing fever
7	Avian Human influenza	7	Dysentery
8	Rabies	8	Maternal mortality rate
9	NNT		
10	Pandemic influenza (H1N1)		
11	Cholera		
12	Small pox		
13	Sever acute respiratory syndrome (SARS)		

.

According to the assessment, from 18 visited sites 8 (44.4%%) of them had case definition for AFP and Measles ,Clinical register was found in all of visited health centers and health post, but rumor log book was not available in all of the visited health facilities. In addition to this all reporting format were not distributed to all health posts and they report on white paper which they do not document as they told us. In addition to that, in Ferfer woreda health office did not report to the Regional Health Bureau due to lack of training and reporting format.

Table 9 : Availability of case definition, clinical register, Guidelines, Rumor log book and CBRF in visited health facilities Shabeele zone, Ethio-Somali region, 2014

s/n	**Variable**	**Health Post**	**Health Center**	**Woreda health office**
1	Availability of case definition (measles& AFP)	2(25%)	3(50%)	3(75%)
2	Availability of clinical register	8(100%)	6(100%)	0(0%)
3	Availability of AFP and measles Guide lines	0(0%)	0(0%)	3(75%)
4	IDSR for measles & AFP (2006)			
5	PHEM guideline	0(0%)	0(0%)	2(50%)
5	Updated Measles (2012)	0(0%)	1(16.7%)	3(75%)
6	Updated AFP/ Polio	0(0%)	2(33.3%)	3(75%)
7	Availability of rumor log book	0	0	2(50%)
8	Weekly report format	0	2(50%)	3(75%)
9	CBRF for measles and AFP	0	0	3(75%)

Data analysis

In all of the visited woredas and health facilities, all of them did not analyze the data collected from health facilities, but the Regional Health Bureau analyzes and follows trend for measles and AFP, Moreover, data analysis were done on regular basis in the Regional Health Bureau and there is no computer in surveillance focal persons at health facilities level. There is no person trained for surveillance data analyses.

Report completeness

Shabeele zone report were received from 8 woreda out of 10 woreda .Because of lack of infrastructure like telephone and internet services, all of the visited woredas were collecting weekly surveillance report from health facilities using mobile telephone and line number in addition to this Mobile Health Team used to collect weekly surveillance report in East-emay,

Kelafo and Mustahil woredas most of the health facilities that do not have network (in hard copy except Ferfer woreda where they need only training and reporting formats if they get this they can send weekly report format as woreda health office head told us.

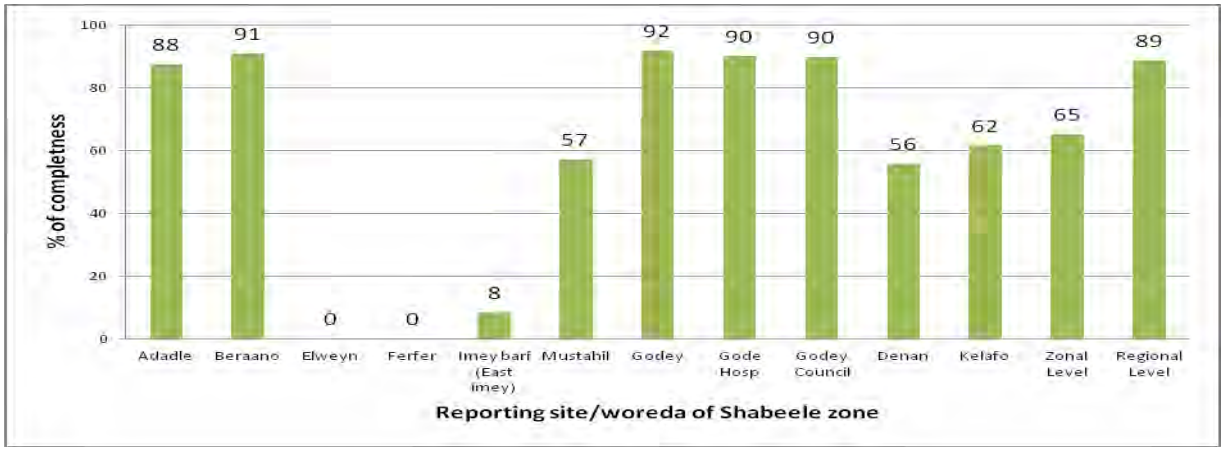


Figure 20: weekly PHEM report completeness in Shabeele zone, Ethio-Somali region, 2014

When we see the report completeness rate of governmental health facilities by woreda, almost 70% of woredas found in Shabeele Zone had completeness rate of 65%(Regional PHEM data) even though there is no data analyses done at woreda level and most of the visited health facilities do not have even reporting format. On the other hand, in all woredas didn‘t receive weekly report from those private health facilities.

Outbreak investigation

All the respondents from assessed Woreda Health Officer responded that, they had not investigated any outbreaks. As a result they did not know threshold level of measles and AFP priority disease; In addition to that, there were neither written documents nor standard procedures for outbreak investigation. During the assessment only two woreda health offices get for AFP investigation format. A total of 5 cases of suspected measles were reported.

Supervisions and Feedback

In 2014 from visited sites 28% (100% WoHo, 50% H.C, and 37.5%% H.P) of them were supervised by higher level during integrated supportive supervision and none of them have surveillance supportive supervision checklist (table10).

Table 10: Availability of support supervision and feedback in the visited health facilities in Shabeele zone, Ethio-Somali Region, 2014

S/N	Variable	Woreda health office (N=4)	Health center (N=6)	Health post (8)
1	Specific supportive supervision to lower level	0	0	0
2	Integrated supportive supervision to lower level	4	3	3
3	Availability of supervision plan	0	0	0
4	Availability supportive supervision checklist	0	0	0
5	Availability of feedback book	0	0	0

Training

All woreda surveillance focal person staffs working in PHEM department were trained short term training on selected priority diseases (such as Measles and AFP) by Regional Health Bureau and WHO From all visited sites, 3 (75%) woredas health offices, 3/6 (60%) health centers and none of health post staff were assigned PHEM officer/ focal person. Of those assigned PHEM officers, 3/6 (50%) of them were trained on the new approaches of Public Health Emergency Management (PHEM) and selected surveillance priority diseases (such as Measles, AFP); On the other hand, according assessment report all Health Extension Workers (HEWs) which are working in the Zone were not trained on surveillance system and selected priority diseases such as Measles and AFP/polio. But during the assessment time from interviewed health extension workers none of the HEW attended the PHEM training.

Resources

From visited Health Offices 3 (75%) and Health Centers 3/6 (50%) were compile weekly PHEM report manually. from Woreda Health Office and Health Centers surveillance focal person were not have computer skill on Microsoft office application. Regarding availability of computer and printer, woreda PHEM unit have computer, printer and telephone for HMIS data management

and communication;. Furthermore, visited Health Centers had no computer and printer. (table 11).

Table 11: Availability of resource for PHEM activities in visited sites of Shabeele Zone, Ethio-Somali Region, 2014

Sino.	Materials/ Item	Woreda (N=4)	H.Cs (N=6)	HP(8)
1	Electricity	100%	50%	0%
2	Bicycles	0%	0%	0%
3	motor cycle	100%	50%	0%
4	Vehicle	0%	0%	0%
5	Computer	100%	0%	0%
6	Printer	100%	0%	0%
7	Fax	0%	0%	0%
8	Line Telephone	100%	0%	0%
9	Private Mobile	100%	66.7%	50%
10	Internet service	0%	0%	0%

Description of attributes of the surveillance system

Usefulness

All visited health institution respondents have common understanding on usefulness of existences of public health surveillance system.

Districts reported; lack of concerned experts, attention from the higher level, low enforcement to private facilities, lack of budget on surveillance and lack of vehicle on surveillance system was identified problems to be solved in order to improve the usefulness of the surveillance system.

Measles

Regionally in 2014 a total of 268 cases were reported in measles suspected cases. Of these cases 5 (2%) were reported from Shabeele zone in which all this cases in Shabeele zone become measles IgM positive. Measles and AFP cases have not frequently reported from this zone which may be due to poor detection of measles and AFP cases.

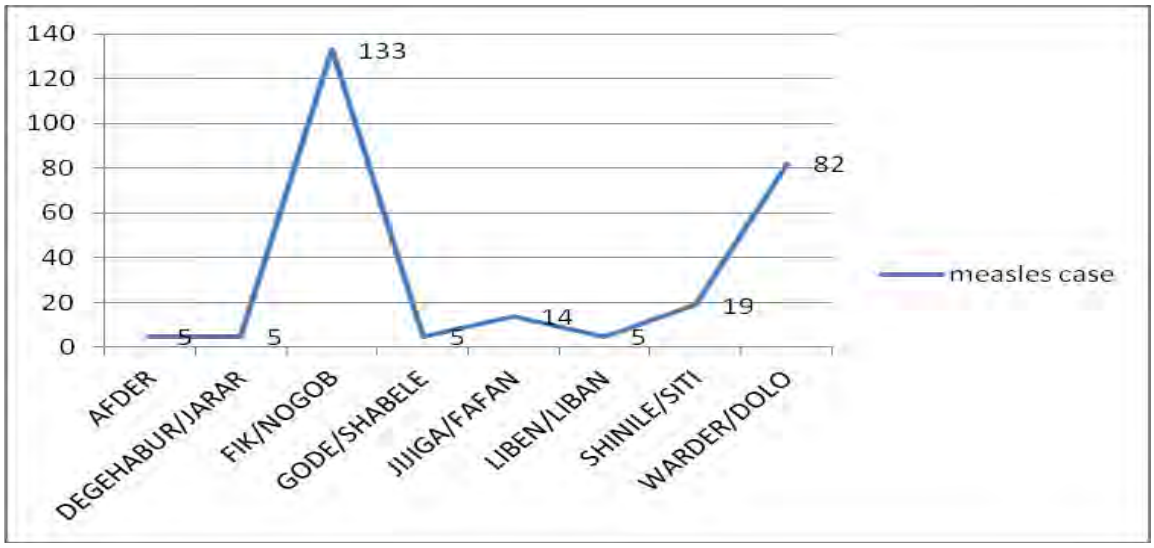


Fig 11: Measles cases that is reported from nine zones of Ethio-Somali Region, 2014

AFP (Acute Flaccid Paralyses)

Regional it was expecting to send 47 but 119 AFP suspected cases were reported regionally 253% in 2014. Of these 10 (8.4%) suspected cases were from Shabeele zone with adequate stool Out of this 10 cases two Kelafo, two Mustahil , two Godey and two from Denan woredas were reported.

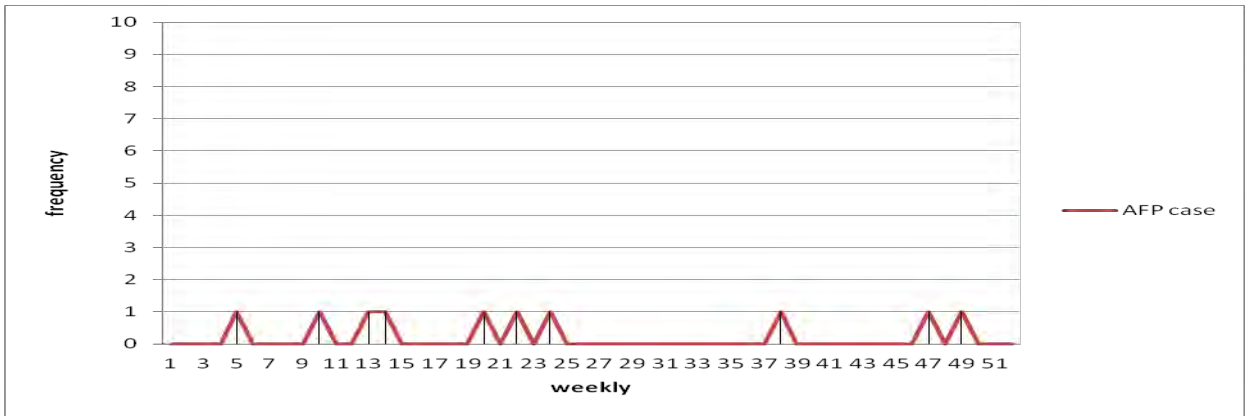


Figure 21: Trend of AFP suspect cases in Shabeele Zone, Ethio-Somali Region, 2014

Timeliness

Timeliness of reporting was 100% for the visited health facilities.

Simplicity

All interviewed respondents from Health Office and focal person in Health Center were replied that the case definition is easily understandable and simple to any Health care provider and health Office staffs but HEWs replied that most of the case definition is written in English which is very difficult to understand.

All system use Registration book of the Health Facilities as the source of information, registration at the Health Facilities level takes from short time and then focal person aggregate on weekly basis if there is no any outbreak and transmitted to the higher level which cannot take more than 15 minute.

Sensitivity

Measles and AFP surveillance system in Ethiopia use WHO standard case definition for health worker at total 0f 10 and 9 cases of Measles and AFP were detected respectively in this Zones,

Lack of laboratory sampling taking at the Health Posts and technical and logistic capacity of the health facilities in detection undermine the burden of cases in the community and hence the sensitivity of the surveillance to pick cases could be minimal.

Acceptability

In this case the participants of the surveillance system are health facilities, health offices and health workers and the community as well; therefore, all the mentioned agents accept and are well engaged to the surveillance activities. Even though they mentioned that they send the report

from their mobile without the presence of assigned budget. Health posts staff did not accept on the importance of surveillance system because they do not understand the reporting format language.

Flexibility

In the visited Woredas and Health Facilities, all health workers knew that the weekly form can be used to notify new diseases the reporting format is open for newly emerged and re-emerging diseases and conditions that the existing surveillance system is flexible.

Positive predictive value/ cases definition ability

PVP surveillance system is calculated as per the guideline PVP is represented by A/A+B. where A is true positive cases, B is false positive cases .Since woreda in Shabeele zone PVP = 5/5+0 = 100%.

Representativeness

Most of the respondents reported that surveillance data was not submitted from the peripheral health posts; Represent in terms of person and time cannot be calculated as the population of each health facilities is not available. It is difficult to cover all health facilities due to lack of communication methods, geographical inaccessibility.

Stability

Lack of surveillance budget in the woredas when they communicate information by telephone they will not be charged by the system which they do the work by their own cost and it was folded and thrown in inaccessible areas for use; Therefore, the government does not allocate fund for surveillance activities except for outbreak response only the nongovernmental organizations allocate fund for surveillance, preparedness and response activity which is major issues noted for sustainability.

Data quality

Health posts on the assessed HEWs not have training on the country priority disease, there is no data sent by health facilities and they do not have the capacity to detect this disease which makes difficult to understand in the format however 50% of the reporting format in the visited health center with necessary information including zero reports is available.

Discussion

The study was conducted to assess measles and AFP surveillance system attribute usefulness of system, data quality, availability of format, training of health workers in this study knowledge of Health extension workers is very low on lack of knowledge can result in health extension workers low index of suspicion of cases of measles and AFP another study conducted in Zimbabwe (9) on Notifiable disease surveillance evaluation indicate that knowledge of Notifiable disease surveillance among health workers was low. Lack of knowledge can result in health workers having a low index of suspicion of cases of Notifiable diseases or failing to report Notifiable disease another outbreak investigation in Nigeria(17) indicate that investigations and control of outbreaks. In Nigeria, in an evaluation of the Notifiable Disease Surveillance System, found that 38% knew about the Notifiable disease surveillance.

In this surveillance evaluation poor performance of data is due to lack of knowledge in Health extension workers who are intends to work peripheral area however the study did not the effect of training performance in health extension worker according to the CDC guideline Quality of data is influenced by the performance of the screening and diagnostic tests (i.e., the case definition) for the health-related event, the clarity of hardcopy or electronic surveillance forms, the quality of training and supervision of persons who complete these surveillance forms, and the care exercised in data management (12).

Measles and AFP cases have not frequently reported from this zone which may be due to poor detection of measles and AFP cases.

Surveillance is a systematic collection, analysis, and interpretation of health and health related data (2, 10). Therefore, the absence of performing data analysis regularly may hinder early detection of health events and taking appropriate controlling and preventive actions before the events are causing more illness and disability in the community (12).

Supervision to health facilities is very low and in addition to this there is no written feedback available in all woredas of Shabeele zone. According to the surveillance guideline in AFRO Region Supervision and feed backing system should be conducted with a regular time interval (10). Feedback concerning surveillance performance and results may be given in written form or verbally during on-site supervisory visits and during the periodic surveillance review meetings in

the studied health institutions none of them were conducted on written feedback for their lower levels.

The need for rapidity of response in a surveillance system depends on the nature of the public health problem under surveillance and the objectives of that system. Recently, computer technology has been integrated into surveillance systems and may promote timeliness. The report completeness of the zone is below 85% but timeliness is above 85. According to WHO acceptable report completeness is 80% and above and timeliness 85% and above (4) and lack of infrastructure like vehicle for transport, telephone, fax machines and computers for data management may hinder the completeness of report infrastructure.

Measles and AFP standard case definitions were available half of the visited health center but all the health post there is no community case definition therefore representativeness of measles and AFP is low due to the un availability of community case definition and most of HEWs did not understand case definition of measles and AFP according to WHO guideline Health staff should be aware of case definitions of measles of AFP/ polio that may afflict not only the local community but also have the potential for spread across geographic boundaries (4)

Limitation

Evaluating surveillance systems is not easy. There is no perfect system; trade-offs must always be made each system is unique and therefore requires a balancing of the effort and resources put into each of its components.

Conclusion

The system is useful for planning, implementing and evaluating the practice the overall functioning of public health surveillance system underway in Shabeele Zone was not satisfactory to achieve its targeted goals of prevention and control of measles and AFP.

Majority of visited areas had no case definition of AFP and measles, there was shortage of surveillance formats and the reporting formats prepared by FMOH was not distributed to all health facilities.

Rumor log book were not available, data were not analyzed in all of the visited sites, no written feedback was observed, none of the Motivation to perform data analyses and development of community case definition intend for HEWs and the community as whole translated in to Somali language.

Regarding supportive supervision, in Shabeele Zone program specific supportive supervision was not conducted for lower level health institutions in 2014. Similarly there was no feed backing system in all level.

Surveillance scores were well for flexibility, timeliness, acceptability and usefulness, but had poor representativeness, data quality and stability.

Recommendations

Based on the finding:

Reporting formats should be distributed at all level including health facilities.

To increase the representativeness of the surveillance system all private health facilities and health post should be included in the system and woreda health offices should receive their weekly surveillance report regularly.

Ferfer woreda health office should be provided training and reporting format in order to report on weekly basis.

Budget should be allocated for public health emergency management to strengthen early detection of health events and response system all the visited woredas.

Updated Surveillance guidelines of measles and AFP/ polio translated in to Somali language should be available in all health posts.

Training should be given to all health institutions surveillance officers how to analyze and interpret data.

Acknowledgments

We thank Somali Regional Health Bureau, Shabeele Zone, and the visited districts for their cooperation during evaluation

Reference

1. FMOH, Public Health Emergency Managment guideline for Ethiopia, 2012
2. FMOH, IDSR National technical guideline, 2nd Edition 2002.
3. FMOH, Ethiopian health sector development program IV 2011-2015
4. WHO Regional Office for Africa Center for Global Health, Technical Guidelines for Integrated Disease Surveillance and Response in the African Region, 2nd edition , October 2010
5. WHO, Basic Epidemiology, 2nd edition.
6. FMOH, Public Health Emergency Managment guideline for Ethiopia, 2012
7. Jawad moleh[1] and jamil ansari [2], evaluation of measles surveillance system in Afghanistan, 2010
8. S.F.Rumisha,L.E.G.Mboera,K.P.Senkoro,D.Gueye, And P.K.Mmbuji, Monitoring and evaluation of integrated Disease Surveillance and response in selected districts in Tanzania, 2007, vol.9, No.1
9. Brian Abel Maponga1, Daniel Chirundu2, Gerald Shambira1, Notion Tafara Gombe1, Mufuta Tshimanga1, Donewell Bangure1. Evaluation of the notifiable diseases surveillance system in sanyati district, Zimbabwe, 2010-2011
10. WHO Regional Office for Africa Center for Global Health, Technical Guidelines for Integrated Disease Surveillance and Response in the African Region, 2nd edition , October 2010
11. Jawad Mofleh*Jamil Ansari,Jawad Mofleh, Jamil Ansari., Evaluation of measles surveillance systems in Afghanistan-2010.
12. CDC, "MMWR updated guidelines for evaluating public health surveillance system," 2001
13. WHO, Basic Epidemiology,2nd edition
14. Jawad mofleh1 and jamil ansari2,evaluation of measles surveillance system in afganistan,2010
15. WHO, Communicable disease control in emergencies A field manual, 2005
16. WHO, Protocol for the Assessment of National Communicable Disease Surveillance and Response Systems, 2001.

17. I. A. Adeoye1, M. D. Dairo1, L. V. Adekunle1, H. O. Adedokun2 and J. Makanjuola2: Investigation of a measles outbreak in a Rural Nigerian community, African Journal of Microbiology Research Vol. 4(5), pp. 360-366, 4 March, 2010.

Chapter 4: Health Profile Description Report

Health profile description report, kebribayah District, Fafan Zone of Eastern Ethiopia of Somali Regional State, March 22-23/2014

Abstract

Background: Health profile is vital for prioritizing prominent health and health related problems of the community at any level. It is basic for planning and for appropriate intervention and is an entry point for operational research. Stake holders in health and health related areas of the community will have evidence based information from well compiled health profile. The purpose of this document was to assess and describe the health and health related issues in the Woreda and communicate the local burden of disease and other health related information due to absent of this kind of document at district level for possible intervention.

Method: Structured questionnaire were used to collect health and health related data in Kebribayah District from March 22-28/2014. The data sources were the District Health Office, District Education Sector, other district sectors and national census data by record review and interview. Finally data were compiled manually and using Microsoft excel.

Result: Kebribayah District has total population of 197,982 of which 23699 (11.97%) were pastoralist, 25 rural kebeles and 4 urban kebeles. The Kebribayah District town has 24 hour electric power , mobile , CDMA internet and cable based telephone service, postal service, two commercial banks of Ethiopia (one in Kebribayah Town and the other in Hartasheka Town) the District is connected to Jigjga via high way. Seven kebeles of the district out of 29 kebeles have 24 hours electric power. 26 kebeles out of 29 kebeles have mobile service. Twenty-two (45.8%) of formal schools have water supply in their compound, 34 (74%) formal schools have latrine, a total of 31 health facilities owned by government are available in the woreda, in the woreda proportion of pregnant women who had at least one ANC and ANC4+services are 30% (1742/5829) and 24% (740/3038) respectively. 76 percent of deliveries were attended by home. Full immunization coverage in the woreda is 72% vaccinated. UTI, malaria, diarrhea and pneumonia are top leading causes of adult morbidity and similarly pneumonia and diarrhea are top leading causes of morbidity in under 5 year children.

Conclusion: In Kebribayah District diseases like: UTI, Malaria, Diarrhea and Pneumonia are the top four causes of morbidity in adult; in addition to that, 70% of the community do not have water supply and 74% functional latrine at the same time ANC follow up of pregnancy women is very low in the district; Therefore, the woreda has to work with other sectors which work Wash and Gender issue to improve the availability of water, toilet and hygiene practices as well as increase ANC follow of the pregnancy women. In the woreda, more than 70 % of deliveries are neither attended by skilled people nor safe. This should be improved by giving health education for the community through social mobilization.

Introduction

The purpose of this document is to scientifically asses the health status, indicators and determinant in addition to this to simplify, package and communicate complex information on vital statistics and the local burden of disease in a practical, accessible format for woreda Health planning, It is intended for use by Woreda Health Office (WoHos), Zonal/Regional Governments and other development partners. Most of the information of the data source is the District Health Office; however, specific data in this report was taken from District Census report Bureau. The primary objectives of this health profile is the existence of functional structures and managerial processes at district level that enable the provision of essential health care services to the population, Organization and management of a health system at District level in terms of its structures, priority health activities and availability of resources to provide a broad overview of the social, economic, demographic and geographic health status of the Kebribayah Woreda health service. The Woreda Health Profile is a living document, which is filled in WoHo in order to use by WoHo, Regional Government and other development partner will create favorable environment for health unit for planning, intervention of health event based on their priority in order to bring changing demography and health of the resident in Kebribayah Woreda. It is common knowledge that the health and socio-economic well-being of people are fundamentally linked to their natural and built environment. In time, the Woreda Health Profile include an environmental health report that is outlined environmental health indicators such as disease and injury prevalence, health hazard types and trends, and other emergent environmental factors that impact human health. Woreda health system has a vital part to play and responsibility for achieving the Millennium Development Goals by 2015. These profiles include most performance targeted for achieving the MDG.

Rationale of the Study:

Somali Region at the woreda level an organized health and health related indicator which determine the health status of the community is scarce and these contribute a gap in planning and taking evidence based information for action. In kebribayah woreda health profile was not done before and also there is no organized health and health related information therefore data generated from the health profile description project will help Kebribayah Woreda and other stakeholders for public health planning, resource allocation, interventions and evaluation. Such

information is essential for sustaining increased investments in Global health. Systematic assessment of health facility performance based on accepted standard and norms may also help to improve service quality.

Objective

General Objective: -

To describe health and health related information of kebribayah woreda and to identify problems for priority setting, March /2014

Specific objectives:-

To describe social, demographic and geographical status of kebribayah district

To assess and describe health and health related issues like health status, health indicators.

To describe existing community health problem

To identify priority problems

Methods

Study design and period

Descriptive cross sectional study was conducted from March 22-28, 2014 in Kebribayah Woredas of Ethiopian Somali Regional State.

Data collection techniques and procedure

The health data were collected from Woreda Health Office as well as health related information was collected from different woreda administrative offices (Water, Education, Agriculture and census Bureau) of the year 2014. Interview and standard check list were the main tools for data collection.

Ethical Clearance

Health and health related information of Kebribayah Woreda was collected after obtaining official letter from Ethiopian Somali Regional Health Bureau as well as permission obtained from Kebribayah Woreda Health Office and other concerned bodies in the district during data collection.

Dissemination of finding

The study result was disseminated to Kebribayah Woreda administration, Woreda Health Office, department of Ethiopia Field Epidemiology Training Program (EFETP), SRHB, and visited health offices in hard copy and soft copy.

Operational Definitions

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

Child mortality rate: The number of death occurring in 2006EC per 1000 women in the reproductive ages (i.e. women aged 15-49).

Crude birth rate: The number of births in a population during 2006 divided by the number of person-years-lived by the population during the same period. It is frequently expressed as births per 1,000 populations.

Crude Death Rate: The number of deaths in a population during 2006 is divided by the number of person-years-lived by the population during the same period. It is expressed as births per 1,000 populations.

Infant Mortality Rate (IMR): The ratio of the number of deaths under one year of age occurring in 2006 to the number of births in the same year.

Clean and safe delivery: Proportion of deliveries attended by HEWs.

Contraceptive prevalence rate: Proportion of women of reproductive age (15-49 years) who are using (or whose partner is using) a contraceptive method, on the year 2006.

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

Result:

Historical Background and Culture

Kebribayah is found 55km east of Jigjga Town, is one of the 67 Woredas of Somali Regions. It named around 1960s during Emperor of Haile-selase the name is derived from Kebrimayax (means grave) where there is conflict of two clans Isaac and Abaskuul in near Kebribayah Town Part of the Jigjga Zone,

The Hartasheikh the second largest Town in Kebribayah Woreda were used as route of illegal market exchange between Ethiopia and Somalia Rebublic but this illegal market exchange was ended. Kebribayah was nominated during emperor of Haileselasse. Religion has a great impact on the culture of people. Most of the people are Muslims. Kebribayah is under traditional rule of elders. Abayskuul is the dominant clan in kebribayah woreda.

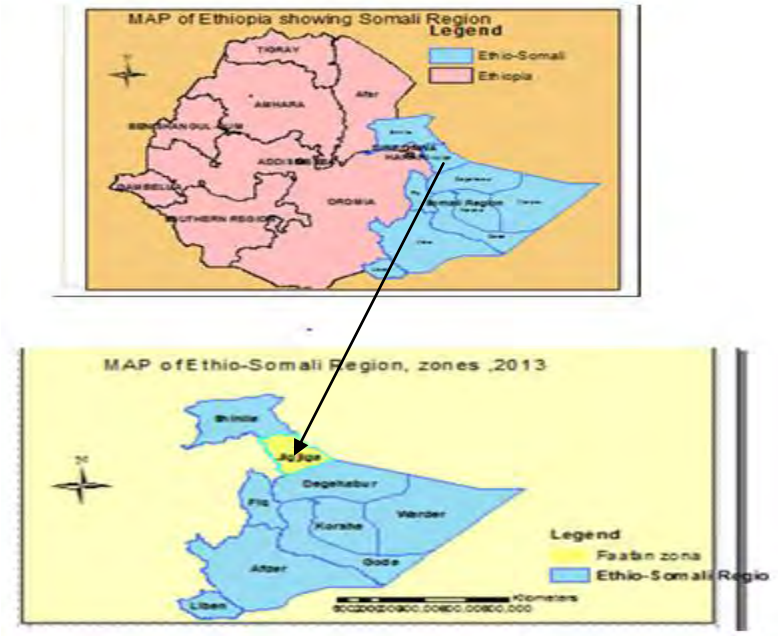


Figure 22：Ethio-Somali Region, Kebribayah District, 2013.

Kebribayah is one of the woreda in the Somali Region of Ethiopia part of the Jigjga Zone , is bordered on the south by the Ararso woreda , on the southwest by the Fik Zone , on the northwest by Gursum , on the north by Jigjga and Awbare , on the North East by Somalia and on the East by Harshin The administrative center of the woreda is Kebribayah; other towns in Kebribayah woreda include Hartasheekha Sheik.. The average altitude of this woreda is around 1686 meters.

The annual rain fall range from 300-400mm and annual temperatures ranges from 20-25 centigrade. The total area of land mass of the Kebribayah District is about 47,809 square km with population density of 2.1 km sq

Demographic information

Kebribayah projected population for 2013 is 197,982 and of these 87,884 female and 110,078 male. While 15.4% are urban inhabitant, a further 23,699 (11.97%) were pastoralists. 19996 and 6593 are children less than 5 year and 1 year respectively. Women with the reproductive age constitute 45239 (22.85%).beside ethnicity 98.77% of the population are Muslim. There were 16,353 refugees from Somalia Republic living in Kebribayah refugee camp the largest ethnic group reported in Kebribayah was the Somali 196,000 (98.5%).

The largest ethnic group in Kebribayah Woreda is Somali which account around 98.5%, all other ethnic groups made up of 1.5% of the population, the Somali language is spoken as first language by 98.5% and second Amharic, 99% of the population they are Muslim.

Table 12: population distribution by village/kebeles and kilometer from the district town, kebribayah district, 2014

Ser. No.	Name of Village/Kebeles	Total population	Male	Female	Kilometer from Kebribayah town
1	woreda	197,982	110078	87884	
2	Kebribayah	14,831	8246	6583	Town
3	Hartasheekha	16122	8964	7157	22 km

4	Guyaw	9573	5323	4249	8km
5	Gilo	12630	7022	5606	17 km
6	Horakelifo	12,066	6709	5356	18km
7	Koran	3330	1851	1478	
8	Durwale	6808	3785	3022	37km
9	Danaba	5295	2944	2350	
10	Risle	4478	2490	1988	37km
11	Gerbi	7627	4241	3386	28km
12	Qaaxo	4467	2484	1983	9Km
13	Farda	5982	3326	2655	30km
14	Marogaajo	5587	3106	2480	
15	Hare	2852	1586	1266	
16	Barisle	2802	1558	1244	
17	Goljano	3730	2074	1656	40Km
18	Fadayga	6023	3349	2674	40Km
19	Eegato	3201	1780	1421	
20	Durya	13,502	7507	5994	23km
21	w.jiro	10255	5702	4552	40km
22	Alaybaday	7808	4341	3466	
23	Qabrianten	4355	2421	1933	

24	Dibiile	7650	4253	3396	15km
25	Jiingada	3776	2099	1676	
26	Labashaag	3304	1837	1467	
27	Qotorooble	3719	2068	1651	
28	Garbiile	11194	6224	4969	

Administrative and political

Kebribayah District have 25 rural kebeles and 4 urban kebeles , the district have its own council and representative of Federal Parliament , all the sectors of the ministry office are found in the Town , there are two International Organization who are supporting organization in the district IRC and Mercy corps , the ruling party in the district is the Somali National Democratic Party (SoDePa) and at least other parts were participated the national election but the majority of the community are SoDePa supporters..

Health professional in the district

In the two health center in the woreda there are a total of 6 BSC nurse, 25 clinical nurse, 5 health officer, 5 pharmacy technician, 8 lab technician and the remaining 26 health extension worker were working in 26 health post in the woreda .

Table 13 : list of health professional in kebribayah district, Ethio-Somali Region, 2014

Ser. No.	Category	Number		
		Male	Female	Total
1	Health officer	4	1	5
2	BSC nurse	5	1	6
3	Clinical nurse (diploma)	18	7	25
4	Mid wife	2	3	5
5	Pharmacy technician	4	1	5
6	Lab technician	5	3	8
7	Health extension worker	16	10	26
8	Public health	7	0	7

Vital Statistics and health indicators

Vital statistics like total death, total births, under one and under five deaths are not recorded in the district.

Table 14: Distribution of population and vital statics, kebribayah district, Ethio-Somali Region, 2014.

Ser. No.	Parameter	Number (%)	Remark
1	Total population	197982(100)	
2	Male	110078(55.6)	
3	Female	87884(44.39)	
4	Under 1 years old	5523(3.3)	
5	Under five years old	19996(10.1)	
6	Under 15 years old	87389(44.14)	
7	Urban	67064(34%)	
8	Female 15-49 years old	45238(22.85)	
9	Pregnancy	6791(3.43)	
10	Live birth	6791(3.43)	
11	Non pregnant women	38448(19.42)	
12	Average house hold size	6.6	
13	Dependency ratio	No Data	
14	IMR/1000	No Data	
15	Under 5 MR/1000	No Data	
16	CBR/1000/year	No Data	

Immunization coverage

The Woreda has conducted both static and outreach immunization services in 2006. Out of 4,954 eligible targeted populations, immunization coverage for children less than one year of age was 80% for BCG, 84% for penta1, 79%, for penta3, 75% , 72% for measles and fully vaccinated respectively.

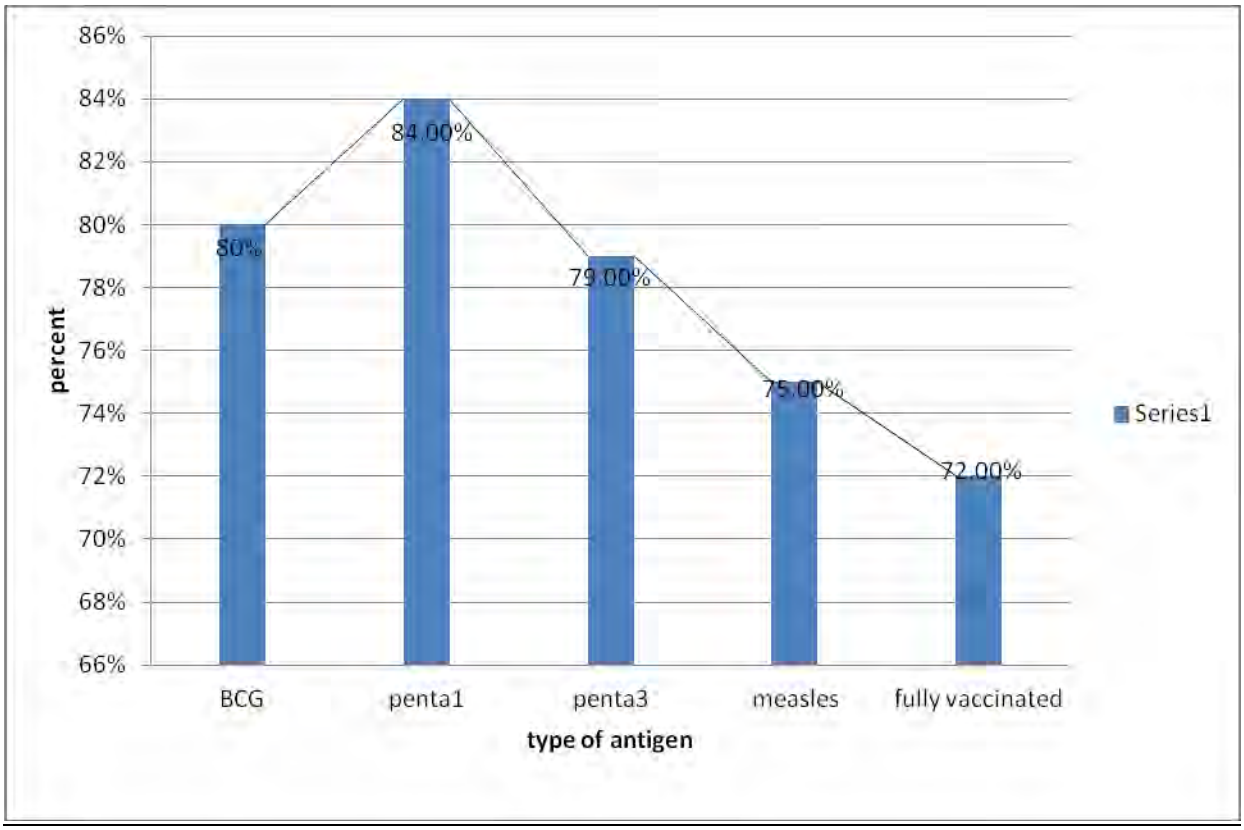


Figure 23: immunization status of kebribayah district, Ethio-Somali Region, 2014

Table 15: Cold chain distribution by village/kebeles and health facilities for 2014 and kilometer from main town, K/bayah District Ethio Somali

S/N	place	Type of health facilities	Number of cold chain	Type of cold chain	KM from kebribayah town
1	Hartasheekha	Health center	2	Solar type and sibir	20
2	Waraabojiro	Health center	2	RCW and	40

				sibir	
3	Farad	Health center	2	RCW	30
4	Wado-abaareed		1	RCW	30
5	Garbi	Health post	1	RCW	25
6	Guyow	Health post	1	Sibir	8
7	Gilo	Health post	1	RCW	17
8	Garbohare	Health post	1	RCW	27
9	Risle	Health post	1	RCW	37
10	Garbile	Health post	1	RCW	15
11	Dibile	Health post	1	RCW	23
12	Durya	Health post	1	RCW	37
13	Goljano	Health post	1	RCW	40
15	Dacawaley	Health post	1	RW50	9
17	Horokalifo	Health center	1	Sibir	18
18	kebribayah	Health center	3	Deep freezer, sibir and RCW	0
	TOTAL		23		

Mother's health services coverage

Regarding ANC1+ and ANC4+services, 30% (1742/5829) and 12 %(670/5723) pregnant women were received the services respectively. 24% (740/3038) percent of deliveries were attended by skilled health personnel in the Woreda in 2006EC .regarding TT2 32 %(1839/5723) of pregnant women have received the TT2 vaccine in general there was a slightly improvement in ANC and delivery in health facilities in Kebribayah Woreda as compared to the previous two year.

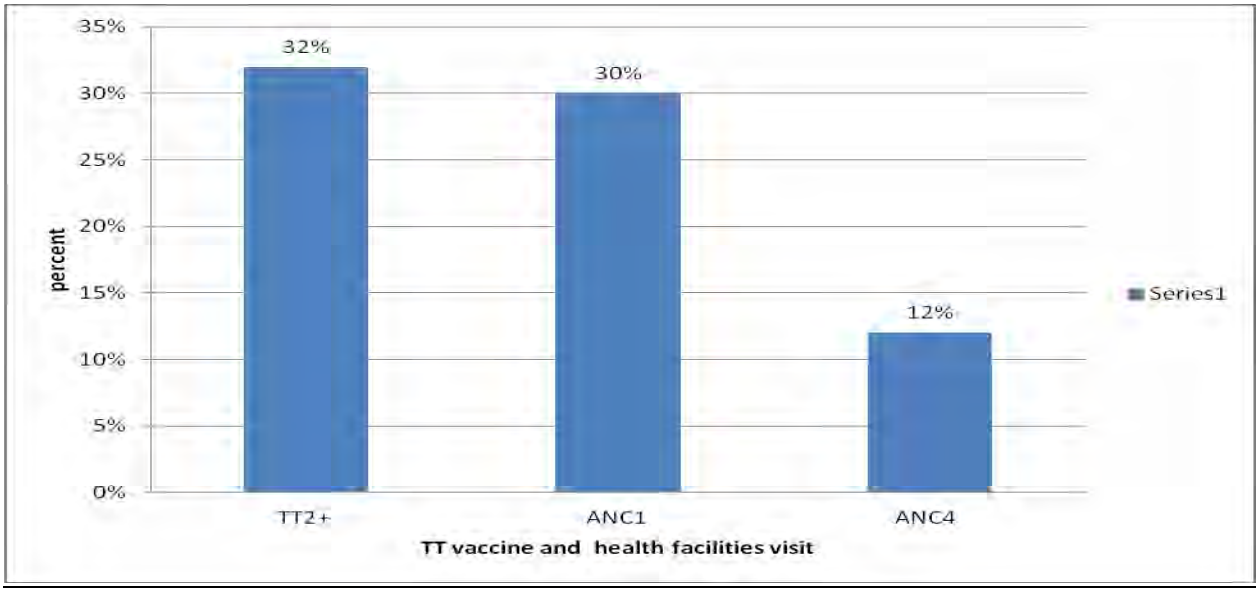


Figure 24 : Mothers health service coverage in kebribayah district, Ethio Somali region, 2013

Education and school distribution

Based on the data received from Kebribayah Woreda Education Office a total of 46 formal and 172 KG school in Kebribayah Office in 2014 Almost all kebeles have school except Dibi kalo have one school.

The overall dropout rate is 4% in 2006. Twenty-two (45.8%) of schools have water supply in their compound, 21 (43.7%) schools have latrine with separate male and female and 13 (27.1%) has common latrine for both sex. A total of 620 teaching staffs is working(in which 33 are degree, 93 diploma, 275 TTI and 219 are ABEs teachers) .

Table 5: Distribution of school by sex in Kebribayah, in 2014, Somali, Ethiopia

Grade	Male	Female	Total	Remark
1-3rd (AB school)	13575	9026	22601	Pastoral school
1-4th	7113	3889	11002	Formal
5-8th	2693	1268	3961	Formal
9-10th	1099	399	1498	Formal
11-12th	386	64	450	Formal

Table 16: Ratios of student with teachers, chairs, books and classes

	Ratios			
class	Teachers	Chairs	Books	Classes
1-4th	1:72	1:12	1:9	1:161
5-8th	1:45	1:8	1:3	1:89
9-10th	1:27	1:4	1:1	1:46
11-12th	1:27	1:2	1:1	1:35

Facilities

The kebribayah district town have 24 hour electric power , mobile , CDMA internet and cable based telephone service, postal service, two bank commercial bank of Ethiopia (one in Kebribayah Town and the other is Hartasheka town) Woreda town, the district is connected to jigjga via high way. 7 kebeles of the district have 24 hours electric power namely: Hartasheekha, Guyow, Gillo, Garbi, kaaxo and Risle. all the kebeles of the district have mobile services except Garbiile, Mula and Horokhalifo Kebeles and are not accessible by motor vehicle during rainy season, all that does not have mobile services have wireless communication system.

Health service institution

Table 17: Distribution of Government health service institution in Kebribayah Woreda, Ethio-Somali Region, 2006 EC

S/N	Type of health facilities	number	Remark
1	Hospital	0	
2	Health center	5	
3	Health post	26	
4	Private clinic	No data	
5	Pharmacy store	1	
6	Rural drug vendor	No data	

Productivity and income

About 79% of the Woreda population lives in Rural and on agro pastoral community. Wheat, corns and Maize are the major stable foods/crops in the district. The productivity of the land per hectare was 25-30 quintal. Total cultivated area of the Woreda is around 42,580 km square beside livestock their main use are cattle, goat and sheep.

District Health System

Organo-gram of District Health Office

The Woreda Health Office has implemented a new organizational structure after the Business Process Reengineering (BPR) concept which was endorsed by the Regional state in 2003. The district has two HMIS, one surveillance focal person, four health promotions (one EPI, 1 MCH, 1 supervisor and one health educator) and one store

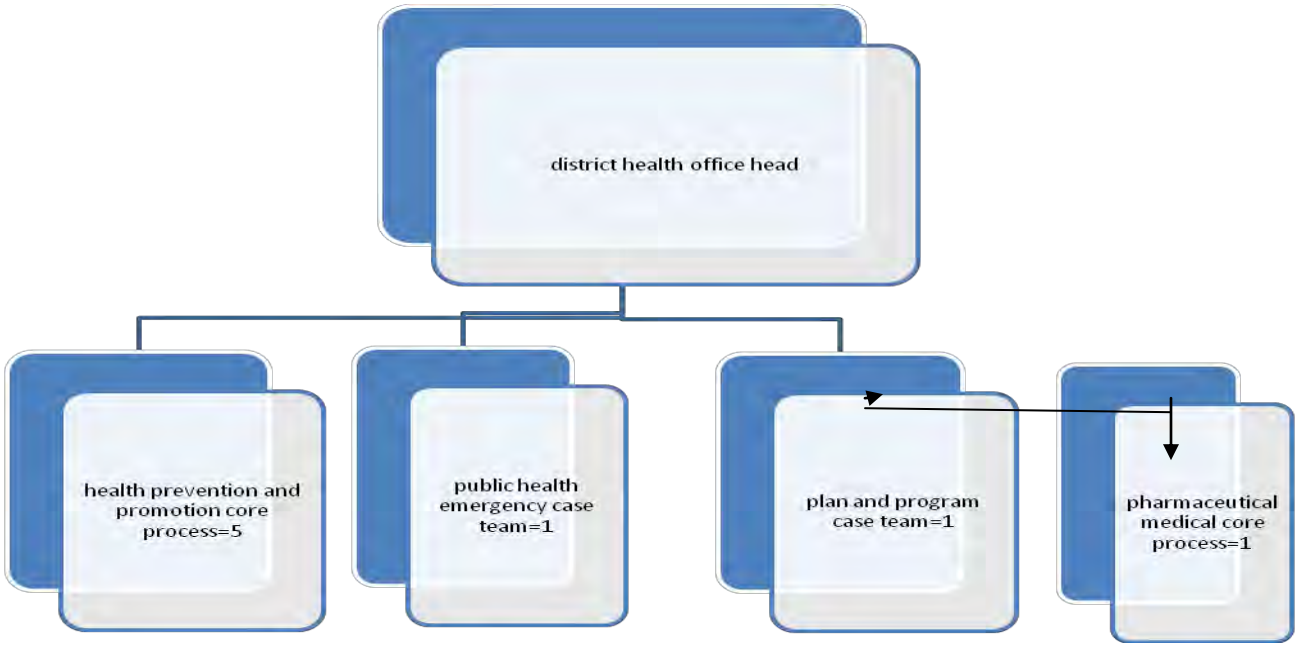


Figure3: Organizational structure of East Kebribayah district Health office, Somali, Ethiopia, 2006.

Hygiene and Environmental Health Services

In kebribayah woreda safe water coverage is 30% in which there are 33 water deep wells, of which 13 are protected , about 13 of water schemes are functional deep wells and 151 government birkas of which 16 birkas are functional the remaining are under construction and maintenance excluding private birkas which Woreda Water Bureau did not have their record On the other hand the total number of toilet that are available in the Woreda is 8,000 toilet which account 30% of the total households.

Health education

Health Extension Worker and health providers used to give House to House health education. In this year a total 300 household communities have graduated 10 packages out of 16 packages for health extension worker. Most of topic covered in this year are Harmful Traditional practices, diarrheal diseases, family planning, water, hygiene and sanitation, HIV/AIDS, tuberculosis, family planning,

In addition to this every health facilities there are regular health education based on the ten top disease of their locality as the woreda health office said.

Table 18 : Adult ten top disease in the kebribayah district, Ethio-Somali Region, 2013

S/N	Disease	Number of patient	Percent
1	UTI	326	16
2	malaria	300	15
3	Diarrhea	278	14
4	Pneumonia	254	12
5	AURTI	184	9
6	Acute bronchitis	184	9
7	STI	158	8
8	Anemia	116	6
9	Trachoma	92	4
10	Helminthes is	90	4
11	Skin infection	76	4
Total		2088	100

Table 19: Ten 5 cause of morbidity in pediatric <= 5 years in kebribayah district, Ethio-Somali region, 2006 EC

S.no	Disease	Number of case	Percent
1	Pneumonia	450	35
2	Diarrhea (non bloody)	360	28
3	Acute Febrile illness (AFI)	211	16
4	Acute upper respiratory infection	120	9
6	Ear infection	75	6
Total		100	100

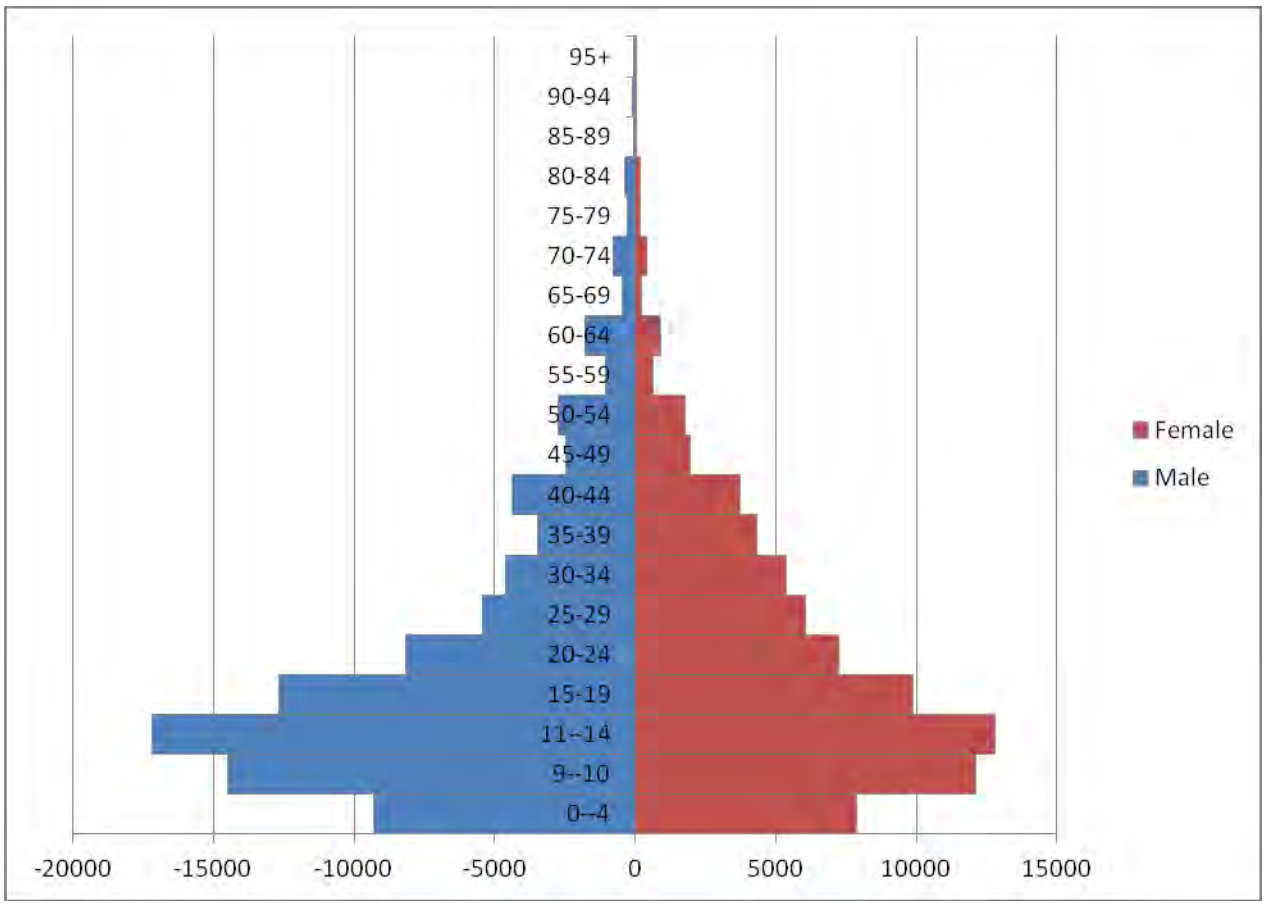


Figure 25 population pyramid of kebribayah district, Ethio-Somali Region, 2013.

Endemic disease

Malaria:

Malarious is endemic in all kebeles throughout the year although it is not the major public health problem in the district.

Table 20: Number of malaria cases seen and examined in the kebribayah district, jigjga zone, Ethio-Somali region 2006EC

Total malaria cases	Total examined	Total positive	PF	PV	P. malaria	Malaria admit ion	Malaria death
150	267	130	102	28	0	0	0

HIV/AIDS

Of the 91,733 people aged above 15 year, 3288 people get voluntary counseling test services and from this number 15 were positive , in the PMTCT program 1400 number of mother get services and 5 were positive 2200 clients visited health facilities and provided PITCT services from which 2 were positive.

A total of 4600 condoms were distributed in the district, HIV incidence in the year 2006 based on the data sent from health facilities such as VCT, PMTCT and PITC is 0.0002%.

Out of the total of five health center, two health center providing ART drugs a total of 6 patient registered for HIV positive and within this number 4 of cases are taking ART drugs from health facilities.

Tuberculosis

Tuberculosis and Leprosy

A total of 256 cases of all types of TB cases were registered in the district health facilities. The districts smear positive pulmonary tuberculosis detection rate was 20%.

Table 21 distribution of tuberculosis cases by sex in kebribayah district, jigjga zone, Ethio-Somali Region, 2014.

Indicator	Male	Female	Total
New pulmonary TB smear positive	24	16	40
New pulmonary TB smear negative	50	48	98
Extra pulmonary TB	60	50	110
Relapse		-	-
Treatment failure	5	3	
Total	139	117	256

Nutrition, food shortage and any other disasters

The Woreda has registered a total of 40 SAM cases in 2006 and has a total of 6 Outpatient Therapeutic Program (OTP) site and one Stabilization Center (SC) is present in the woreda.

Health Budget allocation

Health Budget allocation

The Total budget for the Woreda Health Office in 2006 EC is including salary was 3.5 million including 2,000,000 for salary, 900,000 for Health Facilities drugs and 640,000 constructions

Comparing in 2005 EC there is an increasing rate of 22%. May be the budget gap filled by Non-Governmental Organization (NGO) supported for the implementation of different programs but the data was not available.

Essential drugs and other supplies

According to the woreda logistic and store head in 2006EC a total of 900,000 birr was allocated for drug and other medical supplies, the Bureau Head also reported that there was a shortage of laboratory equipment which we did not get from DMFSS Diredawa branch in addition to this also reported that they have not faced any shortage of drug in this year comparing to the previous.

Discussion

Water coverage of Kebribayah Woreda is low, most of the schools do not have water supply in addition to this 100% of ABCs(KG) school intend for pastoral communities not have water supply and latrine as a result of absence of water in some Schools/Kebeles dropout rate have reached 4% and schools that do not have toilet student openly defecate in the surrounding most of the kebeles get their water from rain harvesting (birkas) in addition to that Hand hygiene in all the school were not practiced at all similarly the practice of hand washing is unacceptably poor particularly in developing countries (15). A study conducted in Kersa woreda, Eastern Ethiopia revealed that from those households participated in the study with latrine the habit of hand washing after defecation was reported to be about 5.1% (9).There is no hand washing facilities in the school, when there is no water in the school, children cannot wash their hands so Unimproved hygiene, inadequate sanitation and insufficient and unsafe drinking water account for 7% of the total disease burden and 19% of child mortality worldwide (16). In Ethiopia about 75% of causes of OPD visits are largely due to the lack basic sanitation provisions (10). Another study conducted in Adis-ababa (12) revealed that risk factor for high urinary tract infection is socio economic status and low educational level, low antenatal follow up coverage our health profile study show that the educational status of women in Kebribayah Woreda is very low and ANC follow up Regarding ANC1+ and ANC4+services which may affect the high occurrence of the UTI Similarly in Kebribayah Woreda majority top 4 cause‘s morbidity both in Adults and children were communicable diseases which can be prevented by improved hygiene and sanitation.

Antenatal care is more beneficial in preventing pregnancy outcome and mother to child transmission of some communicable disease like HIV/AIDS. Timely follow up of pregnancy leads to early detection of pregnancy related problems and take appropriate action (17) kebribayah woreda Regarding ANC1+ and ANC4+services, education status pregnant women follow were very low in addition to that, 70% of delivery attended at home. Combination of contraceptive use, improved transport, education and birth in a health facility can reduce 75% of maternal deaths (6). A study conducted Ethiopia showed that majority of delivery at home assisted by traditional birth attendants this study revealed that the reasons for not preferring health institution delivery were Among the socio demographic variables, families monthly income, women‘s as well as Their husbands educational status and maternal age are significantly

associated with their place of delivery, their educational status(6). Another cross sectional study conducted in Afar Regional study revealed that, Out of all the reasons given as to why they preferred home deliveries, they said that it was because labor progressed fast and there was no time to reach a health facility, Cultural ceremonies surrounding home deliveries and lack of confidence in health facilities were reasons for opting for home deliveries (7). Ethiopia showed that the likelihood of delivering at home was greater among mothers with inadequate knowledge of pregnancy related services, those who started attending ANC after 24 weeks of gestation, mothers having no formal education and rural residents (8).

In kebribayah woreda the contraceptive acceptance rate is very low; this means the populations are not willing to use modern contraceptive methods. According to EDHS 2011, use of modern contraceptive methods among currently married women has increased from 6 percent in the 2000 EDHS to 27 percent in the 2011 EDHS (10). However in Somali region contraceptive rate that total met that are using according to DHS report is 4.3% which is much lower than other Region. Family planning reduces mortality and morbidity due to pregnancy and child birth Family planning saves lives of women and children as well as improves the quality of life for all (17). It is one of the best investments that can be made to ensure the health and well-being of women, children and communities (14). Family planning has great role in significant reduction of maternal mortality by reducing exposure to unintended pregnancy and unsafe abortion in developing countries where the majority of maternal deaths occur (14). The use of modern family planning methods has potential to reduce about 25%- 40% of all maternal deaths in developing countries (9).

The smear positive pulmonary tuberculosis detection rate (20%) was very low compared to the minimum expected standard of WHO (i.e.70%) in addition to this the national TB detection performance was 64% in 2012.

Medium level health professionals are very scarce at health center level and health post level for example 5 health officer, 5 mid wife, 5 pharmacy, 6 BSC nurse, 25 clinical nurse, 8 lab, 7 public health for 5 health center were assigned and 26 HEWs for 26 health post normally according to the national guideline every health post is intended for 2 HEWs (2) but now every health post is assigned for 1 HEWs which is below standard.

Limitation

Unavailability on health and health related research in kebribayah district

Absence of important variable like mortality records in the district

Unavailabity of private birka records in the district

Poor documentation of district health office.

Conclusion

In kebribayah Woreda disease like : UTI, Malaria, Diarrhea and Pneumonia are the top four causes of morbidity in adult in addition to this 70% of the community do not have water supply, Education is one of the most critical variables in epidemiological with high risk and low health seeking behavior, low availability of latrine, immunization coverage and skilled birth attendant didn't achieve national target plan, ANC follow up and the contraceptive acceptance rate of pregnancy women is very low, no mortality records, majority of women delivery at home as well as The smear positive pulmonary tuberculosis detection rate were very low compared expected standard of WHO ,therefore the woreda have to work prevention and control measures should be strengthened to reduce the morbidity of malaria, diarrhea, and other priority diseases and with other sectors which work WaSH and Gender issue to improve the availability of water, toilet and hygiene practices , ANC and contraceptive acceptance rate.

References

1. Sukkur, Pakistan Initiative for Mothers and Newborns(PAIMAN)District Health Profile, 2005
2. Leeds, Grenville & Lanark District HEALTH PROFILE
3. Pakistan initiative for Mothers and Newborns (PAIMAN), , The District health profile, district Dera Ismail Khan; 2009
4. The Pakistan initiative for Mothers and Newborns (PAIMAN), District Health profile; District Mardan Ismail Khan , 2009
5. The Pakistan initiative for Mothers and Newborns (PAIMAN), District health profile; district Jaffarabad, 2005.
6. Binyaayele(Md), What Factors Determine Delivery Practices Of Pregnant Women, Binyam Ayele(Md), May 2005
7. Medhanit Getachew Mekonnen, Kassahun Negash Yalew, Jemal Yesouf Umer, Muluken Melese. Determinants of delivery practices among Afar pastoralists Of Ethiopia. Pan Afr Med J. 2012; 13(Supp 1):17
8. Solomon S, Mark S. Why do womenprefer home birth in Ethiopia.BMC pregnancy and child birth.2013, 13:5.WWW.biomed centtral.com/471-2393/13/5
9. Mengistie B, Baraki N. Community based assessment on household management of waste and hygiene practices in Kersa Woreda, Eastern Ethiopia. Ethiop. J. Health Dev. 2010; 24(2):103-109
10. General Water Coorporation. water and sanitation, clean start:focusing in scool sanitation and hygine, Areflection for GWC. Tanvi Nagpal, Director water and snitation;Washington Dc
11. Central Statistics Agency (CSA).Ethiopian Demography and Health Survey. Addis Ababa, Ethiopia. CSA, 2012
12. Tazebew emiru,genet beyene, and wondewosen tsegaye and silabat melaku. Associated risk factors of urinary tract infection among pregnant women at felege hiwot referal hospital,bahirdar,north western ethiopia, January- April/2011
13. EPHI,public health emergency management guideline,3rd edition, February/2012.

14. WHO, Progress Report on the Global Strategy for Women‘s and Children‘s Health 2010-2015
15. WHO, Guidelines on Hand Hygiene in Health Care: a Summary, 2009
16. Sandy Cairncross,[1,] Jamie Bartram,[2] Oliver Cumming,[3] and Clarissa Brocklehurst[4] . Hygiene, Sanitation, and Water: What Needs to Be Done, Published online 2010 Nov 16
17. FMoH, Prevention of Mother-to-Child Transmission of HIV Ethiopia: July 2007.

Chapter 5: Scientific Manuscript for peer Reviewed journal

5.1: Confirmed Measles Outbreak in Hamaro district, Eastern Ethiopia, April/2014

Abdifatah Tahir[1], Alemayehu B.[2], Ayele B.[3]

1. E-mail: daahir-2057@hotmail.com phone number: 00251915203356

Abstract

Introduction: Measles is a leading cause of vaccine-preventable disease among young children worldwide. We received reports of a suspected Measles outbreak in Hamaro Woreda of Somali Region. We investigated to confirm the outbreak, identify risk factors and implement control measures.

Methods: unmatched 1:2 case-control study was conducted. We defined a suspected measles case as any person with fever, rash, cough, and coryza in Hamaro Woreda from April 6 to May 5, 2014. We reviewed health center records & line list was collected. We interviewed cases & controls using questionnaire. Five blood samples were collected for laboratory confirmation. We used Epi-Info version 7.

Result: Starting from April 6 to May 5, 2014, a total number of 43 suspected measles cases and one death were reported. The overall attack rate (AR) was (6.1/10,000population). Out of total cases, 27(62%) were male with the mean age of 11 years (range from 8 months to 35 year). Majority of cases 24 (55%) were aged below five year. The outbreak was occurred in four kebeles out of the 5 kebeles in the Woreda, the most affected kebele was Hardhagax 30/10,000 population. All five blood sample become positive for measles IgM. In the case control study, being un-vaccinated (OR=9.6429; CI 3.9687-23.4293), having contact with suspect or confirmed OR 6.842 CI;(2.245-12.9344), and travel history (OR=6.17; (1.8124-21.0185) was associated with contracting measles.

Conclusion: An outbreak of measles cases occurred in Hamaro affecting primarily the age group under 5 year. Low vaccination coverage, mothers illiterate, contact with confirmed or suspect measles cases and travel history were among risk factors identified.

Key word: measles: outbreak: case control: Hamaro

Introduction

Measles is an acute highly contagious viral disease with prodromal fever, conjunctivitis, coryza (runny nose), cough and small spots with white or bluish-white centers on an Erythematous base on the buccal mucosa (Koplik spots)(1). It affects mostly children and the virus is transmitted via droplets from the nose, mouth or throat of infected persons through coughing, sneezing or close personal contact or direct contact with infected nasal or throat secretions. The virus remains active and contagious in the air or on infected surfaces for about two hours. It can be transmitted by an infected person from 4 days prior to the onset of the rash to 4 days after the rash erupts and can be prevented by immunization(1).

Measles is a leading vaccine preventable contagious infectious disease caused by a paramyxovirus of the genus Morbilli virus Despite the existent of a safe, effective and inexpensive measles vaccine for 40 years, measles remain a leading vaccine preventable killer of children worldwide (1).

Ethiopia is adopting strategies to control and ultimately to eliminate measles by 2020 as a result of that is implementing routine immunization of children aged 9 to 11 months (1).

Measles remains a common disease in many parts of the developing world (6). An estimated 10 million cases and 164,000 deaths from measles occur worldwide each year. Measles is a leading cause of vaccine-preventable deaths among young children worldwide (6).

On April 26, 2012-regional PHEM received report about rumors suspected measles outbreak from Hamaro district. Following the report, the team was prepared by the regional health bureau in collaboration, WHO Ethiopian including EFETP resident to the site having the objectives of to identify risk factors and implement control measures.

Methods and Materials

Study area setting

The study area was in Hamaro Woreda, it is located in Somali Regional State of Ethiopia the Hamero population is estimated to be 72,063 (36,752 male and 35,311 females). According to the Woreda report, the Woreda health coverage is around 50% and the health delivery system was given using 2 Health Centers, 9 health posts and 1 MHNT facility which is providing primary and secondary health service to the unreached population.

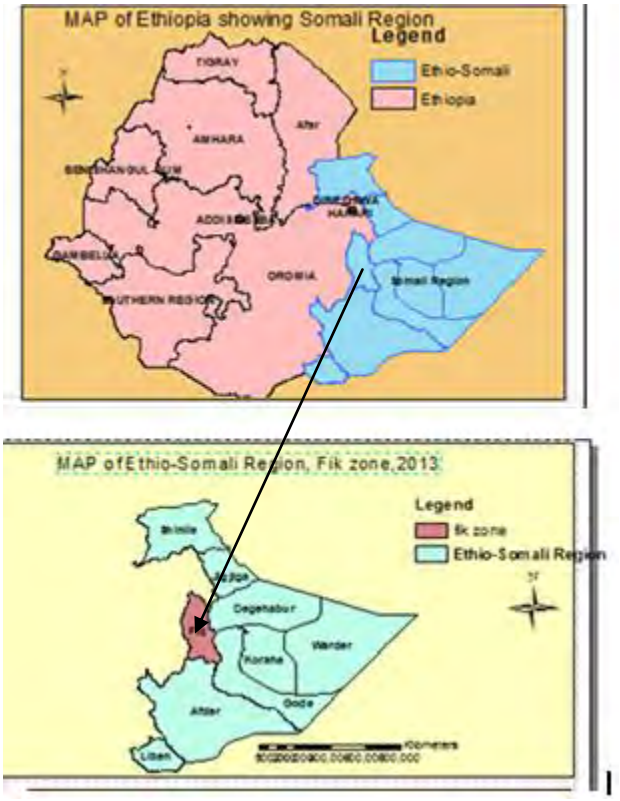


Figure 26: Ethio-Somali Region, Fik Zone, 2013.

Study Design:-

Unmatched 1:2 case control study design was used.

Study Population:-

Cases: Anyone with generalized maculopapular rash lasting ≥3 days and temperature ≥101°F or 38.3°C; plus one of the cough, coryza, or conjunctivitis (44 cases) as per WHO case definition

Controls: were all people without measles symptoms that are living on the same settlement (88 controls).

Data collection method:

Structured questionnaire were used in order to collect basic epidemiological information: symptoms, date of onset of disease, medical care, age group affected, Religion of the family, vaccination history, vitamin A supplementation, breast feeding habit, parent educational level, and prevention measure taken when the outbreak occurred in the woreda. data of both cases and control living in the neighborhood were collected.

Data entry and Statistical analysis

Data collected were entered in to excel and analyzed using Epi info version 7 software. Bivariate analysis was performed by converting all continuous and categorical variables to dichotomous variable and logistic regression analysis was performed to identify risk factors associated with contracting measles. Results were displayed using tables and graphs and it was interpreted using Odd ratio, P value <0.05 and 95% confidence interval.

Inclusion and Exclusion criteria

Inclusion Criteria

Cases

Any resident of Hamaro Woreda who had symptoms of measles (generalized maculopapular rash and fever plus one of the following: cough or coryza (runny nose) or conjunctivitis (red eyes) from April 6- may5/ 2014 and who agreed to participate in the study were included.

Controls

Any resident of Hamaro Woreda during the study who was a neighbor to a case and who did not developed signs and symptoms of measles and agreed to participate was included.

Exclusion criteria

Cases

Those who refused to participate were excluded.

Controls

Those who refused to participate were excluded as well as family members from the same household.

Result

Descriptive epidemiology

A total of 43 suspected measles cases and 88 health control and 1 death that fulfill standard case definition were identified from April 6-27, 2014.Out of total cases 27(62%) were in Male with the Mean age of 11 year (range from 8 month to 35 year) and. Median age of measles cases were 5 year (range from 8 months to 35 years) and control group 4 years (7months to 20 year). Infants aged <1 year accounted for 11% of all cases. Majority of cases 24 (55%) were aged below five year.

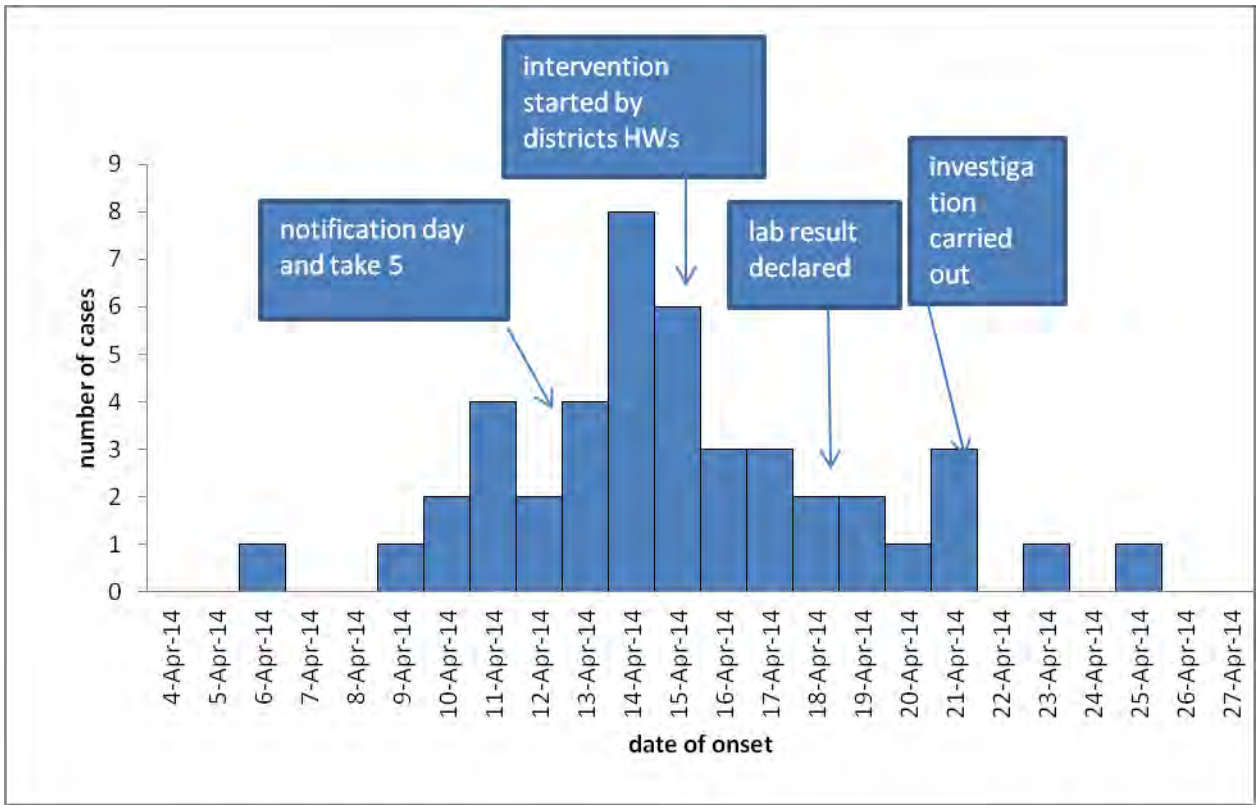


Figure 27: Epi-Curve indicating onset of rash among cases in Hamaro Woreda, Fik Zone, Ethio-Somali Region, April, 2014.

There were multiple peaks on the Epi curve as shown in Figure which showed propagated type of epidemic with person to person transmission. The first case was seen in Hardhagax kebele on

April 6th, 2014 GC, the case was 2 years old of unvaccinated female child that have travel history from Karamara Hospital for other medical problem during her arrival in Hardhagax district the child start fever and after three days started to have rash and cough, coryza and conjunctivitis.

Table 22: Distribution of Measles cases by sex in Hamaro Woreda, Ethio-Somali Region, and April, 2014

Sex	Population	No. Cases	Percent (%)	AR per 10,000	No. Death	CFR%
Male	36752	27	0.07	7.34	0	0
Female	35311	17	0.048	4.81	1	6
Total	72063	44	100	6.1	1	2.2

The overall attack rate was 6.1/10,000 and CFR account 1(2.2%) of the total cases. The attack rate among female was 4.81/10, 000 and male 7.34/10,000 (Table 22).

The outbreak was occurred in four kebeles of the district namely Hardhagax, Gasangas, Dabala and Hamara kebele. The most affected kebele in this outbreak was Hardhagax.

Table 23: Distribution of Measles cases and death by age group in Hamaro District, Eastern Ethiopia, and April, 2014

Age group	population	No of cases	Age specific AR per 10,000	CFR per 100
1-4 year	11530	19	16.5	5
5-14 year	23060	8	3.5	0
>= 15 year	38914	17	4.4	0
total		44	6.1	

Out of the total 43 measles cases and 1 death in the four kebele Hardhagax account 21(47.7%); Hamaro 12(27.3%), Dabala 8(18.2%) and Gasangas 3(7%) cases occurred between February 6-25th from the 4 kebeles (table 3).

Analytical investigation

We recruited 44 cases and 88 controls (1:2). On Bivariate analysis 4 variables: being un-vaccinated (OR=9.45; CI 3.9897-24.3162), having contact with suspected or confirmed measles cases (OR=11.788; CI 4.1417-41.6209), mothers being illiterate (OR 5.33 CI; 2.2776-13.5173), travel history with 7 days outside the village (OR 6.08; CI :(1.8223-23.7331) was statically associated; However, fathers being illiterate (OR 2 ; CI 0.9046-4.3993), was not statistically associated for contracting measles.

Intervention

Cases were managed with appropriate medication by MHT and Health workers; Health education was given for the community members to prevent the transmission of the disease, to motivate health seeking behavior and to vaccinate their children. As a result of the study, one day training on outbreak management and surveillance was done with woreda Rapid Response Team, surveillance focal person and Health Extension Workers. To prevent and control the further spread of the outbreak vaccination, supplemental immunization and strengthening of routine immunization for under 5 children, case management and public health education were instituted.

Discussion

Measles spread through contact with nose and throat secretions of infected people and through airborne droplets released when an infected person sneezes or coughs (1). A person can infect others for several days before and after he or she develops symptoms (2). The disease may spread easily from index cases from jigjiga Ethiopian Somali Regional State capital karamarda hospital to others because Hardhagax located on the road to Hamaro where many people pass and also in areas where infants and children come into contact such as in health centers and schools.

Our study revealed that children whose mothers have no education are five times more likely to develop illness than those born to literate mother and we got similar finding with case control study conducted in India which showed that children whose mother have no education are more likely to develop illness than those born to educated mother (4). Also EDHS 2011 survey indicates children whose mothers have secondary education are more likely to be fully immunized than those born to mothers with no education (7).Our study revealed that children who had contact history of suspected or confirmed cases are eleven times more likely to develop measles cases than those who had no contact history This is also supported by the ministry of health of Zimbabwe, which states that children who live in crowded places are at high risk of contracting measles, and that a person with measles can infect others for several days before he/she develops symptoms. Measles spreads easily in places were children gather for example schools (9).

The investigation shows that the overall attack rate of measles were 6.1/10,000 lower than the attack rate reported in Nylon District Cameron which is 34/10,000 (8). Male were more attacked in this outbreak than female which was 7.34/10,000 in male and 4.81/10,000 females respectively. The most affected age group in this outbreak was under five year age group

Conclusion

Results of this outbreak is assures the occurrence of measles outbreak in Hamaro woreda. Being un-vaccinated, having contact with suspected or confirmed case mothers and fathers illiteracy were the contributing factor for the occurrence of the outbreak.

Recommendation

- Should improve routine immunization and social mobilization activities in all kebeles
- Mothers should be encouraged to be educated i.e. women empowerment
- Health workers should educate and communicate mode of transmission of measles disease.

Reference

1. Gerald Etapelong Sume1, , André Arsène Bita Fouda1, Marie Kobela2, Salomé Nguelé3, Irène Emah2, Peter Atem1, Daddy Mbida1, Kondé Njock3. Measles, line listing, outbreak, Cameroon, Nylon Health District, pan African medical journey
2. Federal Ministry of Health and WHO Ethiopia. National Guideline for measles surveillance and outbreak Management. July 2012
3. I.A Adeoye, M.D.Dairo, L.V.Adekunle, H.O. Adedokun and J.Makanjuola. Investigation of a measles outbreak in a Rural Nigerian Community. African Journal of Microbiology Research, March 2010
4. . November/2011. National Guideline for measles surveillance and outbreak investigation, federal ministry of health and WHO Ethiopia April 2007
5. Mishra A et al. Practical observations from an epidemiological investigation of a measles outbreak in a district of India. Indian J Community Med 2009; 34:117
6. Daba M. et al. Measles Outbreak Investigation and Response in Arsi Zone, Oromia region. Paper presented at AFENET 5th annual conference. Addis Ababa, Ethiopia.
7. Central Statistics Agency (CSA).Demographic and Health survey, 2011.CSA
8. Ministry of health and child welfare,zimbawe,immunization practice: practical guideline for health worker
9. Kufakwanguzvarova W Pomerai[1*], Robert F Mudyiradima[2] and Notion T Gombe[1] Measles outbreak investigation in Zaka, Masvingo Province, Zimbabwe, 2010
10. New York, NY, United Nations Children‘s Fund, Levels & trends in child mortality report 2011: Estimates developed by the UN Inter-agency Group for Child Mortality Estimation., 2011.
11. EHNRI-PHEM. A Guideline on Measles Surveillance and Outbreak Management. Addis Ababa : Draft Document, 2012
12. I. O. Okonko1*, A. O. Nkang1, A. O. Udeze2, A. O. Adedeji3, J. Ejembi4, B. A. Onoja1, A. A.Ogun5 and K. N. Garba1. Global eradication of measles: A highly contagious and vaccine preventable disease, 2009.

Chapter 6: Abstract for Scientific Presentation

Abdifatah Tahir[1], Alemayehu B.[2], Ayele .[3]

Title: **'Measles Outbreak in a Pastoralist Community of Eastern Ethiopia, April, 2014**

Email: daahir-2057@hotmail.com Number: 00251915203356

Abstract

Introduction: Measles is a leading cause of vaccine-preventable disease among young children in developing countries, including Ethiopia. We received reports of a suspected Measles outbreak in Hamaro district of Somali Region. We investigated to confirm the outbreak, identify risk factors and implement control measures.

Methods: A 1:2 unmatched case-control study was conducted, with 44 cases and 88 controls. We defined a suspected measles case as any person with fever, rash, cough, and coryza in Hamaro Woreda from April 5 to May 5/2014. We reviewed health center records & line list were collected. We interviewed cases & control using questionnaire. Five blood samples were collected for laboratory confirmation. We used Epi-Info version 7.1.

Result: Starting from April 6 to May 5/2014, a total number of 43 suspected measles cases and one death were reported. The overall attack rate (AR) was (6.1/10,000population). Out of total cases, 27(62%) were in male with the mean age of 11 years (range from 8 months to 35 years). Majority of cases 24 (55%) were aged below five year. The outbreak was occurred in four kebele out of the 5 kebeles in the Woreda, the most affected kebele was Hardhagax 30/10,000 population. All five blood sample become positive for measles IgM. In the case control study being un-vaccinated (OR=9.6429; CI 3.9687-23.4293), mothers being illiterate OR =5.33 CI;(2.245-12.9344), travel history OR=6.08; CI;(1.8223-23.7331) having contact with suspected or confirmed measles case OR 6.842 CI ;(2.245-12.9344), and travel history (OR=6.17; (1.8124-21.0185) was associated factors with contracting measles.

Conclusion: An outbreak of measles cases occurred in Hamaro affecting primarily the age group under 5 year. Low vaccination coverage, being mother illiterate, having contact with suspected or confirmed cases and travel history was among risk factor identified. Strengthening routine immunization is recommended.

Key word: measles: outbreak: case control: Hamaro.

Chapter 7: Narrative summary report

Meher Need Assessment on Health and Nutrition, Jerar zone, Ethio-Somali state, December/2014

Abstract

Background: Meher season assessments were conducted from November 26 to December 12 /2014 in Jerar Zones. Assessment was done on food and nonfood causes of hazards. Nonfood causes of encountered problems resulted from communicable diseases particularly epidemic prone ones and due to unsafe/contaminated and inadequate levels of water.

Objectives: To determine magnitudes of hazards of different sort, identify risk factors and make recommendations to take reliable intervention measures to address problems encountered.

Result: Top five diseases which were incriminated to cause morbidity were Malaria, Upper Respiratory Tract Infections, UTIs, typhoid fever, and Pneumonia. There were no reported cases of AWD and Meningitis in all visited woredas. All woredas reported lack of emergency drug to manage possible emergency situation for the upcoming 2 month. There was a multispectral PHEM coordination forum in all visited woredas but as assessment results showed their functional strength was limited. LLINs coverage of all visited woredas was greater than 80%.

Conclusion: there were no any ongoing outbreaks reported from all visited district no public health emergency preparedness and response plan. At the district level there is no drug and medical supplies stock at district level.

Introduction

The Government of Ethiopia has been dedicating considerable resources to the response to Public Health Emergencies: from epidemics of diseases to widespread malnutrition resulting from drought. The Region is also exposed to potential natural disasters like floods and resulting displacement of population and related health and social problems with various degree of impact on the health sector (1).

Ethiopia has been conducting human health and nutrition emergency needs assessment twice a year following Meher and Belg seasons in coordinated with food security assessment leaded by Disaster Risk Management and Food Security Sector(5). On the assessments both government and nongovernmental organizations (Ministry of Agriculture, Disaster Risk Management and Food Security Sector, Ministry of Health, Ministry of Water and Energy, Ministry of Education, National Metrology Agency and respective Regional Bureaus, WHO, UNICEF, OCHA, MSF, IRC and etc.) have been participating. During the assessment possible human health and nutrition risks were expected to be identified and numbers of beneficiaries were estimated. Finally using the results of the assessment humanitarian document developed and distributed to all partners to fill the gaps identified to avert and minimize public health consequence.

Ethiopia is one of resource poor countries in which early identifying and instituting prevention activities are crucial strategies to respond to public health emergencies. Following the Meher and Belg rain fall malaria outbreak is expected in many part of Ethiopia because of the suitable conditions formed for mosquito breeding; On the other hand since Ethiopia is in meningitis belt the outbreak of meningitis is also suspected during the dry seasons. Not only this internal displacement due to drought left too many Ethiopian populations vulnerable for diarrheal diseases, measles, severe acute malnutrition and the like from year to year. Shortage of drinking water during dry season is decisive contributing risk factors for the occurrence of acute watery diarrhea across the country (5).

Therefore, early vulnerability assessment and provide necessary resource for at risk population is very important to minimize loss of health budget, school drop rate and production power due to health consequence of natural and manmade disasters and epidemic diseases; Hence, as usual 2014 Meher pre assessment was conducted to identify areas where emergency assistance (health,

nutrition) might be needed due to acute problems and come up with reasonable estimates of the size of the population needing emergency assistance for the upcoming 6 months period.

Objectives

General Objective

To assess and identify public health emergency needs of the Ethiopian Somali Region, December/2014

Specific Objectives

To assess the extent, types, severity and likelihood of human epidemics

To assess the existing health capacity and gaps of the health system to address those risks

To identify areas where emergency assistance (health, nutrition) might be needed due to acute health problems

Method and Material

Study design:

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

Study Area Profile:

The assessment was conducted in Somali Regional state of Jerar districts in the zones were selected. Based on discussion with zonal administration and regional PHEM officers, 5 districts, 5 health center and 12 health post were visited during the assessment namely Degahbuur, Birkood, Ararso, Aware and Gashamo out of the 10 district of the Jerar zone with relatively high risk of public health emergency were identified. In Jerar zone there are 566,818 total populations of which 289,077 are male and 277,741 are female. The zone has 10 districts administrative and one administration city council and. In the zone there is 1 hospital, 10 health centers, and 47 health posts providing both primary and secondary health service for the zonal populations but Degahbuur, Yoocaale and Guanaco woreda not documented their health facilities and the team not have visited, There are 6 General Practitioners, 20 health officers, 65 different nurses, 10 medical laboratory technologists, 2 Environmental health officers and 62 health extension workers working in the zone.

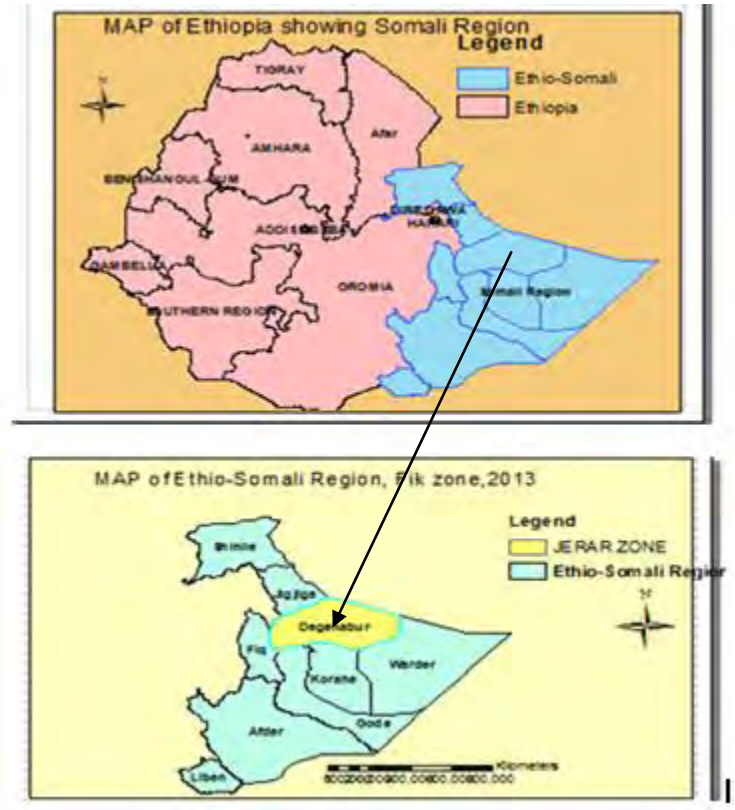


Figure 28: Ethio-Somali Region, Jerar Zone, 2014

Selection of Assessment area:

Hot spot districts were identified by respective Regional Health Bureaus and Zonal administration. During the selection of districts to be addressed by assessment the Regional Health Bureaus and Zonal administration take into consideration both natural disasters and diseases trends such as drought, shortage of normal rain, internal displacements, ongoing diseases outbreaks, floods, landslides, conflict etc.

Assessment Team:

The assessment team was composed of 7 experts from Regional DPPB, ,UNICEF, WFP, PEDA,RHB/WHO, IRC, The two day training was given for all assessment teams at Regional DPPB before deployed to zone on assessment tools and on data collection techniques . The team was classified to food and non-Food section based on their working organization and collect data from respective sectors and the team discuss if they were understand the questionnaire or not all of the team after they understand questionnaire that concerned on their working organization is given.

Assessment Tools:

Structured questioners were used for data collection for health and nutrition related data at district under the Jerar zonal level. The questioners addresses socio-demographic profile, to common causes on morbidity and mortality, status of epidemic prevention and control multi sectorial coordination committee at all levels, preparedness on emergency drug availability and go through asking ongoing epidemic situation and check availability of emergency drug at and district levels.

Source of Data:

Both primary and secondary data were collected from District Health Office department, pharmacist, and public health emergency management officer were interviewed and secondary data was collected from Regional Health Bureau.

Purpose of the assessment: -

The disaster needs assessment will help emergency response decision makers determine and implement appropriate emergency response measures. To plan

Effective response efforts, decision makers need to know:

Whether or not an emergency exists

The demographics of the affected population and the number of people affected

The details of the emergency (cause, location, magnitude of disaster, etc.)

The condition of the affected population (mortality and morbidity rates)

The local response capacities and available resources, including organizational and logistical capabilities

The extent and type of life-saving needs and priorities

The likelihood of additional future problems or needs

Results

Results

Coordination

Somali Regional Health Bureau has functional multi sectorial coordination forum which conducts meeting every month while Multi sectorial coordination (Relevant government offices. NGOs and UN agencies) forum for health at zonal level is functional only during epidemics while there is no multi sectorial coordination forum at district level

Outbreak

There is no ongoing disease out breaks in Jerar zone in last six-month.

Risk Factors for epidemic prone diseases

There is risk factor leading to outbreak particularly AWD, measles and meningitis currently. AWD outbreak is anticipated due to the inadequate safe water supply, using of pond water and Jerar valley which crosses three woredas used for drinking without chlorination posing risk for diarrheal disease outbreak and there was AWD occurrence in the last 3 years in 3 woredas (30%) of the zone, measles outbreak is anticipated due to the low coverage of vaccination in the visited area; On the other hand, since Ethiopia is in meningitis belt the outbreak of meningitis is also suspected during the dry seasons.

Malaria:

The five visited districts (Degahbuur, Birkood, Ararso, Aware and Gashamo) are malaria endemic area. In these districts there are a number of malaria risk factors which could contribute for the occurrence of malaria cases. Jerar zone water depend on stagnant water having Boreholes, Shallow wells and Hand Dug wells which can be breeding sites are the main contributing risk factors during rainy season in all the above five districts. On the other hand ITN distribution is more than 80% in all visited districts.

AWD:

Birkood, Ararso, aware and Gashamo districts were not reported Acute Watery Diarrhea in the last three years while Degahbuur council, Guanaco and Degahbuur district had reported cases of AWD in 2004. There is a risk of AWD outbreak for the district while other part including Awere,Yo‘ale, Daror and Gashamo are depend on rain water harvesting in the form of Huffier Dams , Using household drinking and other domestic usage in a similar scheme can bring cholera outbreak, Birkas and Natural Ponds,. But Degahbour has many communal water source points for livestock drinking includes Bulale, Hora Yasuf.

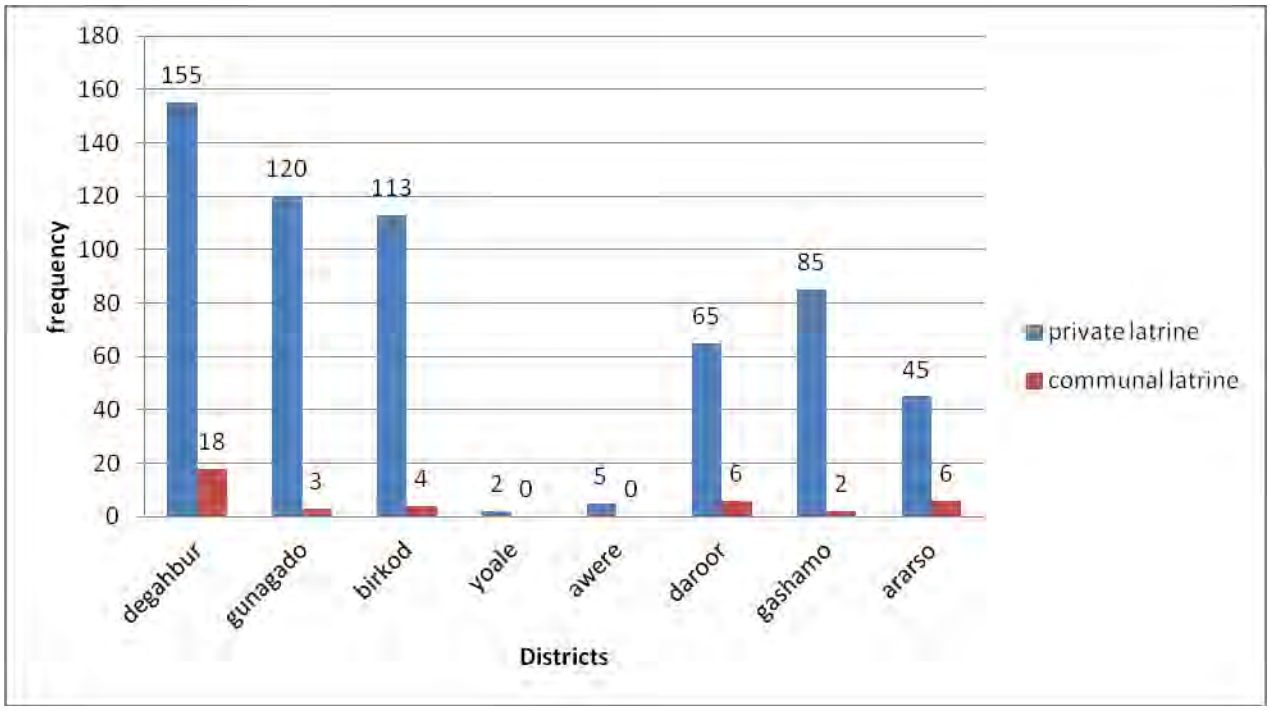


Figure 29: Communal and private latrine in Jerar zone, Ethio-Somali Region ,2006EC

According to this chart, the Sanitation and Hygiene promotion Jerar zone is very poor due to the lack of enough communal latrine in the zone particularly in Yale and Aware woredas due to high cost latrine excavation and most of the communities used to open defection but those are in the main towns have their own private latrines, although it is insufficient comparing to the number of the latrines and people reside in these towns. People are requesting many latrines and machines for removing and cleaning the full latrines with defection. in addition to this, managing the solid waste is very poor in yo'ale, aware, Gunagado woredas, while Daror ,Gashamo, Birkod, Araso and Aware woreda are good , hence they got from SAVE International and International Rescue Committee implementing PDP project in Daror, Gashamo, Ararso, Birkod sanitation campaign awareness about putting the waste the appropriate place and burning it.

Measles:

In the five observed districts there are no measles epidemics currently. The vaccination coverage against measles antigen are around 74 % in Dagahbur, 40% in Birkood, 30 in Aware,60 in Gashamo and 60% Ararso ,In line with low vaccination coverage and widespread

malnutrition in the districts the measles outbreak might be happens in the next six upcoming months.

Nutrition Status:

The woredas of Jerar zone which team were assessed they there were not enough rains for the upcoming 6 months due this, Food insecurity was also the most pressing challenge in woredas of Jerar zone that resulted increase in severity of malnutrition cases in this year, the woredas were common on the issue of nutrition even though there was a shortage of plumb net during our assessment and there was 30 OTP and one SC in Degahbuur hospital in addition to this MHNTs operate two of the woredas in jerar zone but during our assessment we have not seen any plumbnet available in all visited health facilities.

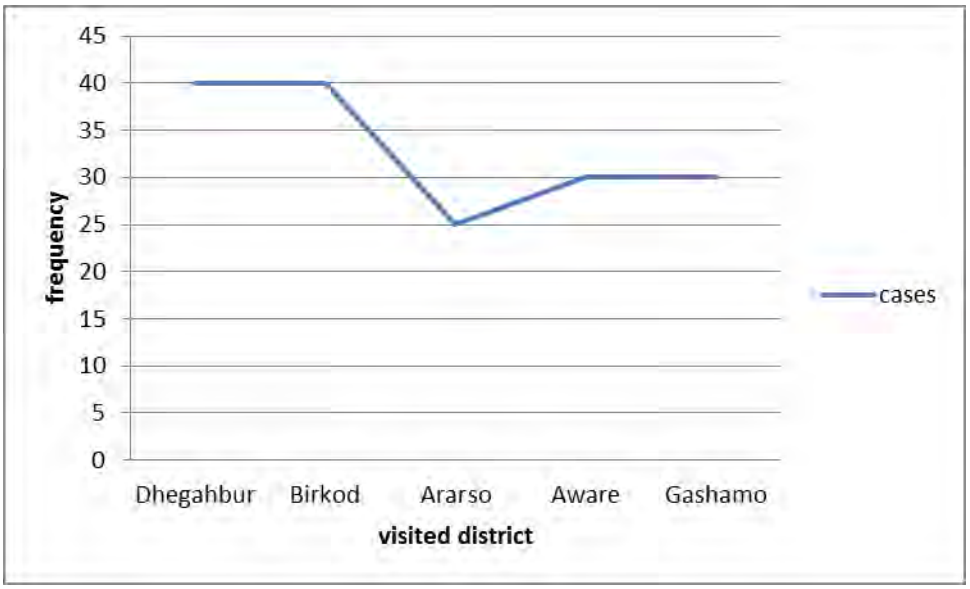


Figure 30: OTP admission of Jerar zone in the past 6month,December/2014

Public health emergency management

No PHEM structure at zonal level there is only one person representative for Regional Health Bureau working Jerar Zone with no fund and logistic and there was no EPRP plan at zonal and woreda level that contained risk analyses, supplies and budget. In regards to drugs there is no emergency drug available at woreda level.

Gaps and challenges Identified

Inadequate PHEM guideline utilization and training

Shortage of budget and computer at woreda Health office and health facilities,

Shortage of drugs and supplies

Lack of zonal health structure

Drug requirements status:

Mostly the woredas were common the lack of adequacy of the essential drugs, which is the very important part of the health service improvements. For example, Birkot woreda which we took as sample of the woredas the requested drugs on their budge the items they requested were 205 different items of medical drugs only they got 58 items of that, which accounts for 71.7% were not received. For the coping and mitigating the situations of shortage of rains, it‘s possible that the immunity of vulnerable risk groups decreased due to lack of enough foods and lack their dependent animal milks and meats so if there is no ready health facilities for their essential drugs treating the opportunistic diseases it‘s possible that a lot of complicated cases will increased All visited districts could not keep emergency drugs at district store, they distribute any drugs they received from woreda health department to health facilities.

Table 24: Emergency preparedness and available drug in the district

	Woredas					
Preparedness: Is there emergency drugs and supplies enough for 2 months? Or easily accessible on need?	Aware	Gashamo	Ararso	Daror	Birkod	Araarso
Ringer Lactate (to treat AWD cases)	N0	N0	No	No	No	No
ORS (to treat AWD cases):	N0	N0	No	No	No	No
Doxycycline (to treat AWD cases):	N0	N0	No	No	No	No
Consumables : Syringes, Gloves (for AWD management):	N0	N0	No	No	No	No
Amoxil susp (measles)	N0	N0	No	No	No	No
Tetracycline ointment (measles	N0	N0	No	No	No	No
Vit A (measles)	N0	N0	No	No	No	No
Coartem for Malaria	N0	N0	No	No	No	No
Lab supply: RDT for Malaria	N0	N0	No	No	No	No
Lab supply: RDT (pastorex) for Meningitis LP set	N0	N0	No	No	No	No
Number of CTC kit available: (for A WD)	N0	N0	No	No	No	No
Main shortage (if any): Specify	N0	N0	No	No	No	No
Is budget allocated for emergency Rapid response by the woreda?	N0	N0	No	No	No	No

Morbidity and Mortality (List top 5 causes of Morbidity and Mortality) in the year 2007 EC (2014GC)

Table 25 : Top five morbidity for pediatric and adult in Jerar Zone, Ethio-Somali Region, December/2014

Zone	Woreda	Rank	Top five causes of morbidity	
JERAR	Degahbuur		Below five	Above five
		1	Pneumonia	Malaria
		2	malaria	Typhoid fever
		3	Diarrhea	AFI
		4	Iskin infection	UTI
		5	Trauma	Diarrheal
	Birkot	1	URTI	DIARRHEA
		2	Malaria	ARI
		3	Pneumonia	Malaria
		4	Skin infection	Conjunctivitis
		5	Diarrheal disease	pneumonia
	Ararso	1	Malaria	Diarrhea
		2	Diarrheal	Anemia
		3	Pneumonia	UTI
		4	Skin infection	Malaria
		5	Others	Ear infection

	Aware	1	Diarrhea	Malaria
		2	Pneumonia	pneumonia
		3	Malaria	Intestinal parasite
		4	Conjunctivitis	AFI
		5	Ear infection	PUD
	Gashamo	1	Malaria	Malaria
		2	Pneumonia	Intestinal parasite
		3	Diarrhea	UTI
		4	Ear infection	Pneumonia
		5	Tonsillitis	Accidental cases
	Daroor	1	Malaria	Malaria
		2	Pneumonia	Pneumonia
		3	Diarrheal disease	Intestinal parasite
		4	Malnutrition	Typhoid fever
		5	Otitis Media	Urinary Tract Infection

Humanitarian response

IRC and SAVE international are only the two NGOs support four woredas of Jarer zone including Aware, Birkod, Ararso, Gashamo and Daror for WASH component implementing PDP funded by DFID doing different activities including Birka rehabilitation, birka construction, borehole drilling, sanitation and hygiene promotion campaign, capacity building for woreda water staffs, providing training WASH committee and distribution of household water filter purification.

In average deyr rain season was normal in the zone, but there is some kebeles in Yale, Aware, Daror and Gashamo that may be at risk for water shortage due to lack of rain or shortage of water supply sources or overpopulation in the residential areas or prolong of the upcoming dry season and here Annex is attached and prepared the name of the kebeles, their population and nearest water source points.

Limitation of the assessment

Time constraint to visit each district/woreda

Poor data documentation in the districts/woredas

Lack of zonal health structure in Ethio-Somali region

Lack of availability of mortality data in the district

Discussion

Strong multi-sectorial committee which could be leaded by administrative body is weak in Jerar zone and Public health emergency preparedness is very low so in order to prevent and control any epidemic, capacity building should be carried out according to the EPHI guideline. Emergency and lifesaving drugs are also expected to be stockpiled at district level to timely mobilize and minimize loss of life the capacity building activity could focus on establishing and/or strengthening system and human resource needs related to PHEM: surveillance system, communication, and logistics. The logistic part focuses on stockpiling drugs, vaccines (buffer stocks), personal protection equipment (PPE), emergency health kits, medical supplies required for prevention and control of epidemics, and nutritional supplements. This has to be augmented with securing funds for related operational activities. The public health emergency management unit shall ensure adequate supplies for the management of different hazards and identified risks are available, as part of the preparedness plan. While doing preparedness, estimate needs based on different assumptions (4).

According to this assessment proportion of house hold that have latrine or using latrine is very low In Ethiopia, according to Demographic and Health Survey 2005, about 62% of the households (12% in Urban and 70% in Rural) had no access to any type of latrine facilities (1). The same data source indicated the proportion of households with private improved sanitation was only 6.8%. This is highly unacceptable given the national prevalence of diarrhea diseases, 18%, among under-five children (1) whose mortality is one of the decisive indicators in the MDG goals (2). Overall child mortality could be reduced by 55% with the provision of safe water, sanitation and hygiene (13). The prevalence of diarrhea in Ethiopia has wider variation, from 11% to 38% (15-17), that mainly depends on season, ecology, and water and sanitation coverage.

Conclusion

In general there are no active epidemic prevention and control committee at both zonal and district level woreda Currently there is no any ongoing outbreak reported from all visited district, house hold that have latrine latrine is very low, District levels have no public health emergency preparedness and response plan. At the district level there is no drug and medical supplies stock at district level.

Recommendations

Regional Health Bureau should educate the public related measures to be taken to prevent and control any emergencies and increase the knowledge of the health professionals and community as whole on sanitation by providing training.

RHB should also maintain the availability of essential drugs at the woreda level these includes improving the health risk identification which is very important all the day.

Planning should be made at Woreda level to allocate budge for purchasing emergency drugs and supplies and stockpiling them at woreda level store.

Regional health bureau should establish multi sectorial coordination forum which takes places on regular manner at Zonal and District level.

Reference

1. Central Statistical Agency Ethiopia, ORC Macro USA**.** Ethiopia Demographic and Health Survey 2005. Addis Ababa; 2006.
2. United Nations. The Millennium Development Goals Report 2005. United Nations report. New York; 2005.
3. Esrey SA, Potash JB, Roberts L, Shiff C. Effects of improved water supply and sanitation on ascariasis, diarrhea, dracunculiasis, hookworm infection, schistosomiasis, and trachoma. Bulletin of the WHO 1991; 69(5):609-21.
4. EPHI, public health emergency guideline, February/201
5. Somali Regional Health Bureau, Meher health and nutrition assessment, 2012

Chapter 8: Protocol for Epidemiological Research Project

8.1: Assessment of Utilization and Factors Affecting Utilization of Insecticide Treated Bed Net in Erer District, Sitti Zone, Somali Region 2015

Introduction

Malaria threatens 300–500 million people and kills more than one million peoples annually [1]. Sub-Saharan Africa accounting for 90% of global malaria cases [2] and a majority of these cases occurring among women and children [3].

Malaria is estimated to cause at least 300 million clinical cases and l million deaths each year, of which more than 90% are in Africa. *Plasmodium falciparum* causes the majority of infections and about 18% of deaths in children less than 5 years of age (10). Approximately 19- 24 million pregnant women are at risk of malaria and its adverse consequences (11, 12). It also causes many other deaths through synergy with other infections and huge economic losses and disability adjusted lives every year.

In Ethiopia, 75% of the land mass is malarious and 68% of the population is at risk of infection (12). The number of re-treated and sold mosquito nets until the end of 2003 was about 425, 100 (4). The Federal Ministry of Health through support from the Global Fund has been distributing long lasting insecticide treated nets to malaria-affected areas starting end of August 2005 (13).

Mostly malaria transmission in Somali Region is the major health problem that occurs after major or minor rainy seasons, which are the source for breeding of mosquitoes and the existence of favorable environment the major factor for survival of the parasite. Major rainy season is from April-May (Gu‘u) and the minor is from October –December (Deyr) while Jigjga & sitti Zones it is July –August just the same to the other parts of the country (SRHB). There was an outbreak of malaria in Erer woreda in 2005 EC in which there is high number of cases in every time comparing to other district of sitti zone.

Little is known about the knowledge and utilization of ITN receivers among people residing in malaria prone areas. In connection with these activities we thought it important to investigate the distribution and proper utilization of ITNs in the selected districts of the country.

.

Identification of awareness gaps, monitoring of behavioral changes on malaria disease this paper describes utilization and factors associated with utilization of ITNs in the previous days among this vulnerable group in the Erer woreda of sitti zone.

Statement of the problem

Despite the activities pertaining to the distribution of bed nets, many questions remain unanswered. The extent to which people are aware and acquire nets is not understood clearly. Observation and rumors of not hanging nets at all, hanging nets in a wrong manner and place and not giving priority to children and pregnant mothers deserve close examination. The perception of the population on the role of bed nets in the prevention of malaria is still another issue. Thus, this study will describe the status of utilization and factors affecting utilization of bed net in Erer, Somali region, where bed nets have been distributed.

Rational study

MDG in 2015 to reduce child mortality by two thirds, malaria is among more than 70 percent of almost 11 million children deaths every year these deaths occur mainly in developing world . An Ethiopia child is 30 times more likely to die by his or her fifth birth day than a child in Western Europe with the effort on distributing More than 20 million LLINs were distributed in Ethiopia between 2005 and 2007; a further 15 million were distributed in 2010 and 2011 to replace LLINs distributed previously. Currently Ethiopia has set a goal of achieving at least will be targeted for universal (100%) LLIN (2011-2015) (2) coverage with one LLIN per sleeping space With this, there is need to study utilization and factors capable of influencing consistent use of ITN and Erer district is one of the highest malaria prone areas in Ethiopian Somali regional state and Malaria outbreak with little known on utilization and factors affecting on Utilization of Bed Net in Erer district so in order to achieve this goal an assessment of Utilization and factors related on utilization of bed net is important.

Objectives

General Objective:

To assess factors affecting utilization of bed net in Sitti Zone, Erer Woreda of Ethiopian Somali Regional States, October, 2015.

Specific objectives:

To study utilization of bed nets by households

To assess risk factors affecting utilization of bed net

To asses‘ awareness level towards malaria, insecticide treated nets in the woreda

To recommend intervention measurements

Methods and Materials:

Study Area and population:

Ethiopian Somali regional state has nine administrative zones: The Sitti administrative zone is located in the north-west of the Somali Regional state. Erer is one of the districts in the sitti zone of Somali Region of Ethiopia. Erer is bordered on the south by Diredawa and the Oromia Region, on the southwest by Afdem, on the northwest by the Afar Region, a rural estate created in 1923 for RasTafari by Pastoralist, which featured fruit trees and tropical plants. The track of the Addis Ababa - Djibouti Railway crosses the southern part of this woreda along the lower slopes of the Erer Woreda.

The Woreda consists of 14 centers – main kebeles and 32 sub kebeles. The Woreda- total population 89163, 0 – 5 years 13773. Health service status 16 health posts 16 functioning 4 health centers were constructed Hurso health center, Erer town health center Aydora health center, Asbuli health center . Human resource serving woreda includes, Nurse 56, Midwives 3, Lab. Tech. 9 PHC workers, 6 Health extension workers, 40 HO, 7 Bsc nurse, and Bsc Env't 3.

On the communication part, most kebeles of the district has either mobile or landline telephone or both. Even though there are rough and seasonal roads, there is public transportation in the woreda.

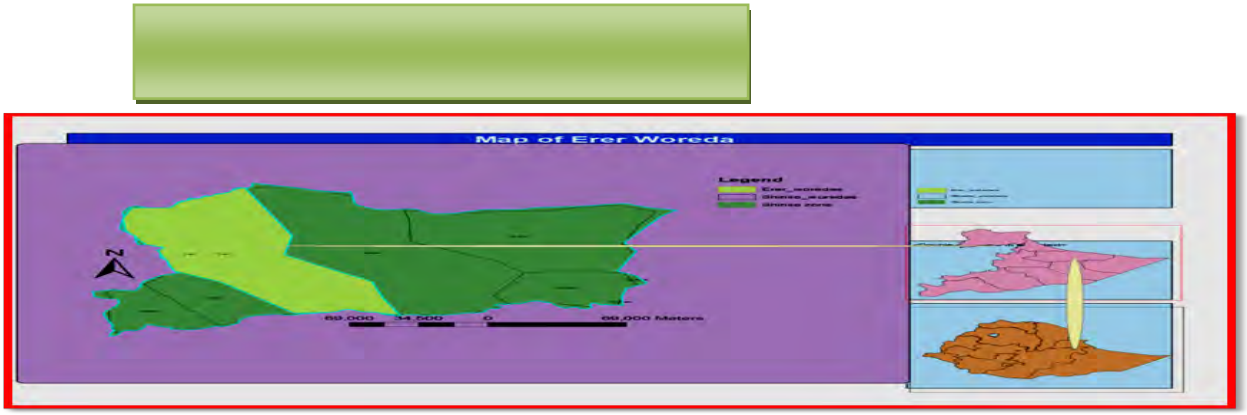


Figure 31: Ethio-Somali Region, Erer Woreda,2014

Study Design and period:

Community based cross-sectional study design will be conduct from October 10-28 /2015.

Source Population:

All house hold living in Erer woreda of Ethiopian Somali Regional State.

Study population:

The participated households were systematically selected from the ITNs freely supplied list of households from the chosen kebeles.

Sample size determination

The study sample size will be determined by statistical calculation. Because of the approximation of households properly utilizing ITNs is unknown, p = 0.5 Will be used, as this value gives sample size sufficiently large to guarantee an accurate prediction, at 95% confidence interval and 5% error of estimate. We will estimate 10% of the population might be non-respond due to different reason for total of 426 households was used by using the formula $\underline{n= z^2 * p (1-p)}$ d^2 (100%-R).

Sampling Procedure:

Malarious kebeles of the study area were stratified into three strata based on their distance from Erer Town (administration towns of the Woreda) in this urban kebeles, semi-urban kebeles located ≤5kms, and rural kebeles located >5kms from the town within the boundary of the district, Socio-demographic factors that affect utilization of ITNs might be different as the location of households becomes far away from the town. The participated households were systematically selected from the ITNs freely supplied list of households from the chosen kebeles. Finally systematic random sampling method will be employed to select house hold to be included in the study. Only one individual (mostly head of household) will participate in the study.

participants who answered at least six and above series of knowledge assessing questions related to malaria and ITN were considered as sufficiently knowledgeable. ITN utilization was considered when presence of bed nets were hanged over the bed and participants slept in the previous night under the nets.

Data collection:

A structured questionnaire will be used for the purpose of data collection. Questionnaire will be translated in to local language and ten grade students who can speak local language will be trained for data collection and 2 supervisors for collaboration and data quality management will be trained prior to study period for 10 days. Interviews using structured questionnaires will be conducted with household heads or spouses from the selected households in the study villages. Pre-test will be conducted in a non-study village to identify the potential problems encountering during data collection and interview. Questionnaires will administered after explaining the purpose of the study and criteria used to select each respondent.

Variables of the study:

Dependent variable: – Utilization of ITN

Independent variables:-Socio-economic Variables, Demographic variables, Knowledge and attitude variables, marital status, Sex, Educational status, Occupation, Monthly income, place of residence and housing condition.

Data Quality:

The pretested and structured questionnaires were used to collect the data. The questionnaire will be prepared originally in English and then will be translated in to Somali and back to English to check for any inconsistencies or distortions in the meaning of words and concepts and to increase the validity of the data. Data collection guideline will be prepared and given for data collectors and supervisors.

Ethical Consideration:

This project obtained ethical clearance from the ethical committee of the medical faculty of , Addis Ababa University Verbal consent was obtained prior to interviewing the respondents and .

Permission will be also obtained from the concerned bodies of Somali Regional health bureau and woreda health office.

Data Analysis:

Data collected during the survey were checked in the field by supervisor and I will entered

Into computer using EPIINFO Data version 7.1.1 and excel . Analysis was made by using bi variate and multi variate logistic regression. Each variable were analyzed by using bi variate logistic regression to know their significance and to assess the separate effects and multivariate analysis was done using backward stepwise logistic regression to control the possible confounding effect for variables with p-value <0.05 in bi variate analysis. P-value of less than 0.05 was considered as statistical significant. Odds ratio (OR) with 95% confidence interval was used to assess the presence and degree of association between dependent and independent variables.

Dissemination of findings:

The findings of this study will be disseminated to Ministry of Health, Addis Ababa University, Somali Regional Health Bureau, Erer woreda health office and different organizations that will have contributions to improve the health condition of the community. In addition, the study finding will also be presented at national and international oral presentation conferences.

Expected outcomes:

Reason for not utilizing will be cleared indicated

Utilization of bed net will be maximized by using effective strategy

How educational status of the family is related to the utilization of bed net will be indicated

Utilization of bed net will be cleared indicated.

Reference

1. RBM/WHO/UNICEF: World malaria report. WHO, Geneva; 2005.
2. Malaria in Africa: Roll Back Malaria Factsheet. Geneva: World Health Organization; 2002.
3. Malaria in Pregnancy: Roll Back Malaria Factsheet. Geneva: World Health Organization; 2002
4. WHO/UNICEF. World Malaria Report 2005: World Health Organization and UNICIEF, 2005.WHO/HTM/MAL/2005.1102
5. Abeje kesie, melaku wali, and tesfu fekensa.Assesment of insecticide treated bed net possession , and proper utilization and the prevalence of malaria in Dejen woreda , east Gojam zone, Ethiopia . accepted 8 June 2014
6. FMOH, National malaria guideline 2012
7. Marie-Reine Ingabire Rutagwera. Assessment of factors associated with utilization of insecticide treated bed nets among women of reproductive age: Observations from the Zambia national malaria indicator survey 2010.
8. UNICEF. Malaria, a major cause of child death and poverty in Africa. 2004
9. Nahlen B, Clarc J, Alnwick D. Insecticide treated mosquito nets. American Journal of Tropical Medicine and Hygiene.2003;68(4):1-5
10. WHO/UNICEF. World Malaria Report 2005: World Health Organization and UNICIEF, 2005. WHO/HTM/MAL/2005.1102.
11. Snow R, Craig M, Deichmann U & Marsh K. Estimating mortality, morbidity and disability due to malaria among African‘s non-pregnant population. Bull Wld Hlth Org. 1999;77:624-640.
12. Guyatt HL & Snow RW. The Epidemiology and burden of *Plasmodium falciparum*-related anemia among pregnant women in sub-Saharan Africa. Am J Trop Med Hyg. 2001;64(suppl 1).

Annex 1: Malaria Project Budget Break Down

Items	Detail activities	no of days	no of person	rate USD	total USD cost
Training	supervisor	1	2	20	40
	Training for data collectors	1	6	10	60
Hall rent	hall rent	1	l/sum	l/sum	80
Stationery	A4 size paper, tonners, pens, bag, notebook				360
Perdium	supervisor	8	2	30	480
	Perdium payment for data collectors	8	6	10	480
Transportation	Vehicle rent, fuel	15	1	100	1500
Total					3000

Annex 2: Consent Form

Title: Assessment of Factors Affecting Utilization of Bed Net in Erer woreda, Sitti zone, Somali, Ethiopia, 2015

Objective: To assess factors affecting utilization of bed net in malaria hotspot area of sitti zone of Somali Regional states.

Procedure: If you agree to be in this research, and sign this consent form, we ask that you fill out a three page survey. The survey should take only 20-30 minutes of your time

Purpose: We are interested in learning more about factors affecting utilization of bed net in your kebeles .We also want to learn more about the things that might get to enhance the utilization of bed net and maximize the benefits of bed net

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

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

Privacy: The records of this study will be kept private. We will not ask your name. We will not use any information that might identify you when we present or publish the study‘s results.

Payment: There is no cost to you for being part of the project. The approximate time that this study will take is around 15- 30 minutes.

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

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

Signature of Interviewer_____

Date of interview _____Time started_____ Time completed_____

Checked by supervisor: Name_____ Signature_____ Date_____

Annex 3: work plan

Description of activity	Project Implementation Time					
	June	July	August	September	October	November

Translation of data collection tools to local language	X x					
Training of data collectors						
pre-test						
Data collection and translated back to English			xx			
Data entry and analyses				xx		
Report writing					xx	
Submission of report						xx

8.2: **Routine immunization coverage and associated factors among children aged between 12-23 month in a Rural nomadic community of Gashamo District, Somali Regional state, Ethiopia.**

Background

Vaccine-preventable diseases are a major source of mortality among children throughout the developing world, causing an estimated 2.5 million deaths per year. To prevent these diseases, vaccines are delivered through routine health services and through supplemental immunization activities (SIAs) according to the global immunization division report. Measuring vaccination coverage permits evaluation of vaccination services, appropriate targeting of additional services and, when linked to surveillance data, assessment of the success of vaccination strategies in preventing disease Although most countries routinely calculate vaccination coverage using administrative data (i.e. by dividing the number of doses administered by the estimated target population), results can be unreliable, particularly when the target population size is poorly known.

Ethiopia is one of the lowest performers in all MDGs. The under-5 mortality rate in Ethiopia is 118/1000 (Millennium Development). In fact, a child in Ethiopia is 30 times more likely to die before age 5 than a child in Western Europe (Millennium Development). Children are the most vulnerable segment of the population, but many of the ailments that cause death in this population can be avoided by completion.

Of routine childhood vaccination, the global Universal Childhood Immunization initiative goals for Routine Immunization (RI) are 80% coverage (Immunization). Ethiopia currently has an aggregated coverage rate of 65.5% according to the 2012 coverage survey in Ethiopia, well below the international standard (WHO: Expanded program on immunization).

According to the EPI coverage conducted in 2012 immunization coverage for penta1 49% and penta 3 30.7% which is below to the national immunization coverage (80%) that there is low access and low utilization of the vaccine .

Gashamo district is among one the district that measles outbreak occurred with having long border to Somalia country that was having an outbreak of polio now focused on Highrisk zones,

primarily border areas . Has 3 Health center and 7 health post in which 3 of the health post donot provide routine EP

Statement of the problem

The World Health Organization has estimated that about 1.5 million children under age 5 years continue to die annually from VPDs (approximately 20% of overall childhood mortality). In particular, pneumococcal conjugate vaccine (PCV), Haemophilus influenza type B (Hib) vaccine, and rotavirus vaccine prevent pneumonia and diarrhea, the two leading causes of death among children under age 5 years in the developing world; the expanded use of these vaccines will be critical for achieving UN Millennium Goal 4—to reduce 1990 child mortality levels by two-thirds by 2015.

Despite the activities pertaining to the distrabution of vaccine at health facilities, vaccine coverage is still low which many questions remain unanswered More than 80% of Gashamo district population is pastoral - nomadic lifestyle. Who are always on the move between Ethiopia and Somalia for grazing and meeting relatives where there are strong links to clans or tribes rather than nationality? The main source of income is driven from livestock rearing and petty trading the live style of the nomadic community is some in all the border woredas ,this has created difficult for polio eradication at present and in the past .

The 2013, Importation of WPV in the Horn of Africa (HOA) with progressive increase in number and geographical extension has been reported from neighboring countries of Ethiopia in Somalia .A total of ten cases were reported from rural border areas in Ethiopian Somali Regional state have frequent population movement across the border with Low population immunity and most of the people lead pastoral - nomadic lifestyle.

Rational of the study

Routine immunization in Somali Region and in particular Gashamo district is not functioning as expected. , Gashamo district reported that only 35% of children between 12 and 23month are vaccinated and Routine immunization is not functioning as expected.. It is one of the high measles outbreak occurred in Ethio-Somali region in 2014, this is high-risk zones, primarily hard to reach area. The available traditional network of information sharing mechanism, knowledge and perception of the community will be study and recommend effective intervention and strategies.

Literature review

Vaccine-preventable diseases are a major source of mortality among children throughout the developing world, causing an estimated 2.5 million deaths per year.1 To prevent these diseases, vaccines are delivered through routine health services and through supplemental immunization activities (SIAs)(8).

Like its predecessor, EPI Essentials (1988), this manual has been written for immunization program managers at national and sub-national levels in developing countries and for people who support these managers, particularly field staff of donor agencies. Our intention is to provide information that is practical as well as technically and operationally sound. For readers who would like to explore topics in greater depth, we have provided additional references.

An infectious disease is an illness that occurs when an infectious agent is transmitted from an infected person, animal, or reservoir to a susceptible host. Some of the factors that influence transmission include Population immunity A basic concept of public health is that every individual who is protected from a disease as a result of an immunization is one less individual capable of transmitting the disease to others. Individuals who have been immunized serve as a protective barrier for other individuals who have not been immunized, provided that the number immunized has reached a certain level. Reaching and maintaining that level, which varies by communicable disease, provides —herd immunity" to unimmunized individuals (6).

Routine vaccination coverage for each required vaccine dose was defined as the percentage of children aged 12–23 months living in selected households for the past 6 months who received the respective dose; complete vaccination coverage was defined as the percentage of these children who received all doses. We present two measures of routine vaccination coverage: coverage determined only from doses documented on a hand-held vaccination card (‗card only') and that determined by combining vaccination card with verbal report from parent or guardian (‗card history')(7).

The Ethiopian Ministry of Health recommends that all children receive nine vaccination doses by age 12 months [1 dose of Bacille Calmette Guerin vaccine (BCG), 3 doses of Diphtheria, Tetanus, and Pertussis vaccine (DTP), 4 doses of oral poliovirus vaccine, and 1 dose of measles vaccine]. In addition, to increase population immunity to measles (4).

Research questions

What are some characteristics of parents and caregivers associated with no and incomplete child vaccination in Ethiopia Somali Region?

What are potential _interception points‘ for communication messages?

Are Local, religious, and traditional leaders in rural areas communicating with the pastoralists?

Objectives

General objective

Assessment of Factors contributing for low utilization of vaccine in children between 12-23 month in a rural nomadic community of Gashamo District, Eastern Ethiopia, December/2014

Specific objective

To assess socio demographic characteristics of the study respondent

To assess caregiver related factors related to low vaccination

To explore the view of clan leaders and other health managers

To identify reasons for no immunization and/or partial immunization including inequities in service provision and/or demand

To recommend effective and affordable interventions

Methods

Study Area and population

The study will be conducted in Gashamo district of Jerar zone; the zone has 7 administrative districts, the zonal population is 543,191 of Somali regional state. The district capital Gashamo Town is 304 km distance far from Regional capital Jigjiga in the east. The district has 17 Rural and 2 Sub-urban kebeles the district has 116,838 total populations of which 26, 697 are women in productive age. For the district the number of family members per house hold is 6.6. The district is selected based on previous measles outbreak and More than 80% of Gashamo district population is pastoral - nomadic lifestyle. Gashamo district is among one the district that measles outbreak occurred with having long border to Somalia country that was having an outbreak of polio now focused on high risk zones, primarily border areas Who are always on the move between Ethiopia and Somalia for grazing and meeting relatives, There are strong links to clans or tribes rather than nationality and it is bordered on the north by Somalia country. The district Has 3 Health center and 7 Health post.

Study period

Study will be conducted from July 10-30/2015 in rural areas of Gashamo district, Somali Region, Ethiopia.

Study Design:

A descriptive cross-sectional household survey will be used to conduct a research.

Source Population:

All care taker who has children between the age group 12-23 month living in the Gashamo rural areas

Elders, clan leaders who are in the district

District health office and EPI focal person in Gashamo district

Study population:

All mother between the ages of 15-49 years old in the selected sample kebeles and households

Religious leaders of the community

Elders or natural leaders of the selected kebeles

Sampling Procedure:

The study units will be stratified multi stage cluster sample identified by stratifying source population by districts. Again we will stratify district household by 10 kebeles out of the 17 kebeles. Finally systemic sampling method will be employed to select 10 household that have eligible children in the study. Only one individual (mostly mothers of the household) will participated in the study.

Sample size calculation

The total sample size to be calculated based on the assumption below Z(confidence level)= 95%, which have 1.96 value proportion of vaccinated children) = 0.5, because it is unknown (margin of error) = 5% ,p(proportion of failure) = 1-p

N=t2p (1-p)/d2 (100-R)

N= sample size

G = Design effect

p= 0.5 (proportion of HH for vaccination is unknown)

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

d= 0.05 (Precision desired)

N1= $2*\frac{(1.96)(1.96)(0.5\ (0.5)}{(0.05)^2}$ = 245 HH= 0.9604= 768 person will participated

- ✓ Total of 30 sample clusters, by selecting three cluster from each kebeles containing seven sample children, is the typical EPI design

Data collection:

A structured questionnaire will be used for the purpose of data collection. Ten health extension worker and 3 supervisors will be recruited for data collection. Training will be given for data collectors and supervisors prior to study period for 1 day. Interviews using structured questionnaires will be conducted with household wife from the selected households in the study kebeles. The questions focused on various sub-themes like, knowledge of mother/caretaker, movement, kebeles leaders/religious leaders, socioeconomic characteristic, focus group discussion with the community leaders on why children is not immunized or partially immunity . Pre-test will be conducted in a non-study village to identify the potential problems encountering during data collection and interview. Focus Group Discussions will held in each village with an aim of gathering qualitative information on vaccine availability and use. Questionnaires will administered after explaining the purpose of the study and criteria used to select each respondent. Informed verbal and written consents will obtained from the focus group participants and the household heads. Confidentiality of information will maintained during the whole study.

Ethical Consideration:

The ethical approval and clearance will be taken from concerned body of Somali regional health bureau and Gashamo health department. The interview will be taken only after the full consent of the person being interviewed at their home in private area , clear explanation will be given about the purpose of this study will neither to evaluate the performance of the individual nor to blame anyone for weakness on immunization but to improve the utilization and accessibility of vaccine in your respected woreda to decrease morbidity related to the vaccine preventable disease like polio which paralyses many children in the developing world

Quality Control

Data collection tools will be reviewed and translated to Somali language. Training will be given for all data collectors and supervisors prior to 1 day. Close supervision will also conducted during data collection. Missed and incorrect data will be checked by the investigator and revisiting will be conducted to fill missed information

Dissemination of the result

The findings of this study will be disseminated to Ministry of Health, Ethiopian Somali Regional Health Bureau and Gashamo health department and all the woreda of Doolo zone

woredas for their having same lifestyle. The findings will also be disseminated to different organizations that will have contributions to improve the health condition of the nomadic mobile rural community. In addition, the study finding will also be presented at national and international conferences

. **Dependent variable**

 Immunization status of children aged between 12-23 months

Independent variable

Knowledge, perception of mothers/caretakers towards vaccination socio-demographic characteristics

Inclusion criteria

-All parents who have children between 12 and 23 months and wants to participate the study

-elders, clan leaders and health worker who are living in the study kebeles

- Health managers, district administration in the district

Exclusion criteria

All care taker who does not have children between 12 and 23 month

All caretakers who are not willing to participate the stud

All care taker who live in the urban of the district (Gashamo town)

Expected out come

Dropout rate will be reduced below 10% if properly implemented

Increase coverage of measles vaccination

Increase coverage of polio vaccination

Clearly will be identified the problems and effective intervention will be implemented

We will identify best communication mechanism in rural nomadic community that is living in the border.

Work plan

Thematic areas	Activities	Tentative time	
Adapting tools	Writing of proposal	August 12-20/2014	
Translating of data collection tools to local language	Translating of questionnaire to local language	October 5-10/2014	
Training of data collectors	One day training for data collectors	October 12/2014	
Pretest of data collection quality	Check for the validity of data collection tools	October 13-14	
Data collection	Field visit	October 15-22/2014	
Data entry	Enter EPIINF7 and excel	October/23-24/14	
Data analyses	Analyses of data	October/25-26	
Report writing	Writing report	October 27-Nov 8/14	
Submission of report	Submission of report	November 12/2014	

Budget and Implementations Time

A total of 3000.00 $USD will be needed to conduct the study. . The project will take about two months including preparation of final report

Training of data collectors and supervisor on data collection method and quality						
s/n	description of activity	participants	DSA rate(USD)	no of days	total ($USD)	
1	data collector	10	12	1	120	
2	supervisor	3	15	1	45	
	sub-total				165	
	stationery					
3	stationery				110	
4	hall rent	l/sum	100	1	200	
5	refreshment	15	10	1	150	
	sub-total				460	
operational cost at field level on data collection						
6	data collector	10	20	6	1200	
7	supervisor	3	20	6	360	
8	stationery				215	
9	car rental and fuel	1	100	6	600	
	subtotal				2375	
	Grand total				3000	

Reference

1. WHO, immunization coverage cluster survey reference manual, June /2005
2. Sharmily G. Roy *Georgia State University* Risk Factors for Childhood Immunization Incompletion in Ethiopia 4-12-2012.
3. Masaharu Maekawa1, Somthana Douangmala2, Kayako Sakisaka3, Kenzoh Takahashi4,Outavong Phathammavong1, Anonh Xeuatvongsa5, Chushi Kuroiwa1. Factors affecting routine immunization coverage among children aged 12-59 months in Lao PDR after regional polio eradication in Western Pacific Region, January/ 2007.
4. FMOH, Ethiopian national immunization coverage, 2012.
5. Sample design and procedures for Hepatitis B immunization surveys: A companion to the WHO cluster survey reference manual.
6. USAID, Immunization essential practical field guideline, 2012.
7. Elizabeth T Luman,1* Alemayehu Worku,2 Yemane Berhane,2,4 Rebecca Martin1,3,5 and Lisa Cairns1, Comparison of two survey methodologies to assess vaccination coverage, February 2007.
8. Global Immunization Division, National Immunization Program, US Centers for Disease Control and Prevention.

Chapter 9: other output

9.1: Training Report of Integrated Management of Newborn and Childhood Illness (IMNCI) and surveillance for Flood affected woredas of Shebelle & Afder zones, January 2015

Introduction

Flash flood occurs annually in Ethio-Somali Region. The floods are a result of the deyr rains which result overflow of Wabishebele River and other temporal river every year. The flood affects 6 woredas of Shebelle zone and 1 woreda of Afdhere zone. These flash floods cause devastation and destruction, causing casualties and displacement. In this year, the effects of the floods have increased compared to past 11 years.

An estimated 41,789 households affected, 26,693 of households have abandoned their homes and 15 persons died in the 2 zones of Ethiopia's Somali region after the Shebelle River burst their banks following heavy rains. The rain displaced these people from 79 kebeles [smallest administrative wards].

In response to this disaster an integrated teams, composed of different Governmental sector and humanitarian partners, have sent to assess the impact of flood on public health and to identify any risk of potential outbreaks in the areas. The assessment shows that the most affected community group by diseases like malaria, malnutrition and etc... Is children. Since there is diseases that have potential to cause an outbreak and gaps seen at health facility level, Ethiopian Somali Public Health Emergency core process under Somali Regional Health Bureau in collaboration with UNICEF plan this IMNCI and Surveillance training for all woredas of Shebelle and West Emey woreda of Afdhere zones in order to minimize post public health threats of children by early detection, reporting and treating of epidemic potential diseases and public health concern issues.

Thus, training have vital role in improving the capacity of health workers for surveillance activity and response to any outbreak/disaster in the local area by preparing/anticipating for early detection, and contain epidemics or any public health threats locally; respond timely to other public health emergencies and recover quickly from their impacts.

Objectives of the Training

To strength capacity of Health workers working in the flood affected woredas in order to implement proper case management of condition including epidemic prone diseases response activities using IMNCI protocol & PHEM Guidelines

To improve skills of HWs handle epidemic prone cases of under-5 children in their catchment area within specified time

Improve public health surveillance & epidemic management through planning effective epidemic preparedness plan based on the scenario of the disease in their local area

Methods of Training given:

Health officers and Nurses was selected and called from health centers of their respective woredas to participate the training in Godey Hospital on IMNCI and epidemic response.

The training schedule and logistics was prepared to achieve the best quality training standard.

Sr. No.	Date of training	Place of training	Participating woredas	Remark
1	08-14/01/2015	Godey Hospital	11 woredas +1 Hospital	1 Hall

Training materials (modules, Booklets, wall charts, checklists, recording forms, stationeries...) were prepared and facilitators were involved from Regional Health Bureau, UNICEF and WHO-Ethiopia

The material in the course is not presented by lecture. Instead, each participant is given a set of instructional booklets, called modules that have the basic information to be learned. Information is also provided through demonstrations, photographs and videotapes. Participants read the modules, observe live and videotaped demonstrations, and practice skills in written exercises, video exercises, group discussions, oral drills, or role plays with the help of facilitators

After practicing skills in the modules, participants practice the skills in a real Hospital setting, with supervision to ensure correct patient care. Each participant works at his own speed and discusses any problems or questions with a facilitator, and receives prompt feedback from the facilitator on completed exercises. The facilitator spends much of his time in discussions with participants, either individually or in small groups.

Pre and post-tests was given to the participants to evaluate the significance of the training given. The quality, process and outcome of the training were continuously monitored using collect comments from participants and attendance was followed daily.

Result

The content of the training is:-

Goal and Objective of the training

Over view of PHEM and Epidemic detection, prevention and management

6 modules of IMNCE

OPD & IPD practices

Training output:

In pre-test the average score was 50.1% and 87.3% in Posttest.

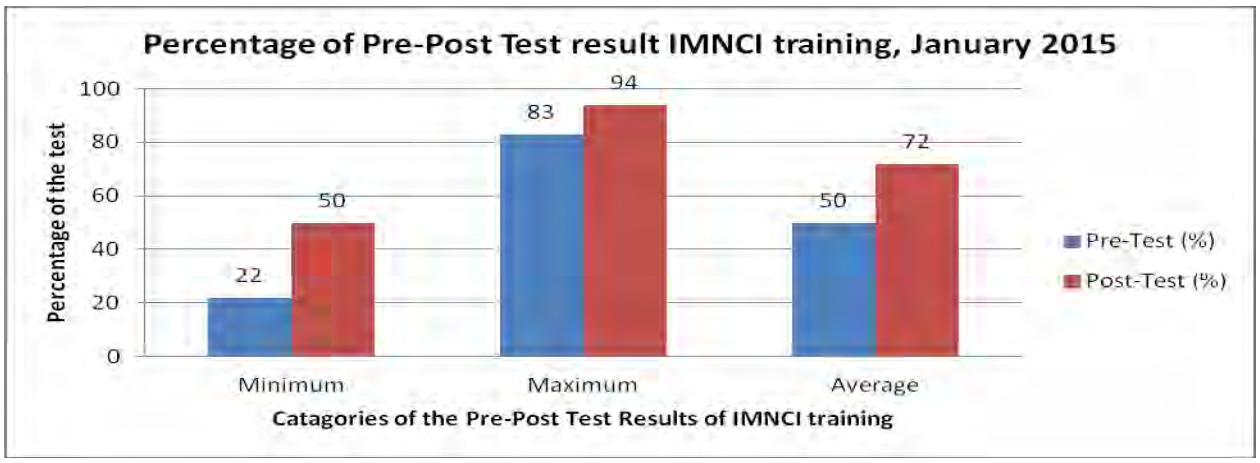


Figure 32: Result of pre-test and posttest training on IMNCI and surveillance in Godey Hospital, Ethio-Somali Region PHEM, and January 2015.

Paired T-Test

		Paired Differences					t	df	Sig. (2-tailed)
		Mean	Std. Deviation	Std. Error Mean	95% Confidence Interval of the				
					Lower	Upper			
Pair 1	Post-test – pre-test	37.3077	18.5549	4.1490	28.6237	45.9917	8.992	19	.000

Challenges:

UNICEF promise to provide training modules and booklets during planning and appoint the office on the date but not provided.

Non-concerned participant and woredas that were not included in the objective came to participate the training without having the letters from their woredas

Hotness of the training places Godey town

Some participant from far woredas and have problem of transportation problem came lately

Measures under taken:

RHB prints the entire necessary document including booklet and fill the gaps

Non-concerned participants returned back to their respective woredas prior to attending the training

Afternoon schedules shifted from 2:00-5:00 PM to 3:00 -7:00 PM

The facilitator gives the training alone for those coming late in different class

Training Cost:

To facilitate the training all training costs were covered by Ethiopian Somali Regional health bureau. Source of the finance was emergency response for flood affected communities supported by UNICEF. All trainees came to the training site by public transport. The transport expenses were reimbursed for all trainees‘ based on their receipt. DSA and hotel accommodation were also covered by Ethiopian Somali Regional Health Bureau. Finally a total of 140,000.00 birr was used to conduct the training.

Discussion

Public Health Emergency Management (PHEM) is defined as the process of anticipating, preventing, preparing for, responding to and recovering from the impact of epidemics and health consequences of natural and manmade disasters. Thus, this training was given to PHEM activities in selected woredas.

Training is part of epidemic preparedness by strengthening human and system capacity in order to undertake appropriate intervention measures in the region. Thus, in order to achieve effective disease surveillance system and improve case management in the region, the need for training of flash flood affected woredas at community and health facility level.

In this training the Bureau was planned to train 50 trainees. In the training 25 was came and participated. The training focuses on IMNCI for those woredas affected by flood in order to strengthen the cases management of diseases that might have a potential risk to an outbreak

Pre- and post-test scores provide information on whether or not participants have learned from the training or to measure knowledge gained from participating in a training course. The pre-test is a set of questions given to participants before the training begins in order to determine their knowledge level of the course content. After the completion of the course, participants are given a post-test to answer the same set of questions, or a set of questions of comparable difficulty. Comparing participant's post-test scores to their pre-test scores enables to see whether the training was successful in increasing participant knowledge of the training content.

Thus, pre and post test was prepared and examine before and after the training. When examining the pre-test result or point of the trainees (N=25), it was found that the average score was 50%, ranging from 22% to 83%. The average score for post-test (N=25) was 87.3%, ranging from 50% to 94%.

When comparing pre-test and post-test scores for 25 participants, the average pre-test and posttest was 50% and 72%. It gives a difference of 22%. It was found to be statistically significant (P-value <.0001. The results of a paired T-test yield significant at the $p<.0.01$, meaning that for the trainees the difference between the pre-test average score and the post-test average score was statistically significant. The T-test was chosen because it assesses whether the mean (average) of two tests are statistically different before and after training

Conclusion

The training gave significant change on most trainees was improved after the training this shows that the training was effective and an input for epidemic preparedness, proper case management and surveillance

Annex IMCI and Surveillance Training Schedule-Godey town, Ethio-Somali Region January 8-14/2015

Time	Activity	Remark	Facilitator
Day 1- January 8 (IMNCI)			
9:00 - 9:15	Registration	Training organizers	-
9:15 - 9:30	Welcoming address and Opening remark		
9:30 - 10:00	Pre-test	Individual	participants
10:00 - 10:30	Tea Break		Organizer
10:30 - 11:00	IMCI strategy - Objectives and rationale	Presentation using slides	Dr.daaha and Ashenafi
11:00 - 11:30	Introduction to case management process - general danger sign , assessment and classification of main symptoms	Presentation and Demonstration	Dr.daaha and Ashenafi
11:30 :12:30	Assessment and classification of cough or difficulty breathing	Demonstration and Reading	Dr.daaha and Ashenafi
12:30 - 2:00	Lunch break		
2:00 - 2:30	Introduction to the chart book let	Demonstration and Reading	Cali cabdi and ziyaad
2:30 - 3:30	Video exercise on General Danger Signs and cough or difficult breathing – C	Presentation and Demonstration	cali cabdi and ziyaad
3:30 - 4:00	Tea Break		

4:00 - 5:00	Introduction to recording form	Presentation and Demonstration	fadxi
Day 2 – January 9 (IMNCI)			
8.00 – 8.15	Review the previous day activities	Rapporteur	
8.15 - 9.00	Introduction to assessment and classification of diarrhea	Demonstration and Reading	Dr.daaha and Ashenafi
9.00 - 10:00	Video exercise on dehydration -	Demonstration and Reading	Dr.daaha and Ashenafi
10.00 - 10:30	Tea Break		
10.30 – 11:00	Video show on assessing dehydration -		Dr.daaha and Ashenafi
11:00 – 12.30	Clinical Activities	Assess and classify children with General danger signs and cough or difficult breathing , and diarrhea	Dr.daaha and Ashenafi
12.30 – 2:00	Lunch break		
2:00 - 3:00	Written exercise	participants	Dr.daaha and Ashenafi
3.00 – 3.30	Feedback for the exercises	Group work	Dr.daaha
3.30 – 4.00	Tea break		Organizer
4.00 – 5.00	Introduction to assessment and classification of fever and use of RDT/ Para screen	Demonstration and Reading (Module and chart booklet	cali cabdi and ziyaad
Day 3 – January 10 (IMNCI)			
8.00 - 8.15	Review the previous day activities	Rapporteur	
8:15 - 9.00	Comprehensive	Assess and classify	cali cabdi and ziyaad

	management of Fever	children with fever	
9.00–10.00	Video show on assessing and classifying child with fever	Exercise D	cali cabdi and ziyaad
10.00–10:30	Tea Break		Organizer
10.30–11.00	Demonstration on RDT/ Para screen		cali cabdi and ziyaad
11.00–12..30	Clinical activities	Hospital	cali cabdi and ziyaad
10.30–12.30	Assess and classify measles		cali cabdi and ziyaad
12.30–2..00	Lunch break		Organizer
2.00 – 3.00	Video show on measles		cali cabdi and Abdifatah
3.00 – 3.30	Assess and classify ear problem		Dr.daaha and Ashenafi
3.30– 4.00	Tea Break		Organizer
4.00 – 4.30	Group Discussion		
Day 4 –January 11 (OTP)			
8:30 - 9:00	Brainstorming on causes of malnutrition in Somali region and best possible solutions	Group exercise and presentation	Ashenafi
9:00 -1:00	Introduction on malnutrition: Types of malnutrition, casual framework	Power point presentation	Ashenafi and cali cabdi
10:00-	Tea Break		

10:30			
11:00 - 11:30	Anthropometric measurements: MUAC measurement, and detection of nutritional edema .	Demonstration and exercise	Dr.daaha and Ashenafi
11:30 - 12:30	Introduction to assessment and classification of malnutrition	Slide presentation & Demonstration on Nutritional screening	Dr.daaha and Ashenafi
11:40 - 12:30	Lunch break		
2:00 - 2.30	OTP admission: procedure and criteria, of admission	Slide presentation, reading	cali cabdi and ziyaad
2.30 - 3:00	Filling the OTP cards	Clinical exercise (In hospital)	cali cabdi and ziyaad
3.00 - 4:00	Practical exercise on MUAC measurement, and identification of nutritional edema	Clinical exercise (In hospital)	cali cabdi and ziyaad
4:00 - 4:30	Tea Break		
4:30– 5.30	OTP treatment: RUTF and routine drugs	Presentation and demonstration	Dr.daaha
Day 5 –January 12 (OTP)			
8:00 - 8:15	Recap of day 1 and practical assignment		Reporter
8:15- 9:00	practice	Presentation	Cali cabdii
9:00 - 10:00	Practice	Presentation	abdifatah tahir
10:00- 10:30	Tea Break		Organizer
10:30-	Practice in hospital	Presentation and	Dr.daaha

11:45		demonstration	
11:45-12.30	Lunch Break		
12:30- 2:00	Practice in Hospital	Presentation and demonstrations	Dr.daaha and cali cabdi
2:00 -3:00	Group discussion		ziyaad
3:00- 4:00	Tea Break		Organizer
4:00-4:30	IMNCI practice in hospital	Presentation and demonstration	Abdifatah
4:30- 5:00	Practice in hospital	Presentation	abdifatah tahir and Ashenafi
Day 6– janaury13(WASH)			
8:00 - 9:00	Overview of Somali Region MHNTs operational guideline	Presentation	cali cabdi and ziyaad
9:00 - 10:00	flood and their management	Presentation and Group work	cali cabdi and ziyaad
10:00-10.30	Reporting and documentation - Routine & Emergency	Presentation and Group work	cali cabdi and and ashenafi
10:30-12:30			
12:30 - 2:00			
Day 7 -January 14 (Surveillance)			
8:00 - 9:00	Introduction on surveillance	Presentation	
9:00 - 10:00	surveillance	Presentation and demonstration	Abdifatah tahir
10:00-	Tea Break		

10:30			
10:30-11:30	Basic case management protocols	Presentation	Dr. Daaha
11:30-12:30	Group discussion		Dr. Daaha
12:30 - 2:00	Lunch Break		organizer
2:00 - 2:45	Sensitization on major epidemic prone diseases	Presentation	Abdifatah And Ashenafi
2.45 - 3.45	Surveillance on priority disease (AFP,measles and AWD)	Presentation	Abdifatah and ashenafi
3:45- 4:15	Tea Break		Organizer
4:15- 5:30	Group discussion		

9.3: Ebola orientation in Ferfer district, Ethio-Somali region

Introduction

Regional Health Bureau FETP supervisor from December 22- January 4 send residence to conduct ebola virus disease assessment in ferfer woredas where there is risk of entry of cases in ferfer woredas because Ethiopian soldiers who are supporting Somalia countries for peace stability, enter in Somalia through ferfer woredas so in order to prevent the risk of occurring the Ebola virus disease fom Moqdisho assessment on the situation and the soldier should be orient on Ebola prevention and control measure on Ebola

Objective

To strength surveillance on EVD on ferfer border area of Ethiopian Somali Region

To Train Ethiopian soldier who are in ferfer woredas on Ebola virus prevention and control measure

Method

Met and discuss with woreda administration and woreda health office

Selected on kebeles that flood have affected

Health facilities visit and water source observation

Community visit and discuss their common disease in their area

Give regional phone number and our mobile

Gaps identified

soldier is used to train and support African peacekeepers on Somalia peace stability where same times may go Mogadishu as it is needed as the woreda health office told me

There is no any awareness given to the health workers and soldier

Ethiopian mobile and line network is not working while they use Somalia countries telecommunication

Free hotline number is not appropriate to call because there is not network

There is not high movement on the population in ferfer woredas

Activities done

Orientation were given Ethiopian soldier in ferfer woredas border in Mogadishu town= 400 person

Orientation were given for Health education promoters in flood affected woredas=100 person

Orient Ferfer health center staff=3

Orientation on Ebola virus disease to the 30 Health workers from 6 woredas who attend training held in Godey town

Ethiopian Somali Regional PHEM number I have given and to call if they suspect any person from EVD and to send report to RHB surveillance team

Challenge

Soldier refuses to take photos

Is far away from jigjga

The road to Ferfer very difficult

Recommendation

Every soldier from central level to other countries should be trained on EVD prevention and control measure

9.4. Epidemiological Week 27 for week ending 23-29/10, 2006 E.FY (June 23-29/ 2014)

HIGH LIGHTS OF THE WEEK

- *The completeness of report is* ***92%***
- *One AFP cases reported*
- *Dysentery & SAM cases increased while measles cases decreased*
- *No outbreak is ongoing in the Region*

Introduction

This bulletin provides information on PHEM activities, and summarizes surveillance data and performance on epidemic prone diseases and other public health emergencies. It indicates surveillance data of week 27 of 2014. It highlights the surveillance completeness, trends of diseases under surveillance, cluster of cases and events, ongoing outbreaks and responses undertaken in the region.

Completeness of the report

In week 27, about 92% health facilities have sent their surveillance report on time. The completeness increased consequently in the last 3 weeks. Except one zone (Nogob) and afder all have achieve the minimum requirement of completeness (80%) as shown below on Epi-week 27.

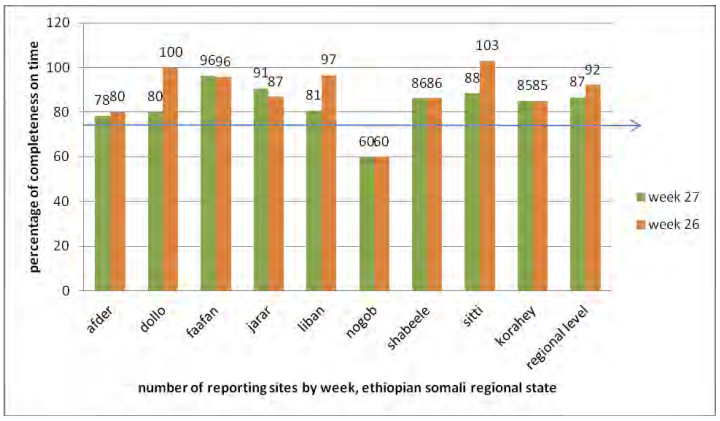


Figure 1: Report completeness rate by zone, Week 27,2014

AFP

No AFP cases reported in epi- week 27 .

Malaria

A total of 1237 clinical and lab confirmed malaria morbidity was reported with slide positivity rate of 42%. Among the total morbidity treated at health

Ongoing response

Case management

Health education

Surveillance

Malaria

Facilities 61% were confirmed/positive by Microscope/RDT. Plasmodium Falciparum was 80.5% in this week.

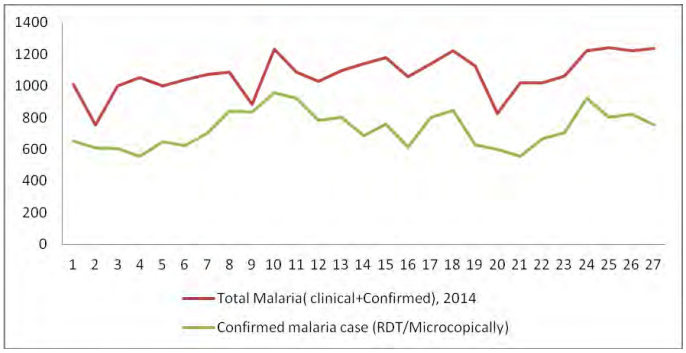


Figure2:- Trend of malaria cases (Total & Confirmed) of Somali Region by epidemiologic weeks, June 2014

Jarati woreda reported the highest cases followed by Shilabo woreda and Kabridahar Hospital as shown below.

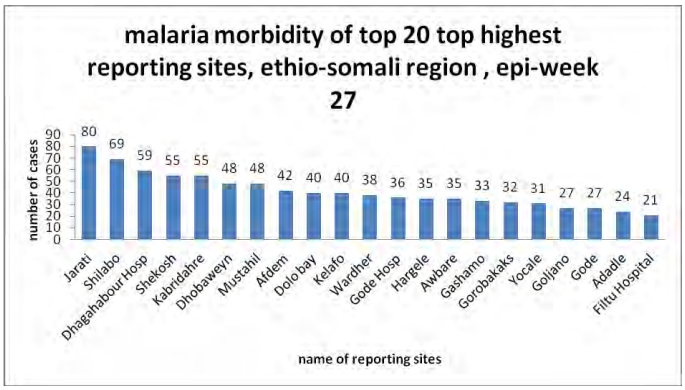


Figure3 Distribution of malaria morbidity by top 20 Woredas, Ethiopian Somali Region Epi-Week 27, 2014

Malnutrition(SAM)

A total of 361 SAM morbidities were reported. It was increased by 1.1% from week 26.

Highest case was from Gashamo followed by Dhegahbur hospital and Kabridehare woreda as shown (Fig. 4)

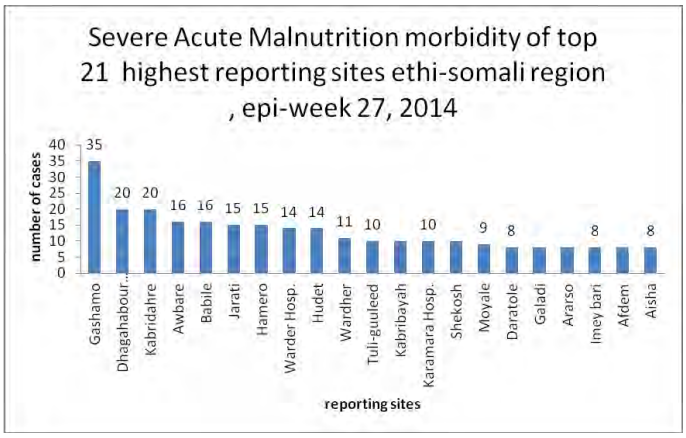


Figure4 Distribution of SAM cases by top 21 high reporting woredas, Somali Region, Epi-week 27, 2014

Dysentery

A total of 223 dysentery morbidity was reported in 27th week of 2014. It was decreased by 3.1% compared to week 26.

Gashamo Woreda reported highest dysentery morbidity followed by kelafo & Awbare as shown below.

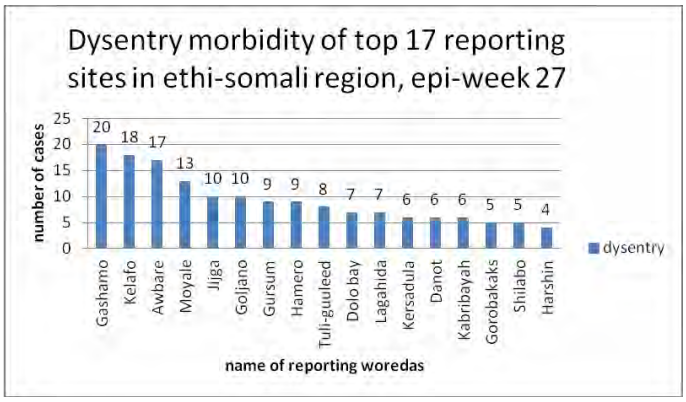


Figure5 Distribution of Dysentery cases by top 17 high reporting woredas on Epi-week 27, 2014

Typhoid

A total of 120 typhoid fever cases were reported. It was decreased 7.7% comparing to week 26th.

Raso woreda reported the highest case followed by Hamero & babile.

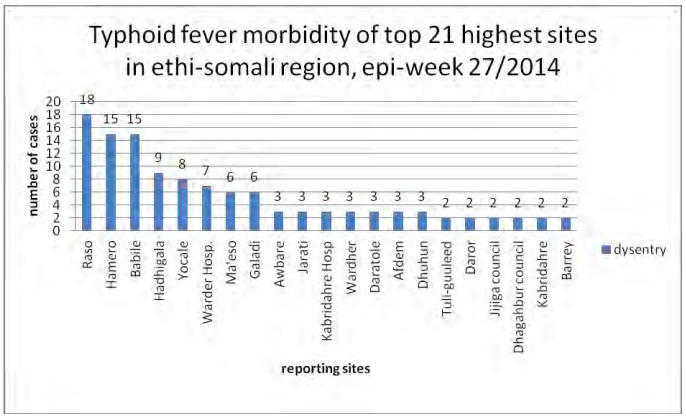


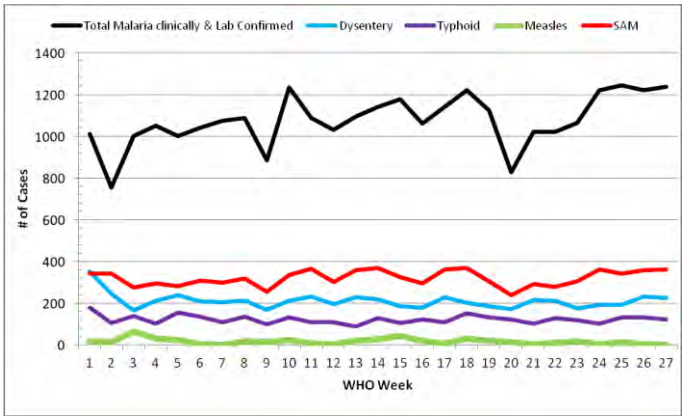
Figure6 shows distribution of Typhoid cases by top 21 reporting woredas, Somali region on Ep-week 27, 2014

Measles

No cases of suspected measles cases reported on epi-week 27 comparing those 4 cases reported on epi week 26 in which 3 cases harshin woreda and 1 case karamara hospital

Trends of diseases

The following figure shows trends of priority diseases in the region in past 27 weeks of



Acknowledgment

I would like to acknowledge UNICEF-Ethiopia supporting us for their technical support and covering the finance of the training and my to mentors Ato alemayehu and ayale for their unreserved support and my supervisors who supported me to conduct this traini

Annex 1: Questionnaire for case control study on measles outbreak in Hamaro district, Eastern Ethiopian region, 2013

Measles Questionnaire

Measles outbreak investigation form (Hamaro Woreda, Somali Region)

Interviewee status: ☐ Case ☐ Control Date MM/DD/YYYY___/___/___/ ID No_____

A. Identification information:

1. Name_____Region_____Zone_____

Woreda_____Kebele_____kebele _

B. Socio-demography:

2. Age_____ 3. Sex: ☐ male ☐ female 4. Occupation_____

5. Respondent relation to cases or controls? ☐ Mother ☐ Father ☐ Guardian

6. Educational status of father : a. illiterate b.no mother A, illiterate B.No

C. possible source of infection:

7. Have you travelled to somewhere else in the previous 7 to 18 days before the onset of rash? Yes ☐ No ☐

8. If yes for No 8, where? _____

9. Contact with confirmed cases in the past 7 to 18 days? Yes ☐ No ☐

10. If yes for No 10, where and who_____/_____respectively?

D. Clinical information:

11. Symptoms and signs: ☐ Fever ☐ Rash ☐ Cough ☐ Coryza ☐ Conjunctivitis

12. Date of onset of rash? MM / DD/ YYYY____/____/____/

13. Have you visited health facility? Yes ☐ No ☐

14. If yes for No 16, date seen at health facility___/____/____/

15. Complication Yes ☐ o ☐

16. If yes for No 18: ☐ Diarrhea ☐ r infection B☐dness Cor☐lsion Othe☐specify)

17.Treatment Yes ☐ No ☐

18. If yes for No 20: ☐ORS ☐ntibiotics V☐A Su☐lementary food TTC☐atment Anti-pyretic ☐ ☐ther (specify)

E. Laboratory information:

19. Was sample taken? ☐es N☐

20. If, yes, date taken____/____/_____/

21. Laboratory result: ☐sitive for measles specific IgM Ne☐ive for IgM pendi☐

F. Vaccination status:

22. Have you vaccinated for measles? ☐s N☐

23. If yes, source of information? ☐tory V☐cination card

24. If yes for 25, last vaccination date____/_____/_____/

25. Dosage: ☐One ☐vo & above ☐n't know

26. No of children eligible for vaccination ---------& <yrs. -------- in the house hold?

G. Transmission to others:

27. Have you travelled before and after four days the rash erupts? Yes☐ No ☐

28. Is there other case in the neighborhood? Yes N☐ ☐

29. If yes for No 31, distance from your house? _____

30. Is there other case in the household? Yes ☐ ☐

31. If yes for No 33, who is he/she? _____

H. Knowledge:

32. Do you know the transmission of measles virus? Ye☐ No ☐

33. If yes for No 42, how: ☐Through air f☐d co☐act feca☐oral route wate☐

☐Appeal of God

34. Is measles preventable disease? ☐s N☐

35. If yes for 44, how? ☐Vaccination T☐ditional treatment oth☐(specify)

Thank you for your time!

Investigator_____Position_____Sign._____

Co-investigator_____positon_____sign._____

Annex 2 : Questionnaire for wild polio virus investigation in Bookh and Warder district, Ethio-Somali Region, 2013

WHO/EPI- Polio Eradication Program

Investigation Form for WPVs and cVDPVs

Reason why this case is investigated :(check the one which is appropriate)

Confirmed WPV1 _____

Relationship of informant to AFP case being investigated:_____

Identifying information

EPID Number: _____ Latitude_____ Longitude_____

Date Onset of Paralysis: (dd/mm/yy) ____/____/_____

Sex (check one): Male __ _Female_____

Date of Birth (dd/mm/yy):___/____/_____

(If Date of birth not available then) Age in Months or years at time of Onset of Paralysis:_____

Date of onset of paralysis, _____/_____/_____

Date of notification, _____/_____/_____

Date of investigation, _____/_____/_____

Date of 1st stool collection, __/__/___ Date of 2nd stool collection,__/__/___

Date stools sent to the lab, _____/_____/_____

Date stools arrived in the lab, _____/_____/_____

Stool condition on arrival at lab: Adequate ____ Inadequate _____

Reason if stool is inadequate…….....

Fathers full Name_____ Age of Father:_____

Father‘s Occupation:_____(Nomadic, rural or town)

Mother‘s full Name:_____age of mother_____

Religion:

Father Muslim ____ Christian: _____ other (explain)_____

Mother Muslim____ Christian: _____ other (explain)_____

Location/village _____

Clan _____ sub clan _____

kebele:_____ woreda/district:_____

Zone_____ Region: _____

How long has the child been living at this location? (Specify days, months or years)_____

Is the family of the case nomads? Yes_____ No____

Was the child living in a different location in the month prior to the onset of paralysis? (Yes or no)____

If yes please give location: Village_____kebele_____Woreda/District:_____

zone_____Region _____

Additional History

Parents Educational Status (Check box for the highest level of education of each parent)

Highest Educational Level	Father	Mother
Illiterate		
Read & write		
Primary School		
Secondary School		
Post-Secondary School or Higher		

Socioeconomic Status of Case household (give your best personal assessment)

Poor:___ Middle Class:_____Wealthy:_____

Description of Area (check one)

Rural	
Urban/town	
Nomadic	

Give any other information that you feel is significant in describing the area in which the case household live._____

Does the family live in a permanent structure? Yes_ No____

Distance (estimated in KM) from the case household to the nearest health facility?____

Name of nearest health facility._____

Does that health facility offer routine immunization services? Yes_____ No_____

situation)

Is the family aware of any other AFP Cases in the surrounding area? Yes__No____

If yes give the name and location of cases and whether they have been previously investigated or not: (put this information below)

Clinical Information (this information should be reconfirmed from the family and not copied from the original case investigation form)

Date on initial examination___/____/____

Was there fever at the onset of paralysis? Yes_____ No____

How long, in days, between the onset of paralysis and full paralysis?_____Days

Body parts involved in paralysis/weakness: (check all that apply)

	Upper Arm	Lower Arm	Upper Leg	Lower Leg
Right				
Left				

For additional clinical part use the detail case investigation for late cases

Was the paralysis/weakness asymmetric? Yes_____ No____

Describe the muscle tone of the paralyzed/weak limbs at time of onset (check one):

Normal_____ Decreased/Floppy____

Were the specimens adequate? Yes_____ No____

If no, explain_____

Was there any history of trauma in the days or weeks prior to the onset of paralysis? Yes__No__

If yes please explain__

Was there any history of injections in the days or weeks prior to the onset of paralysis? Yes _____No

If yes please explain

Travel History

Did the AFP case travel in the 30 days prior to the onset of paralysis/weakness? Yes ____No____

If yes where? (Explain briefly and give dates as best as possible)_____

_____

Did any close family members travel outside of the local area in the 30 days before onset of paralysis? Yes_____ No_____

If yes where? (explain briefly and give dates as best as possible)_____

Were there any recent visitors to the home from outside of the local area in the 30 days prior to the onset of paralysis? Yes_____ No_____

If yes from where? (explain briefly and give dates as best as possible)_____

Has the AFP case travelled since the onset of paralysis/weakness? Yes_____No___

If yes where? (Explain briefly and give dates as best as possible)_____

Vaccination History

IMMUNIZATION HISTORY:

Does the family have a vaccination card for the child? Yes_ No___

DATE OF IMMUNIZATION

YES	NO	UNKNOWN	if yes DD/MM/YY
OPV 0	_____	_____	_____	_____/_____/_____
OPV 1	_____	_____	_____	_____/_____/_____
OPV 2	_____	_____	_____	_____/_____/_____
OPV 3	_____	_____	_____	_____/_____/_____
NID '98	_____	_____	_____	

If routine missed, ask why?

1. Lack of parental awareness 2.Mothers too busy/not at home
3. Vaccinator did not come 4. Far distance 5. Parental refusal
6. Card lost 7. No immunization service 8. Others, Specify

If NIDs missed, why? Choose answer from above _____-

If other or refused then give an explanation of the reason why were missed_____

In the affected settlement, is there evidence that Traditional Leaders are fully engaged/supportive in campaign (e.g. clan /community heads following the vaccination teams? Are the vaccination teams selected from the area) Yes ___ No____

If no, explain_____

Assessment of the vaccination practices, cold chain and health worker's knowledge of the VVM technology.

Is the health facility provide routine immunization 1.Yes 2.No

Is there EPI trained health personnel assigned? 1. Yes 2. No

How many times in a day do you record the fridge temperature?

AFP surveillance

Who Reported this case? Health facility focal person ___ vaccinators__ communitygroup....Informant___Other__ If other, explain _____

AFP surveillance performance of the woreda(indicators) 2013 2012 2011 2010 2009 2008

for last 12 months **NPAFP rate** : ___ ___ ___ ___ ___ ___

If yes, is/ are the AFP cases found recorded in the health facility register? Yes____ No____

If not and paralyses is less than 60 days old, was full investigation including stool collection done? Yes ____ No___

Are there any gaps in AFP Surveillance identified: Yes ____ No____

If Yes, explain:

Community attitudes towards vaccination and paralysis (FGD guide)

What do you think about the vaccination service in your area?

What do you think of the advantages of vaccination?

Have you seen any child with paralysis in your community?

Where do people take a child with paralysis?

Do you get health education regarding EPI?

Do health workers going out for outreach and epidemic control sensitize the community on AFP surveillance?

Immunization status of settlement children

s.n	Child age	sex	OPV for routine	If no why	OPV for SIAs	If no why

ANNEX 3: Questionnaire of Measles and AFP surveillance evaluation in Shabeele Zone.

DISTRICT (INTERMEDIATE LEVEL) QUESTIONNAIRE

Region_____ **Name of respondent**_____
Zone _____ **Tele**_____
Woreda _____ **Date**_____

General

I. Availability of a National Surveillance Manual

1. Is there a national manual/ guideline for surveillance system?
   Yes /No/ Not applicable / Unknown
2. ***If yes***, describe (last update, diseases included, case definitions, surveillance andcontrol, integrated or different for each disease):

   _____

   _____
3. What is the objectives of surveillance? _____
4. What are the strengths of your surveillance system? _____

   _____
5. What are the weakness of your surveillance system? _____

   _____

II. Case Detection and Registration

1. Do you have standard case definitions for the Country‘s priority diseases like AFP (polio) and measles?
   Yes / No / Unknown / Not applicable
2. If the answer is yes for Q #3, observe the presence of the standard case definition for each priority disease. Yes No
3. If answer for Q 4 is No, for which disease did, you lack the case definition? _____

   _____

III. *Data reporting::*

4. Is the Federal/ Regional health bureau responsible for providing surveillance forms to the health facilities? Yes No Unknown Not applicable
5. *If yes*, have you lacked appropriate surveillance forms at any time during the last 6 months? Yes No Unknown Not applicable
6. What are the reporting entities for the surveillance system?
   a. Public health facilities
   b. NGO health facilities
   c. Military health facilities
   d. Private health facilities
   e. Others_____
7. Was there any report of the immediately reportable diseases in the past 1 month? Yes/ No
8. If yes, for Q 8, with in what time is the report received after detection of the diseases?
   a. Less than 1 hour
   b. 2-24 hour
   c. 1- 2 days
   d. 3- 7 days
   e. After 1 week
9. Percent of health facilities that have means for reporting to next level by e-mail, telephone, fax or radio_____
10. How do you report weekly, monthly and other formations to higher level?
    a. Mail
    b. Fax
    c. Telephone
    d. Radio
    e. Electronic
    f. Other
11. Did you have address of Zonal PHEM officers? Yes /No
12. How frequently are you communicating with the regional PHEM officers on emergencies and other daily activities?
    ☐ Daily ☐ Monthly ☐ Yearly
    ☐ Weekly ☐ Quarterly ☐ Others----------
    ☐ Every 2 week ☐ Every 6 month
13. Did you have address of HC/HP PHEM focal persons? Yes /No
14. How frequently are you communicating with the HC/HP PHEM focal persons on emergencies and other daily activities?
    ☐ Daily ☐ Monthly ☐ Yearly
    ☐ Weekly ☐ Quarterly ☐ Others----------
    ☐ Every 2 week ☐ Every 6 month
15. Did you have case based reporting formats for out breaks? Yes /No ☐ Not Applicable

16. Was there guide line for specimen collection, handling and transportation to the next level? Yes/No ☐ Not Applicable
17. Did you have line list for reporting outbreaks? Yes/No ☐ Not Applicable
18. Did you face shortage of surveillance reporting and recording formats? Yes/ No
    If yes, which form _____
19. When are you expected to send weekly report to the regional PHEM unit?
    ☐ Monday ☐ Tuesday ☐ Wednesday ☐ Thursday ☐ Friday ☐ Saturday ☐ Sunday☐ I don‘t know
20. When are you expected to receive weekly report from HCs/HPs?

    ☐ Monday ☐ Tuesday ☐ Wednesday ☐ Thursday ☐ Friday ☐ Saturday ☐ Sunday

    ☐I don‘t know

21. How is the woreda communicating the HCs/HPs PHEM officers in case of immediately reportable diseases? ☐ by e-mail ☐ by phone ☐ by fax ☐ regular weekly report ☐ others
22. Did you send summary or short report to the administrative /program leaders or other responsible organs on planning, prevention and control activities addressing Important issues at community level that have arisen through the surveillance system? Yes /No
23. If answer for Q9 is yes to whom did you send? _____

    _____
24. If you faced any problems on communicating and reporting, list them_____

    _____
25. Mention the alternative solutions that you take to tackle the problems you listed on the above? _____
26. Do you have assigned surveillance officer for PHEM activities and working on? Yes /No
    If no, who is responsible for PHEM activities?

    _____
27. If yes for Q 28, did he trained on surveillance system?☐ Yes ☐ No
28. If answer for Q 29 is yes a) when---------- b) Topic----------c) For how long?
    ----

29. Did you conducted any onsite training / orientation about surveillance system for the HC and HP PHEM focal persons? yes/No
30. Was data compiled? Yes /No
31. Did you have computer on your office? Yes/No
32. Did you have computer on your department (PHEM unit)? Yes /No
33. What is the data entry and compilation instrument? ☐ Manual ☐ Computer ☐ other----------
34. Did you have computer skill on ☐ MS word ☐MS excel ☐MS power point ☐ Epi-info
35. Did you analyze the data collected from surveillance system? Yes /No
36. If answer for Q 37 is yes, did you described data by, ☐ time ☐ place ☐ person
37. If yes for Q 38, for which disease _____
38. Did you have denominators for data analysis? ☐ total population ☐ male ☐ female ☐ under five
39. Please indicate the frequency of your data analysis.

☐ Weekly	☐ Monthly	☐ Annually
☐ Every two week	☐ Quarterly	☐ No regular time
	☐Every 6 month	

40. Did you notify the results of your analysis to the higher level PHEM? Yes/No
41. Did you notify the results of your analysis to the lower level PHEM?Yes/No
42. If answer for Q 38 is No, what is the reason?

☐ Lack of knowledge	☐ Shortage of materials	☐ Other----------
☐ Shortage of time	☐ Analysis is not familiar	
☐ Less attention	☐ Negligence	

43. How can reporting system be improved?

_____

_____

44. Do you have an action threshold for any of the country priority diseases?

Yes No I don‘t know

45. ***If yes,*** what is it? _____cases _____% increase _____rate

(Ask for 2 priority diseases)_

_____

_____

I. Epidemic preparedness

46. Did you have plan for epidemic response and preparedness? Yes/No
47. Did you have emergency stocks of drugs and supplies? Yes/No
48. If answer for Q 49 is No, how did you control epidemics? _____
49. Had you experienced shortage of drugs, vaccines and supplies in 2004 EFY? Yes/ No
50. Wasworeda epidemic management committee established? Yes /No
51. Did the epidemic management committee have regularly scheduled meeting time? Yes/No
52. Was Woreda Rapid response team established? Yes /No
53. Did the Rapid response team have regularly scheduled meeting time during epidemics? Yes /No
54. Did you have case management protocol for epidemic prone diseases? Yes /No
55. Did your PHEM have multi sectorial emergency preparedness and response task force committee? Yes /No
56. In what frequency did the task force meet during outbreaks? _____
57. Were partners working together with your office on emergencies? Yes /No
58. If answer for Q 59 is yes, what type of supports did they give to your office? _____

    _____
59. Was there a budget for epidemic response? Yes /No
60. Had you a car assigned for emergencies (PHEM)? Yes /No Not functional
61. If answer for Q 62 is NO, how did you address emergencies? _____

    _____
62. Had you faced any Challenges on epidemic response and preparedness in 2003 EFY?
    ☐ Yes ☐ No
63. If answer for Q18 is yes, a) list the challenges_____

    b) What measures did you take to tackle the challenges? _____

II. Outbreak investigation

64. Had you investigated any outbreak in 2006 EFY? Yes/No

65. Did you have outbreak investigation check list? Yes / No

66. If answer for Q 2 is No, how did you know possible factors for the outbreak? ----------

67. Where was laboratory confirmation of cases done?

☐Regional laboratory ☐ EHNRI ☐Contracted private laboratory

☐ Hospital ☐ Health center ☐ Other----------

68. Who was responsible to investigate an outbreak?

☐ Rapid response team ☐Staffs of woreda H.O ☐ Health facility staffs

☐ HEWs ☐ Experts organized randomly ☐Other----------

69. If answer for Q 66 is yes how many out breaks did you investigated in 2004 EFY? ____

S. No	Name of out break	Place	No of cases			No of deaths			Start date of the out break	Investigation date
			M	F	U5	M	F	U5		
1										
2										
3										

70. Had you faced any challenge in outbreak investigation in 2006 EFY? Yes/ No

71. If answer for Q72 is yes, a) list the challenges_____

_____

b) List the alternatives that you take to tackle the challenges._____

*III. **Responses***

72. Has the district implemented prevention and control measures based on local data for at least one reportable disease or syndrome?

Yes No Unknown Not applicable

73. Does the district responded within 48 hours of notification of most recently reported outbreak (from written reports)

Yes No unknown Not applicable

74. Does the district achieved an acceptable case fatality rate for most recent outbreak (Observe from outbreak report)

    Yes No Unknown Not applicable

75. Has epidemic management committee evaluated their preparedness and response activities during the past year? (observe written report to confirm)

    Yes No Unknown Not applicable

IV. Supervision and Feedback

76. Did you have supervision plan in 2006 or 2007 EFY? Yes/ No
77. If answer for Q 78 is No, how did you supervise? _____-

    _____

78. If answer for Q 78 is yes, did you supervise the health centers (HCS) and health posts (HPs) according to your plan in 2006 or 2007 EFY? Yes/ No
79. If answer for Q 80 is No, what is the reason? _____-

    _____

80. If answer for Q 80 is yes, how many times did you supervise each health center (HC) and health post (HP) in 2006 or 2007 EFY? Health center_____ health post_____
81. Had you reviewed about surveillance practice by higher level supervision? Yes /No
82. Did you have regular supervision checklist? Yes/ No
83. If answer for Q 84 is No, how did you supervise the health centers and health posts?

    _____

84. Were you supervised by higher level officers in 2006 or 2007 EFY? Yes/ No
85. If answer for Q 86 is yes how many times in 2006 or 2007 EFY? _____
86. Did you send feedback of your supervision to the health centers (HCS) and health posts (HPs) commenting/indicating their strong and weak sides? Yes /No (observe)
87. If answer for Q 88 is No, why_____

    _____

    _____

88. If answer for Q 88 is yes, for how many HCs and HPs did you send a feedback in 2006 or 2007 EFY? HC---------- and health post----------
89. Had you received feedback from higher level supervisors in 2006/ 2007 EFY? Yes/ No
90. If answer for Q 91 is yes how many feedbacks did you received in 2004 or 2005 EFY? _

91. Did you conducted active case search for health facilities? Yes/No if yes, how many times and for how many health facilities? _____

92. Had you faced any challenge on supervision and feedback in 2006/07 EFY? Yes/No

93. If answer for Q 93 is yes a) list the challenges_____

_____

_____

b) List the measures that you take to tackle the challenges_____

_____

V. Training

94. Have you been trained in disease surveillance?

Yes No Unknown Not applicable

95. ***If yes,*** specify when, where, how long, by whom?

_____

96. What percent of your personnel in the district have been trained in surveillance and epidemic management? _____

VI. Resources

97. **I. Percent of sites that have:**

Logistics

1. Electricity 2. Bicycles 2. Motor cycles 1. Vehicles

98. **Data management**

a. Stationery b. Calculator c. Computer d. Printer e. Statistical package

99. **Communication**

a. Telephone service
b. Fax
c. B radio
d. Computers that have modems

100. **Information education and communication materials**

a. Posters
b. Megaphone
c. Flipcharts or Image box
d. VCR and TV set
e. Generator
f. Screen
g. Projector (Movie)
h. Other:

VII. Satisfaction with surveillance system

101. Are you satisfied with the surveillance system?

Yes No Unknown Not applicable

102. ***If no***, how can the surveillance system be improved?_____

103. **Opportunities for integration**

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

_____

_____

Questionnaire for Attributes and level of Usefulness:

1. Total population under surveillance_____ 2007
2. What is the incidence / Prevalence of 2006 -in your area/region
   - AFP(polio) _____cases _____Deaths _____
   - Measles _____cases _____Deaths _____

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

Does the surveillance system help?

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

Observe (confirmation):

1. interventions and diseases trends analyzed ---Available //Not available

II. Describe Each System Attributes:

Simplicity:

A. Is the case definition of the priority diseases (measles, AFP….) easy for case detection by all level health professionals? Yes/ No

B. The surveillance system allow all levels of professionals to fill data? Yes/No

C. Does the surveillance system help to record and report data on time?

D. Does the surveillance system (Reporting format) have necessary information for investigation? Yes/No

E. How long it takes to fill the format? a, <5 minute b-10-15 minutes c- >15 minutes

F. How long does it take to have laboratory confirmation of

A. Measles
B. AFP (Polio)
C. Others _____

Flexibility:

A. Can the current reporting formats be used for other newly occurring health event (disease) without much difficulty? Yes/ No

B. Do you think that any change in the existing procedure of case detection and reporting formats will be difficult to implement? Yes /No

Comment:_____

_____

_____

C. Is the system easy to add new variables? Yes /No

D. Is the surveillance system easy to integrate with other systems? Yes /No

E. Is the surveillance system easy to add new disease on report? Yes /No

F. Is the system easy to add new information technology? Yes /No

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

1) Are the reporting site / data collectors trained/ supervised regularly? Yes/No
2) **Observe:** Review the last months report of these diseases
3) Average number of ***unknown or blank responses*** to variables in each of the reported forms

_____

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

_____

5) Are all health facilities reporting (including late report)?☐ Yes ☐ No
6) Percent of health facilities that send report of each week in 2006 EFY. --------

Total weekly reports received from H.C/health posts (including late reports. from February 2014—december, 2014)

WHO epid. Wk	N^{o} of HPs that report	N^{o}of HPs that do not report	N^{o} of HCs that report	N^{o} of HCs that do not report	WHO epid. wk	N^{o} of HPs that report	N^{o}of HPs that do not report	N^{o} of HCs that report	N^{o}of HCs that do not report
week 6 **(3-9 feb/14)**					wk32 **(4-10 august/14)**				
wk7 **(10-16/14)**					wk33 (11-17 august/ 14				
wk8 **(17-23/14)**					wk34 (18-24 august/14)				
wk9 **(24feb-2march/14)**					wk35 (25-31 august/14)				
wk 10 (3-9march/14)					wk36 (1-7 sep/14)				
wk11 **(10-16march/14)**					wk37 (8-14 september. 3/14)				
wk12 (17-23march/14)					wk38 (15-21 september/05)				

wk13 (24-30/14)					wk39 (22-28 september/14)				
wk14 (31march-6 april/14)					wk40 (29 september-5october/14)				
wk15 (7-13 april/14)					wk41 (6-12 october/14)				
wk16 (14-20 april/14					wk42 (13-19 october/14)				
wk17 (21-27 april/14					wk43 (20-26 october/14)				
wk18 (28 april-4 may/14)					wk44 (27 october- 2 novem/14)				
wk19 (5-11may/14)					wk45 (3-9 novem/14)				
wk20 (12-18 may/14)					wk46 (10-16 november/14				
wk21 (19-25 may/14)					wk47 (17-23 november/14)				
wk22					wk48				

(26 may-1 june/14)					(24-30 november/14)				
wk23 (2-8 june/14)					wk49 (1-7dec./14)				
wk24 (9-15 june/14)					wk50 (8-14 dec/ 4				
wk25 (16-22 june/14)					wk51 (15- 21 dec/14)				
wk26 (23-29 june/14)					wk52 (22-28 dec)/14				
wk27 (30 june-6 july/14)									
wk28 (7-13 jul/14)									
wk29 (14- 20 jul/14)									
wk30 (21-27 jul/14)									
wk31 (28 jul-3 august/14									

Acceptability:

6. Do you think all the reporting agents accept and well engaged to the surveillance activities? Yes/No
7. If yes, how many are active participants (of the expected including all private clinics)? _____/_____
8. If No for Q #1, what is the reason for their poor participation in the surveillance activity?

A. Lack of understanding of the relevance of the data to be collected
B. No feedback / or recognition given by the higher bodies for their contribution;
C. i.e. no dissemination of the analysis data back to reporting facilities
D. Reporting formats are difficult to understand
E. Report formats are time consuming
F. Other:

_____

_____

G. Were all participants using the standard case definition to identify cases? Yes/ No
H. If yes, what is your evidence? _____
I. Were all the reporting agents send their report using the current and appropriate surveillance reporting format? Yes/ No (if yes observe the documents)
J. Were all the health professionals aware about the surveillance system? Yes/No (if yes how they awared)

Representativeness:

9. What is the health service coverage of the district? _____%
10. Do you think, the populations under surveillance have good health seeking behavior for these diseases? Yes / No
11. Was the surveillance system enabled to follow the health and health related events in the whole community? Yes /No
12. If answer for Q 3 is no,who do you think is well benefited by the surveillance system? ☐ The urban ☐the rural ☐both

13. If yes for Q 4, do you think that rural and urban communities are equally benefited in surveillance system? Yes/ No , if no why _____
14. Are all the Socio demographic variables included in the surveillance reporting format? Yes /No
15. If the answer for Q 6 is No, which a) Sex---------- b) age group---------- C) ethnic group----- d) religion---------- is less represented?

Timeliness:

1. Are all health facilities reporting on time? ☐ Yes ☐ No
2. Percent of health facilities that report on time. ----------

ANNEX 4: Questionnaire for Health Profile in kebribayah woreda, Ethiopia, Ethiopia

Region ----------Zone----------District---------- Respondent----------Interviewer----------

1. Historical back ground of the area

Woreda Name_____

How & why the name given_____

How and when the woreda was formed/founded?_____

Any other historical aspect_____

2. Geography and Climate (including map, altitudes, agro ecological zones etc)

Altitude _____

Surface Area _____(_____% from the zone)

Town _____rural _____(land)

Geographical coordinate

Latitude _____

Longitude _____

Annual rain fall(average)_____

Annual temp(average)_____

Climatic zones=Dega_____(%) Weynadega_____temperate_____(%) Kola_____tropical_____(%)

Woreda boundaries

North _____South_____

East _____Weast_____

3. Political and Administrative Organization

Total no. of kebeles:

rural_____

Urban_____

How many NGOs are in the area _____

Ruling political party_____

Bank _____

4. Population and Population structures

Demographic data

Total Population _____Male_____Female_____ sex ratio_____

Urban Total _____ Male_____Female_____

Rural Total _____ Male_____ Female_____

Productive age group_____

Population under 1yrs_____

Population under five yrs_____

Population < 15 years_____

Population >64 years_____

Women 15_49 years of age_____

Total population by kebele(each kebele pop)_____

Population enumerated by woreda/H.E.Ws_____

(Population pyramid)

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

Ethnic/language

_____(%) _____(%)_____(%)

Religion

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

Protestant_____(_____%), Other _____ (_____ %)

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

Main income sources

Agriculture

Cultivated area_____

Grazing area_____

Cropping seasons_____

Land density_____

Livestock

Truism

Trade

Other business

House hold income source

Agriculture_____ (No.)

Government Employer_____(No.)

Private Employer_____(No.)

Daily Laborer_____(No.)

Different business_____ (No.)

Jobless _____ (No.)

Average Income_____

6. Education and school Health

Number of educational institution and no of enrolled

K.G._____No of students Male __Female_____

Primarily School_____ No of students Male __Female_____

Secondary_____ No of students Male __Female_____

Preparatory_____ No of students Male __Female_____

College/ University_____ No of students Male __Female_____

TVET_____ No of students Male __Female_____

Total School Age Children (target) _____

Total Enrolment _____Male _____Female_____

School dropout in year 2006_____

If there is school dropout why _____

Number of teachers at elementary ,secondary and colleges/universities _____

Educational status of the community

Total Educated people_____

Male _____

Female _____

level of education

Illiterate _____

Read and write _____

12 completed_____

Diploma _____

Degree & above _____

School health activities:

Number of schools with water supply_____

Toilets:

Schools with functional latrines (male & female)_____

Schools with HIV/other Health clubs_____

7. Facilities

Transport

Accessibility (main roads)_____ _____

Type of road _____

How many kebeles have access to transportation _____

Flow of transportation per day_____

Telecommunication

How many people have access to fixed telephone?_____

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

How many kebeles have access to fixed telephone?_____

How many kebeles have access to mobile phone? (coverage)_____

Post Office_____

Bank_____

Power supply

How many house hold get power supply_____?

Water

Total safe water coverage _____ (___%)

Safe water supply coverage by kebele _____

Main source of water supply _____

Kebeles getting safe water____ (__ %)

Population getting safe water_____ (__ %)

Daily water consumption per day per person_____

8. Disaster situation in the woreda

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

Any recent disease outbreak/other public health emergency_____

If yes cases_____ and deaths_____

9. Social situation:

Number of libraries_____

Number of NGO working on public health_____

Number of youth clubs_____

10. Health service institutions and infrastructure

S.NO	Type of health institution		No of institutions
1	Number of Hospitals	with sustainable/ 24 hour /electric power	
		without sustainable/ 24 hour /electric power	
		with telephone service(cable based/mobile)	
		without telephone service (cable based/mobile)	
		with piped water supply	
		Without piped water supply	
2	Number of Health Centers	with sustainable/ 24 hour /electric power	
		without sustainable/ 24 hour /electric power	
		with telephone service (cable based/mobile)	
		without telephone service (cable based/mobile)	

		with piped water supply	
		Without piped water supply	
3	Number of Hospitals		
4	Number of Health centers		
5	Number of Health post		
6	Number of private clinics	Lower	
		Medium	
		Higher	
7	Number of Drug vendors		
8	Number of Drug stores		
9	Number of Pharmacies		
10	Number of Diagnostic laboratories		
11	Hospital to population ratio		
12	Health center to population ratio		
13	Health posts to population ratio		
14	Physical health service coverage		

Health budget allocation:

Government

Total budget allocated for the district _____

Total budget allocated for health _____(____%)

Total budget allocated for emergency_____

Funds from NGO

Total _____ (purpose/programs)_____

Community Health Services;

Status of services provided by community health workers namely

No. of TBAs/TTBA_____ and their responsibility _____

No. of HDA_____ and their responsibility _____

Responsibility of HEWs _____

Others_____

11. Top 10 diseases of morbidity and mortality:-

Morbidity cases in adult OPD			Pediatrics/ <5 year		
Rank	Diseases	%	Rank	Disease	%
1			1		
2			2		
3			3		
4			4		
5			5		
6			6		
7			7		
8			8		
9			9		
10			10		

12 . Child Health

A. Health centers providing IMNCI service_____

C. Live births weighing < 2500gm_____

B . Moderate malnutrition in < 3yrs_____

D. Severe malnutrition in < 3yrs_____

13. Health staff to population ratio:

Physicians (GP+ specialist)_____

Health officers_____

All Nurses_____ Mid-wife Nurses_____

Medical lab_____ Pharmacy_____, Env'tal _____Health education_____

Health extension workers_____

Other_____

Expected No of health staff based on BPR and the gap_____

cause of the gap_____

No of Health posts full filled HEW _____

No of health posts access with telephone _____

14. Vital statistics and health indicators

S. No	Indicator	Rural	Urban	Total
1	Total population			
2	Male			
3	Female			
4	Under 1 years old			
5	Under 5 years old			
6	Under 15 years old			
7	Productive age female (15-49 years)			
8	Pregnant women			
9	Live births			
10	Total fertility rate			
11	Crude birth rate			
12	Crude death rate			
13	maternal mortality rate			
14	Child mortality			
15	Under 5 mortality rate			
16	Infant mortality rate			
17	Dependency ratio			
18	Average household size			

15. Immunization

Penta 1

Penta3 coverage _____

Measles coverage _____

Full Immunization Coverage_____

measles dropout rate_____

Penta3 dropout rate _____

PAB_____

16. Maternal health coverage

S.No	Type of service	Coverage (%)
1	Antenatal care (ANC) Coverage at least 1 visit (%)	
2	Antenatal care (ANC) Coverage at least 4 visit (%)	
3	Contraceptive acceptance rate (CAR (%))	
4	Contraceptive prevalence rate (CPR (%))	
5	Post natal care (PNC) Coverage	
6	Proportion of delivery attended by skilled personnel	
7	Proportion of delivery attended by HEW	
8	HOME delivery	

17. Environmental Health & sanitation.

Latrine coverage_____ & Latrine utilization rate_____

Solid waste management_____

Liquid waste management _____

others_____

Health Education (what, when, where, how and who conducted health education)

_____

_____

18. Endemic disease

A) Tuberculosis and Leprosy

S. No	Cases	Number		
		male	female	total
5	TB case detection rate			
6	TB treatment success rate			
7	TB treatment cure rate			
8	Defaulters			
	No of Leprosy cases			

B) MALARIA

S. No	Malaria cases		Adult	
			M	F
2	Confirmed malaria cases	Pf		
		Pv		
		Mixed		
3	Admission cases due to malaria			
5	IRs coverage	Urban		
		Rural		
		Total		
6	Coverage of LLITN (1 LLITN/1.8 person)	Urban		
		Rural		
		Total		
5	LLITN utilization coverage	Urban		
		Rural		
		Total		

C) HIV/AIDS

HIV prevalence_____

HIV Incidence_____

VCT_____

PMTCT_____

PHTIC _____

Mothers who received NVP from those tested positive_____

Persons Ever Enrolled in HIV Care_____

Persons Ever Started on ART_____

Persons Currently on ART _____

19. Nutrition and foods

Nutrition (malnutrition related OTPs, SC,TSF,CBN and PSNP activities)/HO & Early warning

Total OTP sites_____, total admissions to OTP/yr_____

Total SC sites,_____, Newly opened/yr_____, total admissions to SC/yr_____

Is there TSF (targeted supplementary feeding) program in the woreda_____

CBN program_____ PSNP _____other_____

General food security condition_____

What do you think the main problems of the district are?

_____

Essential drugs (shortage):-

_____

Annex 5 : Meher Disaster Assessment Tools used in Degahbuur zone .Ethio-Somali region, 2014 at District level

Interviewer name _____ Institution:_____ _____

Interview Date: (dd) ____/(mm)_____/2011_____ _Zone:_____ Woreda _____

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

SECTION I: SOCIO- DEMOGRAPHIC PROFILE				
Woreda total population:	M:_____F:_____		Under 5_____	Total:_ ___
Special Population *(if any):*	Pastorals____	Refugees____	IDPs____	Migrant Workers___

Section II: Health Profile	
Morbidity and Mortality (List top 5 causes of Morbidity and Mortality) in the year 2007 EC (2014GC)	
Morbidity	Mortality
1.	1.
2.	2.
3.	3.
4.	4.
5.	5.

List number of cases/deaths from ___ 2007 to ___ 2007 (November – December 2015)

Month	AWD		Malaria		Measles		Meningitis	
	Cases	Deaths	Cases	Deaths	Cases	Deaths	Cases	Deaths
Jul 2015								

Aug 2015								
Sep 2015								
Oct 2015								

Ongoing outbreak?	
Is there any ongoing outbreak of any disease? YES_____ NO_____	
If yes, specify the type of disease	
Number of cases _____Deaths _____(specify the time period)	
Preparedness: Is there emergency drugs and supplies enough for 2 months? Or easily accessible on need?	
Ringer Lactate *(to treat AWD cases)*	Yes□ No□
ORS *(to treat AWD cases)*:	Yes□ No□
Doxycycline *(to treat AWD cases)*:	Yes□ No□
Consumables : Syringes, Gloves *(for AWD management):*	Yes□ No□
Amoxil susp (measles)	Yes□ No□
Tetracycline ointment (measles	Yes□ No□
Vitamin A (measles)	Yes□ No□
Coartem for Malaria	Yes□ No□
Lab supply: RDT for Malaria	Yes□ No□
Lab supply: RDT (pastorex) for Meningitis	Yes□ No□
Number of CTC kit available: (for A WD)	Yes□ No□
Main shortage (if any): Specify	
Coordination	
Is there a multi sectorial PHEM coordination forum?	Yes□ No□
Is there a drought response plan?	Yes□ No□
SECTION III: RISK FACTORS	

Diseases	Risk factors for epidemics to occur	Yes/N

		o
Malaria	Malaria endemic area	
	Presence of malaria breeding site	
	Interrupted or potentially interrupting rivers	
	Unprotected irrigation in the area	
	LLINs coverage <80%	
	Depeleted prevention and control activities	
Meningitis	Was there Meningitis epidemic in the last 3 years (If yes specify date)	
	If yes : number of people vaccinated	
AWD	Was there AWD epidemic in the last three years(If yes specify date)	
	Source of water safe? (indicate the source)	
Measles	Ongoing measles cases	
	Widespread malnutrition	
	Is vaccination coverage good? (indicate <1 measles vaccine coverage)	
	Number of HH latrine that is available in the district	

Declaration

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

Name: Abdifatah Tahir Haji

Signature: _____

Place: AAU, Addis Ababa

Date of Submission: 15 May /2015

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

Name of advisor: Mr.Alemayehu Bekele

Signature: _____

Date: _____

Name of advisor: Dr.Ayele B.

Signature: _____

Date: _____