

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:

Gosaye Beriso Chakiso

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

June, 2016

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Advisor:

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Approval by Examining Board

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Advisor

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List of Abbreviations and acronyms

AAU	Addis Ababa University
ACIP	Advisory Committee on Immunization Practices
ACT	Artemisinin-based Combination Therapy
AFB	Acid Fast Bacilli
AFRO	Regional Office for Africa
AIDS	Acquired Immune Deficiency Syndrome
AL	Artemether-Lumefantrine
AR	Attack Rate
ARV	Anti Rabies Vaccine
BCG	Bacille Calmette-Guérin
BPR	Business Process Reengineering
BSC	Bachelor of Science
C ⁰	Degree Centigrade
CCB	Cold Chain Breach
CDC	Center for Disease Control
CFR	Case Fatality Rate
CI	Confidence Interval
CNS	Central Nervous System
CSF	Cerebro Spinal Fluid
CTC	Cholera Treatment Center
Cu.mm	Cubic mille meter
CVS	Central Vaccine Store
DPT	Diphtheria, Pertusis and Tetanus
Dr.	Doctor
DVS	District Vaccine Store
E.C	Ethiopian Calendar
E.g.	Example
EFETP	Ethiopian Field Epidemiology Training program
EFY	Ethiopian Fiscal Years
EPHA	Ethiopian Public Health Association
EPHI	Ethiopian Public Health Institute

EPI	Expanded Program On Immunization
EQAP	External Quality Assurance &Control Program me
FAT	Fluorescent Antibody Test
FMoH	Federal Ministry of Health
G/Dl	Gram per Deci Liter
GBS	Guillain Barre System
GC	Gregorian Colander
HC	Health Center
HCF	Health Care Financing
HEP	Health Extension Program
HepB	Hepatitis B
HEW	Health Extension Worker
HF	Health Facility
HIV	Human Immune Deficiency Virus
HMIS	Health Management and Information System
HP	Health Post
Hr.	Hours
HSDP	Health Sector Develop Program
IDS	Integrated Disease Surveillance
IDSR	Integrated Disease Surveillance and Response
IGM	Immune Globulin
IHR	International Health Regulation
ILR	Ice Lined Refrigerator
IRS	Indoor Residual Spray
ITN	Insecticide Treated Net
KM	Kilo Meter
LGA	Local Government Area
LLINs	Long-lasting Insecticidal Net
MASL	Meter above sea level
MCH	Maternal and Child Health
MDSR	Maternal Death Surveillance and Response
MDVP	Malty Dose Vial Policy

MIN	Minute
Mm Hg	Mille Meter Mercury
MMWR	Morbidity and Mortality Weekly Report
Mr.	Mister
MRI	Magnetic Resonance Imaging
NGO	Non Governmental Organization
NPHL	National Public Health Laboratories
NPHLN	National Public Health Laboratories Net Work
OPV	Oral Polio Vaccine
OR	Odd Ratio
ORHB	Oromia Regional Health Bureau
OTP	Outpatient Department
PCM	Phase Change Materials
PF	Plasmodium Falcifurum
PFSA	Pharmaceuticals Fund and Supply Agency
PHCU	Primary Health Care Unit
PHEM	Public Health Emergency Management
PPV	Positive Predictive Value
PV	Plasmodium Vivax
RDT	Rapid Diagnostic Tests
RVS	Regional Vaccine Store
S/N	Serial Number
SAM	Sever Acute Malnutrition
SARS	Severe Acute Respiratory Syndrome
SIAS	Supplementary Immunization Activities
SNNPR	Southern Nation Nationality and People Representative
SOP	Standard Operations Procedure
SPH	School of Public Health
Sr.	Sister
TT	Tetanus Toxoid
US AID	United State Dollar
WHO	World Health Organization

Executive summary

This document contains a two years Field Epidemiology Training Program outputs which is equivalent with thesis to be submitted to school of public health for fulfillment of masters degree in Field Epidemiology. It includes reports of diseases outbreak investigations, public health surveillance data analysis, surveillance system evaluation, narrative summary of disaster situation report, manuscripts, abstracts, training report and PHEM weekly bulletin. In accordance, the document is organized to ten chapters.

Chapter One: contains disease outbreak investigations. The investigator has conducted two outbreak investigations and one case report. Two of the investigations were conducted using case control study design; whereas a case report was written by using case report study design with retrospective review of medical records. All investigations report contains abstract, introduction, methods, discussions, conclusion, recommendations, acknowledgement and references separately.

Chapter Two: contains report of surveillance data analysis which was conducted on Assessment of Control Measures and Trends of Malaria in Oromia Regional state, i.e. 2011 to 2015: five years data were used in the analysis. The objective of the study was to assess control measures and trends of malaria and put directions for intervention measures at the Region.

Chapter Three: addresses surveillance system evaluation entitled “Surveillance system performance of measles, malaria and Typhoid fever in Bale Zone of Oromia Region, to generate evidence based information for the better improvement of the surveillance system.” This chapter clearly presents the purpose and objectives of the measles, malaria and typhoid fever surveillance and its progress towards their objectives. The surveillance attributes: simplicity, flexibility, stability, acceptability, representativeness, timeliness, data quality, sensitivity and positive predictive value were also assessed in the chapter.

Chapter Four: contains assessment of Health Profile Data Description of Dugda Dawa district of Borana zone, Oromia Regional State. In this chapter, health and health related data of the district were evidently collected and detected as imperative for prioritizing major problems. It is basic for appropriate planning of public health interventions; and it is regarded as entry point for public health researches. Stake holders of health and health related issues will access evidence based information from this chapter.

Chapter Five: Consists of Scientific Manuscripts for Peer reviewed Journals. The manuscripts were prepared according to Ethiopian journal of health development author's guideline. The first manuscript was Outbreak of Measles in IluAbabora zone, Oromia Region, Ethiopia, January 2016 and the second was Quadriplegia Rabies Post Exposure Vaccination, Shashemene District, West Arsi zone, Oromia, Ethiopia, 2015

Chapter Six: The investigator prepared three abstracts for submission to scientific conference during residency time; namely, Outbreak of Measles Chiro woreda West Hararge Zone Oromia Region, Ethiopia, 2015, Five years (2011-2015G.C) malaria surveillance data analysis, Oromia Region, Ethiopia, 2015 and Quadriplegia Rabies Post Exposure Vaccination, Shashemene District, West Arsi zone, Oromia, Ethiopia, 2015

Chapter Seven: includes the narrative disaster situation report of West Arsi, North and East Shoas' zones of Oromia region. This chapter clearly presents "belg" human health and nutrition need assessment conducted in the above zones. As part of early warning and vulnerability assessment, the government of Ethiopia has been conducting nationwide human health and nutrition emergency need assessment twice a year in collaboration with different government sectors and partners. The assessment was conducted to identify potential problems which need humanitarian assistance. Based on the report from the assessment, humanitarian requirement document was developed and shared with potential partners for response.

Chapter Eight: The investigator prepared one proposal for research project. The objective of this study is to assess the vaccines cold chain distribution system in government health facilities in the West Arsi zone Oromia region, Ethiopia 2016 .We have designed retrospective cross-sectional community and facility study to detect cold chain management system .

Chapter Nine: describes training conducted on cholera case management and control strategy. The training covers Epidemiology, case management, and CTC establishment.

Chapter Ten: Finally, Public Health Emergency Management weekly bulletins incorporated in to this document. Twenty four bulletins were prepared by the investigator and of which only two of them were included in this study. The weekly bulletins were communicated to different stakeholders including ministry of health through Ethiopian Public Health Institute on weekly bases.

Chapter- I
Outbreak
Investigations

1.1 Measles Outbreak Investigation in Chiro Woreda, West Hararge Zone, Oromia Region, Ethiopia, January, 2015

Abstract

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Introduction: Measles is highly contagious viral disease and is one of the leading causes of death in children worldwide. In August 2014, Measles like illness affecting the community was detected in Chiro woreda of West Hararge zone, Oromia Region. Woreda health office calls to Oromia Regional Health Bureau for possible assistant to investigate the illness. Therefore, the investigator conducted study to verify the existence of measles outbreak in the woreda and assessed factors contributing to the outbreak.

Method: Descriptive study followed by Case-control study design was conducted on January 2015 in Chiro woreda. Initially, Data collection instrument was prepared. During data collection, Cases were identified by Public Health Emergency management Guideline (PHEM) case definition and compared each of them to two controls recruited in the household of the closest neighbors. Finally, A total of 180 samples were interviewed of which 60 were cases; The outbreak was confirmed by laboratory and Bivariate and multivariate analysis were conducted and odds ratio with 95%CI significant statistical association was declared at <0.05 P-value.

Result: A total of 173 cases (attack rate 8/10,000) and one death (case fatality rate 58/10,000) were identified .Of the cases 90(33%) were unvaccinated. Being vaccinated and having awareness on the mode of transmission for measles infection were protective factor for developing the disease and statically significant with OR 0.06 (95% CI = 0.03-0.13) and OR 0.04(95%CI= 0.03-0.05) respectively.

Conclusion: Low community awareness and low vaccination coverage was prone contributing to the outbreak.

Key words: Measles outbreak, Case-control, Chiro, Oromia, Ethiopia, 2015

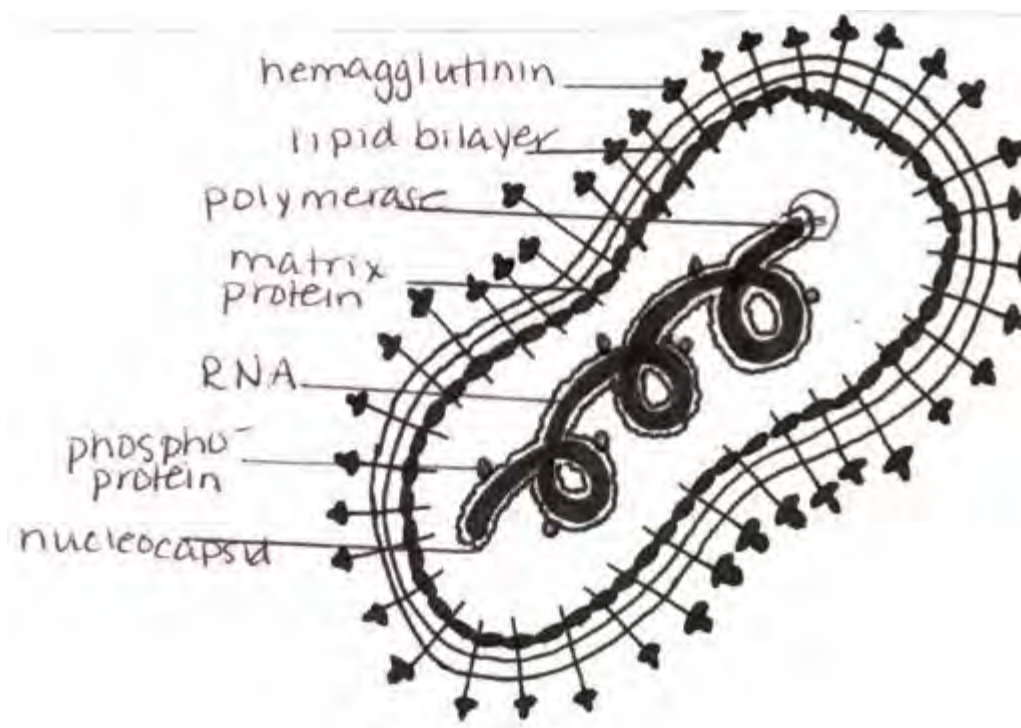
Introduction

Measles is an acute, highly contagious viral disease caused by measles virus. This highly contagious virus is transmitted primarily by respiratory droplets or airborne spray to mucous membranes in the upper respiratory tract or the conjunctiva [1]. More specifically, measles is an acute viral illness caused by a virus in the family paramyxovirus, genus Morbillivirus. Basically, Measles is characterized by a prodrome of fever (as high as 105°F) and malaise, cough, coryza, and conjunctivitis, followed by a maculopapular rash. The rash usually appears 14 days after exposure and spreads from head to trunk to lower extremities. Measles is usually a mild or moderately severe illness. However, measles can result in complications such as pneumonia, encephalitis, and death [2]. Measles virus is a paramyxovirus of a single serological type, closely related to the viruses causing canine distemper and rinderpest in cattle. Virions consist of an inner nucleocapsid that is a coiled helix of three proteins Nucleocapsid, Phospho protein and Lipid bilayer (N, P, L) and Ribonucleic acid (RNA) and an envelope containing three proteins Matrix protein, hemagglutinins and fusion (M, H, F). A haemagglutinin (H) protein mediates absorption of the virus to receptors on the host cell and a fusion (F) protein is responsible for the membrane fusion of virus and host cell and penetration of virus into the host cell [3]. Measles is one of the most contagious viruses, with a secondary attack rate among susceptible individuals higher than 90%. The virus can be transmitted in the air (aerosolized) in respiratory droplets, or by direct or indirect contact with the nasal and throat secretions of infected persons. Individuals with measles are considered infectious from four days before to four days after the onset of rash. Following exposure, the incubation period before onset of the first symptoms is usually 10–12 days. The rash usually appears 14 days after exposure (range 7–18 days) [4]. The risk factors for measles virus infection include; infants who lose passive antibody before the age of routine immunization, children with vitamin A deficiency and immunodeficiency due to HIV or AIDS, leukemia, alkylating agents, or corticosteroid therapy, regardless of immunization status and children who travel to areas where measles is endemic or contact with travelers to endemic areas. Malnourished and young children are at higher risk of developing complications and mortality from measles infection. Malnutrition (including vitamin A deficiency), underlying immunodeficiency and lack of access to medical care are all factors leading to the high case fatality rates observed in many parts of the world. In Ethiopia, the current routine immunization schedules recommend a dose of measles vaccination at nine months of age [1]. All immunization

programs should have a standard of getting an access for all children with two doses of measles containing vaccine (MCV). The second dose may be delivered through routine immunization or periodically mass campaign upon the strategies able to achieve high coverage [5]. In WHO Africa Regions, the only effective preventive measure is vaccination with two doses of measles-containing vaccine, usually administered as a measles-mumps-rubella (MMR) vaccine. National vaccine uptake of at least 95% with two doses of MMR vaccine is considered to be necessary to achieve region-wide [6]. However, a vaccination uptake of below 95% of the population in several EU Member States has resulted in an accumulation of susceptible individuals. Thus measles has re-emerged in the region that resulted in an outbreak in sub-groups of populations with low vaccine uptake and then spread to the general population [7]. The sero-conversion rate of measles vaccine at nine month of age is 85%, accordingly, even in regions where routine immunization coverage is high; some children from each birth cohort remain susceptible to measles. When large numbers of susceptible children accumulate over time, periodic outbreaks may occur in well vaccinated woredas [1]. Despite tremendous achievement towards globally measles mortality reduction and measles elimination goals, globally in 2010 there were 327,305 measles cases reported and estimated measles 139,300 measles death (i.e. approximately 380 death/day) [2]. The resurgence of measles outbreak in Africa these last few years has caused much suffering and many deaths. More than 200,000 cases and 1400 death were officially reported for 2010 taking into account generalized under reporting real numbers could be 10 or 20 times higher [8]. In 2013, measles incidence was 7.2 cases per 100,000 populations. A total of 243 measles outbreaks were confirmed in 2013 compared to 146 in 2012 with a total of 192 affected woredas (districts) in 2013 compared to 125 in 2012. Based on the epidemiology of measles in Ethiopia and burden of disease modeling, it is estimated that more than 1.5 million cases of measles (all age) and 70,000 deaths (assuming 4% case fatality ratio) would occur in Ethiopia annually. For many years the average number of measles cases reported to the Ministry of Health by the region ranged from 500-2000 annually [9]. The WHO-UNICEF coverage estimates for measles vaccination in Ethiopia indicate an increase from 37% in 2000 to 66% in 2012 [1]. However, measles outbreaks continue to occur throughout the regions of Ethiopia. Measles vaccine coverage of the Chiro Woreda also ranges 64% -93% from 2010-2014 [10]. After the report of the measles outbreak from Chiro Woreda was reported, team was deployed

for investigation. The main aim of this outbreak investigation was to assess the magnitude and risk factor of measles infection in Chiro Woreda, Oromia Region, from February 14-28/2015 and make recommendations for the future improvement.

Measles Virus Family: Paramyxoviridae Genus: Morbillivirus



Source: Principles of Virology Flint, Enquist, Krug, Racaniello, and Skalka (2000) p 538
& Medical Virology by White and Fenner (1994) p 461-465

Rationale of the study

In August 28, 2014 the first case was reported to Chiro district health office by health extension worker from Madicho-3 kebele. He was an eight years old male patient with unvaccinated status; he had no history of taking trip to other place before the onset of the illness. On September/ 2014 the district organized a team of 12 members and send to the site for further investigation. The team identified 48 additional cases and starts to treat the cases without conformation. But the cases continue to propagate to adjacent kebeles. Finally woreda health office calls to Oromia Regional Health Bureau (ORHB) for assistance to investigate measles like illness which is increasing in number day to day. So that the investigator plan to verify measles outbreak in the district

Literature Review

Thresholds are markers that indicate when something should happen or change. They help Surveillance and program managers answer the question, “When will you take action, and what will that action be?” Thresholds are based on information from two different sources. One a local situation analysis for the specific disease or condition describing who is at risk for the disease, what are the risks, when is action needed to prevent a wider epidemic, and where do the diseases usually occurs. Two International recommendations from technical and disease control program experts. These guidelines recommend two types of thresholds: an alert threshold and an action threshold for the diseases under surveillance. An alert threshold suggests to health staff that further investigation is needed and preparedness activities should be initiated. An action threshold triggers a definite response. All diseases under surveillance has action threshold for example Five suspected measles cases in one month OR 3 confirmed measles cases in one month are measles action threshold [11]. EE Isere, AA Fatiregun, and A Adeyemo conducted Measles outbreak and response immunization in a south-western district of Nigeria: January to June 2010. The result revealed that Fifty-three per cent of the confirmed cases were males. Most of the cases (77.7%) were children aged 6-59 months. More than three quarters of the confirmed cases (88.1%) were unvaccinated with the measles vaccine. Two cases of measles-related deaths were identified, giving a case fatality rate of 2.4 % [12]. In their Global Plan for Measles Mortality Reduction, WHO and UNICEF have targeted 47 priority countries with high measles burden. Most of the 47 priority countries are in Africa and South-East Asia, and they account for the overwhelming majority of global deaths from measles and its complications. This strategic plan includes the following key components: a) Provide the first dose of measles vaccine to successive groups of all children at the age of nine months or shortly after) Guarantee a ‘second opportunity’ for measles vaccination, either through campaigns or routine immunization. The second opportunity is needed both to increase the chance that every child receives at least one dose of measles vaccine, and to provide a second dose to children that already received one dose, thereby increasing the proportion of the population that is protected against measles. When the first dose is given at nine months, not all children will develop a protective response. The second dose, given later, will increase the protective response and the likelihood of immunity.

c) Establish an effective system to monitor coverage, and conduct measles surveillance with integration of epidemiological and laboratory information .d) Improve clinical management of every measles case [13]. Shamrock Izadi, Seyed-Mohsen Zahraie and Majid Sartipi conducted an Investigation into a Measles Outbreak in Southeast Iran in 2010. The result indicated that among 126 cases identified, three confirmed and six epidemiological linked cases with total 9(7%) were below the age of six months [14].

Interpreting an epidemic curve:

The first step in interpreting an epidemic curve is to consider its overall shape. The shape of the epidemic curve is determined by the epidemic pattern (for example, common source versus propagated), the period of time over which susceptible persons are exposed, and the minimum, average, and maximum incubation periods for the disease. An epidemic curve that has a steep upslope and a more gradual down slope (a so-called log-normal curve) is characteristic of a point-source epidemic in which persons are exposed to the same source over a relative brief period. In fact, any sudden rise in the number of cases suggests sudden exposure to a common source one incubation period earlier. In a point-source epidemic, all the cases occur within one incubation period. If the duration of exposure is prolonged, the epidemic is called a continuous common-source epidemic, and the epidemic curve has a plateau instead of a peak. An intermittent common-source epidemic (in which exposure to the causative agent is sporadic over time) usually produces an irregularly jagged epidemic curve reflecting the intermittence and duration of exposure and the number of persons exposed. In theory, a propagated epidemic — one spread from person-to-person with increasing numbers of cases in each generation — should have a series of progressively taller peaks one incubation period apart, but in reality few produce this classic pattern [16]. Kufakwanguzvarova, et al. conducted unmatched case control study on Measles outbreak investigation in Zaka, Masvingo Province, Zimbabwe, 2010. The result revealed that In multivariate analysis, factors that remained independently associated with contracting measles in Zaka district measles outbreak were, contact with a case AOR=41.14(95%CI: 7.47-226.54), being unvaccinated AOR= 3.96(95%CI: 2.58-6.08) and not receiving additional doses of vaccine AOR 5.48 (95%CI: 2.16-11.08.) [17].

Objective

General objective

To assess the magnitude and risk factor of measles infection in Chiro Woreda, Oromia Region,
Ethiopia January 14-28/2015

Specific objectives

To confirm the existence of measles outbreak

To describe the magnitude of measles infection

To determine the risk factors for the measles outbreak

Methods and Materials

Study area

Chiro is one of the 16 woreda of West Hararge zone. It is located in Eastern part of Ethiopia with the distance of 326 km, from Addis Ababa. Administratively the district divided into 40 Kebeles. Chiro is woreda with difficult topography .In the district there are 46 public health facilities (6 health centers 40 health posts).Projected population of 2015 is estimated to be 209690 comprises 106942 female. Under one and five years of age are 8597 and 33550 respectively. Health service and measles vaccination coverage of 2015 is 95% and 84% respectively.

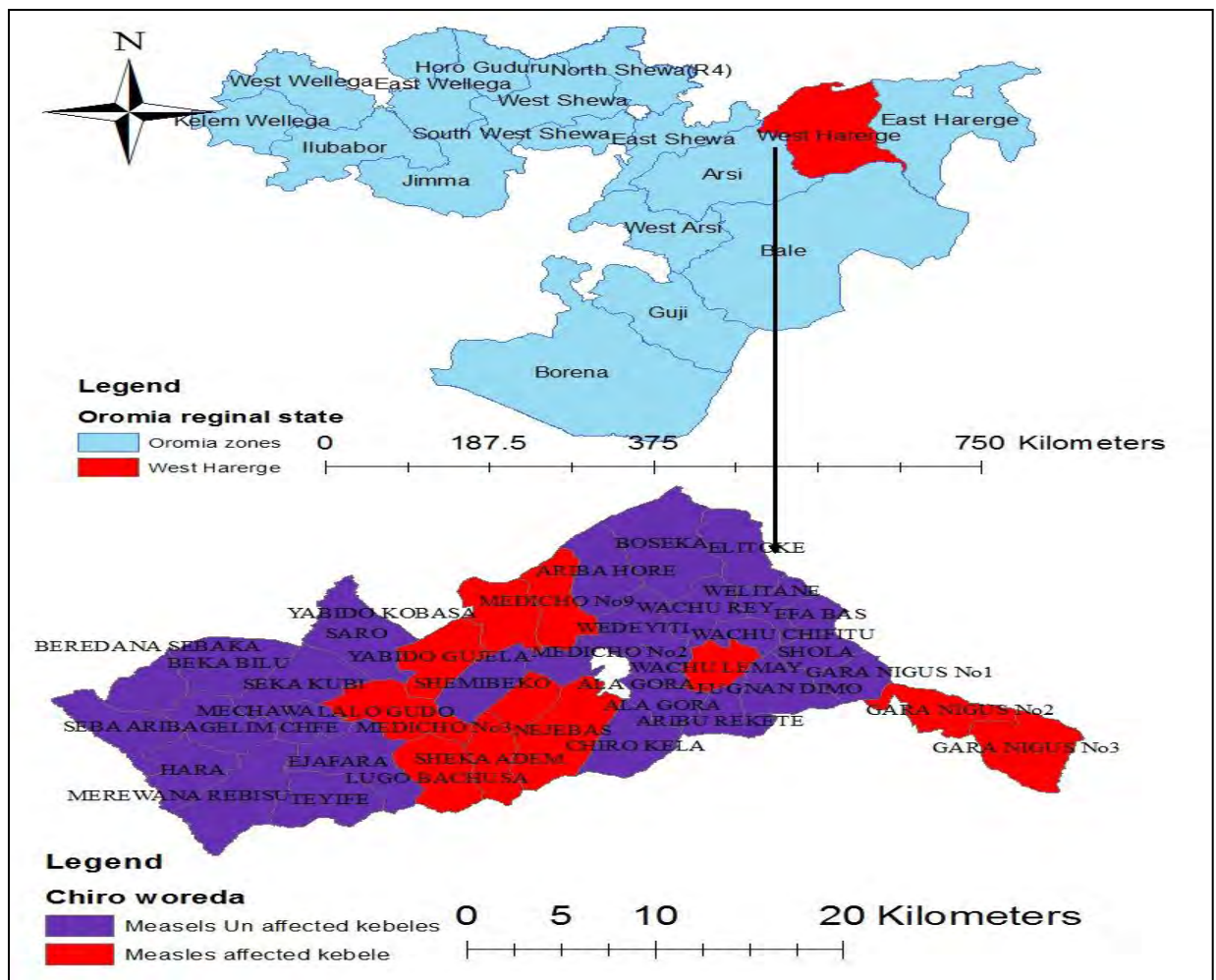


Figure 1: Measles cases distribution by Keble's of Chiro woreda West Hararge zone Oromia region, Ethiopia 2015

Study period

The study was conducted starting from January 14-28/2015, in Chiro woreda west Hararge zone, Oromia region, Ethiopia.

Case definition

Measles suspected cases at community level:

A community member should report any person with rash and fever to a health worker and also advise the person to go to a health facility.

Suspected measles case:

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

Confirmed measles case:

Cases with a positive laboratory result for measles specific immunoglobulin (IgM) antibody testing that had not received measles vaccination within the 4 weeks before the specimen collection.

Measles outbreak:

Is laboratory confirmed when 3 or more laboratory confirmed measles IgM -positive cases occur health facility or district in a month

Epidemiologically linked case:

A suspected measles case that has not had a specimen taken for serologic confirmation and is linked (in place, person and time) to a laboratory confirmed case; i.e., living in the same or in an adjacent district with a laboratory confirmed case where there is a likelihood of transmission; onset of rash of the two cases being within 30 days of each other.

Measles death:

For surveillance purposes, a measles death is defined as any death from an illness that occurs in a confirmed case or epidemiologically linked case of measles within one month of the onset of rash [1].

Study Design

Case control study design were conducted to identify risk factors for the occurrences of the outbreak

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Source population

All population living in the Chiro Woreda

Study population:

All population living in Chiro Woreda suspected as measles cases, selected and interviewed

Inclusion criteria:

Cases: Any residents of Chiro Woreda who had symptoms of measles and agreed to participate from January 14-28/ 2015.

Controls: Any residents of Chiro Woreda during the study who was a neighbor to a case and who did not develop 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 as well as family members from the same household

Sample size determination

Sample size determined by assumption of two side confidence level 95% power(chance of detecting)80%,ratio of control to cases 2,hypothetical proportion of control with exposure 10 from others study Odd ratio 3.5 then by using Epi info we get 61 cases and 121 control

Sampling procedure

Un-matched case control study design and descriptive study were conducted to investigate the outbreak. Surveillance reports and records were reviewed. A line list of suspected cases was collected from Woreda Health office. Cases were defined based on WHO standard measles case definition. During this study, 60 measles cases and 120 controls were interviewed with standard questionnaire. The controls were similar to case by social place and residential. The investigator also conducted active case search.

Data collection tools and Methods

We used a structured questionnaire to collect information including socio-economic demography, clinical status of the cases, the possible risk factors and awareness on mode of transmission and control/prevention measures for measles infection. The data was collected through face to face interview with the respondents (community), by reviewing the line list data in the health facility

Variable specification

Dependent variable

Measles infection

Independent variables

Measles vaccination status

Over-crowding

Travel history

Contact history

Awareness on mode of transmission of measles infection

Awareness on prevention/control of measles infection

Ethical consideration

This study is planned to confirm the existence of an outbreak, complete an investigation, and recognize associated risk factors to offer recommendation among people with measles cases in Chiro woreda of West Hararge zone. Written permission obtained from Oromia Regional Health Bureau and using this official letter, the zonal Health Department and woreda health office asked for their collaboration to this study and lastly selected community were communicated. Informed consent obtained from individual chosen to be respondent of this study. For this reason a consent form was attached to each questionnaire which explained about the purpose of the study confidentiality, and the respondent's full right to take part or not to take part in the study will be fully appreciated.

Results

Descriptive Epidemiology

On August 28, 2014 the first case was recognized by woreda health office from Madicho-3 Kebele. He was an 8 years old male patient with unvaccinated status and he had no take a trip history to other place before the onset of the illness. The epidemic lasted for 22 weeks starting from August 28/2014.

Description of measles cases by time

The duration of measles outbreak was five months and fifteen days with intermittent interventions across the kebeles where the cases were occurred.

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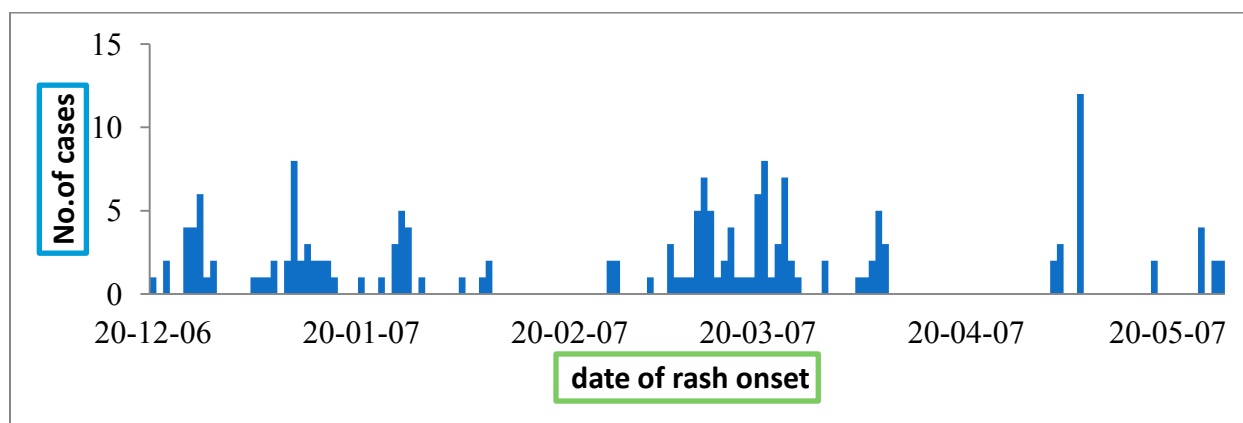


Figure 2: Epi Carve of measles outbreak by date of onset in Chiro woreda, West Hararge zone, Oromia region Ethiopia 2015

Description of measles cases by place and person

A total of 173 cases were identified within five months (22/12/2014-28/05/2015) and one death with case fatality rate 6/10000. The overall attack rate (AR) of the case was 8/10,000 population. The attack rate is the same in both sex each (4/10,000 population). The highest attack rate was registered in Nejebus kebele (3/10,000 population). Followed by Madicho3 (1/10,000), Yubdo Shomboko (1/10,000), and Gara Nugus 3(1/10,000) populations. The following figure shows distribution of measles cases by kebeles.

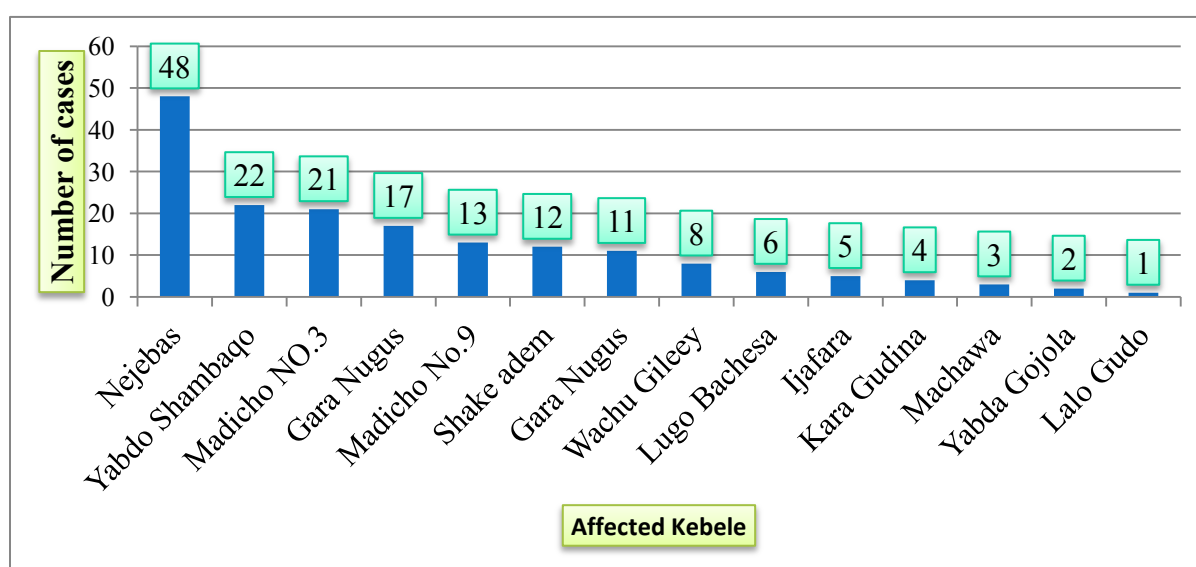


Figure 3: Distribution of measles cases by affected kebele in Chiro woreda West Hararge zone, Oromia region, Ethiopia, 2015,

Among 173 cases identified in fourteen kebeles 87 were males. The following figure shows distribution of measles cases in Chiro woreda.

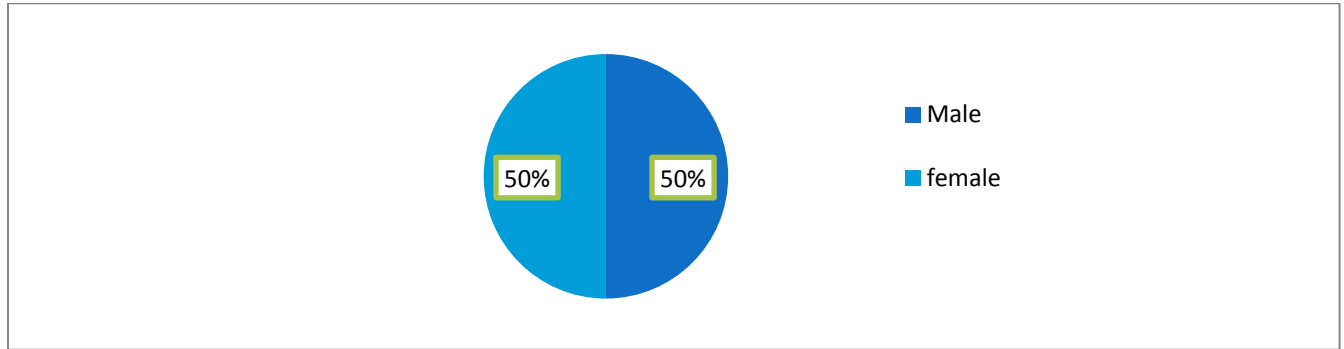


Figure 4: The proportion of measles cases by sex in Chiro woreda, West Hararge zone Oromia region, Ethiopia, 2015

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Levels of vaccination coverage

Ninety (52%) of the total 173 measles cases had no history of vaccination. Majority of the cases 93(54%) were in the age of 1-4 years. Under nine month and above fifteen years were almost similar. Measles containing vaccine (MCV1) and (MCV2) of the cases were 16% and 17% respectively. The following table indicates this.

Table 1: Vaccination history of Measles case-patients by age and sex, Chiro district, West Hararge zone Oromia region, Ethiopia, 2015

Age group								
Vaccination Status	Sex	<9 Months	9-11 Months	1-4 Yrs	5-9 Yrs	10-14 Yrs	>=15 Yrs	Total
Ineligible	Male	2	0	0	0	0	0	2(1%)
	Female	2	0	0	0	0	0	2(1%)
Unknown	Male	0	0	1	8	2	0	11(6%)
	Female	0	1	5	3	4	2	15(9%)
1 MCV dose	Male	1	2	10	2	0	0	15(9%)
	Female	0	2	5	3	2	0	12(7%)
≥2MCV doses	Male	0	0	14	2	1	1	18(10%)
	Female	0	0	11	1	0	0	12(7%)
Unvaccinated	Male	0	3	23	9	5	2	42(24%)
	Female	0	4	24	5	10	1	44(25%)
Total		5(3%)	12(7%)	93(54%)	33(54%)	24(14%)	6(3%)	173(100%)

Of the total measles cases 90(52%) were unvaccinated, 26(15%) vaccinated with one dose of measles vaccine, 30(17%) vaccinated with two dose of measles vaccine and 27(15%) cases their vaccination status was unknown. The following figure indicates this situation.

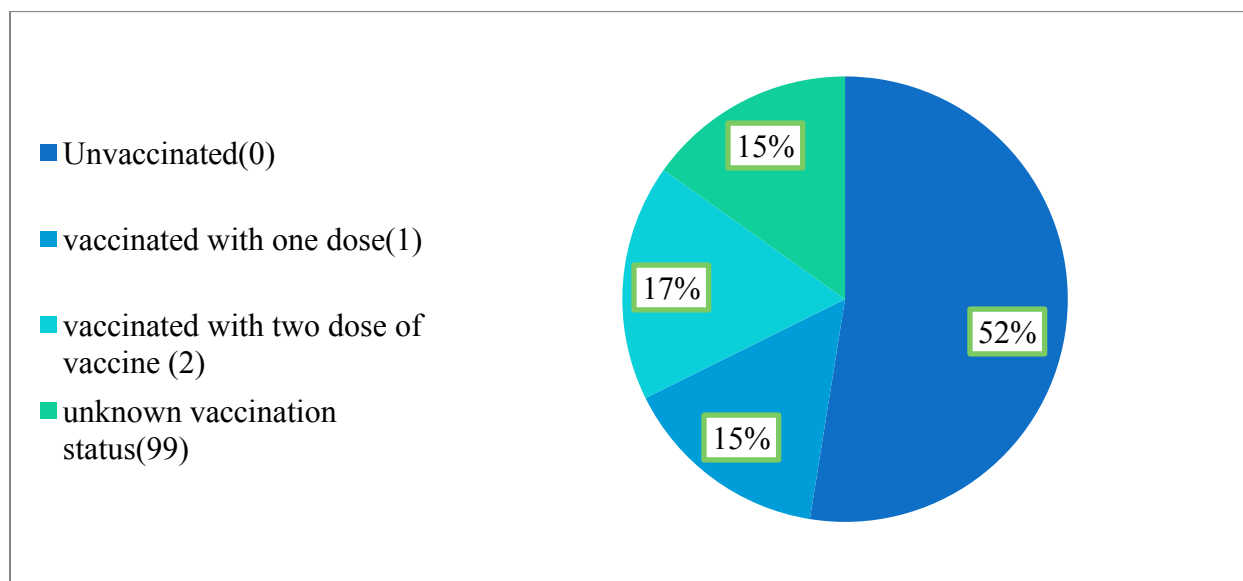


Figure 5: Vaccination status of measles cases in Chiro woreda West Hararge zone Oromia Region, Ethiopia 2015

Analytic epidemiology

A total of 60 cases and 120 controls were selected from the community to identify the risk factors for measles outbreak in affected Kebeles of the Chiro Woredas, West Hararge zone. All measles cases had a history of rash fever conjunctivitis, and cough, 88% diarrhea, and 93% had lower respiratory infections (pneumonia). The socio- demographic characteristics of the study participants and risk factors for measles outbreak were described in table below.

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Table 2: Demographic characteristics of measles case and controls in Chiro District, West Hararge zone Oromia Region, Ethiopia, 2015

S/No	Variables		Cases No.(%)	Control (%)
1	Age	<years	4(6.7%)	3(2.5%)
		1-4 Years	23(38.3%)	71(59%)
		5-14 Years	29(48.3%)	43(36%)
		15 years and above	6(10%)	3(2.5%)
2	Religion	Muslim	58(96.7%)	107(89%)
		Orthodox	2(3.3%)	13(11%)
3	Occupation of the cases	Unemployed	4(6.7%)	1(1%)
		Housewife	1(1.7%)	2(2%)
		Farmer	10(16.7%)	0
		Not applicable	15(25%)	49(41%)
		Others	30(50%)	68(56.7%)
4	Educational level of mothers	illiterate	0	4(3.3%)
		Primary	10(16.7%)	24(20%)
		Secondary	50(83.3%)	92(76.7%)
5	Ethnicity	Oromo	59(98.3%)	117(97.5%)
		Amhara	0	3(2.5%)
		Others	1(.83%)	0

By Bivariate analysis, being vaccinated and awareness about the mode of transmission for measles infection were a protective factor for developing the disease and statistically significant with an odd ratio (OR) of 0.06 (95% CI = 0.03-0.13, P= 0.00001) and 0.11(95%= 0.05-0.23, P= 0.00001) respectively. Whereas, contact with a measles cases and history of travelling prior to two weeks of onset were risk factor for developing the diseases and statistically significant with an OR of 8.75(95%CI= 4.31-17.8, P<0.000001) and 8(95%CI=3.14-20.34, P=0.000001) respectively.

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Table 3: Bivariate analysis of measles outbreaks in Chiro Woreda, West Hararge Zone, Oromia Region, Ethiopia, 2015

S/No	Variable		Cases No (%)	Control No (%)	Crude OR(95%CI)	P-value
1	Being Vaccinated	yes	15(25%)	102(85%)	0.06(0.03-0.13)	<0.0000
		No	45(75%)	18(15%)		1
2	Contact with the cases	Yes	39(65%)	21(17.5%)	8.75(4.31-17.80)	<0.0000
		No	21(35%)	99(82.5%)		001
3	Travel History prior to two weeks	Yes	20(33.3%)	8(6.7%)	8(3.14-20.34)	<0.0000
		No	40(66.7%)	112(93.3%)		01
4	Awareness on prevention and control	Yes	24(40%)	102(85%)	0.11(0.05-0.23)	<0.0001
		No	36(60%)	18(15%)		
5	Admitted to OTP in the past three months	yes	20(33.33%)	23(19.2%)	2.2(1.05-4.47)	<0.03
		No	40(66.67%)	97(80.8%)		

Laboratory result of the outbreak

Five blood samples were collected from suspected patients for measles in Chiro Woreda of West Hararge Zone and sent to the EPHI for confirmation. Four specimens were tested positive for measles IgM and the fifth was an epidemiologically linked case during the specified outbreak period. Hence, based on the result of the laboratory test in the woreda, typical measles clinical manifestation and epidemiologically linked with laboratory confirmed cases, the outbreak was confirmed and cases were treated as measles.

Interventions taken

The investigator identified and characterized the measles outbreak of the district. Technical support was given for health workers on case management, line listing and reporting to respective level accordingly. Cases were treated to prevent further spread and reduce morbidity and mortality related to measles and its complication using medications Anti biotic, oral rehydration salt (ORS), Tetracycline (TTC), and Vitamin A both at house hold and health facility level. Routine surveillance was enhanced and the situation was closely followed at each level on a daily bases. We gave health education on harmful traditional practice that prevent family to take the child to health facility for the community members and students in areas where the community are mostly assembled like, Mosque, schools, local meetings as well as at house hold level while searching for active cases to prevent the transmission of the disease, motivate health seeking behavior and treatment if there is sign and symptoms of measles. The zone has started closely working with the affected and the entire neighboring woredas to prevent/control the outbreak from spreading to other areas, and alarming the community, health extension worker and community leader to strength the local surveillance system. In addition active surveillance has been conducted in neighboring kebeles of the woreda. The measles vaccination coverage within the specific kebeles was reviewed and bordering villages with low vaccination coverage were planned to vaccinate.

Discussion

Five blood samples were collected from suspected patients for measles in Chiro Woreda of West Hararge Zone and sent to the EPHI for confirmation. Four specimens were tested positive for measles IgM which is in the range of threshold put by national guide lines and the fifth was an epidemiologically linked case during the specified outbreak period. Thresholds are markers that indicate when something should happen or change. They help Surveillance and program managers answer the question, “When will you take action, and what will that action be?” Thresholds are based on information from two different sources. One a local situation analysis for the specific disease or condition describing who is at risk for the disease, what are the risks, when is action needed to prevent a wider epidemic, and where do the diseases usually occurs. Two International recommendations from technical and disease control program experts. These guidelines recommend two types of thresholds: an alert threshold and an action threshold

for the diseases under surveillance. An alert threshold suggests to health staff that further investigation is needed and preparedness activities should be initiated. An action threshold triggers a definite response. So that All diseases under surveillance has action threshold for example Five suspected measles cases in one month OR 3 confirmed measles cases in one month is measles action threshold(11) .Half of the cases 90 (52%) of the total 173 measles cases had no history of vaccination. This is not similar with study conducted in Nigeria in 2009 which indicated that; More than three quarters of the confirmed cases (88.1%) were unvaccinated with the measles vaccine. In our study unknown vaccination status which most probably unvaccinated was included as an independent category; This group accounts to be 15% .So, that inclusion of this group hide similarity of our study with study conducted in Nigeria in 2009(12).In their Global Plan for Measles Mortality Reduction, WHO and UNICEF have developed strategic plan which includes the following key components:

a) Provide the first dose of measles vaccine to successive groups of all children at the age of nine months or shortly after) Guarantee a ‘second opportunity’ for measles vaccination, either through campaigns or routine immunization. The second opportunity is needed both to increase the chance that every child receives at least one dose of measles vaccine, and to provide a second dose to children that already received one dose, thereby increasing the proportion of the population that is protected against measles. When the first dose is given at nine months, not all children will develop a protective response. The second dose, given later, will increase the protective response and the likelihood of immunity. However, in our study both first and second dose of measles vaccinated cases were low (15% and 17%) (13).In this study age less than nine years were four cases and no age blow six month case was reported. This is different to study conducted in Southeast Iran (14).In this study, exposure to the causative agent is sporadic over time and an epidemic curve reveled an intermittent common-source epidemic and produced an irregularly jagged epidemic curve (16).In This study contact with measles case and travel history were factors that remained independently associated with contracting measles in Chiro district with crude odd ratio(COR)=8.75(95%CI: 4.31-17.80) P-value<0.0000001 and COR=8(95%CI 3.14-20.34) P-value <0.000001 respectively. It was similar with study conducted in Zaka district [17]

Limitation

Lack or/and incompleteness of some data

Conclusion and Recommendation

Children aged less than five years were the most affected group by measles outbreak. The outbreak was confirmed by laboratory and low community awareness, low vaccination coverage, contact history with measles case and travel history to the site of measles epidemic were independent risk factors for outbreak. Community empowerment on measles prevention and control strategy, scaling up routine and supplementary immunization activities (SIAs) in regional, zonal and woreda level is paramount activities for prevention of measles outbreak.

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Reference

- [1]. EHNRI; FDRE, Guide lines on Measles Surveillance and Outbreak Management, January 2012 Addis Ababa, Ethiopia
- [2]. VPD Surveillance Manual, 6th Edition, and 2013 Measles: Chapter 7-1
- [3]. WHO Guidelines for Epidemic Preparedness and Response to Measles Outbreaks 1999
- [4]. Surveillance Guidelines for Measles, Rubella and Congenital Rubella Syndrome in the WHO European Region Update December 2012
- [5]. World Health Organization (WHO). Summary of WHO Position Papers – Recommended Routine Immunizations - updated. 26 February 2014; Available from :<<http://www.who.int/immunization/documents/positionpapers/>>
- [6]. World Health Organization (WHO), Progress towards eliminating rubella and congenital rubella syndrome in the western hemisphere. WHO Weekly Epidemiology Rec, 2003-2008.83(44): p. 395-400.
- [7]. Filia A, et al. Cluster of measles cases in the Roma/Sinti population, Italy. EuroSurveill June-September 2006 [cited 11 41]; 3062]. Available from: <<http://www.eurosurveillance.org/ViewArticle.aspx?ArticleId=3062>>.
- [8]. Medicines Sans frontiers-Operational center Brussels Factsheet-February 2012
- [9]. Akalu HB (2015) Review on Measles Situation in Ethiopia; Past and Present. J Trop Dis 4: 193. doi:10.4172/2329-891X.1000193
- [10]. Chiro woreda administrative health office report of 2014, Chiro
- [11]. Public Health Emergency Management Guidelines for Ethiopia 2012
- [12]. EE Isere, etal. Measles outbreak and response immunization in a South-western district of Nigeria: January to June 2013
- [13]. WHO Response to measles outbreaks in measles mortality reduction settings 2009
- [14]. Shahrokh Izadi, etal. An Investigation into a Measles Outbreak in Southeast Iran 2011
- [15]. Principles of Virology Flint, Enquist, Krug, Racaniello, and Skalka (2000) p 538& Medical Virology by White and Fenner (1994) p 461-465
- [16]. Principles of Epidemiology in Public Health Practice Third Edition an Introduction to Applied Epidemiology and Biostatistics

[17]. Kufakwanguzvarova W Pomerai etal. Measles outbreak investigation in Zaka, Masvingo Province, Zimbabwe, 2010

[18].CDC: Situational Update, Clinical Guidance, and Vaccination Recommendations
Clinician Outreach and Communication Activity (COCA) Webinar February 19, 2015

1.2 Measles Outbreak

Investigation in Gechi-District, IluAbabora Zone Oromia Region, Ethiopia, 2016

Addis Ababa University College of Health Science School of Public Health

Measles Outbreak Investigation in Gechi-District, IluAbabora zone Oromia Region, Ethiopia, 2016

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Abstract

Introduction: Measles is an acute viral respiratory illness. Measles like sickness lasting four months in the Gechi district of IluAbabora zone, reported to Oromia region. We investigated to confirm the outbreak and identify risk factors.

Methods: We used unmatched case-control study design with descriptive cross-sectional survey to identify the risk factors for the occurrence of measles infection. PHEM guidelines standard case definition was used to identify suspected measles cases. From October 4/2015 we investigated all cases in the affected district using line lists and questionnaires and compared cases with controls. Five blood specimens were collected for laboratory confirmation.

Results: We identified 394 suspected cases and no deaths in ten Kebeles of the district from 4 October 2015 to 7 February 2016; 98 (25%) were from one kebele, Chara (incidence rate of 16.6 per 1000 population). There were four laboratory confirmed out of the five blood test performed and 390 epidemiologically linked cases.

We compared 60 cases to 120 controls and found that prior vaccination (Adjusted Odds Ratio (AOR) =, 0.43, (95%CI): 0.22-0.84 was protective of disease. Contact with measles cases (AOR=9.38, (95%CI): 4.43-19.83) and recent travel to areas with active measles cases (AOR=9.39, 95%CI: 2.54-34.76) were independent risk factors associated with outbreak.

Conclusion: Measles outbreaks are still a public health concern, even though vaccination coverage increases year to year in the region. We confirmed a measles outbreak in Gechi district of IluAbabora zone. Low community awareness and vaccination coverage was prone contributing to the outbreak.

Key words: Measles, case control, Chiro, Outbreak, Oromia, Ethiopia, 2016

Introduction

The earliest written description of measles is classically attributed to the Persian born physician Abu Becr (Rhazes) in the 10th century. Rhazes was the first to differentiate measles from smallpox and considered the former to be more dreaded. Although he recognized both the cyclical and seasonal nature of the disease, it was not until the 17th century that Thomas Sydenham of London identified the infectious nature of measles. The studies of Peter Panum in the Faroe Islands in 1846 showed that the disease was acquired solely by direct transmission. Outbreaks of measles occurred for the first time in the South Pacific during the mid and late 19th century, with devastating results among the Fijians and New Zealand Māori. In 1954 Enders and Peebles in the USA reported the first successful isolation and propagation of the measles virus in human and monkey kidney cells. This led to the production of live attenuated measles vaccine, which was first licensed for use in the USA in 1963[1]. Measles is one of the communicable diseases still causing preventable mortality and morbidity in the country. Measles morbidity and mortality reduction strategies include improving routine vaccination coverage, providing a second opportunity for measles vaccination through supplementary immunization activities (SIAs), improving measles-case management, and establishing case-based measles surveillance. Since 2002, Ethiopia adopted these regional goals and strategies and has been taking important steps to control measles [2]. Measles is a highly contagious virus that lives in the nose and throat mucus of an infected person. It can spread to others through coughing and sneezing. Also, measles virus can live for up to two hours in an airspace where the infected person coughed or sneezed. If other people breathe the contaminated air or touch the infected surface, then touch their eyes, noses, or mouths, they can become infected. Measles is so contagious that if one person has it, 90% of the people close to that person who are not immune will also become infected. Infected people can spread measles to others from four days before through four days after the rash appears. Measles is a disease of humans; measles virus is not spread by any other animal species [3]. Measles is an acute viral respiratory illness. It is characterized by a prodrome of fever (as high as 105°F) and malaise, cough, coryza, and conjunctivitis -the three “C”s -, a pathognomonic anathema (Koplik’s spots) followed by a maculopapular rash. The rash usually appears about 14 days after a person is exposed; however, the incubation period ranges from 7 to 21 days. The rash spreads from the head to the trunk to the lower extremities. Patients are

considered to be contagious from 4 days before to 4 days after the rash appears. Of note, sometimes immunocompromised patients do not develop the rash [4]. Measles is thought that measles virus (MV) enters the host by infection of alveolar macrophages and/or dendritic cells in the airways, and is amplified in local lymphoid tissues. Viremia mediated by infected CD150⁺ lymphocytes results in systemic dissemination. Infection of lymphocytes and dendritic cells in the respiratory sub mucosa facilitates basolateral infection of epithelial cells via the newly identified receptor Nectin-4. Concomitant and extensive epithelial damage may contribute to efficient transmission to the next host [5]. The incubation period is approximately 10–12 days from exposure to the onset of fever and other nonspecific symptoms and 14 days (with a range of 7–18 days), from exposure to the onset of rash [1]. Measles can be a serious in all age groups. However, children younger than 5 years of age and adults older than 20 years of age are more likely to suffer from measles complications. Common measles complications include ear infections and diarrhea. Whereas Severe Complications such as pneumonia (infection of the lungs) and encephalitis (swelling of the brain) are mentionable; in addition to these Measles may cause pregnant woman to give birth prematurely, or have a low-birth-weight baby [6]. Despite tremendous achievements towards global measles mortality reduction and measles elimination goals, globally, in 2010, there were 327,305 measles cases reported and an estimated 139,300 measles deaths (i.e., approximately 380 deaths/day) [7]. The resurgence of measles outbreak in Africa these last few years has caused much suffering and many deaths. More than 200,000 cases and 1400 death were officially reported for 2010. Taking into account generalized under reporting real numbers could be 10 or 20 times higher [8]. In 2013, 4780 confirmed measles cases were reported nationwide in Ethiopia [9]. In 2015 Oromia Region reported 21,170 suspected measles cases. Among these cases 1612 (8%) were from Ilu Ababora zone [10]. This study was conducted to investigate cause of measles, risk factors and to give put direction for measles prevention and control measures.

Rationale of the study

An October 4, 2015, the first case was recognized by health staff of Chara health center. The case was from Bedele woreda site which is adjacent to Chara health center of Gechi district. He was a seventeen years old male patient with unvaccinated status. He had no take a trip history to other place before the onset of the illness. The health center staff was not reported to neither Gechi health office nor to Bedele woreda. In December 1, 2015 outbreak investigation team organized and visited to the site and identified about 49 suspected cases. The team started to treat cases by Amoxicillin, vit.A, TTC, ORS and Anti pyretic accordingly; but the cases started to expanded to others Kebeles including Mucha Chara, Konoso, Coptu, Haro and Didessa. Finally the district health office asked Oromia Regional Health Bureau to investigate measles like illness dramatically expanding in the district. So that we EFETP resident plan to investigate measles like illness.

Literature Review

Action threshold levels for declaring an outbreak of measles are five suspected measles cases in one month OR 3 confirmed measles cases in one month [11].

In Ethiopia, the expected case-fatality rate is between 3% and 6%; the highest case-fatality rate occurs in infants 6 to 11 months of age, with malnourished infants at greatest risk. These rates may underestimate the true lethality of measles because of incomplete reporting of outcomes of measles illness. In certain high-risk populations, case-fatality rates as high as 30% have been reported in infants aged less than 1 year of age. The prevalence of measles cases in Ethiopian is one per 1000 persons [1]. Syed M. Akramuzzaman, Felicity T. Cutts, Md J. Hossain, Obaidullah K. Wahedi, Nazmun Nahar, Darul Islam, Narayan C. Shaha, and Dilip Mahalanabis, 2002 conducted A case-control study in Dhaka, Bangladesh. The result showed that the crude and adjusted odds ratios (OR) for receipt of measles vaccine were 0.2 (95%CI=0.1, 0.4, $P < 0.001$) for health facility attendance was 24.7 (95%CI = 5.3–114.7, $P < 0.001$) [12]. Laboratory confirmation is essential for all outbreaks and all sporadic measles cases. Detection of measles-specific IgM antibody and measles RNA by real-time RT-PCR are the most common methods for confirmation of measles infection [3]. Kufakwanguzvarova W Pomerai, Robert F Mudyiradima, and Notion T Gombe conducted unmatched case control study on Measles outbreak investigation in Zaka, Masvingo Province, Zimbabwe, 2010. The result revealed that In multivariate analysis,

factors that remained independently associated with contracting measles in Zaka district measles outbreak were, contact with a case AOR=41.14(95%CI: 7.47-226.54), being unvaccinated AOR=3.96(95%CI: 2.58-6.08) and not receiving additional doses of vaccine AOR 5.48 (95%CI: 2.16-11.08.)[13].

Objectives

General objective

To verify the existence of measles outbreak and identify risk factors for the outbreak in Gechi
woreda Ilu Ababora zone, Oromia Region from January 22/- February 7/2016

Specific objectives

To describe measles infection by place, person and time

To identify the etiologic agent

To identify risk factors of measles

Methods and Materials

Study area

Gechi district is one of the 24 districts of IluAbabora Zone, Oromia Region. It is found in 138 km from zonal town Matu and 480 km from Addis Ababa. The three highly affected Kebeles (Chara, Mucha and Konoso) are under Chara Health center and located 22 km away from the town of Gechi Woreda. Administratively the woreda is divided in to 33 Kebeles (32 rural and 1 urban). Among 32 rural kebele eight of them are inaccessible by car. In the district there are 4 health centers, 32 health posts and 4 private clinics; but there is no hospital in the district. Projected population of 2016 are 90314 (82028 rural and 886 urban), male 44254 female 46060, under one 2908, and under five 14450. The physical health service coverage of the woreda is 111% by health center and 172% by health post.

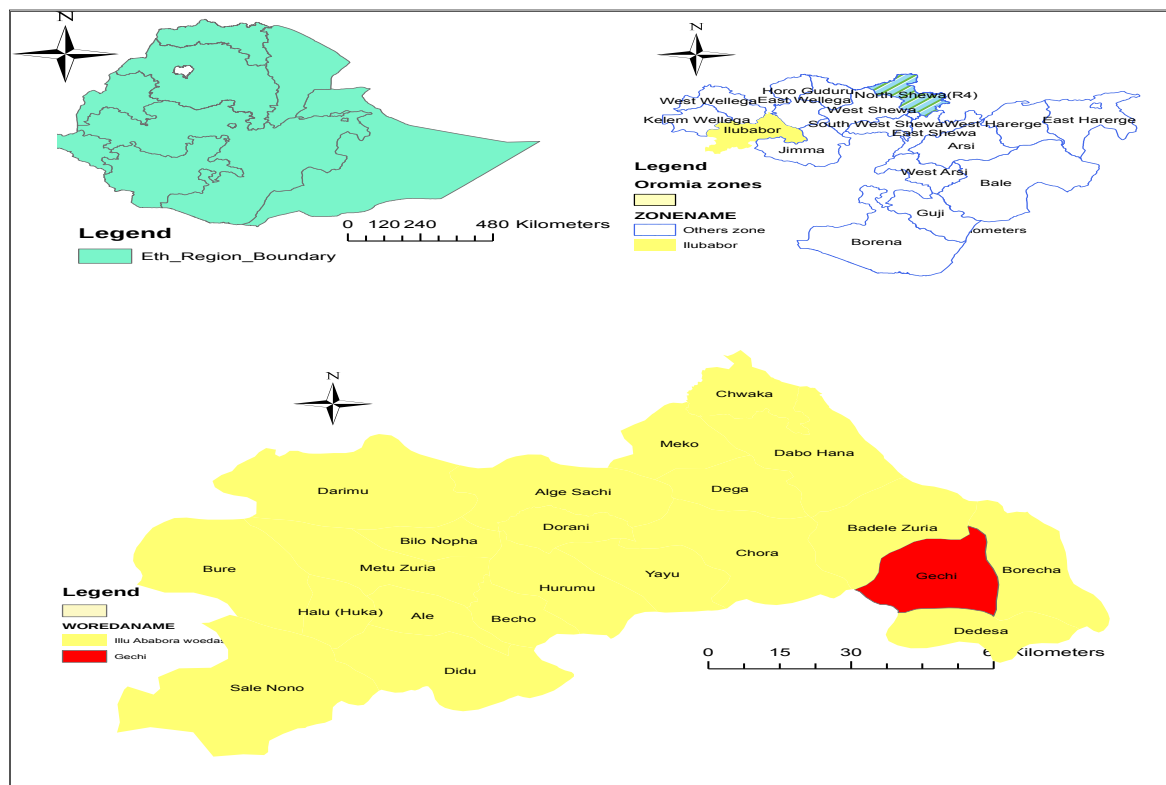


Figure 6: Map of Gechi district, IluAbabora zone, Oromia region, Ethiopia, 2016

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Study Period

The study was conducted from January 22- February 7/2016 in three Kebeles of Gechi districts namely Mucha, Chara and Konoso.

Study design

We used unmatched case-control study design with descriptive cross-sectional survey to identify the risk factors for the occurrence of measles infection.

Target population

All population living in Gechi district

Study population

All population living in the three Kebeles Chara Mucha and Konoso of Gechi district

Sample population

A collection of individuals selected from three Kebeles

Study Subject

The actual individuals directly participated in the study from three Kebeles

Sample Size Determination

Sample size will be determined by assumption of two side confidence level 95% power(chance of detecting),80% ratio of control to cases 2, Hypothetical proportion of control with exposure 10, Odd ratio 3.5, then by using Epi info we get 61 cases and 121 control.

Inclusion and Exclusion Criteria

Inclusion Criteria

Cases: Any residents of Gechi Woreda who had symptoms of measles and agreed to participate from 22 January to February 02/2016

Controls: Any residents of Gechi Woreda during the study who was a neighbor to a case and who did not develop 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 as well as family members from the same household

Sampling procedure

Un-matched case control study design and descriptive study were conducted to investigate the outbreak. Surveillance reports and records were reviewed. A line list of suspected cases was

collected from health center, Woreda Health office, zonal health department and regional health bureau. Cases were defined based on National measles Guidelines standard measles case definition. During this study, 60 measles cases and 120 controls were interviewed with standard questionnaire. The controls were similar to case by social place and residential. The investigator team also conducted active case search.

Data collection tools and Methods

We used a structured questionnaire to collect information including socio-economic demography, clinical status of the cases, the possible risk factors and awareness on mode of transmission and control/prevention measures for measles infection. The national measles guideline; national PHEM guide line and camera were fully available. The data was collected through face to face interview with the respondents (community), by reviewing the line list data in the health facility and properly registering the geographical location of individual households.

Variable specification

Dependent variable

Measles infection

Independent variables

Measles vaccination status

Over-crowding

Travel history

Contact history

Awareness on mode of transmission of measles infection

Awareness on prevention/control of measles infection

Ethical consideration

This study is planned to confirm the existence of an outbreak, complete an investigation, and recognize associated risk factors to offer recommendation among people with measles cases in Chiro woreda of West Hararge zone. Written permission will be obtained from Oromia Regional Health Bureau and using this official letter, the zonal Health Department and woreda health office asked for their collaboration to this study and lastly selected community will be communicated. Informed consent will be obtained from individual chosen to be respondent of this study. For this reason a consent form was attached to each questionnaire which explained

about the purpose of the study confidentiality, and the respondent's full right to take part or not to take part in the study will be fully appreciated

Case Definition

Measles suspected cases at community level:

A community member should report any person with rash and fever to a health worker and also advise the person to go to a health facility.

Suspected measles case:

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

Confirmed measles case:

Cases with a positive laboratory result for measles specific immunoglobulin (IgM) antibody testing that had not received measles vaccination within the 4 weeks before the specimen collection.

Measles outbreak:

Is laboratory confirmed when 3 or more laboratory confirmed measles IgM -positive cases occur health facility or district in a month

Epidemiologically linked case:

A suspected measles case that has not had a specimen taken for serologic confirmation and is linked (in place, person and time) to a laboratory confirmed case; i.e., living in the same or in an adjacent district with a laboratory confirmed case where there is a likelihood of transmission; onset of rash of the two cases being within 30 days of each other.

Measles death:

For surveillance purposes, a measles death is defined as any death from an illness that occurs in a confirmed case or epidemiologically linked case of measles within one month of the onset of rash [1].

Data Analysis

Data was entered onto Epi-Info version 7.1.0.6. If records were found out of range; it was rechecked with the corresponding questionnaire, accordingly correction methods was taken. Descriptive statistics and Odds ratios with 95% confidence intervals were calculated to compare risk factors among cases and controls. Age Specific Attack Rates were calculated by taking population of the district from Gechi District Health Office and the conversion factor for each age group was taken from the 2007 population and housing census. Conditional logistic regression (clogit commands) was utilized to identify independent risk factors associated with contraction of measles. Variables that had significant associations in the bivariate analysis, a confidence interval excluding one ($P\text{-value} \leq 0.05$) were included in a multivariate model, followed by a step-down procedure to remove those factors not contributing significantly ($P < 0.05$).

Results

Descriptive epidemiology

An October 4, 2015, the index case was recognized by health staff of Chara health center. The case was from Bedele woreda site which is adjacent to Chara health center of Gechi district. He was a seventeen years old male patient with unvaccinated status. He had no take a trip history to other place before the onset of the illness. The epidemic curve was a multi-peak with sharp rise and gradual fall that indicated a propagative type of outbreak

We identified 394 suspected cases and no deaths in ten Kebeles of the district from 4 October 2015 to 19 February 2016; ninety eight of the patients (25%) were from one kebele, Chara (incidence rate of 16.6 per 1000 population) (Figure 1). There were four laboratory confirmed and 390 epidemiologically linked cases. Four out of the five the blood tests performed were positive for measles specific IgM antibodies.

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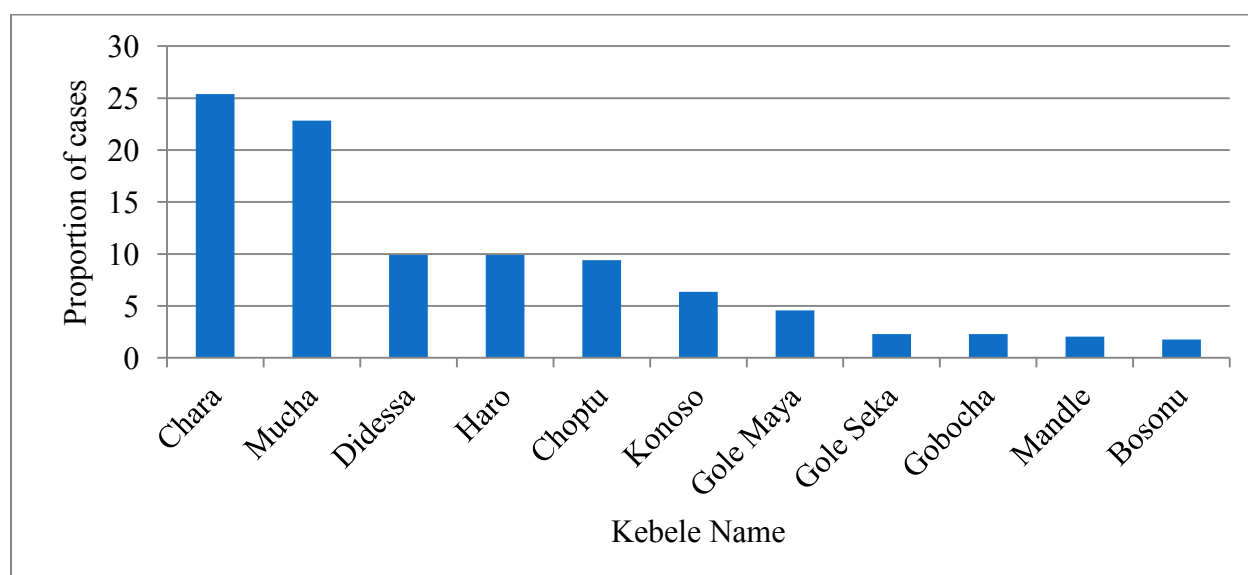


Figure 7: Distribution of Measles cases by Kebele, Gechi District, IluAbabora zone Oromia Region, 2016

The median age of the measles patients was 6 years (ranges: three months to 45 years) and females comprised 53%. Nine cases were age blow six months, 51(13%) Aged younger than one year 130(33%) were age 1-4 years 76(19.3%) were age 5-9 years, and 72(18.3%) were age 10-14 years.

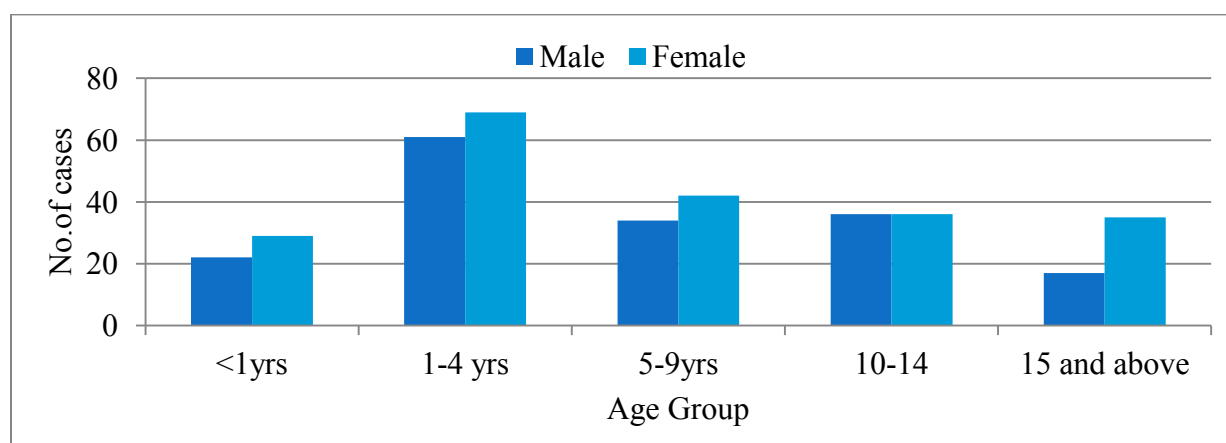


Figure 8: Sex and age distribution of measles cases, Gechi District, IluAbabora zone Oromia Region 2016

The epidemic curve showed a propagated pattern (Fig-3). The index case developed a rash and was seen on 1st October 2015 in Bedele District. The peak numbers of measles patients were on

12th December 2015. The measles outbreak subsided two months and fifteen days after intervention started.

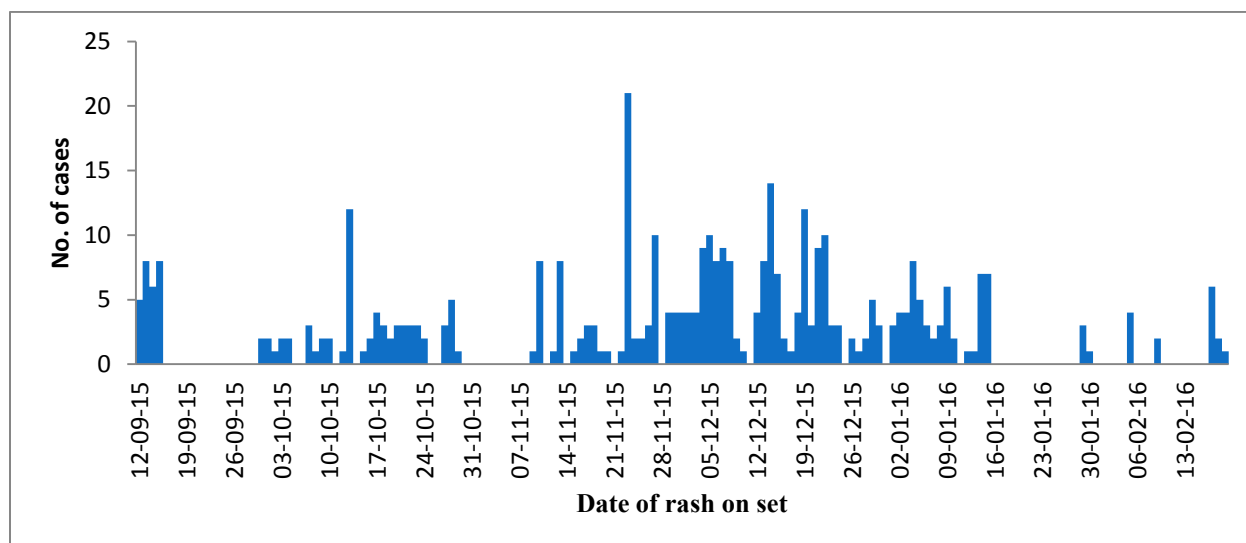


Figure 9: Number of measles cases by date of rash onset, Gechi District, IluAbabora zone, Oromia Region 2016

Of the total measles cases, 9(9%) of the cases were unvaccinated against measles, 267 (68%) of the cases received only one dose and 92(23%) were unknown vaccination status.

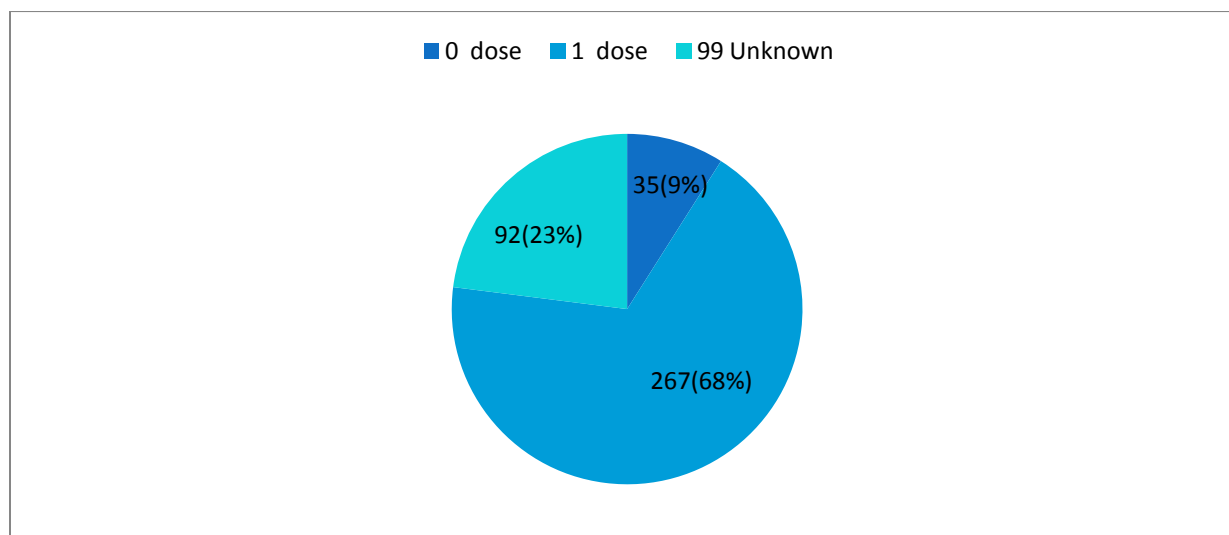


Figure 10: Vaccination status of Measles cases in Gechi woreda Ilu Ababora, zone Oromia Region, Ethiopia 2016.

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Analytic epidemiology

A total of 60 cases and 120 controls were selected from the community to identify the risk factors for measles outbreak in affected Kebeles of the Gechi Woredas, Ilu Aba Bora Zone. All measles cases had a history of rash fever conjunctivitis, and cough, 88% diarrhea, and 93% had lower respiratory infections (pneumonia). The socio- demographic characteristics of the study participants and risk factors for measles outbreak were described in table below

Table 4: Demographic characteristics of measles case and controls in Gechi District, Ilu Aba Bora Zone Oromia Region Ethiopia 2016

S/No	Variable Name		Cases No (%)	Control No (%)
1	Religion	Muslim	58(96)	102(85)
		Orthodox	1(2)	4(3)
		Protestant	1(2)	14(12)
2	Ethnicity	Amhara	0(0)	4(3)
		Oromo	60(100)	116(97)
3	Occupation	Farmer	1(2)	1(1)
		Housewife	3(5)	2(2)
		Not applicable	33(55)	63(52)
		Others	22(36)	53(44)
		Unemployed	1(2)	1(1)
4	Sex	Female	31(52)	47(39)
		Male	29(48)	73(61)
5	Level/education	KG	1(2)	1(1)
		Not applicable	29(48)	59(49)
		Primary	29(48)	58(48)
		secondary	1(2)	2(2)

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Table 5: Bivariate analysis of measles outbreaks in Gechi Woreda, Ilu Ababora Zone, Oromia region, Ethiopia, 2016

S/N	Variable		Cases no (%)	Control no (%)	Crude OR (95%CI)	P-Value
1	Being vaccinated	Yes	26(43.33)	84(70%)	0.3277(0.17-0.62)	.00054
		No	34(56.67)	36(30%)		
2	Contact with measles cases	yes	42(70%)	25(21%)	8.78(4.33-17.79)	0.0003
		no	18(30%)	94(79%)		
3	Knowledge on mode of transmission	Yes	24(40%)	79(66%)	0.35(.18-.66)	0.0001
		No	36(60%)	41(34%)	1.66(.89-3.10)	0.11
5	Educational level of family	Yes	32(53.33)	67(55.83)	.90(.48-1.68)	.75
		No	28(46.67)	53(44.17)		
6	History of travel prior to Two weeks	yes	13(21.67)	4(3.33)	8.02(2.49-25.86)	.00007
		No	47(78.33)	116(96.67)		
7	Over crowdedness(≥ 6)	Yes	34(56.67)	42(35.00)	2.43(1.29-4.58)	0.006
		No	26(43.33)	78(65.00)		

By multivariate analysis, being vaccinated and awareness about the mode of transmission for measles infection were a protective factor for developing the disease and statistically significant with an odd ratio (OR) of 0.33(95% CI = 0.17-0.62, P= 0.00054) and 0.35(95% CI = 0.18-0.66, P= 0.0001) respectively. On the other hand, contact with a measles cases was risk factor for developing the diseases and statistically significant with an OR of 8.78[95% CI= 4.33-17.79, P<0.0003]

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Table 6: Bivariate vs multivariate analysis of independent factor associated with measles outbreak among cases and controls of Gechi Woreda, Oromia Region, 2016

S/NO	Risk factors	Crude OR(95%CI)	Adjusted OR(95%CI)	Adjusted P-value
1	Being vaccinated	0.33(0.17-0.62)	0.43(0.22-0.84)	0.02
2	Awareness on Measles	0.35(0.18-0.66)	0.46(0.23-0.91)	0.03
3	Contact with cases	8.78(4.33-17.79)	9.38(4.43-19.83)	0.0001
4	Travel History	8.02(2.49-25.86)	9.39(2.54-34.76)	0.0008

1.1.4.3 Laboratory result of the outbreak

Five blood samples were collected from five patients in Gechi Woreda of Ilu Aba Bora Zone and sent to the EPHI for confirmation. Four specimens were tested positive for measles IgM and the fifth was an epidemiologically linked case during the specified outbreak period. Hence, based on the result of the laboratory test in the woreda, typical measles clinical manifestation and epidemiologically linked with laboratory confirmed cases, the outbreak was confirmed and cases were treated as measles

Interventions taken

Measles outbreak was identified and characterized. Practical assistance was given for health workers on case management. Cases were managed accordingly by distributing supportive treatments (Antibiotics, tetracycline ointment, oral rehydrating salt, Vitamin A, and anti-pyretic) both at house hold and health facility level. Routine surveillance was enhanced and the situation was closely followed at each level on a daily bases. We gave intensive health education for the community members and students in areas where the community are mostly assembled like, church, schools, local meetings as well as at house hold level while searching for active cases to prevent the transmission of the disease, motivate health seeking behavior and treatment if there is sign and symptoms of measles. The zone has started closely working with the affected and the entire neighboring woredas to prevent/control the outbreak from spreading to other areas, and alarming the community, health extension worker and community leader to strength the local surveillance system. In addition active surveillance has been conducted in neighboring kebeles of the woreda. The measles vaccination coverage within the specific kebeles was reviewed and

bordering villages with low vaccination coverage were vaccinated. Schools in the highly affected area were closed to minimize mode of transmission

Discussion

Four out of the five the blood tests performed were positive for measles specific IgM antibodies in the district and outbreak was declared. This is similar with the national measles guide line, five suspected cases or three laboratory confirmed cases were needed to declare an outbreak of measles. Therefore, we confirmed the existence of measles outbreak with a prevalence of 4.4/1000 and 80% IgM positive among a total of five clinically measles suspected cases in Gechi Woreda from 4 October/2015-7 February/2016 (11). We identified 394 suspected cases with no deaths in ten Kebeles of the district from 4 October 2015 to 7 February 2016; the overall attack rate(AR) and case fatality rate(CFR) of the district was(0 and 4.4) respectively. In Ethiopia, the expected case-fatality rate is between 3% and 6%; the highest case-fatality rate occurs in infants 6 to 11 months of age, with malnourished infants at greatest risk. These rates may underestimate the true lethality of measles because of incomplete reporting of outcomes of measles illness. In certain high-risk populations, case-fatality rates as high as 30% have been reported in infants aged less than 1 year of age. The prevalence of measles cases in Ethiopian is one per 1000 persons (1). The similarity of the two study was concerning to prevalence of measles cases; but, regarding to case CFR this study shows zero(0) result this might be due to incomplete reporting of death cases or good case management. As multivariate analysis of this Gechi Woreda outbreak investigation shows, being vaccinated for measles infection and knowledge on preventive aspect of measles vaccine were protective factor for developing the disease and statically significance with an Adjusted odd ratio (AOR) of 0.43(95% CI = 0.22-0.84, P= 0.02), and 0.46(95%CI=0.23-0.91, P=0.03) which is similar with the study done in Dhaka, Bangladesh (12). In This study contact with measles case and travel history were factors that remained independently associated with contracting measles in Gechi district with AOR=9.38(95%CI: 4.43-19.83, P=0001) and AOR=9.39(2.54-34.76) respectively. It was similar with study conducted in Zaka district (13). This all factors may contribute to the occurrence of measles outbreak in Gechi District. As a response of an outbreak, cases were treated to prevent further spread; and reduce morbidity and mortality relate to measles. Ongoing active surveillance was enhanced and continued in the community by Hews and the situation was closely followed at

each level on a daily bases. Health education was given for the community members of the affected and adjacent kebeles on the mode of transmission, treatment, prevention methods, to enhance their health seeking behavior.

Conclusions and recommendations

Number of measles cases were increasing in Children aged 5-14 including above 15 years of population. Therefore, the strategy started to incorporate less than 15 years to measles campaign by the Ministry of Health (MoH) should continues at all level (woredas, zonal and regional) to improve vaccination coverage . In addition the woreda health office has to improve routine immunization in the population in collaboration with stakeholders to prevent spread of an outbreak and occurrence of further outbreak in the woreda as soon as possible.

Reference

- [1]. EHNRI; FDRE, Guide lines on Measles Surveillance and Outbreak Management, January 2012 Addis Ababa, Ethiopia
- [2]. In: J Chin (ed). 2000. Control of Communicable Diseases Manual (17th edition). Washington: American Public Health Association
- [3]. WHO: National, Division of Viral Diseases 2014
- [4]. CDC. Prevention of Measles, Rubella, Congenital Rubella Syndrome, and Mumps, 2013: Summary Recommendations of the Advisory Committee on Immunization Practices (ACIP). MMWR 2013; 62(RR04);1-34.
- [5]. Rory D de Vries¹, Annelies W Mesman, Teunis BH Geijtenbeek, W Paul Duprex, Rik L de Swart The pathogenesis of measles 2012
- [6]. National Center for Immunization and Respiratory Diseases, Epidemiology and Prevention of Vaccine-Preventable Diseases 2015
- [7]. VPD Surveillance Manual, 6th Edition, 2013 Measles: Chapter 7-1
- [8]. Medicines Sans frontiers-Operational center Brussels Factsheet-February 2012
- [9]. World Health Organization (WHO). Summary of WHO Position Papers – Recommended Routine Immunizations - updated. 26February 2014; Available from :<
<http://www.who.int/immunization/documents/positionpapers/>>.
- [10]. Akalu HB (2015) Review on Measles Situation in Ethiopia; Past and Present. J Trop Dis 4: 193. doi:10.4172/2329-891X.1000193
- [11]. Public Health Emergency Management Guidelines for Ethiopia 2012
- [12]. Syed M. Akramuzzaman, et al., Measles vaccine effectiveness and risk factors for measles in Dhaka, Bangladesh; Bulletin of the World Health Organization. 2002. p. 776-782.
- [13]. Kufakwanguzvarova W Pomerai et al. Measles outbreak investigation in Zaka, Masvingo Province, Zimbabwe, 2010

1.3 Quadriplegia Rabies Post Exposure Vaccination, Shashemene District, West Arsi Zone, Oromia, Ethiopia, 2015

Quadriplegia Rabies Post Exposure Vaccination, Shashemene District, West Arsi zone, Oromia, Ethiopia, 2015

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Abstract

Background: Rabies is a serious disease. It is caused by a virus. Mainly rabies is a disease of animals. Basically, humans get rabies when they are bitten by infected animals. There are two clinical manifestations of rabies – frantic and paralytic. Frantic rabies is most common form of human rabies.

Case Report: Sudden Quadriplegia was detected in a 28 year-old female patient who had taken rabies immunization. A case report study design with retrospective review of medical records was conducted to assess course of development of quadriplegia in a woman received rabies vaccine after exposure.

Conclusion: This study presents a case report of sudden Quadriplegia developed after rabies immunization - no other etiological factors were detected and clinical management is discussed in light of the literature.

Key Words: Quadriplegia, rabies, side effect, vaccination, Shashemene, Oromia, Ethiopia

Introduction: The Greeks called rabies lyssa or lytta which means frenzy or madness. They named human rabies hydrophobia which means fear of water, a symptom shown by rabies victims. Rhabdovirus is Lyssavirus genus. The family Rhabdoviridae consists of more than 185 different viruses isolated from both plants and animals. Rabies is susceptible to disinfectants and inactivated by drying. Rabies virus found in all over the worldwide except Australia, Antarctica, and some islands. The genus Lyssavirus has only one major sero group [1]. Rabies is a person bitten by suspected rabid dog and presented with fever, nausea, vomiting, agitation, pharyngeal spasms (hydrophobia/ aerophobia) [2]. Rabies is a serious disease caused by a virus. It is mainly a disease of animals. Humans get rabies when they are bitten by infected animals [3]. Rabies is a viral disease that affects the central nervous system (CNS) of mammals and has an extremely high case fatality rate [4]. Rabies is a disease transmitted from animals to humans. There are two clinical manifestations of rabies – frantic and paralytic. Frantic rabies is most common form of human rabies [5]. There are different types of side effect following post exposure vaccination including burning, chills, dizziness, fever, general feeling of discomfort or illness, headache, itching, pain, redness, or swelling at the injection site, muscle or joint aches, nausea, stomach or abdominal pain [6]. The World Health Organization (WHO) estimates that 59,000 people die from rabies annually (or 160 people a day) and approximately 15 million people receive treatment after being exposed to animals suspected of having rabies. The greatest threat of rabies occurs in the world's poorest regions, Africa and Asia, where domestic dog vaccination is not widely implemented and access to post-exposure treatment is limited. Rabies remains a notoriously neglected and under-reported disease in the most affected countries, largely because healthcare in these regions tends to be severely limited and most victims die at home.

The Global Alliance for Rabies Control also estimates an enormous global economic burden, reaching 8.6 billion USD annually. The vast majority of this burden is shouldered by Africa (36.4%) and Asia (59.6%) [7]. A retrospective record review conducted in Ethiopian public health institute (EPHI) shows that 2014 suspected rabid animals were clinically examined and the overall post exposure treatment for humans was 17,204 within and around Addis Ababa in the period of 2001-2009. Among 3460 animal brains investigated in the laboratory with fluorescent antibody test (FAT) 75% were confirmed as rabies positive. The production and distribution of anti-rabies vaccine reached 130,673 treatment doses for human vaccine and

85,055 doses for animal respectively. The recorded data indicated the underestimate of rabies diagnosis, post exposure prophylaxis and fatal human cases, which could be attributed due to the absence of national rabies surveillance system vaccine [8].

Back Ground

In August 17/2015 there was a call from Shashemene district to Oromia Regional Health Bureau (ORHB) for anti-rabies drugs need for rabid individuals in one of Shashemene district kebele , Alache Arabate. The Bureau informed the health office as there was anti rabies drug in Arsi Negele District which was taken from Ethiopian Public Health Institute (EPHI) in that similar month for people who ate rabid oxen meat in the district. Shashemene district health office took anti rabies drug from there and started to treat suspected individuals in Malka Oda Hospital of Shashemene town. In the course of treatment, a 28 years female patient developed progressive paralysis. After her paralysis, there was a dilemma in the family of the women whether the paralysis was due to vaccine or health professional mismanagement. For the second time, Shashemene district health office called to ORHB for assistant to differentiate whether the paralysis was due to vaccine or health professionals fault. By considering this issue ORHB, PHEM core processes send the investigator to the site to ensure whether the paralysis was due to vaccine or health professionals' error. This study is designed to assess course of development of quadriplegia in a woman received rabies vaccine after exposure.

Literature Review

The Advisory Committee on Immunization Practices (ACIP-2006) Guidelines indicates that there are three type of exposure to rabies based on WHO category. Category (I) is touching or feeding of animals licks on intact skin and treatment is not recommended if reliable case history is available. Category II, is nibbling of uncovered skin minor scratches or abrasions without bleeding, administer vaccine immediately stop treatment If animals remain healthily throughout observation period of 10 days or if animals euthanized and found to be negative for rabies by appropriate laboratory techniques. Category III, single or multiple trans dermal bites or scratches contamination of mucus membrane with saliva(licks), administer rabies immunoglobulin vaccine immediately and stop treatment if animals remain healthily throughout observation period of 10 days or is killed humanely and is found to be negative for rabies by appropriate laboratory techniques. Human rabies infections are divided into two forms: furious (or encephalitic), and paralytic (or dumb).The furious form presents with the hydrophobia, delirium and agitation that create the common picture of rabies. About five percent of patients presents with the paralytic form and have little clinical evidence of cerebral involvement until late in their course. The spinal cord and brain stem bear the brunt of the illness in the paralytic form. In contrast to the furious form, paralytic rabies patient lacks hydrophobia, aerophobia, hyperactivity, or seizures. Their initial findings suggest an ascending paralysis, resembling acute inflammatory polyneuropathy the Guillain-Barre Syndrome (GBS), or a symmetric quadriplegia. Weakness may be more severe in the extremity where the virus was introduced. Meningeal signs (headache, neck stiffness) may be prominent despite a normal sensorial. As the disease progresses, the patient becomes confused and then declines into coma. The major differential for furious rabies is viral encephalitis. In the absence of exposure to a rabid animal, and if hydrophobia and hyperactivity are not prominent, it may be difficult to distinguish among these possibilities. Cerebro-spinal fluid (CSF) and electroencephalographic findings in rabies may mimic those of herpes simplex encephalitis; some patients receive empirical therapy with acyclovir while awaiting a more secure diagnosis. Tetanus or strychnine poisoning should be considered. Paralytic rabies may resemble acute inflammatory polyneuropathy, transverse myelitis, or poliomyelitis. Furious and Paralytic type are 80% and 20% respectively .In both circumstance death is due to cardio-respiratory failure. Survival is 3-5 days in furious type and 7-

21 days in paralytic [9]. J. N. Panicker, (etal.) (2004) in India examined diagnostic dilemma in flaccid paralysis following anti-rabies vaccine. They found that a neuro-paralytic syndrome following Pasteur's post-exposure rabies immunization was first recognized in 1889. Even though modified vaccines have been developed, Sample vaccine is still used commonly because of its low cost and easy availability. Sample vaccine is a suspension of phenol or beta-propionolactone killed virus in sheep brain. They also found incidence of a neurological complication with Sample vaccine is approximately 1 per 220 [10]. Indian Journal of Medical Microbiology (2011) 29(2):178-91. This study reveals that there is fatal rabies despite exposure of prophylaxis [(11)]. S. Kumar (2004) in India examines differentiating paralytic rabies from post ant rabies vaccine polyradiculoneuropathy. He found that Firstly, there are several features that could be useful in differentiating paralytic rabies from polyradiculoneuropathy, which could be summarized as follows:

1. History of dog bite:
 2. Incubation period: The mean incubation period in paralytic rabies is 49 days as compared to 14 days in case of post- Anti Rabies Vaccine (ARV) neurological syndromes.
 3. Clinical involvement: Sphincter disturbances and sensory symptoms (in addition to ascending flaccid paralysis) are common in paralytic rabies which is not the case with post-ARV polyradiculoneuropathy.
 4. Disease progression: Paralytic rabies progresses rapidly with early respiratory paralysis and death ensues within 7-11 days of symptom onset in all cases. On the other hand, post-ARV polyradiculoneuropathy has a better outcome with conservative management or immunotherapy and the mortality is less than 10%.
 5. Magnetic resonance imaging (MRI): MRI of the brain in paralytic rabies shows exclusive involvement of the gray matter including the basal ganglia, thalami, pontine and midbrain nuclei
- SJ Depani ,(etal) (2012) in Malawi postulated that even if there was no history of dog bite and on examination no dog-bite scar, but had frank signs of rabies encephalitis i.e. obvious hydrophobia and aerophobia we can conclude as rabies. They found that Rabies should be suspected in every patient with a rapidly evolving GBS-like illness—even if there is no history of exposure and no evidence of encephalitis on presentation [12].

Objective

General Objective:

To assess course of development of quadriplegia in a woman received rabies vaccine after exposure.

Specific Objective

To assess the nature of exposure to a suspected case of rabies

To describe the progression of the paralysis over the time after receiving rabies vaccine

To assess clinical status of the patient

Methods and Materials

Study Area

Shashemene rural is one of the 15 districts in West Arsi zone of Oromia Region which is situated to the Southern part of the Region. It has 76788 km² area and 250km distance from capital city of the region Addis Ababa. It shares common boundaries with Arsi Negele to north, Kofale to the east, Shalla to the west and Wondo and Bashan Guracha Districts to the south. Shashemene woreda has no urban kebele and there are 37 rural Kebeles with total population of 251225, projected from 2007 population census (4). Hundred percent of the population lives in rural areas, and most of the people in the district are subsistence farmers. In the district there are one district health office 7 health centers and 38 health posts.

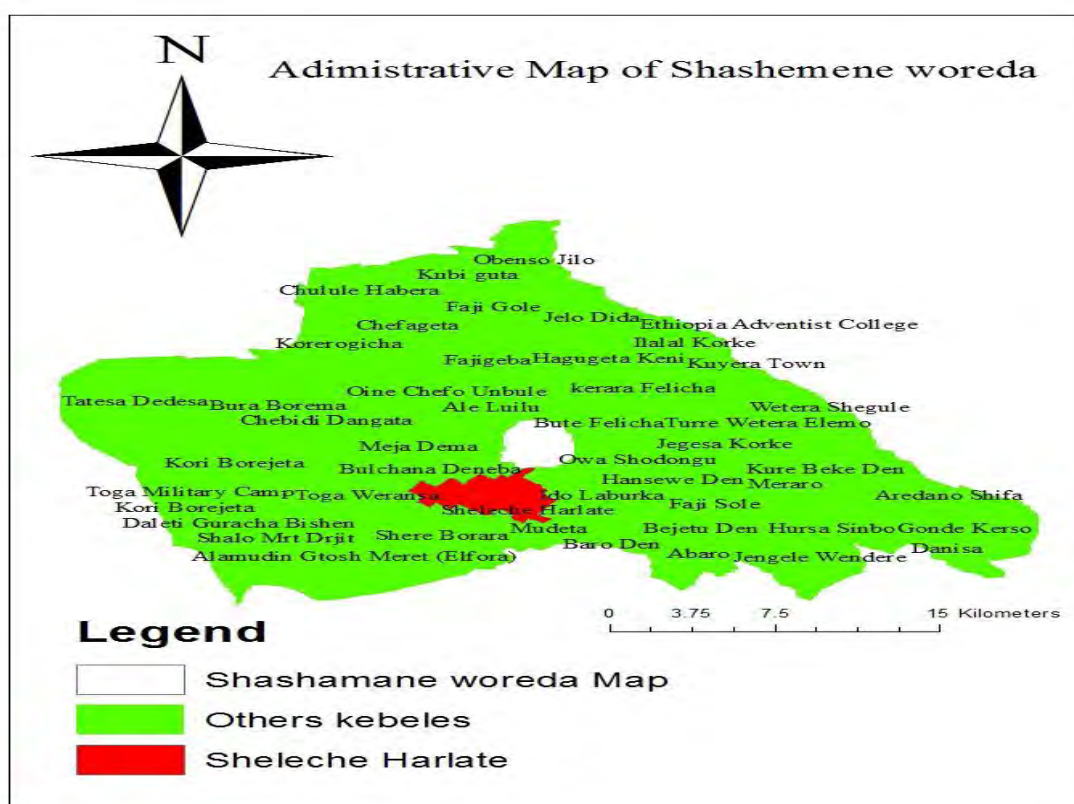


Figure 11: Administrative Map of Shashemene woreda, West Arsi zone, Oromia Region, Ethiopia, 2015

Study Design

A case report study design with retrospective review of medical records was conducted to assess course of development of quadriplegia in a woman received rabies vaccine after exposure.

Data collection instrument

Data was collected by open ended questionnaires developed to assess socio demography, contact history, clinical sign and symptoms, family history and illness related to paralysis and food intake of the patient.

Data analysis

Data was analyzed descriptively based on specific objectives and narration was done from result obtained.

Ethical consideration: Oromia Regional Health Bureau Research Review committee wrote permission letter to West Arsi zone health department as the investigator conduct case report of quadriplegia. In the same way, West Arsi zone health department wrote similar letter to Shashemene district health office to support the investigation. Finally, informed consent was obtained from family of the patient to conduct case report.

Case definition

Case classification of Human Rabies

Suspected: A case that is compatible with the clinical case definition

Probable: A suspected case plus history of contact with a suspected rabid animal.

Confirmed: A suspected case that is laboratory-confirmed

Human exposure to rabies

Possible exposure: A person who had close contact (usually a bite or scratch) with a rabies-susceptible animal in (or originating from) a rabies-infected area.

Probable exposure: A person who had close contact (usually a bite or scratch) with an animal displaying clinical signs consistent with rabies at time of the exposure, or within 10 days following exposure in a rabies-infected area.

Exposed: A person who has had close contact (usually a bite or scratch) with a laboratory-confirmed rabid animal [13]

Operational Definition

Tetraplegia also known as quadriplegia is paralysis caused by illness or injury that results in the partial or total loss of use of all their limbs and torso [14].

Results

Alache Arabate is one of Shashemene rural district kebele of West Arsi zone Oromia Region .In August 17/2015 an eleven years old male child was bitten by a dog in neighborhood. The dog was characterized by unprovoked aggression, eating chicken and running towards the cars since their home is around the street. Finally, the dog killed by car accident in August 18/2015.

Families of the child took him to Jorro clinic, one of medium private clinics found in Shashemene town. Health professionals of the clinic treated the child by prochain pencil line injection for five days and returned back to home. In addition, family also visited one of nearby traditional healer and took drinking type of traditional medicine for the treatment. The child developed abdominal discomfort after three days of taking the traditional drinking medicine and then stopped to take it. After forty nine days(i.e. October 1/2015) the child developed sign and symptoms including burning sensation which started from sole of bite leg and gradually progress to the upper leg, thirsty with hydrophobia ,illusion, lack of sleepiness, difficulty to urinate and weight loss. Family took the child to Shashemene referral hospital; discuss the issue with physician and the physician disclosed that treating the child is impossible and return back to the home by prescribing anti pain for the child .Before his death in October 2/2015 the child bite 4 people. Among these people only one person took anti rabies Vaccine; the remaining three people treated by traditional medicine. Two children in the village shared candy with the affected child and were treated with traditional medicine. Five people directly had direct contacted with saliva of affected child on intact skin and started to take ant rabies vaccine. Among these persons a twenty-Eight year-old woman, Oromo in ethnic group received a total of thirteen doses of Phenol zed ant rabies vaccine before the development of any symptoms and developed quadriplegia in the fourteen day of treatment. Those thirteen doses of phenol zed ant rabies vaccine were administered according to schedule in the subcutaneous of umbilical, starting from the day of the contact. She had a history of fever, and back pain for one day before onset of paralysis. Her past history elicited an incident contact of saliva of child with symptom of rabid dog in her right hand (grade I) three weeks back. Apart from this there was no recent history of

nerve illness, medication use, head trauma, stroke, increased blood pressure or systemic illness. She had no family history of paralysis. The common food intake in their home was “teff injera” with” shiro wot” and no history of food intake changed in that three previous months. She used tap water for drinking and she has no history of alcohol intake. The patient had complained of back pain, history of tingling, numbness at the lower extremities but there was no history of hydrophobia, Photophobia or behavioral changes. Clinical examination revealed a febrile, alert, and conscious woman. Her temperature was 36.8 °C; pulse rate was 86/min, blood pressure 100/50 mm Hg, respiratory rate 20/min, and SPO₂ 92%. Neurological examination detected that difficulty of urination. Laboratory investigations showed hemoglobin: 11.4 g/dL, white cell count 81800/cu.mm (neutrophil: 57.8%, lymphocyte: 9.6%, eosinophil: 0.00%), platelet count: 1, 87000/cu.mm. Conservative management was started but rapid progression of paralysis occurred over the next two days. There was involvement of respiratory muscles as well as features of bulbar palsy. The patient was put on ventilator support in intensive care unit in Black Lion Hospital. She admitted in Black Lion Hospital in October 16/2015 and discharged in January 11/2016 after she indicated improvement on respiratory system, but still she can't move her both upper and lower limb. Now she is on physiotherapy treatment and still she can't move her upper and lower limb.

Discussion

The woman had direct contact with saliva of rabid child on intact skin (grade I) and visited hospital for treatment. The physicians initiated anti rabies vaccine without taking appropriate history of contact status of the woman. After receiving thirteen dose of anti rabies vaccine the woman developed quadriplegia. Three type of exposure to rabies based on WHO category

Category I, is touching or feeding of animals licks on intact skin type of exposure is none and treatment is not recommended if reliable case history is available. Category II, is nibbling of uncovered skin minor scratches or abrasions without bleeding type of exposure is minor administer vaccine immediately stop treatment If animals remain healthily throughout observation period of 10 days or if animals euthanized and found to be negative for rabies by appropriate laboratory techniques. Category III, single or multiple Trans dermal Bites or Scratches Contamination of mucus membrane with saliva (Licks) type of exposure is severe administer rabies immunoglobulin and vaccine immediately stop treatment If animals remain healthily throughout observation period of 10 days or is killed humanely and is found to be negative for rabies by appropriate laboratory techniques [9].In this case report treatment is started in category one which is not recommended to anti rabies vaccination by WHO criteria. This might be due to lack of awareness on rabies vaccination criteria or fearing of hundred percent cases fatality rate of the diseases. Human rabies infections are divided into two forms: furious (or encephalitic), and paralytic (or dumb).The furious form presents with the hydrophobia, delirium and agitation that create the common picture of rabies. About a fifth of patients presents with the paralytic form and have little clinical evidence of cerebral involvement until late in their course. The spinal cord and brain stem bear the brunt of the illness in the paralytic form. In contrast to the furious form, Paralytic rabies patient lack hydrophobia, aerophobia, hyperactivity, or seizures. Their initial findings suggest an ascending paralysis, resembling acute inflammatory polyneuropathy (the Guillain-Barre syndrome), or a symmetric quadriplegia. Weakness may be more severe in the extremity where the virus was introduced. Meningeal signs (headache, neck stiffness) may be prominent despite a normal sensorial. As the disease progresses, the patient becomes confused and then declines into coma. The major differential for furious rabies is viral encephalitis. In the absence of exposure to a rabid animal, and if hydrophobia and hyperactivity are not prominent, it may be difficult to distinguish among

these possibilities. CSF and electroencephalographic findings in rabies may mimic those of herpes simplex encephalitis; some patients receive empirical therapy with acyclovir while awaiting a more secure diagnosis. Tetanus or strychnine poisoning should be considered. Paralytic rabies may resemble acute inflammatory polyneuropathy, transverse myelitis, or poliomyelitis (9). Our case report is similar with this study by lacking hydrophobia, aerophobia, hyperactivity, or seizures and ascending paralysis. Furious and Paralytic type are 80% and 20% respectively (9). In both circumstance death is due to Cardio-Respiratory failure. Survival is 3-5 days in furious type and 7-21 days in paralytic. In our case report the woman stay for three months in the hospital and she also still alive. This might be the paralysis is not related to rabies case and it is related to vaccine. N. Panicker,(etal.) (2004) in India examined Diagnostic dilemma in flaccid paralysis following anti-rabies vaccine. They found that a neuro-paralytic syndrome following Pasteur's post-exposure rabies immunization was first recognized in 1889. Even though modified vaccines have been developed, Sample vaccine is still used commonly because of its low cost and easy availability. Sample vaccine is a suspension of phenol or beta-propionolactone killed virus in sheep brain. They also found incidence of a neurological complication with Sample vaccine is approximately 1 per 220(10). In our country this suspension of phenol has been used even though, it has high complication. This might be due to absence of data indicating magnitude of risk of this vaccine in our country or economic problem.

Limitations

Since, the woman was in intensive care unit and unconsciousness family was not interested to give full history of the women rather than giving care for her. Lack of post prophylaxis related paralysis study without direct contact in our country may lead to inappropriate conclusion. Therefore; study related to Rabies vaccination should be initiated to minimize discrepancy.

Conclusion

The woman had contact with saliva of rabid child on intact skin (grade I) and started taking anti rabies vaccine which is not recommended by WHO Category. Health professionals initiated anti rabies vaccine without taking appropriate history and diagnosis of contact status of the the patient due to 100% fatal behavior of the disease or lack of awareness.

In this case report paralysis start from lower limb and progress to upper limb like paralysis related to rabies. In addition, there are no sign of hydrophobia, aerophobia, hyperactivity, or seizures. Death is due to Cardio-Respiratory failure and survival is 7-21 days if paralysis is related to rabies. Since the woman is still alive this paralysis was not related to rabies disease rather than it related to rabies vaccine.

Recommendation

The clinical diagnostic techniques and the available vaccines must be improved.

Appropriate education of a population and health care professionals should be undertaken.

All possible efforts have to be made by the government and other bodies to increase and improve public health resources and to create awareness about the disease.

Further study to investigate factor contributing to Paralysis in rabies vaccination

References

- [1]. Centers for Disease Control and Prevention.CDC. Compendium of Animal Rabies Prevention and Control, 2011 National Association of State Public Health Veterinarians, Inc. (NASPHV)
- [2]. Federal Democratic Republic of Ethiopia Public Health Emergency Management, Guidelines for Ethiopia. Ethiopian Health and Nutrition Research Institute Public Health Emergency Management Centre, February 2012, Addis Ababa, Ethiopia
- [3]. Centers for Disease Control and Prevention. CDC twenty four seven. Saving Lives, Protecting People Rabies vaccine information statement-2009
- [4]. Centers for Disease Control and Prevention CDC 24/7: Saving Lives. Protecting People Rabies and Rabies Related Lyssa viruses-2012
- [5]. Association For Prevention And Control Of Rabies In India (APCRI) Regd.) Rabies Prophylaxis APCRI Guidelines (Who Asia 2006)
- [6]. Mayo Foundation for Medical Education and Research(1998-2015)
- [7]. World fact sheet ET(01/09/2015)
- [8]. The status of rabies in Ethiopia: A retrospective record review(2001-2009)
- [9]. the Advisory Committee on Immunization Practices (ACIP-2006)
- [10]. J. N. Panicker, (etal). Diagnostic dilemma in flaccid paralysis following anti rabies vaccine (2004)
- [11]. Indian Journal of Medical Microbiology (2011) 29(2):178-91
- [12]. (Infectious Disease Epidemiology Section Office of Public Health, Louisiana Department of Health & Hospitals 800-256-2748 (24 hr. number).
- [13].“WHO recommended standards and strategies for surveillance, prevention and control of communicable diseases" 2013.
- [14]. From Wikipedia, the free encyclopedia

Chapter-II
Surveillance
Data
Analysis

2.1 Assessment of Control Measures and Trends of Malaria in Oromia Regional state, Ethiopia 2015

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Abstract

Introduction: Malaria is one of the most important health issues in Ethiopia. Approximately 60 percent of Ethiopia's population lives in malaria-endemic areas. In 2014, according to the Ministry of Health, malaria was one of top ten leading cause of morbidity and health facility admissions, accounting for 5.3 and 2.4 percent respectively. Between 2000 and 2013, an expansion of malaria interventions helped to reduce malaria incidence by 30% globally, and by 34% in Africa. During the same period, malaria mortality rates decreased by an estimated 47% worldwide and by 54% in Africa. In the under-five age group, mortality rates have declined by 53% globally, and by 58% in Africa. This study is designed to assess control measures and trends of malaria in Oromia Region.

Method: A, retrospective record review for the period of 2011 to 2015 GC was carried out at Oromia Region using the available control measures and malaria cases data from Regional Malaria, PHEM and Planning department. Descriptive cross-sectional study was used to analyze the five year control measures and trends of malaria in Oromia Region.

Conclusion: Increasing number of health facility, with increased human power and applying malaria prevention and controlling measures decrease morbidity and mortality related to malaria illness.

Key words: Control measures, Malaria, Data analysis, Oromia, 2015

Introduction

Malaria is a mosquito-borne disease caused by a parasite; intraerythrocytic protozoa of the genus *Plasmodium* (e.g., *P. falciparum*, *P. vivax*, *P. ovale*, and *P. malariae* among other species). The first two species cause the most infections worldwide. *P. falciparum* is the agent that most commonly causes severe and potentially fatal malaria. *P. vivax* and *P. ovale* may have dormant liver stage parasites, which can reactivate and cause malaria several months or years after the infecting mosquito bite. *P. malariae* can result in long-lasting infections and if untreated can persist asymptotically in the human host for years, even a lifetime. The first symptoms of malaria (most often fever, chills, sweats, headaches, muscle pains, nausea and vomiting) are often not specific and are also found in other diseases (such as influenza and other common viral infections). Likewise, the physical findings are often not specific (elevated temperature, perspiration, tiredness). In severe malaria (caused by *P. falciparum*), clinical findings (confusion, coma, neurologic focal signs, severe anemia, respiratory difficulties) are more striking and may increase the suspicion index for malaria [1]. About 20 different *Anopheles* Species are locally important around the world [2]. Malaria is a disease caused by a parasite that lives part of its life in humans and part in mosquitoes [3]. Malaria can be transmitted by the bite of the *Anopheles* mosquito or by a contaminated needle or transfusion [4]. The Incubation Period in days for *vivax*, *ovale*, *malariae*, and *falciparum*, are (8-27, 8-27, 16 -> 40 and 6-25), respectively [5]. In 2014, 97 countries and territories had ongoing malaria transmission. An estimated 3.3 billion people are at risk of malaria, of whom 1.2 billion are at high risk. In high-risk areas, more than one malaria case occurs per 1000 population. There were an estimated 198 million cases of malaria worldwide (range 124–283 million) in 2013, and an estimated 584 000 deaths (range 367 000–755 000). 90% of all malaria deaths occur in Africa. In 2013, an estimated 437 000 African children died before their fifth birthday due to malaria. Globally, the disease caused an estimated 453 000 under-five deaths in 2013. Between 2000 and 2013, an expansion of malaria interventions helped to reduce malaria incidence by 30% globally, and by 34% in Africa. During the same period, malaria mortality rates decreased by an estimated 47% worldwide and by 54% in Africa. In the under-five age group, mortality rates have declined by 53% globally, and by 58% in Africa [6]. Malaria is one of the most important health issues in Ethiopia. Approximately 60 percent of Ethiopia's population lives in malaria-endemic areas. In 2014, according to the

Ministry of Health, malaria was one of top ten leading cause of morbidity and health facility admissions, accounting for 5.3 and 2.4 percent respectively [7]. In 2013, almost half of the population at risk in Africa (49%) had access to an insecticide-treated mosquito net, compared to 3% in 2004. In 2014, an estimated 214 million long-lasting insecticidal nets (LLINs) were delivered to malaria-endemic countries in Africa, bringing the total number of LLINs delivered to that region since 2012 to 427 million. In 2013, 124 million people were protected from malaria by indoor residual spraying around the world. In Africa, 55 million people, or 7% of the population at risk, lived in households that were regularly sprayed. The volume of rapid Diagnostic tests (RDT) sales to the public and private sectors of endemic countries has increased from 46 million in 2008 to 319 million in 2013. Globally, 392 million courses of Artemisinin-based Combination Therapy (ACTs) were procured by endemic countries in 2013, up from 11 million in 2005. In 2013, for the first time, the total number of diagnostic tests (RDTs and microscopy combined) provided in the public sector in Africa exceeded the total number of ACTs distributed. This indicates a prominent shift away from presumptive treatment and is thus an encouraging sign [6].

Rationale

Regularly analysis of surveillance data is a key function for describing malaria distribution and others epidemic prone disease within the region. It is used to characterize the disease burden, develop guidance to improve malaria control efforts, monitoring disease trends, and evaluating the effectiveness of disease control programs and policies. Results from data analysis can trigger public health authority to take appropriate action.

Literature Review

The World Health Organization (WHO) African Region has the highest coverage rates for IRS, but the proportion of the at-risk population protected has decreased in recent years. In the world at risk population protected by IRS decreased from 5% to 4% in 2010 and 2013 respectively. In WHO Africa Region the proportion of the population at risk protected by IRS decreased from 11% to 7% in 2010 to 2013 respectively. The recent regional decrease is accounted for by changes in a few countries, in particular Ethiopia, which accounted for 42% of the population protected by IRS in the region in 2013. The proportion of the population at risk protected by IRS did not change substantially in other regions. World Malaria Report of 2014 showed that the number of LLINs delivered to sub-Saharan African countries and distributed by national programmes increased in 2013 and 2014. This increased procurement and distributions of nets has led to an increase in the proportion of the population sleeping under an ITN. In recent years, all distributed nets, and therefore most of the available nets, have been LLINs. Over 142 million LLINs were delivered to countries in sub-Saharan Africa by manufacturers in 2013; a total of 214 million are projected to be delivered in 2014. Adding these nets to the 70 million delivered in 2012, a cumulative total of 426 million will have been delivered to countries in sub-Saharan Africa between 2012 and 2014. However, a comparison of the estimated number of LLINs available in households with the reported number of net deliveries suggests that allocation of LLINs during distribution is not 100% efficient (because some households receive additional nets before their existing nets have expired); it also suggests that over half of distributed ITNs are lost from households within 24 months. Consequently, not all of the 426 million delivered nets were available in households in 2014[11]. Ethiopian Annual performance Report of 2014 reveal that in 2014, 19,866,625 LLINs was planned in malaria-endemic areas; however, 11.7 million LLINs were actually distributed, increasing the cumulative number of distributed LLINs

to 58,676,86. In the same year 5111694 households were planned for IRS. However, a total of 3,930,604 households in malaria endemic areas were sprayed in 2014, below 2013 performance (5,032,693 households). The total number of laboratory confirmed plus clinical malaria cases were 2,627,182 (with a decrease from 3,862,735 cases reported in 2013). A total of 213 deaths were recorded in 2014, with a Case fatality Rate (CFR) of 0.01%. Out of the total 2,627,182 malaria cases reported in 2014, 2,210,298 (84.1%) were confirmed by either microscopy or rapid diagnostic tests (RDT), out of which 1,415,150 (64.0%) were *Plasmodium falciparum* (PF) and 795,148 (36.0%) were *Plasmodium vivax* (PV). The percentage of laboratory confirmed cases in 2014 (84.1%) was higher than the percentage (73.8%) estimated in 2013. A total amount of 5,321,471 doses of Artemisinin-based combination therapy (ACT), 200,000 vials of Artesunate injection, and 7,416,167 RDTs were distributed to regions for malaria prevention and control (10). National Goals and Targets of the President's Malaria Initiative: To reduce malaria mortality in Ethiopia by 50% by the end of a three-year project period. This is to be achieved through the following planned actions: 90% of households with a pregnant woman and/or children under-five will own at least one insecticide treated net (ITN); 85% of children under-five will have slept under an ITN the previous night; 85% of pregnant women will have slept under an ITN the previous night; 85% of dwellings in geographic areas targeted for indoor residual spraying (IRS) will have been sprayed; 85% of pregnant women and children under five will have slept under an ITN the previous night or in a house that has been sprayed with IRS in the last 6 months; 85% of government health facilities have ACTs available for treatment of uncomplicated malaria and 85% of children under five with suspected malaria will have received treatment with an ant malarial drug in accordance with national malaria treatment policies within 24 hours of onset of their symptoms. [12]. Primary health care facilities play a major role in malaria control and often provide the bulk of malaria case management services in a country, usually both clinical services and overall programme management for community activities in the catchment area [13]. Study conducted in Oyo State, Nigeria in 2014 on Impact of malaria rapid diagnostic tests on prescription patterns of Artemisinin based combination therapy show that after introduction of RDT, confirmed malaria cases and ACT treatments were being administered in excess [14]. Trevor P Jensen et al 2009 conducted Use of the slide positivity rate (SPR) to estimate changes in malaria incidence in a cohort of Ugandan children, and they found that

Changes in SPR provided a useful estimate of changes in the incidence of malaria in a well defined cohort; however, a gradual decline in the incidence of non-malaria fevers introduced some bias in these estimates [15].(Yan Bi, et al) 2012, conducted as slide positivity rates predict malaria transmission and they found that SPR was significantly positively associated with the malaria incidence rates [16].SPR can show epidemic: Generally, rates exceeding the usual health post and/or season specific thresholds of RDT or microscopy slide positivity rate should be considered an epidemic; In the absence of the above data, if the positivity rate (RDT or microscopy slide) is at least 50% out of at least 50 specimens tested, this is considered as the occurrence of an epidemic in the health facility catchment area [17].President's Malaria Initiative Ethiopia Malaria Operational Plan FY 2014 indicates that Ethiopia has made significant progress in scaling-up diagnostic testing for malaria: the percentages of all malaria cases reported that were confirmed by RDT or microscopy increased from 67% in 2011 to 83% in 2012. Oromia has shown a significant achievement in reducing presumptive treatment of malaria from 99% in 2007 to 23% in 2013[19].

Objectives

General objective

To assess control measures and trends of malaria and guide intervention measures at Oromia Region from 2011 to 2015 GC.

Specific Objectives

To describe trends of Malaria preventive measures

To describe trends of health facility in the region

To describe trends of HEW in the region

To describe malaria drug distribution in the region

Method and Materials

Study area:

Oromia is the largest region in Ethiopia. Its capital City is Finfinne. The region is sharing boundaries with all regions except Tigray Regional state. Administratively the region is divided into 18 rural and 12 urban totally 30 zones. There are around 337 Woredas in it among these 12 Woredas are found in urban and 325 Woredas are found in rural area. Total Kebeles in Oromia are 6583. In Oromia Region there are around 43 governmental hospitals, 67 NGO hospitals, 1297 health center, 6583 health post and 615 other health facilities. Total population of Oromia region is 33,914,866 and its area of the region is about 298,164.29 km² (8). The Oromia National Regional State is characterized by high plateau and very limited lowland areas. The altitude of the region ranges from below 500 masl at the rift to 4377masl at Mt. Tullu Dimtu. The region experiences annual temperature ranging from 100 C to 300 C, with mean annual temperature of 190 C and has bi-modal rainy seasons with the annual rainfall ranges from 400-2400 mm (9).

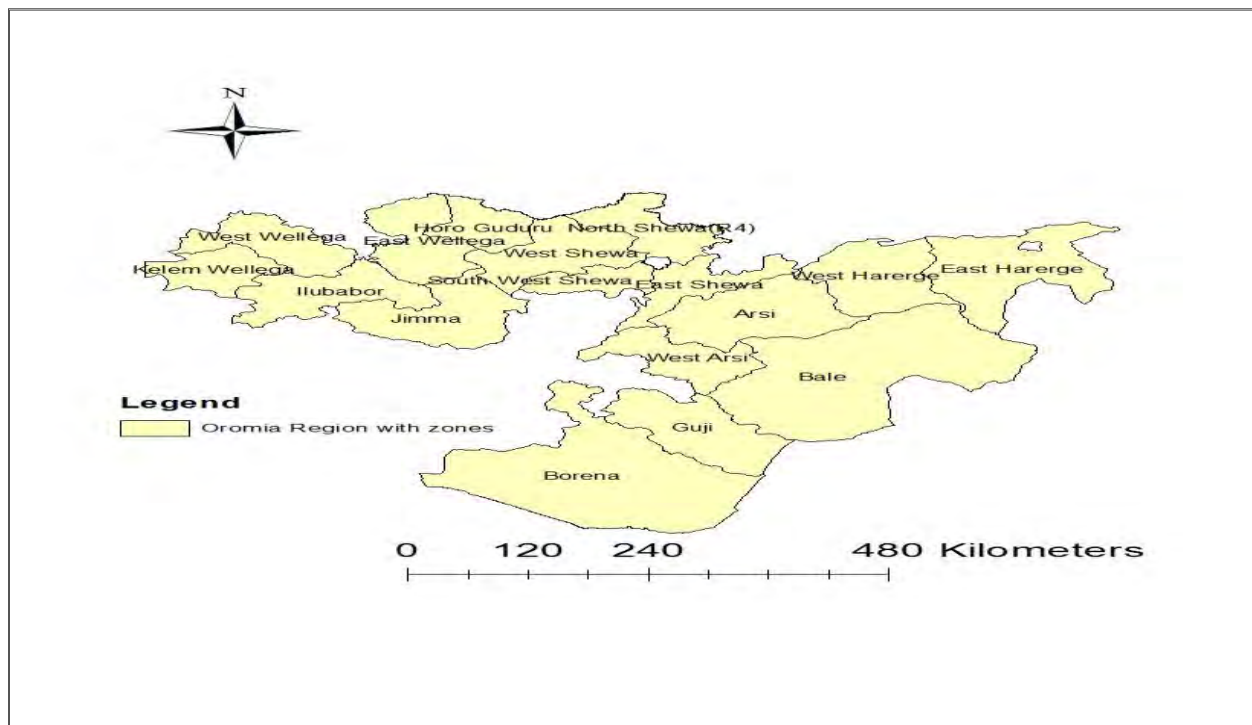


Figure 12: Administrative Map of Oromia Regional state with all zones 2016

Study period

We collected, analyzed and interpreted secondary data on control measures and trends of malaria for the past five years (June 2011- June 2015 G.C) from July 30 /2015 to August 30/2015

Study Design

Descriptive cross-sectional study was used to analyze the five year control measures and trends of malaria in Oromia Region.

Data source

Data will be collected from Oromia regional health bureau communicable department, Health management information system (HMIS) and Public Health Emergency Management (PHEM) core process.

Data collection procedure: previously collected Monthly report of Oromia regional health bureau data was used.

Malaria cases definition

Suspected

Detection of Plasmodium species by rapid diagnostic antigen testing without confirmation by microscopy or nucleic acid testing in any person (symptomatic or asymptomatic), regardless of whether the person experienced previous episodes of malaria while outside the country

Confirmed

Detection and specific identification of malaria parasite species by microscopy on blood films in a laboratory with appropriate expertise in any person (symptomatic or asymptomatic) diagnosed in the United States, regardless of whether the person experienced previous episodes of malaria while outside the country.

OR

Detection of Plasmodium species by nucleic acid test in any person (symptomatic or asymptomatic) diagnosed in the United States, regardless of whether the person experienced previous episodes of malaria while outside the country.

OR

Detection of unspecified malaria parasite by microscopy on blood films in a laboratory with appropriate expertise in any person (symptomatic or asymptomatic) diagnosed in the United

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States, regardless of whether the person experienced previous episodes of malaria while outside the country.

Cases also are classified according to the following World Health Organization categories:

Autochthonous:

Indigenous: malaria acquired by mosquito transmission in an area where malaria is a regular occurrence

Introduced: malaria acquired by mosquito transmission from an imported case in an area where malaria is not a regular occurrence

Imported: malaria acquired outside a specific area (e.g., the United States and its territories)

Induced: malaria acquired through artificial means (e.g., blood transfusion, common syringes, or malariotherapy)

Relapsing: Recurrence of disease after it has been apparently cured. In malaria, true relapses are caused by reactivation of dormant liver-stage parasites (hypnozoites) of *P. vivax* and *P. ovale*

Cryptic: an isolated case of malaria that cannot be epidemiologically linked to additional cases.

Operational Definition

Health post: Health institution providing services for 3000-5000 population.

Health center: Health institution providing services for 15000-25000 population

Primary Hospital: Health institution providing services for 60,000-100,000 population

Primary Health Care Unit: A Primary Hospital, Health center and health posts

General Hospital: Health institution providing services for 1-1.5 million populations

Specialized Hospital: Health institution providing services for 3.5-5 million populations

Data analysis

Data will be analyzed by using Microsoft excel and result presented by graph, table and figure.

Ethical Review. The study was conducted in accordance with the national policies on ethics.

Ethical approval was obtained from the Research Ethical Review Committee of Oromia Regional Health Bureau and from selected Department like Communicable Disease Control, PHEM Core Process, Planning and Communication.

Result

All zone found in Oromia regions are malaria endemic; the region swim in the malaria epidemic year by year. The government started to mitigate malaria epidemic by expanding hospitals, health centers and health posts. Before 2005, there were only 41 clinics, 22 hospitals, 51 health centers at regional level and the community face difficulty to alleviate epidemic of communicable disease like malaria. Primary health care unit (PHCU) meaning five satellites health post with one health center started in 2005. One health center and a health post provide services for 25,000 and 5000 population at rural area respectively. In health post two health extension workers assigned and started to implement 16 health extension programs at kebele level. In 16 health extension, program attention has given to malaria prevention and control strategy. The health extension program brings dramatic reform on health in history of epidemic prevention in this region. The following figure shows that trends of health posts, health centers, hospitals

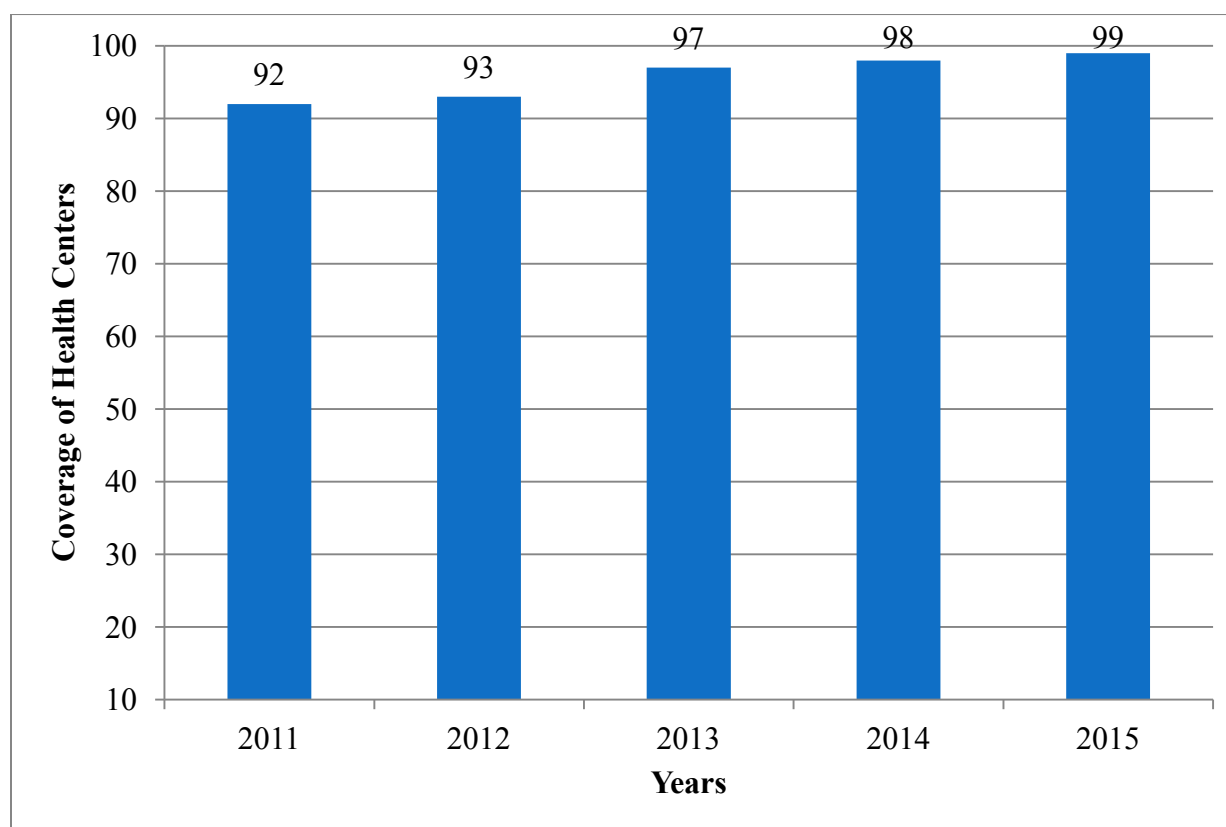


Figure 13: Trends of health posts in Oromia Region, Ethiopia, 2015

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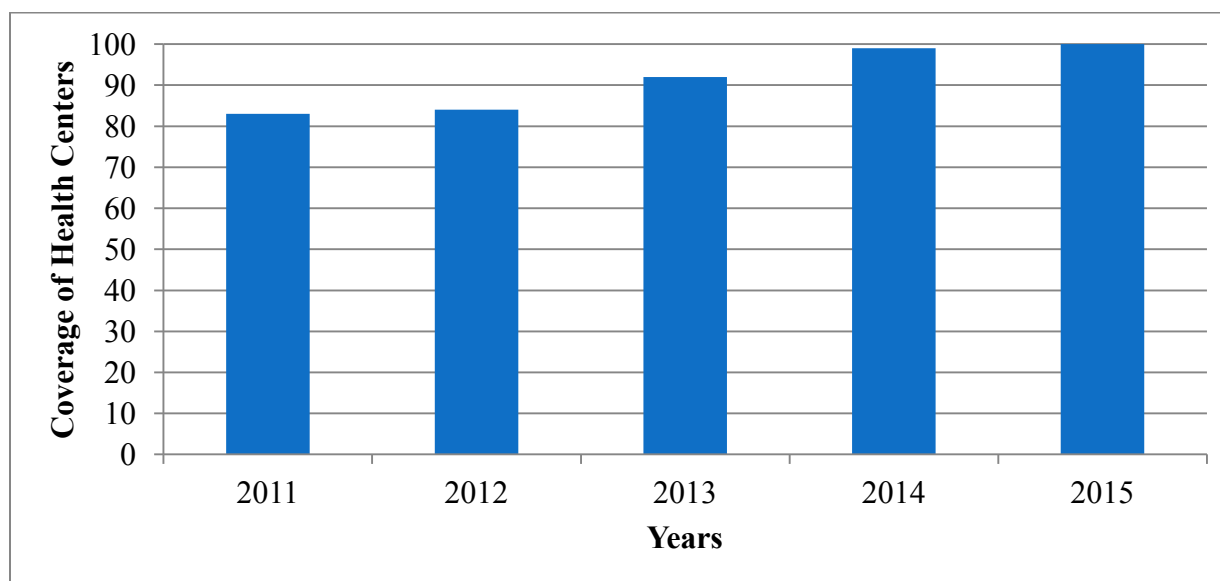


Figure 14: Trends of health centers in Oromia Region, Ethiopia, 2015

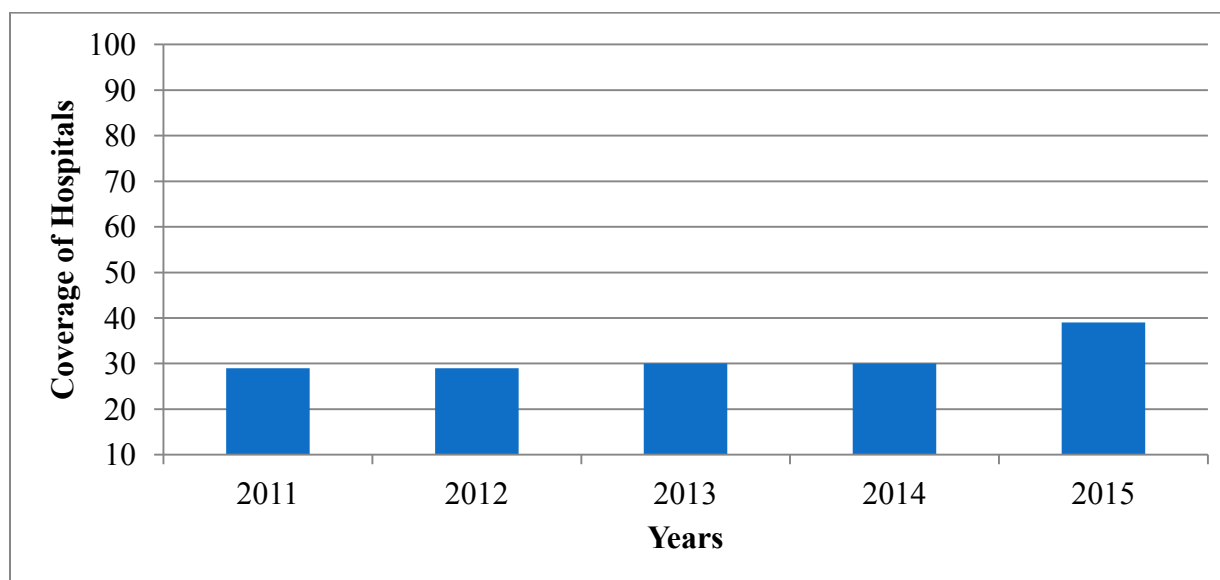


Figure 15: Trends of Hospitals in Oromia Region, Ethiopia 2015

Hint: Expected Hospital is calculated by District Hospital which services 250,000 population

Health extension program was introduced in the region in 2005, initially in agrarian communities and subsequently tailored and scaled up into the pastoral and urban communities; the program was developed by the Government of Ethiopia to be the main vehicle for achieving universal coverage of primary health care. The health extension Program (HEP) is fully integrated into the broader health system and is part and parcel of the Primary Health Care Unit structure. The

program delivers preventive, promotive, and basic curative services. All services delivered under the program are free and available to everyone. The Health Extension Workers (HEWs) are the key players in the program. They are all female, 10th grade high school graduates, recruited from the community with the active participation of the community. They are trained for one full year and then deployed back into the community to promote health and provide services at the village level. Two HEWs are paired to serve 500, 1000 to 2500 and 3,000 to 5,000 people in urban, pastoral, and agrarian communities respectively. Much of their time is devoted to home visits and outreach. Over 13450 HEWs are recruited, trained, and deployed to the villages. Over 6519 health posts have been constructed and equipped with the active participation and contribution of the community. The following figure indicated trends of health extension worker in the region

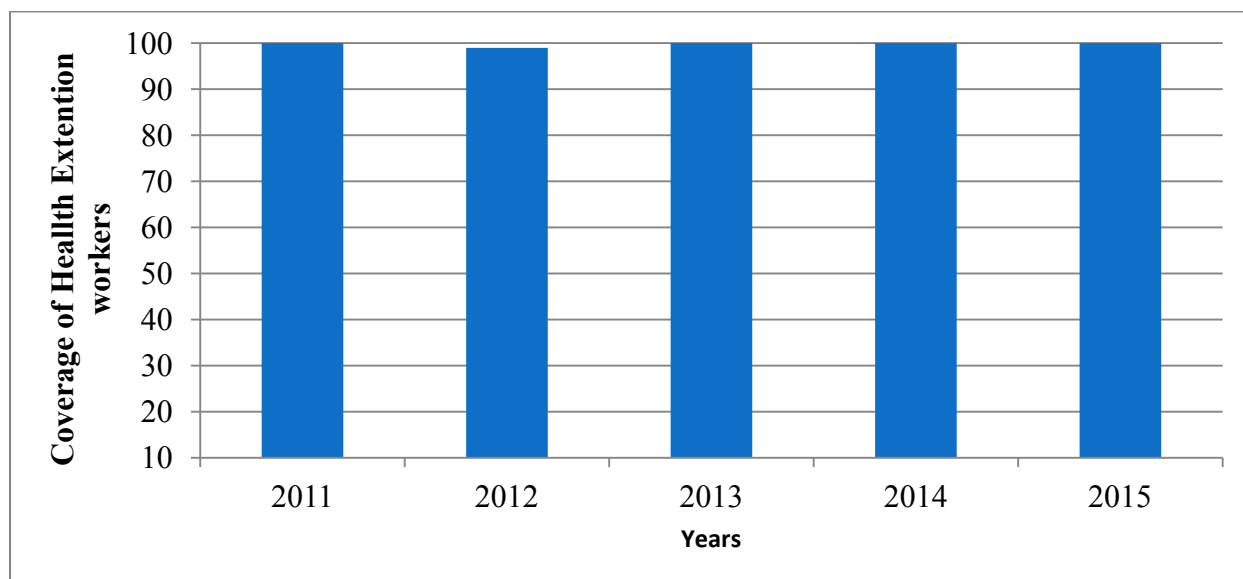


Figure 16: Trends of health extension worker in Oromia region Ethiopia 2015

Indoor Residual Spraying (IRS)

IRS is the application of long-acting chemical insecticides on the walls and roofs of all houses and domestic animal shelters in a given area, in order to kill adult vector mosquitoes that land and rest on these surfaces. The effectiveness of IRS in reducing malaria transmission and disease burden was first demonstrated in the 1930s in South Africa and India. In Oromia, IRS was first implemented in the mid-1960s. The primary effects of IRS towards curtailing malaria transmission are: Reducing the life span of vector mosquitoes so that they can no longer transmit malaria parasites from one person to another; and reducing the density of vector mosquitoes. The

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following figure shows trends of IRS in Oromia

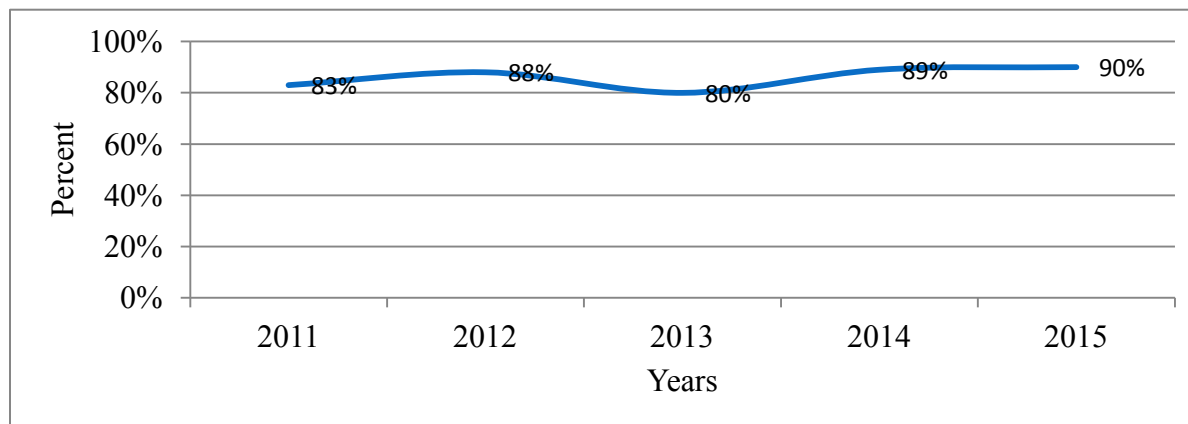


Figure 17: Trends of IRS in Oromia region Ethiopia 2015

To protect regional people from being bitten by infected mosquitoes, LLINs are an effective tool to significantly reduce morbidity and mortality due to malaria. Additionally, when coverage rates are high and if a large proportion of human biting by local vectors takes place after people have gone to sleep, LLINs also can have an impact on vector populations. A LLIN has three main functions: I) When mosquitoes are in contact with the net, it has a knock-down effect, temporarily incapacitating or even killing mosquitoes; ii) It has a repellent effect; and, iii) It reduces contact between the person sleeping under the net and mosquitoes by acting as a physical barrier. For these purpose Oromia regional Health Bureau distributed LLINs years by years. The following Figures showed LLINs distributed by region each year.

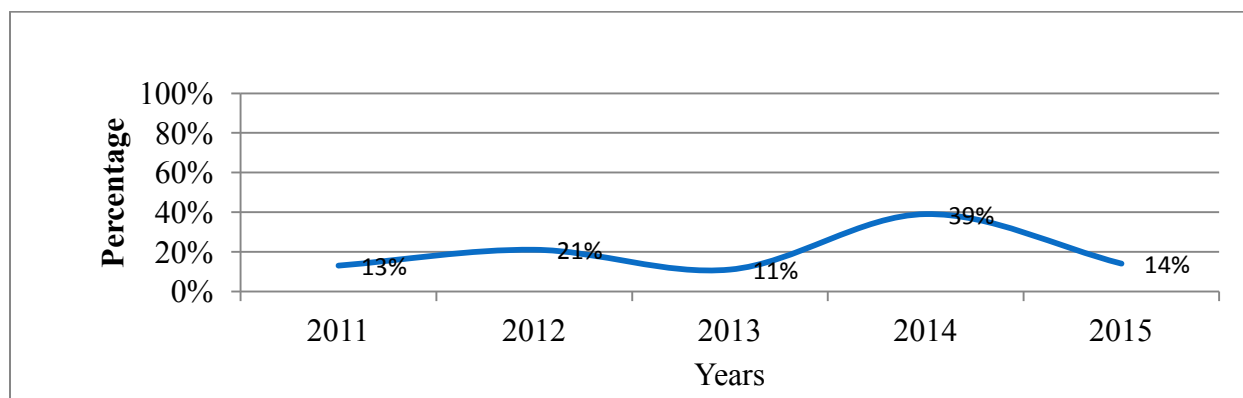


Figure 18: Trends of LLINs distributed by Oromia region, Ethiopia 2015

The health service delivery system in the region is tiered into primary, secondary and tertiary levels. The most peripheral level is the health post, a basic facility staffed by two HEWs, usually

at the rural community level. Although HEWs primarily implement preventive and promotive activities, they also have the capacity to diagnose malaria using RDTs and to treat patients with ACTs or chloroquine according to the national treatment guidelines and RDT results. The next tier of health facilities includes the health centers, which together with the satellite health posts form primary health care unit. Microscopy is available for malaria laboratory diagnosis at health centers, but not at health posts, where multi-species RDTs are available. Ensuring prompt and effective treatment will prevent most cases of uncomplicated malaria from progressing to severe and fatal illness. In 2005, single-species RDTs were introduced at health posts in Region, greatly improving access to accurate *P. falciparum* malaria diagnosis at peripheral levels. Currently multi-species RDTs capable of specifically detecting both *P. falciparum* and *P. vivax*, are being supplied by Oromia regional health bureau to health posts, enhancing malaria diagnosis by species at the periphery and reducing the need for empiric treatment and wastage of anti-malarial drugs. It also provides the opportunity to accurately identify parasite-negative patients in whom another cause of fever (diagnosis) must be sought without delay. Patients who test negative by malaria RDT do not need anti-malarial medications. The following figures revealed five years trends of malaria RDT.

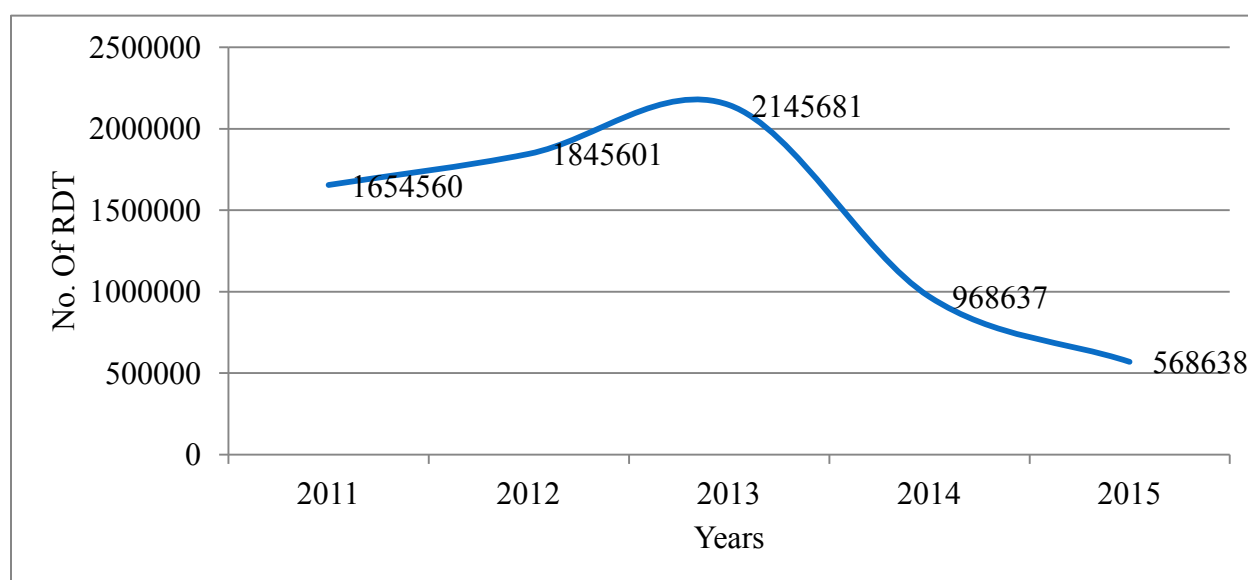


Figure 19: Trends of RDT distributed by Oromia region, Ethiopia, 2015

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Treatment of malaria should be based upon a parasitological confirmed diagnosis whenever the situation permits. RDT evidence providing confirmation of malaria by malaria species requires prompt treatment with the appropriate anti-malarial drugs. If the RDT or microscopy test indicates a *P. falciparum* infection, then the patient should be treated with appropriate doses of Artemether-Lumefantrine (AL), ensuring the patient is able to swallow the medication. Figure below shows trends of AL distributed in Oromia Region.

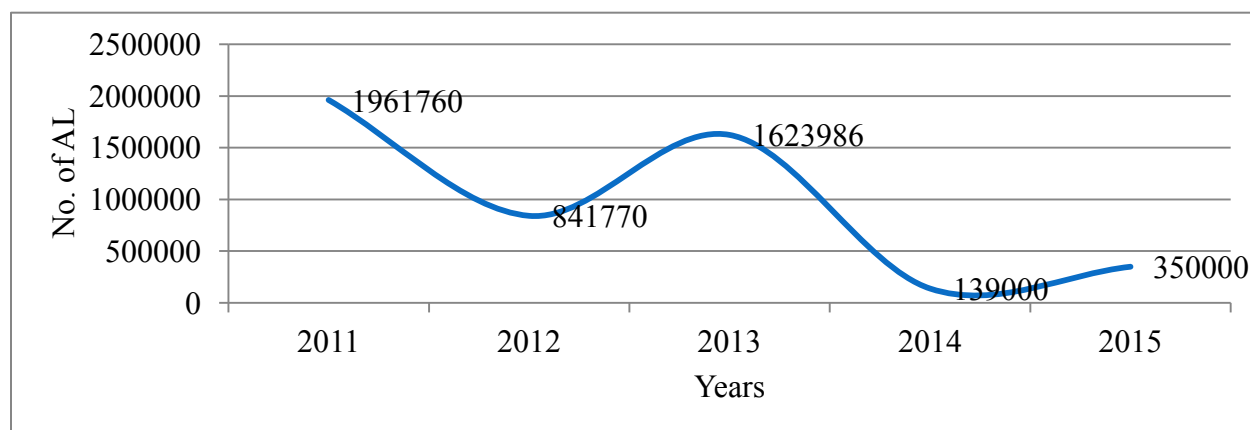


Figure 20: Trends of AL distributed in Oromia region Ethiopia 2015

Table 7: Shows house hold got ITNS and population protected in Oromia region, Ethiopia 2015

S/No	Years	Total population of the region	Total house hold	House hold get ITNS	Population protected
1	2011	30,250,225	6,302,130	574,807	2,759,074
2	2012	31,127,481	6,484,892	937,500	4,500,000
3	2013	32,030,178	6,672,954	480,750	2,307,600
4	2014	32,959,053	6,866,469	1,810,115	8,688,550
5	2015	33,914,866	7,065,597	656,365	3,150,553
total					

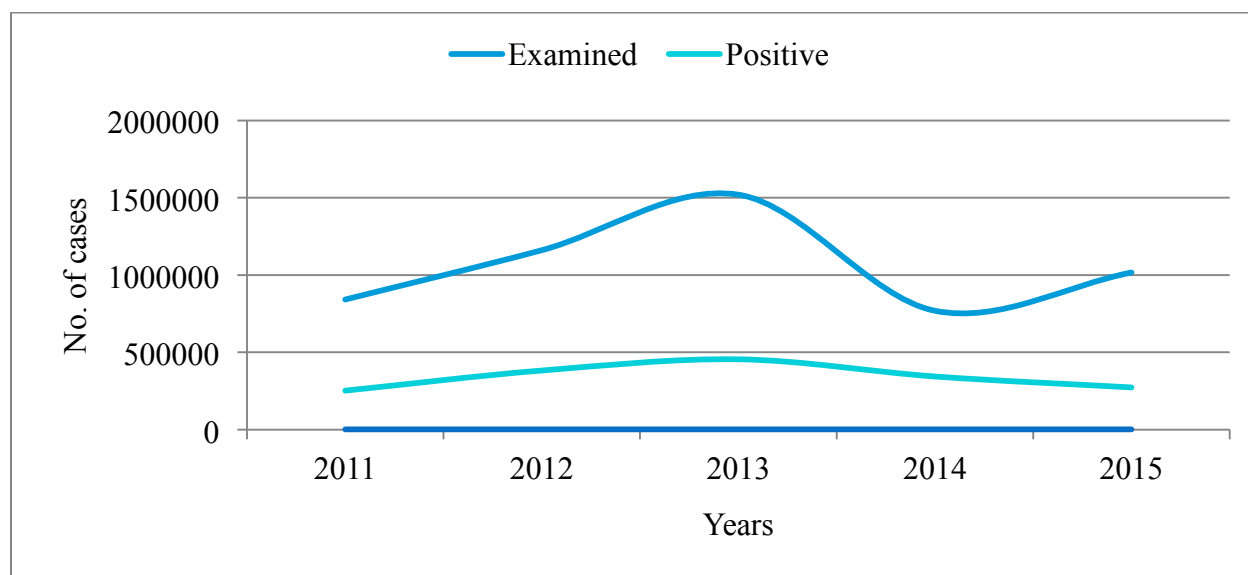


Figure 21: Trends of examined vs. positive malaria cases in Oromia region, Ethiopia, 2015

Slide positivity rate is Proportion of microscopy slides found positive among the slides examined (18). The following figure shows trends of slide positivity rate five years Oromia regional health bureau.

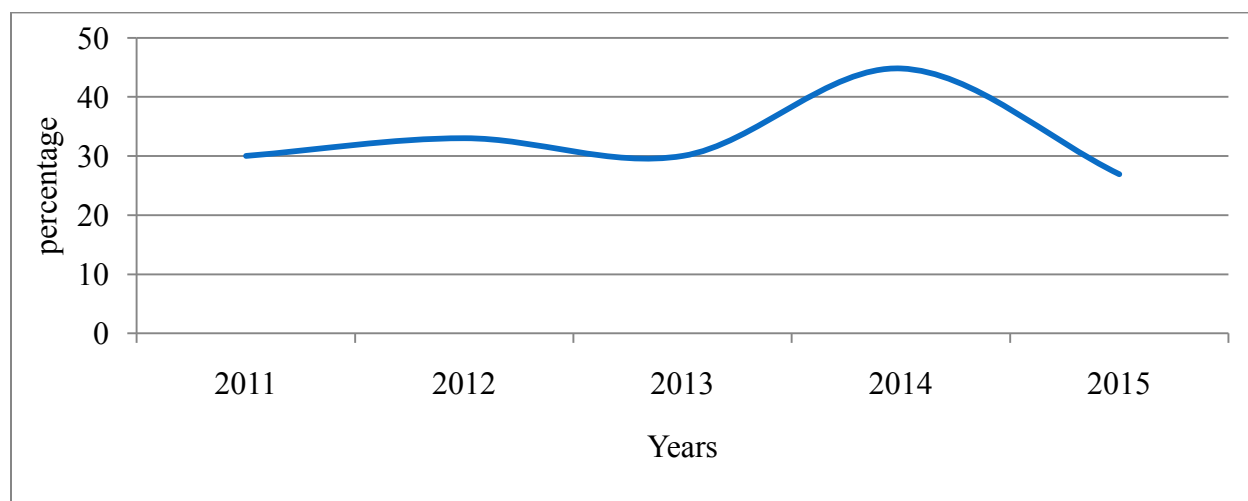


Figure 22: Trends of malaria slide positivity rate of Oromia region Ethiopia 2015

Malaria is mainly seasonal in the highland fringe areas and of relatively longer transmission duration in lowland areas, river basins and valleys. Although historically there have been an estimated 10 million clinical malaria cases annually, cases have reduced since 2006[17]. The following figure shows trends of Clinically treated malaria in the Oromia region.

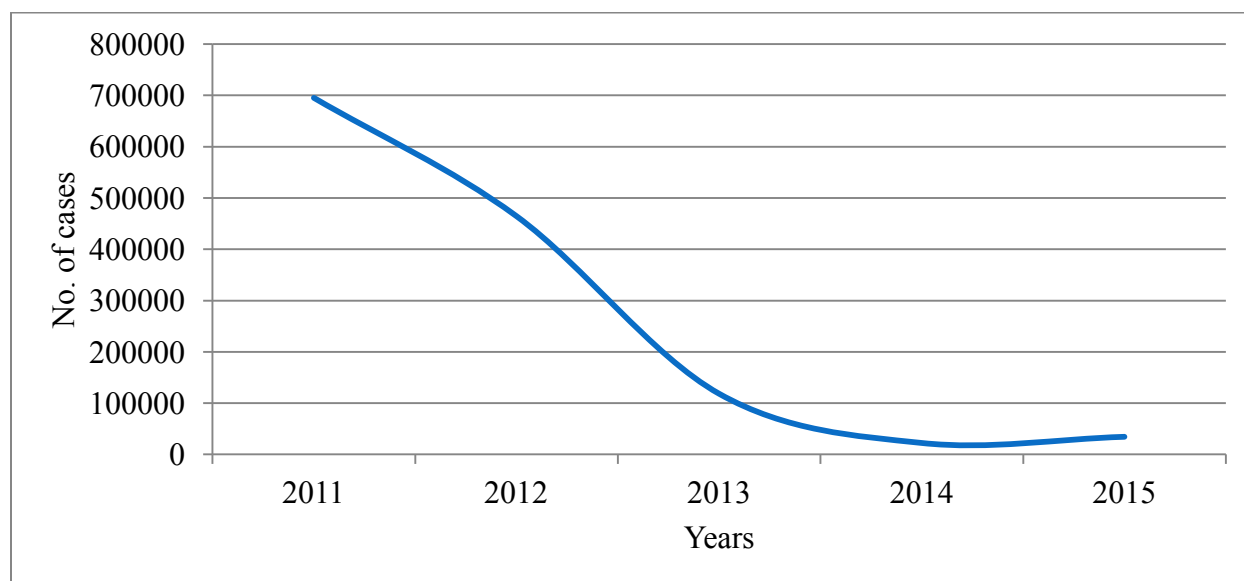


Figure 23: Trends of clinically treated malaria cases in Oromia region Ethiopia 2015

P. falciparum is the dominant parasite species in malaria epidemic situations, and this species causes severe and complicated manifestations and almost all malaria deaths (17). The following figure shows trends of malaria related death in Oromia region.

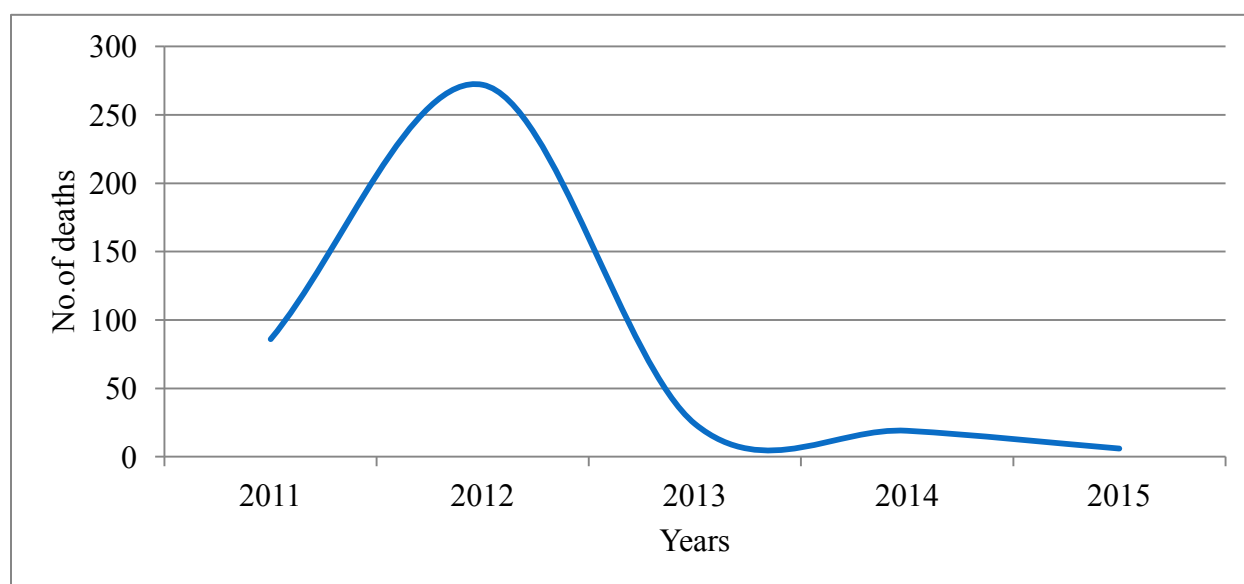


Figure 24: Trends of malaria cases related death in Oromia region, Ethiopia 2015

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Table 8: Summary of malaria cases treatment in Oromia region Ethiopia, 2015.

Year	Examined	positive	Positivity rate	PF	PV	MIX	Clinical	Total treated	Admission	Death
2011	842123	252637	30	108466	19147	104848	695457	948094	4762	86
2012	1160597	382997	33	199360	45314	193473	464622	847619	4316	272
2013	1519273	455782	30	197566	146803	13366	118260	574042	5343	24
2014	769373	344361	44.8	173191	110213	14255	22261	319920	3131	19
2015	1,016,562	273,395	26.9	168,986	98,480	5,929	34,318	307,713	474	6

Discussion

In Oromia Region from 2011 to 2015 number of health post and health center gradually increased from 92% to 99% and 83% to 100% respectively .Primary health care facilities play a major role in malaria control and often provide the bulk of malaria case management services in a country, usually both clinical services and overall programme management for community activities in the catchment area [13].Hospitals usually have clinical and diagnostic services for outpatients and inpatients, act as referral and give support to lower-level facilities(13),but number of hospital in the region did not indicted visible increment in the past five years. This might be due to attention given to health posts and health centers to ensure accessibility.IRS is one of malaria controlling measures put by WHO in the region, trends of IRS does not indicated any decrement rather it indicates incremental fusion. This is more or less similar with 2014 WHO report which reveal that WHO African Region has the highest coverage rates for IRS, but the proportion of the at-risk population protected has decreased in recent years. In the world at risk population protected by IRS decreased from 5% to 4% in 2010 and 2013 respectively. In WHO Africa Region the proportion of the population at risk protected by IRS decreased from 11% to 7% in 2010 to 2013 respectively. The recent regional decrease is accounted for by changes in a few countries, in particular Ethiopia, which accounted for 42% of the population protected by IRS in the region in 2013. The proportion of the population at risk protected by IRS did not change substantially in other regions (11).In this study the number of LLINs delivered to the region and distributed by regional health bureau was increased in 2013 and 2014. This

increased procurement and distributions of nets has led to an increase in the proportion of the population sleeping under an ITN. In recent years, all distributed nets, and therefore most of the available nets, have been LLINs. a cumulative total of 4,459,537 LLINS will have been delivered to the Region in between 2011 and 2015. However, a comparison of the estimated number of LLINs available in households with the reported number of net might not 100% efficient (because some households receive additional nets before their existing nets have expired); it lost from households within 24 months. Consequently, not all of the 4,459,537 LLINs delivered nets were available in households in 2015. This is similar with WHO world malaria report of 2014(11).In this study distribution of both RDT and AL decreased in the past five years .Decreased RDT distribution in the region diminish identification of confirmed malaria cases. This study was similar with Study conducted in Oyo State, Nigeria in 2014(14).Clinically treated malaria cases decreased dramatically in the region. This study was similar with study conducted nationally in Ethiopia by President's malaria initiative Malaria Operational Plan FY 2014 indicated that Oromia has shown a significant achievement in reducing presumptive treatment of malaria from 99% in 2007 to 23% in 2013(19).This might be due to increased health facility (Health centers and health posts) with increased human powers who conducted microscopic/RDT malaria diagnosis. Plasmodium falciparum is responsible for most malaria deaths, especially in Africa. The infection can develop suddenly and produce several life-threatening complications. With prompt, effective treatment, however, it is almost always curable (20). In our study malaria death was decreased in past five years. This may be due to accessibility of health facility with accessible health professional at community level, and existence of malaria prevention and control strategy.On average, 60%-70% of malaria cases have been due to P. falciparum, with the remainder caused by P. vivax. Anopheles arabiensis is the main malaria vector; An. pharoensis, An. funestus and An. nili play a role as secondary vectors (17).But, in our study except 2015 this criteria, did not fulfilled. This might be due to additional category which is called mix category.

Limitation

Discrepancy of recorded data between HMIS and PHEM

Conclusion

Increasing number of health facility, with increased human power and applying malaria prevention and controlling measures decrease morbidity and mortality related to malaria illness.

Recommendation

The high *P.falciparum* and *P.vivax* malaria prevalence observed in the study area necessitates strong malaria intervention measures in the Region.

There should be strategy to replaced timely worn-out Long Lasting Impregnated Nets (LLINs)

Health extension workers and district health offices should advocate the use and mending of Long Lasting Impregnated Nets (LLINs) until replacement is done.

Mixed malaria category should be categorized to one of malaria species.

Reference

- [1]. NNDSS Malaria (Plasmodium species) Case definition 2014.
- [2]. (WHO malaria fact sheet No.94 April 2015)
- [3]. National Institute of Allergy and Infectious Diseases (NIAID) Understanding Malaria Fighting an Ancient Scourge 2007
- [4]. Malaria Definition: Infectious disease Center: February 20, 2016
- [5]. Supplemental materials to the lectures given by Dr. Wiser in Malaria (TRMD 782) : <http://www.tulane.edu/~wiser/malaria/>
- [6]. (WHO Malaria fact sheet No.94 December 2014)
- [7]. President Malaria initiative reports 2015
- [8]. Oromia Regional Health Bureau Annual report 2015
- [9]. Oromia National Regional State Program of Plan on Adaptation to Climate Change 2011
- [10]. Annual Performance Report EFY 2006 (2013/14)
- [11]. WHO World Malaria Report 2014
- [12]. Malaria in Ethiopia www.EthioDemographyAndHealth.Org. Aynalem Adugna
- [13]. WHO Malaria case management: Operations manual
- [14]. Oyo State, Nigeria Impact of malaria rapid diagnostic tests on prescription patterns of Artemisinin based combination therapy 2014.
- [15]. Trevor P Jensen et al 2009 Use of the slide positivity rate to estimate changes in malaria incidence in a cohort of Ugandan children,
- [16]. Yan Bi. et al 2012, Can slide positivity rates predict malaria transmission?
- [17]. National Malaria Guidelines Third Edition Federal Democratic Republic of Ethiopia Ministry of Health January 2012
- [18]. WHO Disease Surveillance for Malaria Control, an operational manual 2012
- [19]. President's malaria initiative Ethiopia malaria operational plan FY 2014
- [20]. National Institute of Allergy and Infectious Diseases Understanding Malaria Fighting an Ancient Scourge, 2007.

Chapter-III
Surveillance
system
Evaluation

3.1 Surveillance system performance of measles malaria and Typhoid fever in Bale Zone of Oromia Region, Ethiopia, 2015

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Summary

Introduction: Public health surveillance is the systematic ongoing collection, collation and analysis of data for public health purposes and the timely dissemination of public health information for assessment and public health response as necessary. Malaria, measles and typhoid fever are among the public health priorities of the country. So that evaluating of the overall performance of the existing surveillance system of these diseases plays a major role in identifying the gaps and to take corrective measures accordingly. The objective of this study is to evaluate the surveillance system performance of core functions, supportive activities and system attributes of malaria, measles and typhoid fever in Bale zone Oromia region.

Method: A cross sectional survey was conducted from 15 October to 5 November 2015. Data was collected using both face to face interviews and certain observations monitored by the principal investigator as a complementary measure used the CDC's updated guidelines for evaluating public health surveillance system. Study area was selected based on the gaps they have during reporting or used purposive method and study units were selected on a convenience basis. Diseases under surveillance were selected based on the public health importance of the study area. A total of 34 study units (8 district health offices and 24 health facilities) and three priority diseases were selected.

Results: Majority (94.1%) of the health facilities and districts health office had standard case definitions of the selected diseases. The cases definition of measles, malaria and typhoid fever was available in the visited health facilities, by the order of 97%, 88.2% and 70.6% respectively. In 20(58.8%) study units national manuals for surveillance were available. Except two health center, the rest health center, hospital, woreda and zone have a rapid response team which is not functionally active as needed but which in turns to be active after the occurrence of outbreak. The overall completeness of the visited districts was 62.3% (ranges 33.3 – 82%); PVP was 18.4% for malaria and 50% for typhoid fever. Seventy five percent of the visited sites had trained

man power for surveillance. Feedback and supervision is better from districts to facilities than from region to districts. About 26(76.5%) of the interviewed focal persons for surveillance were satisfied with their job.

Conclusions: Specific surveillance system evaluation and feedback is not practiced at regular basis. Laboratory participation in surveillance is very limited and quality assurance system is not conducted in health facilities by the Regional/Federal Health Research Laboratory for disease other than Tuberculosis. Representativeness was found to be low. Regular supervision and training of human power is paramount for surveillance system evaluation.

Introduction

Public health surveillance is the systematic ongoing collection, collation and analysis of data for public health purposes and the timely dissemination of public health information for assessment and public health response as necessary [1]. There are two types of surveillance, indicator-based surveillance and integrated disease surveillance. Indicator-based surveillance refers to structured data collected through routine integrated disease surveillance, nutritional and laboratory surveillance. In integrated disease Surveillance, the various surveillance activities become integrated into one system within the broader national health system. It also emphasizes all functions of surveillance activities to be carried out using similar structures, processes and personnel [2]. Data disseminated by a public health surveillance system can be used for immediate public health action, program planning and evaluation, and formulating research hypotheses [3]. Ethiopia had introduced Integrated Disease Surveillance (IDS) in 1996, focusing on 17 priority communicable diseases. Two years later, in 1998, the 48th World Health Organization (WHO) Regional committee for Africa adopted a resolution on integrated disease surveillance of communicable diseases. It is aimed to assist health workers to detect and respond to diseases of epidemic potential, diseases of public health importance, and diseases targeted for eradication and/or elimination through the available effective control and prevention interventions. Recognizing and addressing the problem of vertical disease surveillance systems, member states adopted (Integrated Diseases Surveillance and Response (IDSR) as a regional strategy for early detection and effective response to priority communicable diseases in the African region [4]. Federal ministry of health (FMOH) underwent the process reengineering, identifying the IDSR to be the core process to be evaluated. The IDSR was evaluated and identifying its strength and weakness, was recommended to establish Public Health Emergency Management (PHEM) as of 2009. One of the major activities of PHEM is to take over the diseases surveillance parallel to preparedness, response and rehabilitation in any health related emergencies and outbreaks. Based on the assignment, PHEM identified 19 communicable diseases and one health problem, Sever Acute Malnutrition (SAM) based on their potential to cause outbreaks, became international concern and diseases on eradication/elimination and also health burden for the country (Table 1 PHEM Guidelines). Additional to the 20 diseases to be monitored, PHEM is also monitoring any clustering of diseases in the country. Other diseases

which are not included in the IDS will be monitored through Health management and Information system (HMIS) [2, 5]. Recently Maternal death is incorporated to IDSR, because IDSR promotes rational use of resources by integrating and streamlining common surveillance activities[6]. Ethiopia is also one of the most malaria epidemic-prone countries in Africa. Rates of morbidity and mortality increase dramatically (i.e. 3-5 fold) during epidemics [7]. Measles is one of the communicable diseases still causing preventable mortality and morbidity in the country[8]. Typhoid fever remains a global health problem for *Salmonella typhi*. It is difficult to estimate the real burden of typhoid fever in the world because the clinical picture is confused with many other febrile infections, and the disease is underestimated because of the lack of laboratory resources in most areas in developing countries. As a result, many cases remain under-diagnosed. In both endemic areas and in large outbreaks, most cases of typhoid fever are seen in those aged 3–19 years [9]. Typhoid fever is a life-threatening illness caused by the bacterium *Salmonella Typhi*. In the United States, it is estimated that approximately 5,700 cases occur annually. Most cases (up to 75%) are acquired while traveling internationally. Typhoid fever is still common in the developing world, where it affects about 21.5 million persons each year [10].

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Table 9: Diseases under surveillance based on the PHEM structure, 2015

S/no	Immediately reportable diseases		Weekly reportable diseases
1	Acute Flaccid Paralysis	1	Dysentery
2	Anthrax	2	Malaria
3	Avian Human Influenza	3	Meningitis
4	Cholera	4	Relapsing Fever
5	Dracunculiasis (Guinea worm)	5	Typhoid Fever
6	Measles	6	Typhus
7	Neonatal Tetanus	7	Malnutrition
8	.Pandemic Influenza		
9	Rabies		
10	Severe Acute Respiratory Syndrome(SARS)		
11	Small Pox		
12	Viral Hemorrhagic Fever		
13	Yellow Fever		
14	Maternal Death		

Source: PHEM Guide Lines

Rationale of the study

The purpose of evaluating public health surveillance systems is to ensure that problems of public health importance are being monitored efficiently and effectively. Public health surveillance systems should be evaluated periodically, to assess the quality, efficiency, efficacy, usefulness and gap of the existing system accordingly to improve the surveillance system [3 11]. In Bale zone there are four governmental hospitals, eighty four health centers and three hundred seventy health posts. But, it is the only zone known by low completeness and timeliness from eighteen rural zones found in the region by having these number of health facilities [11]. A report is said to be complete if all the reporting units within its catchments area has submitted the reports on time and a report (from a reporting unit) is said to be on time, if it reaches the designated level within the prescribed time period. Since this system has gap in the zone evaluation of the existing surveillance system is paramount to understand gaps, suggest possible intervention and also help to improve public health decision making.

Literature Review

The health workforce density in Ethiopia has increased from 0.84 to 1.3 per 1000 population between 2008 and 2013, indicative of an improvement in supply and availability of health workers. However, the doctor, health officer, nurse and midwife to population ratio is 0.7 per 1000 population, far behind the minimum threshold of 2.3 doctor, nurse and midwife to 1000 population ratio required to ensure high coverage with essential health interventions [11].

Reporting Periodicity

The identified 21 disease and conditions are classified into two reporting periods depending on their epidemic potential, diseases targeted for elimination and eradication as immediately reportable and weekly reportable.

Immediate reporting: Currently 14 diseases are identified to be reported immediately to next reporting level. For the immediately reportable diseases, a single suspected case is considered as a suspected outbreak. Therefore, suspected outbreak of these diseases should be notified from level to level within 30 minutes of identification as follows: From community or health post or health center to woredas health office within 30 minutes, from woreda health office to zone/region within another 30 minutes, from zone to regional office within another 30 minutes, from region health bureau to federal level within another 30 minutes, MOH to WHO within 24

hours of detection. You can report the information verbally or by telephone, radiophone or use an electronic methods such as email, fax, mobile short message service. Weekly reporting: Currently 7 diseases and conditions are identified to be reported weekly to the next reporting level. Reporting of the total number of cases and deaths seen within a week(Monday to Sunday) and should be reported to the next level as follows: Health facilities report data from Monday to Sunday to woreda every Monday till midday; Woredas report to zone/region every Tuesday till midday; zone (if applicable) report to region every Wednesday till midday; Region report to Ethiopian Public Health Institute (EPHI) every Thursday [2, 12].The National Public Health Laboratories Net Work (NPHLN) member laboratories should participate in a national external quality assurance and control program me (EQAP). The NPHLN should be responsible for running and supporting the EQAP; overseeing the reliability, reproducibility, and relevance of results from the public health laboratories at all levels of the health system. The NPHLN should: Adopt norms, standards and indicators to measure performance, Supervise the implementation of quality systems (including quality assurance programs, auditing and monitoring) or working in partnership with the agency that has this responsibility, Evaluate results, and provide feedback and support to participant laboratories, Participate in international quality assurance schemes where feasible and relevant and Prepare an annual report on the performance of the laboratories grading them accordingly with recommendations to improve quality [13].supportive supervision is helping service providers to achieve work objectives by improving their performance, ensuring uniformity to set standards, identifying problems and solving them in a timely manner, making a follow-up on decisions reached during previous supervision visit, identifying staff needs and providing opportunities for personal development and reinforcing administrative and technical link between high and lower levels[14].Feedback is generally more meaningful if given as soon as appropriate after observation or reaction occur, thus keeping it concrete and relatively free of distortion that come from the lapse of time[15].

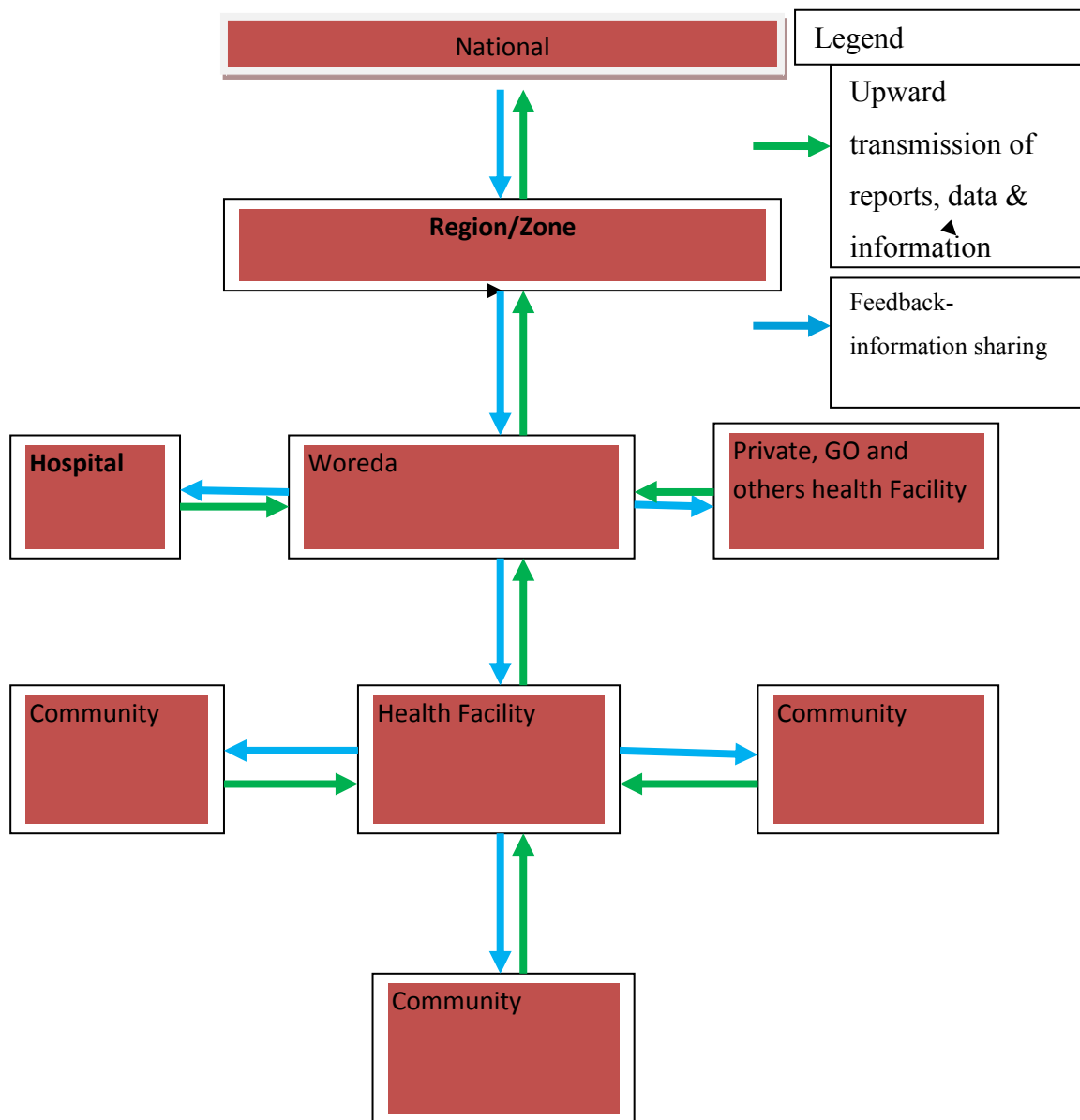


Figure 25: Diagram illustrating the conceptual formal and informal flow of surveillance data and information throughout a health system.

Objectives

General objective:

To evaluate the performance of the existing surveillance system

Specific objectives:

- To investigate the implementation of core surveillance activities Notifiable diseases reporting system in respect to case detection, registration, confirmation, reporting, epidemic preparedness and response.
- To assess supportive activities of surveillance system such as supervision, staff training, information feedback, equipment and financial support.
- To assess the status of surveillance system attributes like sensitivity, simplicity, positive predictive value, flexibility, completeness, timeliness, acceptability, representativeness, acceptability and specificity
- To describe constraints and challenges faced in the process of implementing the surveillance system

Methods and materials

Study area: This surveillance system evaluation was conducted in Bale zone of Oromia Region which has a total of 21 districts (19 rural and 2 urban) and a total population of **1757383** based on the 2008 population projection. There are 4 district hospitals, 84 health centres and 370 health posts. Fifteen out of twenty one woredas are malaria endemic.

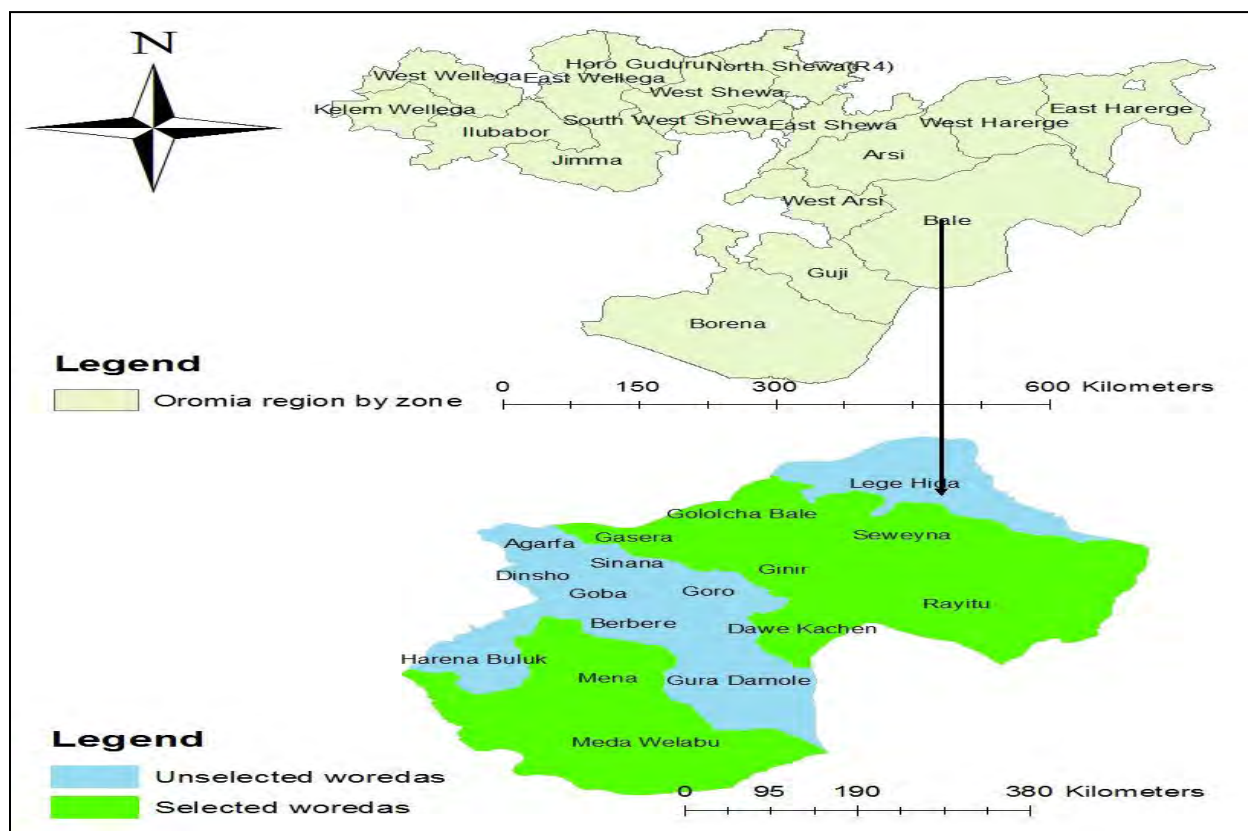


Figure 26: Selected and Unselected woreda for surveillance system evaluation of Bale zone Oromia Region Ethiopia 2015

Study period: The field work was carried out from October 15 to November 5, 2015

Source population: All governmental health facilities and health offices of the Bale zone of Oromia Region.

Study population: The surveillance system evaluation included a total of thirty four study units; twenty five governmental health facilities (one Hospital, eight health centers and sixteen health posts), eight district health offices and zonal health department.

Data collection methods: Selection of the study area was made based on some background information of gaps of reporting such as low timeliness and completeness of reporting to the

higher level, so used purposive method. Selection of health facilities was made on a convenience basis taking into consideration by selecting malaria endemic woredas and diseases under surveillance were selected based on the public health importance of the study area. Two weekly (malaria and typhoid fever) and one immediate reportable disease were considered in the evaluation of the system. Data were collected using the tools of WHO/AFRO and updated CDC questionnaires which are designed for the assessment of national communicable disease surveillance system. Data were collected using both face to face interviews and certain observations monitored by the principal investigator as a complementary measure: Performance of the core activities of surveillance system of the district which includes case definitions, case detection, registration, reporting, data analysis, interpretation, dissemination and epidemic preparedness and response were assessed. Supportive activities of the surveillance system in regard to supervision, staff training, information feedback, equipment (communication materials) and financial support were assessed. Status of system attributes (sensitivity, positive predictive value, Timeliness, completeness, simplicity, data quality, flexibility, usefulness, and acceptability) were evaluated. In addition posted flow charts of the surveillance system, graphs, tables, maps of the selected diseases, availability of surveillance guidelines, standard case definition, etc. were checked. Records of registration book, feedback reports of surveillance, weekly and immediately reports of surveillance in the past three months, and line lists of outbreak investigation were reviewed. Focal persons of PHEM at zonal, district and at health facility levels, health professionals, and stakeholders of districts at various levels were interviewed to get the important data of the existing surveillance system of the study area.

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Results

Among twenty one districts of Bale zone eight woredas selected for surveillance system evaluation based on gap they had on surveillance system. Assessed districts, its total population classified by rural and urban are described in the following table.

Table 10: Population under surveillance Bale zone of Oromia region, Ethiopia, 2015

Assessed area	Total population	Rural	Urban
Ginir	180453	155933	24520
Rayitu	42646	39195	3451
Sawena	84100	78620	5480
Dawe Serer	54696	49466	5230
Gololcha	125334	116390	8944
Gasara	97296	92431	4865
Mada Wolabu	124089	119,750	4339
Dalo Manna	115550	100,075	15475
Total	824164	751860	72304

Core activities

A. Case definition: -In most (94.1%) of the health facilities and districts health office standard case definitions of the selected disease were available.

Standard case definition

Malaria: Any person with fever or fever with headache, rigor, back pain, chills, sweats, myalgia, nausea, and vomiting, or a person diagnosed clinically as malaria [7].

Measles: Any person with fever and maculopapular generalized rash and cough, coryza, or conjunctivitis, or any person in whom a clinician suspects measles [2].

Typhoid fever: Any person with gradual onset of remittent fever (rising in step ladder fashion) in the first week, head ache, arthralgia, anorexia, constipation and abdominal pain [9].

Community case definition

Community case definitions are a simplified version of standard case definition used to aware the community to notify any suspected cases and also to make them aware for early diagnosis of the

priority diseases under surveillance. These are sensitive (loose) case definitions that increases case detection rate.

Malaria: Any person with fever, or fever with headache, back pain, chills, sweats, muscle pain, nausea and vomiting [7].

Measles: Any person with fever and rash starts from face [2].

Typhoid fever: Any person with fever, constipation or diarrhea [9].

B. Availability of surveillance manual

In twenty out of the thirty four visited site (58.8%) there were national manuals for surveillance. But in the rest 14 health facilities there were no surveillance manuals at all. Availability of surveillance manual decrease as we go down from zone to health post level; the manual is either in the woreda or zonal stores.

C. Case detection and registration

The cases definition of measles, malaria and typhoid fever was available in the visited health facilities, by the order of 97%, 88.2% and 70.6% respectively. The case definitions of malaria, measles and typhoid fever were easily understandable by the health care providers of the facilities and they were used to diagnose suspected cases of the listed diseases on their day to day diagnosing activities of patients. As the health professionals and health extension workers informed us, community case definitions of these priority diseases were used during health education and community mobilization on health and health related issues on meetings. Clinical registers were available in all of the visited health facilities. But the clinical registers were not specific to all priority diseases and they used common registration book for all. All health centers had the cold chain capacity and guideline to collect and ship samples for measles. Laboratory confirmation of cases took a wide range of time. Malaria took 25 minutes up to forty minutes, and typhoid fever took 40 minutes to an hour; but measles took greater than one month and was mentioned as no more useful for timely intervention; and they wonder why they are collecting the samples. Especially health centers and health posts did not have any feedback to know the status of the collected blood samples as no system exists to declare the laboratory result to the periphery. At the time of visited there was no Widal reagents in all health facilities for previous three months except Ginir hospital. Health posts only performed rapid diagnostic tests (RDT) of

malaria. Three health centers were without Gimsa Stain reagent and use Rapid Diagnostic Test (RDT) as health posts.

D. Epidemic preparedness and response

Except two health center, the rest health center, hospital, woreda and zone have a rapid response team which is not functionally active as needed but which in turns to be active after the occurrence of epidemics. Woredas and hospital had epidemic preparedness plan, but budget line for epidemic response was under the control of woreda administrative office. Hundred thousand birr each was allocated in all visited woreda for epidemic response. The budget was not specific for only health sector, but it was for any epidemic occurred in the woreda. Mostly stocks of medicines and reagents were from health care financing (HCF). Reagents and medicines for HCF are supplied by pharmaceuticals fund and supply agency (PFSA) which may hinder early intervention due to the process to go through when the PHEM need to take immediate action.

E. Reporting

Only the zonal health department used a computerized system to monitor district completeness and timeliness reporting, but there was no cross checking how many health facilities reported at the ground level. For these reasons, sometimes number of expected health facility fluctuated without true variation of health facility in some woreda. There was shortage of reporting format in the last six months in four visited health facilities and they use their own hand written paper to receive reports. Overall completeness of reporting of the visited sites was 62.3%, completeness of reporting was high in Gasara district (82%) followed by Ginir (72%). Timeliness of reporting from health post to health center then to district of the priority disease is difficult to evaluate because data incompleteness like date of receipt was not recorded in all levels. To check data quality for health facilities we counted and compared the reported malaria and Typhoid fever cases with summary report to go to higher level and laboratory registration books for the previous three months. Date of report received from the next lower level, expected number of health facilities to report and reported individuals and date of report sent to next higher level, epidemic week number and inconsistency of recorded dates and the actual date of report was the missed variables we investigated. For the previous three months (July, August and September) there were no cases variations of measles cases recorded from the facility of Gololcha woreda registered and reported to district level. Due to lack of widal reagent all health centers was

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providing typhoid services symptomatically. Regarding to malaria the total RDT and microscopic examination was under estimated than the actual total examined on the registration. 24 suspected malaria cases examined and confirmed by health extension worker of Dawe Serer kebele in previous three months but they report it as 12 only to the catchment health centers. Reports were sent by personal mobile phone call or hard copies delivered in person from catchment health posts to health centers and from health centers to districts, from district they made a call or the zonal health department made a call to receive the report. Only the zonal level has access to internet and can email the reports to region. Network inaccessibility and no refunding mechanisms of personal mobile phone and transport expenses were the main problems of PHEM focal persons complain found in the assessed sites.

Supportive functions:

A. Feedback and supervision

Zonal health department planned to conduct joint supportive supervision rather than specific PHEM supervision to health facility on quarterly basis. But zonal health department supervised only health centers (without including health posts) once in the previous six months to grade health centers. All health centers and health posts supervised at least once in previous three months by woreda health office; but supervision is joint rather than specific. All the visited sites disclosed that they did receive one feed back at six month from zonal health department for health centers and two written feedback to both health centers and health posts in the preceding six months from woreda health office. Frequency of feedback from districts to health facilities was better than that of zone to districts. But feedback to communities related to epidemic prone disease that had occurred in the community is almost none practiced.

B. Material resources available for surveillance

Resources for data management, communication, and other logistics were all available at the zonal level. The PHEM case team at the zonal level has not its own vehicles and face difficulty to supervise health facility as needed. Health management information system (HMIS) Computers are available in the all districts and health centers except Kuroftu health center of Dawe Serer. All health facilities except Ginir hospital use personal mobile for communication especially for surveillance data reporting. Twenty four hour electric power supply is present in seven visited district, but Dawe Serer woreda with health centers and other seven health centers

used solar or generator to maintain reagents, medication and during their day to day activities. There was no a radio call system in any of the remote areas of the visited districts; which impacted the timeliness of reports of both immediately and weekly reportable diseases. In visited districts the other main challenges of PHEM focal persons were lack of enter net access and they travel to 10 km to 55 Km for searching enter net access by Motor bicycle or cars.

C. Training

Seventy five percent of the assessed health office responded that staffs working on surveillance units got training of five days by the regional health bureau in collaboration with WHO officers. But in health post level health extension workers (HEW) did take such a training six years ago and they didn't get additional refreshment surveillance training. At the health facilities, only the focal persons assigned for surveillance were trained, but others health care providers did not get training or orientation on PHEM. In Rayitu district the trained PHEM focal person had change working environment and the new one didn't get training on PHEM.

System Attributes:

A. Acceptability

In general, health workers expressed they are satisfied with their work related to surveillance. The aspect with the lowest overall satisfaction level was education and training opportunities, no peridium for field visit, lack of attention from managerial to PHEM department as maternal and child health department (MCH) and no refunding for personal mobile phone and transport expenses. 76.5% of the interviewed surveillance focal persons were satisfied with what they were doing on surveillance.

B. Usefulness of surveillance data

Only collecting surveillance data through case based and weekly basis is not sufficient by itself to improve the public health problems through preventing and controlling the impact of priority diseases. Data must be analyzed, interpreted, and used for taking action accordingly. In each the visited sites data was not analyzed regularly in all health facilities, districts, including zone. The main reasons they reported for not analyzing data were lack of technical skills and had limited time for the surveillance system, due to work overload. At the district level the PHEM focal person had additional responsibly like malaria or MCH foal person in addition to PHEM. In health centers the focal persons have an assignment to diagnose patients. At zonal level only two

persons assigned on PHEM and spend most of their time by collecting data from districts level by calling to them. In all district malaria data was analyzed on weekly basis and also there was flow chart used to control occurrence of outbreak of malaria easily but not for measles and Typhoid. At zonal level data was analyzed for malaria, measles and typhoid fever; histograms, line graphs and charts were used for analysis, even though lacks continuity. Action threshold was set for malaria and measles at all districts and zonal level. But there is no established threshold for typhoid fever in all visited district and health facility.

C. Representativeness

In visited site of Bale zone report completeness and timeliness was(62%)which was blow the WHO target (80%).Very little amount of the private health sectors only four reported to district health office. Lack of Gimsa Stain and widal reagents to diagnosis patient will affect the representativeness of the reported cases. In addition to this the health extension worker in health posts only diagnoses patients two to three days per week, and also they have limited capacity

D. Flexibility

No site reported difficult to use report format including newly incorporate maternal death to the immediately reportable diseases. All agreed on the flexibility of the reporting format.

E. Stability

Following the introduction of the Business process Reengineering (BPR) the system is well established and structured at all level but lack of budget line(budget code),low attention given by managers at all level and experienced staff turnover affects the stability of the system.

F.Positive predictive value

We took three months facility based data and divided the positivity rate of total examined by RDT and microscope for malaria, and examined Widal test for Typhoid fever. Only 2 measles cases were reported from Mada Wolabu to zonal health department and they didn't take blood sample for laboratory confirmation.

PVP for malaria = Total confirmed cases by laboratory / Total suspected cases diagnosed in laboratory for confirmation

$$= 60/326 = 18.4\%$$

PVP for typhoid fever = Total confirmed cases by laboratory/ Total suspected cases diagnosed in laboratory for confirmation

= 1/2 = 50%

This report is only from Ginir hospital because in others health centers there was no widal test reagent and they treat patients symptomatically.

Sensitivity

Sensitivity of a surveillance system can be considered on two levels: - First at the level of case detection second, the ability of the system to detect outbreaks, including the ability to monitor changes in the number of cases over time (3)

In the detection of cases

Health facilities use case definition to detect malaria, measles and typhoid fever cases for example those with acute febrile illness send to laboratory for confirmation. For malaria the case detection is very good since reagent at the health facility and RDTs available at health posts level. But for typhoid due to shortage of reagents in the visited health facilities cases was not identified well. Due to this they send zero report for typhoid cases in many health facilities.

In detection of outbreaks

Outbreak detection depends on regular data analysis, health seeking behavior of the society, availability of reagents and definition of thresholds, timeliness and completeness of reporting, population under surveillance and budget line. As explained previously timeliness and completeness of the report is expected low and budget line was under the control of woreda administrative office ; all these indicates low sensitivity of the system to detect the outbreak.

Laboratory

Laboratory staff complains that that they were not assigned to carry out surveillance activities. All the visited sites can make confirmation of malaria cases using different tests (health posts perform RDT, health centers and hospital performs microscopic examination). All have also the capacity to transport serum samples of suspected measles cases for IgM antibody confirmation to central laboratory (EPHI).

The Central and regional research laboratory performs culture of different microorganisms, drug susceptibility tests, quality assurance of peripheral laboratories, beyond the ordinary laboratory activities. But it did not take malaria and typhoid slides from all the visited peripheral laboratories to perform external quality control. External quality control was performed only to

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Acid Fast Bacilli (AFB) slides. Temperature fluctuations of refrigerators were the other problems to maintain reagents validity, due to poor access of electric power supply.

Discussion

There was a surveillance focal person in all the visited sites but the focal persons had work overload and lack of capacity to do data analysis regularly. There was a poor practice of interpretation and utilization of surveillance data at facility and district level, simply compile data from the next lower level and submitted to zone without further analysis. Thus the collected data has a limited usefulness. However, PHEM Guide Lines indicated that Surveillance data analysis and interpretation is a crucial part that guides responses to public health emergencies. The analysis provides key information for taking prompt public health actions. Data analysis provides the following important outcomes: identifying outbreaks or potential outbreaks, provides information for predicting changes of disease rates over time and enables appropriate action [2]. In this study, attention given to data analysis has gaps due to work over load and lack of capacity of PHEM focal persons.

Suspected outbreak of immediately reportable diseases should be notified from level to level within 30 minutes of identification and Reporting of the total number of cases and deaths seen within a week (Monday to Sunday) and should be reported to the next level as follows: Health facilities report data from Monday to Sunday to woreda every Monday till midday; Woredas report to zone/region every Tuesday till midday; zone (if applicable) report to region every Wednesday till midday; Region report to EPHI /PHEM every Thursday (2, 12). In our study the flow of data from lower level (health post) to higher level (regional and national) were underestimated. This is due to the trend of reporting only from governmental health facilities with incomplete and poor corporation of private and NGO clinics and lack of reagents and materials such Widal reagent, electricity, internet access and reporting format; this will affect the system attributes and this pose a problem to timely and appropriate interventions to be taken and preparation of future plan.

Zonal health department and district health office planned to conduct joint supportive supervision rather than specific PHEM supervision to health facility on quarterly basis. But, Zone health department supervised only health centers (without including health posts) once in the previous six months to grade health centers. All health centers and health posts supervised at

least once in previous three months by woreda health office; but supervision is joint rather than specific. Frequency of feedback from districts to health facilities was better than that of zone to districts. But feedback to communities related to epidemic prone disease that had occurred in the community is almost null. Supportive supervision is helping service providers to achieve work objectives by improving their performance, identifying problems and solving them in a timely manner, making a follow-up on decisions reached during previous supervision visit[13].feedback is generally more meaningful if given as soon as appropriate after observation or reaction occur, thus keeping it concrete and relatively free of distortion that come from the lapse of time(14).In this study lack of regular supervision and feedback, training of staff, refunding of transport and telephone expenditures and per diem has impact on the overall performance of the surveillance system.

Limitation

Due to incomplete data (Date of receipt and reported) we did not calculate timeliness of the report. When we calculate the positive predictive value of the system only one hospital was considered, this might affect the representativeness of positive predictive value of the system

Conclusions

Specific supportive supervision and feedback is not conducted both at woreda and zone level. Data utilization is very low at the lower level of the reporting unit including zonal health office. The status of surveillance system attributes like sensitivity, positive predictive value, completeness and timeliness, had problem in this zone. Lack of refunding mechanism for personal telephone expenditures, inaccessibility of internet services, work over load and low capacity of PHEM focal persons for data analysis in the districts were major challenge in visited woredas.

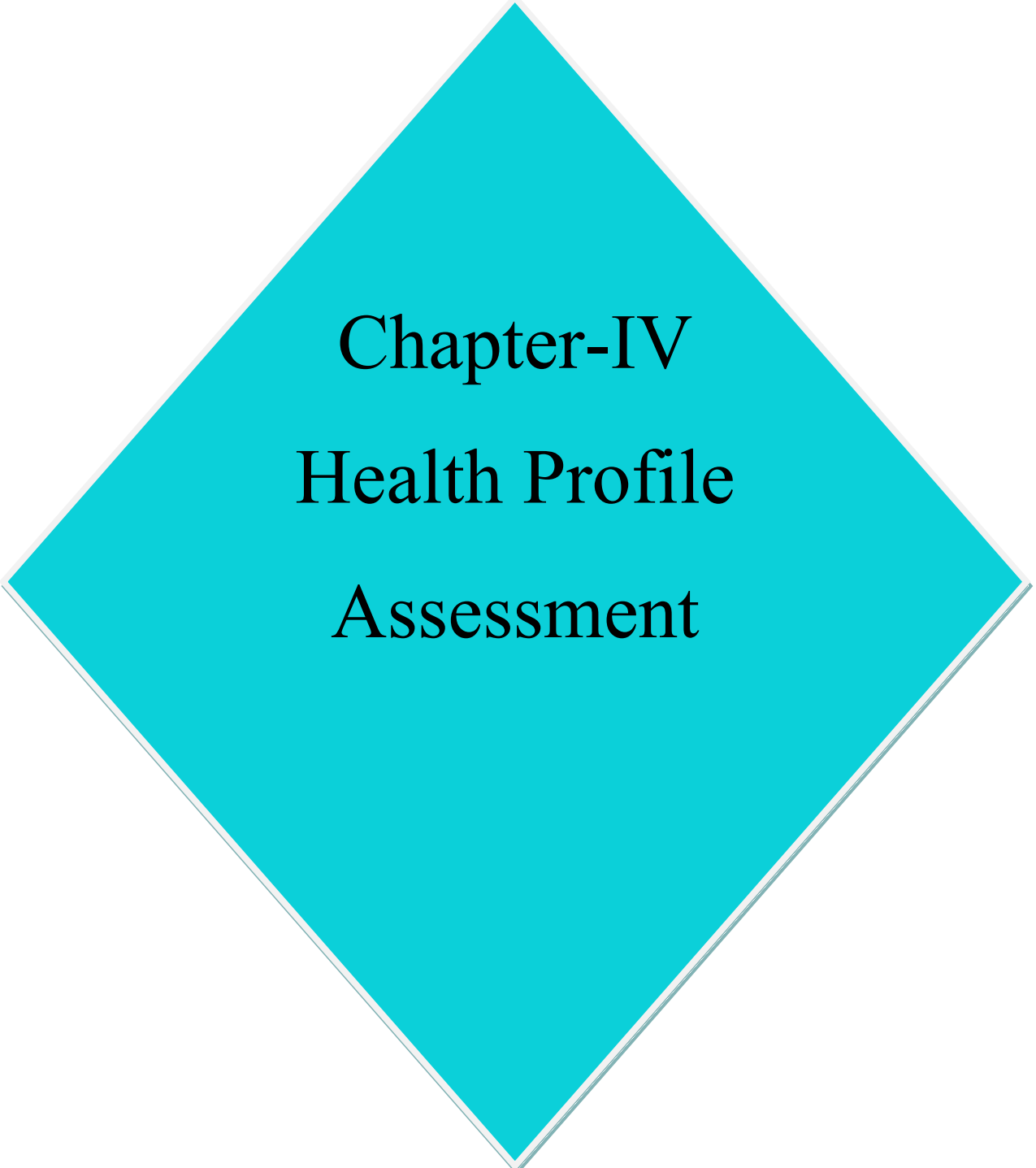
Recommendations

- Gap filling training, refreshment and on job training should be given to the surveillance focal persons, health extension worker and reserve health professionals, respectively.
- Budget line of PHEM department should be modified to minimize complain of PHEM focal persons at different level to due to lack of peridium for those who travel long distance to investigate or supervise in regard to surveillance and reporting of the health data by their own expenditures.
- Central/Regional health research laboratory should increase their capacity by decentralizing sites to promote quality assurance programs.
- Networked system should be established by the Federal/ regional to facilitate surveillance activities
- Zonal health department should develop time frame for data analysis and distribute to all health facilities and district health offices
- Reagent procurement should be requested accordingly rather than keeping PFSA as others medicine to improve quality.
- Specific Supportive supervision should put in place to surveillance system.
- Private and NGO health facilities should be aware the importance of reporting of cases and legally enforcement to report priority diseases of the country to respective institutions.

Reference

- [1]. IHR, 2005
- [2]. Federal Democratic Republic of Ethiopia Public Health Emergency Management Guidelines for Ethiopia. Ethiopian Health and Nutrition Research Institute Public Health Emergency Management Centre, February 2012, Addis Ababa, Ethiopia
- [3]. Centers for Disease Control and Prevention (CDC). Updated Guidelines for Evaluating Public Health Surveillance Systems; Recommendations from the Guidelines Working Group MMWR, July 27, 2001; 50 (RR-13)
- [4]. WHO Regional Committee for Africa: Integrated Diseases Surveillance in the African Region: A Regional Strategy for Communicable Diseases (AFR/RC48/R2). Harare, Zimbabwe, September 1998
- [6]. PHEM implementation manual for MDSR Federal Ministry Health Ethiopian Public Health Institute, March 1, 2015
- [7]. National malaria guidelines third edition Federal Democratic Republic of Ethiopia Ministry of Health January, 2012 Addis Ababa.
- [8]. Guideline on measles surveillance and outbreak management 3rd edition Ethiopian health and nutrition research institute federal democratic republic of Ethiopia January 2012 Addis Ababa Ethiopia
- [9]. WHO, guidelines for the management of typhoid fever July 2011
- [10]. CDC-Typhoid fever: general information NCDVED may 14, 2013
- [11]. (Revised HRH strategy-FMOH, 2014).
- [12]. Oromia Regional Health Bureau Annual PHEM report 2015
- [13]. Guide for National Public Health Laboratory Networking To Strengthen Integrated Disease Surveillance and Response (IDSR) Test Version 1.0 September 2008
- [14]. The United Republic of Tanzania Ministry of Health and Social Welfare Manual for Comprehensive Supportive Supervision and Mentoring on HIV and AIDS Health Services National AIDS Control Programme (NACP) March 2010

[15]. Guidelines for giving and receiving feedback Dr.George F.J Lehner Partner in excellence
2008



Chapter-IV Health Profile Assessment

4.1: Health Profile Assessment of Dugda Dawa District, Borana Zone, Oromia Region, Ethiopia, 20015

Executive summary

Health profile is a programme to improve availability and accessibility for health and health-related information in the district. Summarized and prioritized health and health related information is useful for planning, implementing and evaluating health programs. Therefore, well described health profile can be useful for health program managers and stake holders to take appropriate measure. The objective of this study is to assess health profile of Dugda Dawa woreda by identifying health problem and overall health status of the population in the catchment area. Interviews and standard questionnaires were used as tools for data collection. Sources of data were Dugda Dawa Woreda health, education, water and energy resource, agricultural/Pastoralist, Finance and Economic Development and Administrative offices. Data was collected for ten days from February 12-22/2015. Micro soft excel was used to analysis of collected data. Pneumonia, trauma and typhoid fever, accounted for adult morbidity with 23.6%, 12.9% and 10.8% respectively from total Outpatient department cases. Whereas, pneumonia, diarrhea (non-blood) and diarrhea with dehydration with (37.08%, 14.37% and 13.96%) respectively in under-five children morbidity. Four Tuberculoses deaths and one relapsing case were reported. Insecticide Treated Nets distributions were 92%; but malaria is still among the ten top diseases. Severe acute malnutrition is a major public health problem of the woreda. Three hundred forty one new admissions were reported at OTP sites from July to December. Presence of treatment failure and defaulter may facilitate Multi-Drug Resistant (MDR) TB which is dangerous and very difficult to treat in nearby health facilities and can results in death. Community Mobilization on drug resistance TB and strong follow up of those on treatment and default tracing mechanisms should be established.

Introduction

Health profile is a program me to improve availability and accessibility for health and health-related information in the district. The profiles give a snapshot overview of health for each local authority. Health Profiles are designed to help local government and health services make decisions and plans to improve local people's health and reduce health inequalities, the profiles present a set of health indicators that show how they area compares to the national average. The indicators are carefully selected each year to reflect important public health topics [1].The health profile is intended to be a set of indicators of basic demographic and socioeconomic characteristics, health status, health risk factors, and health resource use, which are relevant to most communities [2].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. Stakeholders in health and health related areas of the community will have evidence based information from well compiled health profile. The purpose of this document is to assess and describe the health and health related issues in the worda and communicate the local burden of disease and other health related information.

Rationale of study

Health profiles are designed to give an easily accessible snapshot picture of the communities' health. Describing health profile is helpful to understand the current health of population and of the many aspects of the community's life that influence it. Health profile generates data that are useful and useable at the community level. The data generated from the health profile description project will help districts, and other stakeholders for public health decision making, resource allocation and priority setting. Dugda Dawa woreda is one of Borana zone district known by different health and health related problem like outbreak of malaria, measles and malnutrition. Therefore, the researcher pan to conduct health profile assessment of the district and prioritize the main issue of the district for appropriate measures.

Literature Review

The 2014 Ethiopian Mini Demographic and Health Survey revealed that 52 % of women who give birth were received antenatal care from a skilled provider, that is, from a doctor, nurse, or midwife for their most recent birth. One woman in every three (32 percent) made four or more antenatal visits during the course of her pregnancy. The median duration of pregnancy at the time of the first antenatal visit is 4.9 months. Even though the percentage of facility births continues to be low in Ethiopia (16 percent), there has been remarkable progress in the last fifteen years from 5 percent in 2000. Only 13 percent of women received postnatal care within the first two days of delivery. Nevertheless, this is an improvement from fifteen years ago when only 2 percent received postnatal care during the same period [4]. The 2014 Federal Ministry of Health (FMOH) report indicates that Tuberculosis (TB) is still among the major communicable diseases with huge public health significance. Detecting and curing TB are among the key health interventions for addressing poverty and inequality. The TB case detection rate was 53.7% in (2013/14), below the detection rate of 58.9% in (2012/13). TB treatment success and cure rates reached 92.1% and 69.1% respectively in (1013/2014) [5]. The 2011 malaria indicator survey (MIS) shows that 1.3% of all age groups were positive for malaria using microscopy [6]. The cumulative number of Insecticide Treated Nets (ITN's) exceeded 65 million and about 6 million households in malaria prone areas are sprayed yearly with indoor residual sprays. On average, three million malaria cases are being treated annually with few hundreds of deaths, making the malaria case fatality rate below 0.01%. In 2014, the total number of laboratory confirmed plus clinical malaria cases of 2,627,182 were treated and 213 deaths were reported [5]. The preliminary ESPA+ report (2014) indicates that about six in ten of all health facilities in Ethiopia, including the private sector, have a testing system-with nearly all hospitals (96 to 100 percent) and health centers (92 percent) offering the service. The TB case detection rate was 53.7% in (2013/14), below the detection rate of 58.9% in (2012/13). TB treatment success and cure rates reached 92.1% and 69.1% respectively in 2014 (5). According to EDHS 2011, Diarrhea prevalence is highest among children residing in households that drink from unprotected wells (18 percent), those residing in rural areas (14 percent) [7]. The health workforce density in Ethiopia has increased from 0.84 to 1.3 per 1000 population between 2008 and 2013, indicative of an improvement in supply and availability of health workers. However, the doctor, health

officer, nurse and midwife to population ratio is 0.7 per 1000 population, far behind the minimum threshold of 2.3 doctor, nurse and midwife to 1000 population ratio required to ensure high coverage with essential health interventions [8].

Objectives

General objective:-To assess and describe health related issue about health status, health indicators and to identify problems for priority setting in Dugda Dawa Woreda of Borana zone Oromia, Ethiopia, 2015

Specific objectives:

To identify health problems of the district

To assess factors that affect health in the district

To assess the human power of the district health offices and health facilities

To describe existing health infrastructure of the district

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Method and Materials

Study Area

Health profile description was conducted in Dugda Dawa woreda of Borana zone Oromia Region 2015.

Study Period

All required data of 2015 G.C were collected, analyzed and interpreted from April 12-22/ 2015

Study Design

Descriptive cross sectional study was conducted using standard questionnaire. In addition, interviewing and discussion with concerned body will also be conducted

Data Collection Method

Health and others health related data of 2015 were collected and reviewed from woreda health , education , water & energy resource, woreda administrative, Culture and tourism offices and different literature and publications to be incorporated to get other an available information.

Data Analysis

Data was compiled and analyzed manually by using Microsoft Excel software

Results

Historical back ground

Dugda Dawa woreda is one of the fifteen Woredas found in Borana zone, Oromia Region. Historically the names came from combination of two “Afan Oromo” words “Dugda”(Back) and “Dawa”(name of river) Meaning people living around the boarder of the river .It is established as independent district separating from Bule Hora woreda in 2006 making its center of administration as Finchawa town. Dugda Dawa community is Guji Oromo in Origin; but categorized as Borana zone for administrative purpose when Guji and Borana were separated as two independent zones in 2006 (Dugda Dawa Woreda Culture and Tourism Office)

Geographic Location and Climatic conditions

Dugda Dawa woreda is located at a distance of 70 km from zonal town Yebello and 490 Km from Addis Ababa to the Southern part of the Region. The district shares common boundaries with Bule Hora woreda in North, Yebello woreda in south, Malka Soda woreda in East and Burji woreda’s of Southern Nation and Nationality People Representatives (SNNPR) in West. The total catchment area of the woreda is 66957 hectares. The altitude of the district is 300 to 900

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meters above the sea level. The climatic condition of the district is 13% High land, 26% Mid-Land and 60% Low Land. Annual range of rain fall is about 300 to 600 mm and yearly estimated temperature to be between 28°C - 32°C

Political and Administrative divisions

Administratively Dugda Dawa woreda is divided into 15 Kebeles; (13 rural and 2 urban). All Kebeles are accessible by vehicles. Regarding to electric power supply and telephone service, all Kebeles have mobile service but only two urban Kebeles have 24, hour's electric power supply. Hence all health posts and health centers found in rural area use kerosene for refrigerators. There was one Non Governmental Organization (NGOs) who are working with the woreda health office, by providing family health commodities and trainings for health professionals accordingly.

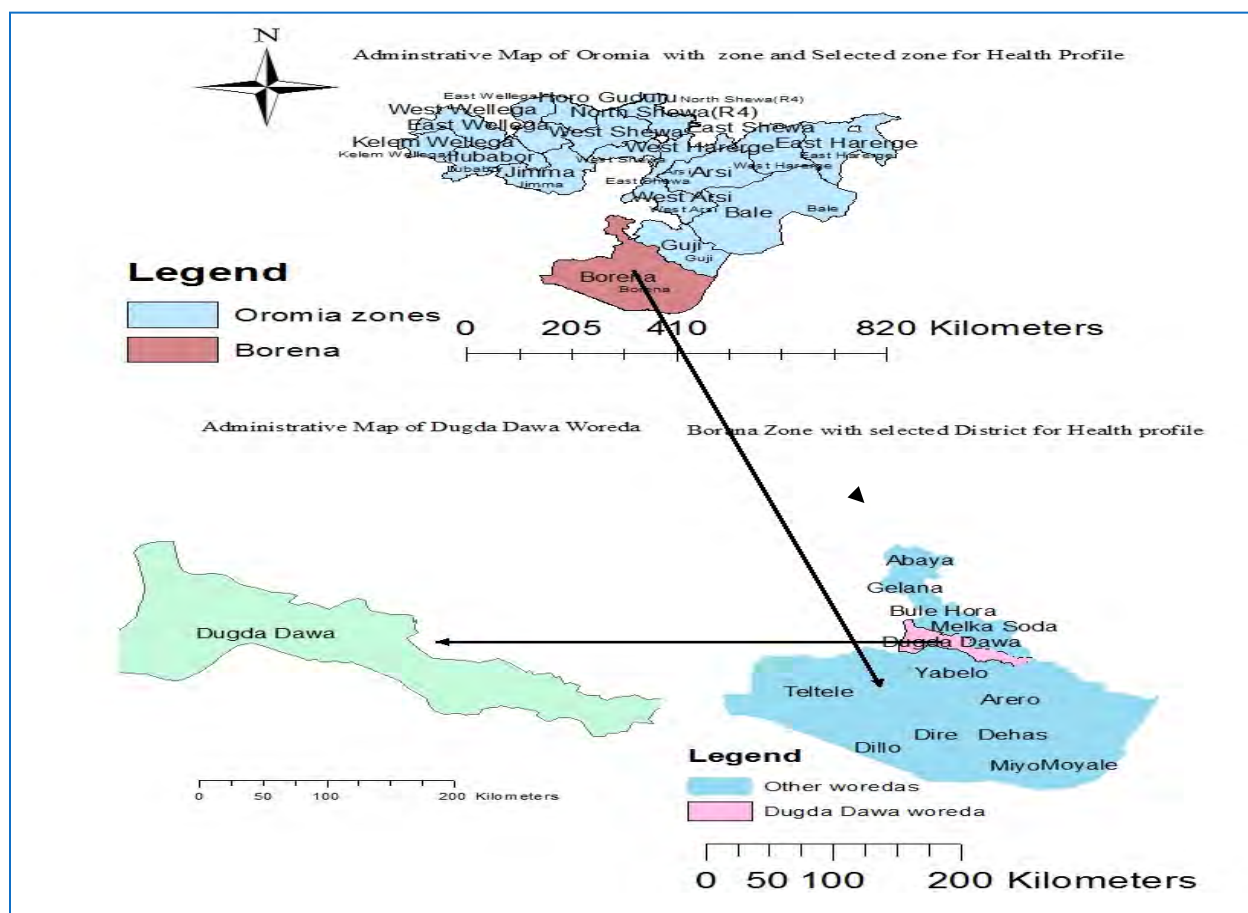


Figure 27: Administrative Map of Dugda Dawa woreda, Borana zone, Oromia Region, 2015

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Socio-Demographic Characteristics

Dugda Dawa woreda has a total population of 108,339 of these 55253 are female and 53086 are male which gives sex ratio of 1:1. Annual growth rate of population is 2.9%.

Of the total population 54,169 are productive age group; hence the total dependency ratio of the woreda is 55%. Religious composition is 5% Orthodox, 75% protestant 5% Muslim and 15% Wakefata. There was no data indicating ethnic composition of the woreda.

Table 11: Estimated population by Kebeles and age category, Dugda Dawa woreda Borana Zone 2015

S/N	Name of kebele	Total Population	Total HH (4.8)	Under 1 year (3.1%)	Under 5 years (16.4%)	Under 15 years (48%)	>65 years (4.74%)	Women 15-49 years
1	Finchawa 01	5275	1099	164	865	2532	250	1166
2	Finchawa 02	5530	1152	171	907	2654	262	1222
3	Magada	12207	2543	378	2002	5859	579	2698
4	Medano	6308	1314	196	1035	3028	299	1394
5	Jigheessa	7098	1479	220	1164	3407	336	1569
6	Gorbali	7073	1474	219	1160	3395	335	1563
7	Chame kura	5044	1051	156	827	2421	239	1115
8	Deru	3972	828	123	651	1907	188	878
9	Arbicho	11571	2411	359	1898	5554	548	2557
10	Megao	9947	2072	308	1631	4775	471	2198
11	Kinsho	8776	1828	272	1439	4212	416	1939
12	Barguda	4231	881	131	694	2031	201	935
13	Hida korma	5044	1051	156	827	2421	239	1115
14	Biyo	9619	2004	298	1578	4617	456	2126
15	Wolena	6644	1384	206	1090	3189	315	1468
total	Woreda	108339	22571	3359	17768	52003	5135	23943

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A population pyramid displays the count or percentage of a population by age and sex. It does so by using two histograms —most often one for females and one for males, each by age group— turned sideways so the bars are horizontal, and placed base to base. The pyramidal shape of the population distribution of a Dugda Dawa woreda indicated that many births, and low life expectancy.

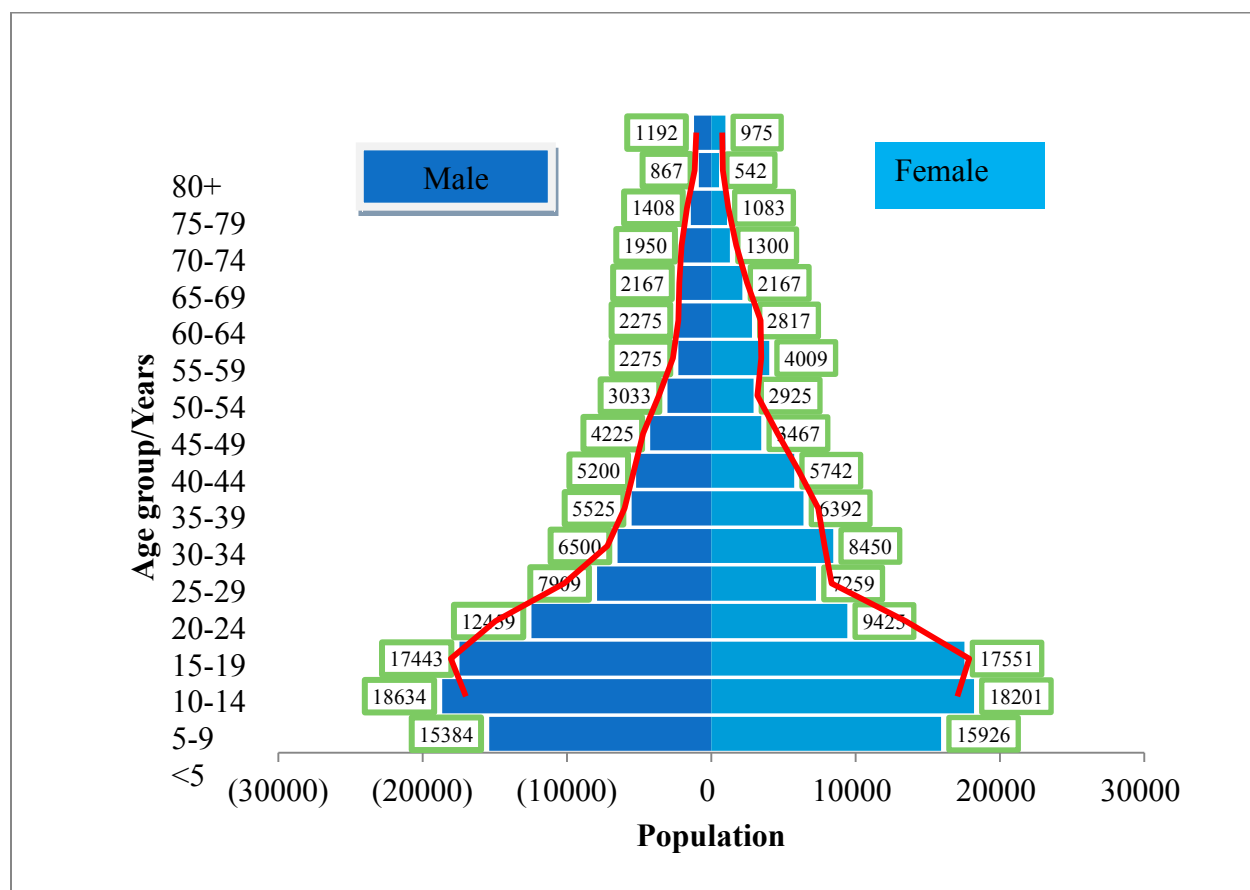


Figure 28: Population pyramid of Dugda Dawa Woreda Borana zone, Oromia Region, Ethiopia 2015

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Education

Dugda Dawa woreda has 53 primary first cycle schools with a total of 1572 students (979 male and 593 female), currently attending their education, 806 male and 497 female with 17.67% and 16.36% dropout rate in male and female respectively. Elementary second cycle schools with a total of 4383 students (2886 male and 1495 female) currently attending their education 2395 male and 1232 female with 17% and 17.59% dropout rate in male and female respectively and one general secondary school with a total of 1156 students (739 male and 417 female) currently attending their education with 19.35% and 6.23% drop out rate in male and female respectively. There is one preparatory school with a total of 230 students (183 male and 47 female) currently attending their education with 9.29% and 8.5% drop out rate in male and female respectively. There is no higher educational institutions like colleges and TVET in the woreda. The total educational coverage of the woreda is 82 % (Woreda educational office annual report).

Table 12: Indicating educational cycle, enrollment, attending education and dropout rate of Dugda Dawa woreda Borana zone Oromia Region 2015

S/No	Educational cycle	Enrollment		Attending education		Dropout rate	
		Male	Female	Male	Female	Male	Female
1	1-4	979	593	806	497	17.7%	16.4%
2	5-8	2886	1495	2395	1232	17%	17.59%
3	9-10	739	417	596	391	19.4%	6.2%
4	11-12	183	47	166	4	9.29%	8.5%
	Total	4787	2552	3963	2124	17.2%	16.8%

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Productivity and income

The main base of economy for inhabitants of Dugda Dawa woreda is 96% Pastoralists, 2% merchant and 2% others. The average monthly or yearly income of individual in the woreda is not known. There are different types of livestock's in the district; the following table indicates types and number of livestock in the district.

Table 13: Types and number of livestock in the Dugda Dawa district of Borana zone Oromia Region, Ethiopia, 2015

S/no	Type of Livestock	Amount in Number
1	Cattle	310682
2	Sheep	98355
3	Goat	215525
4	Camel	34277
5	Hens	81764
6	Horse	187
7	Donkey	28672
8	Mule	2157

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Health Service institution and infrastructure

There are 16 health posts, 3 health centers and eleven private clinics; but no hospital in Dugda Dawa. Regarding to availability of telephone service, water and electric power supply in health facility; except one health center all health posts and the rest two health centers have no wireless or cable based telephone service or piped water supply. All health centers and health posts are accessible by vehicle. The potential health service coverage of the Dugda Dawa woreda is 77%.

Table 14: Number of health facilities by type in Dugda Dawa Woreda Borana Zone Oromia Region, 2015

S/no	Type of health institution	Number
1	Hospital	0
2	Health center with electric power	1
3	Health center with piped water supply	0
4	Health center with telephone service	0
5	Number of health posts	16
6	Number of private clinics	11
7	Number of Pharmacy	0
8	Number of drug vendor	0
9	Number of Diagnostic Laboratories	0
10	Hospital population ratio	0
11	Physical health service coverage	77%

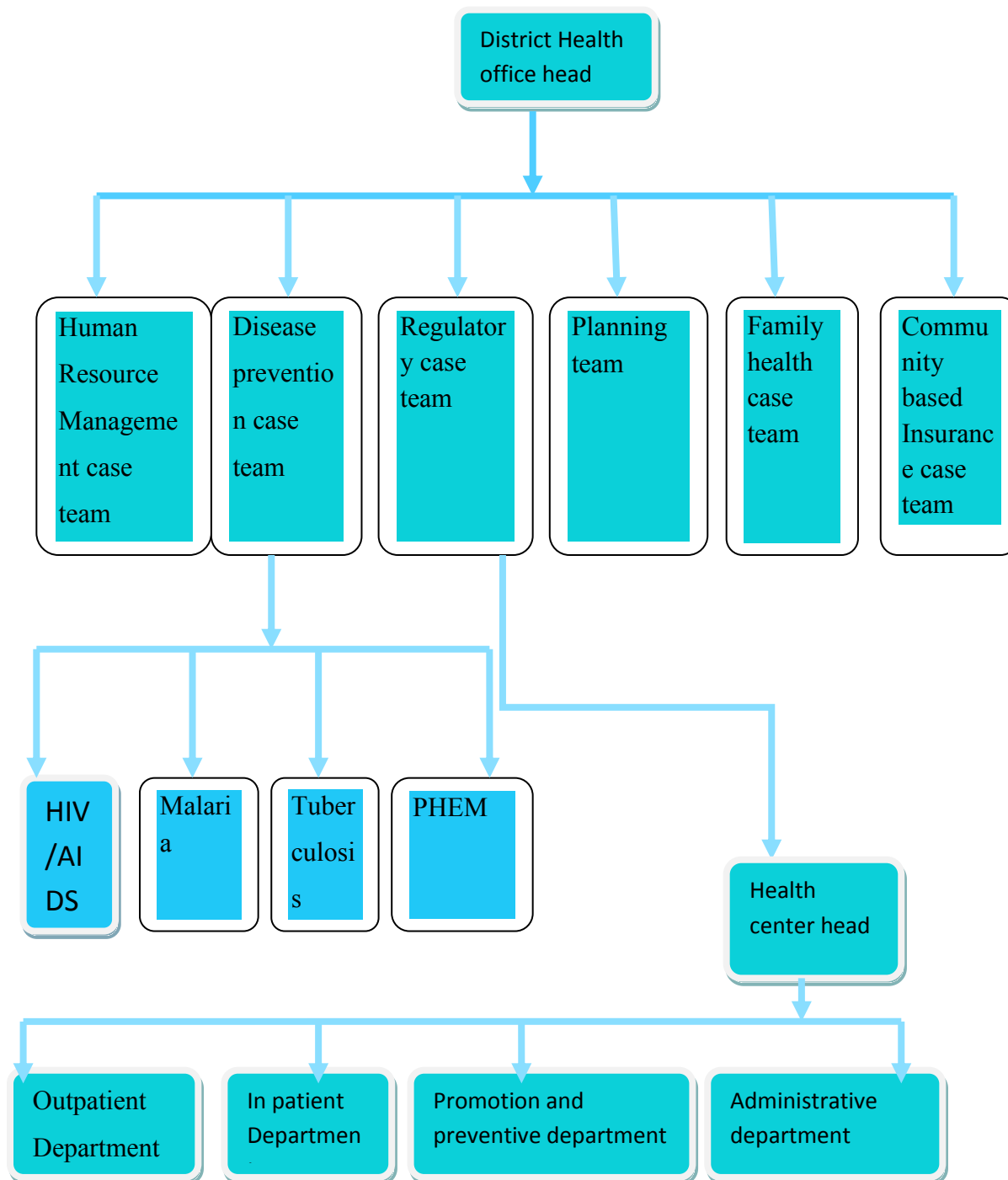


Figure 29: Organizational structure of Dugda Dawa woreda Borana zone Oromia Region, Ethiopia 2015

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Human resource in health institution and health office

In the three health centers under Dugda Dawa woreda there were 29 nurses (27 diploma and 2 Bsc. Nurses), 3 health officers, 2 Environmental health officers, 2 pharmacy technicians, 2 laboratory technicians and 7 mid-wife. On the other hand, in 15 kebeles of Dugda Dawa woreda of Borana zone, there were 57 health extension workers (10 diplomas and 47 certificates) who were assigned at kebele level and providing 16 health extension program services to community. The following table shows the number and type of professional by educational level currently on work in comparison with number of professional required at district level per standard.

Table 15: Human resources in Health facility of Dugda Dawa woreda Borana Zone, Oromia, Region, Ethiopia, 2015

S/no	Professional type	Educational level	Number of professional	Required
1	Nurses	Degree	2	3
2	Nurses	Diploma	27	18
3	Laboratory	Degree	0	3
4	Laboratory	Diploma	2	3
5	Pharmacy	Degree	0	3
6	Pharmacy	Diploma	4	3
7	Health officer	Degree	3	6
8	Mid-wife	Degree	0	3
9	Mid-wife	Diploma	7	6
10	Supportive staff	Degree	1	0
		Diploma	9	21
		Blow Diploma	18	12
11	Health extension worker		57	86
12	HO to population ratio	1:36113 1:1900 0 1:3736		
13	HEW to population ratio			
14	Doctor to population ratio			
15	Nurses to population ratio			

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Cold chain system

In Dugda Dawa District there were no health post with functional Refrigerator and health extension worker took vaccine from their respective primary health care unit (PHCU) health center and provided services to community. In addition to these, one health center with their respective satellite health posts were without any refrigerator. This health center and its satellite health posts received vaccine from one of health center adjacent to its cluster. In availability of refrigerator at health facility level might cause lose of vaccine potency in the district; which may again lead to low sero conversion of those who took vaccination. Furthermore, this district was recurrently attacked by measles outbreak year to year.

Table 16: Human powers in district health office of Dugda Dawa woreda Borana zone Oromia Region 2015

S/N	Professional type	Exist	Required
1	Woreda health office head and vice head	2	2
2	Family health case team	1	4
3	Communicable disease case team	2	7
4	Regulatory case team	1	6
5	Community based Insurance case team	0	3
6	Planning and budget case team	1	3
7	Human resource management case team	1	13
Total		10	38

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Vital Health statistics and health indicators

Projected population of 2015 fiscal year of Dugda Dawa woreda is 108339. Among this population, 55253(51%) were female with a total of 22571 households. The average house hold family size is 4.8 people per house hold. Vital statistic like crude birth rate (CBR,) crude death rate (CDR) and infant mortality rate (IMR) data were not available.

Table 17: Indicates vital health statics and health indicators of Dugda Dawa Woreda, Borana Zone, Oromia Region, Ethiopia, 2015

S/No	Parameter	Number (%)
1	Total population	108339
2	Male	53086(49%)
3	Female	55253(51%)
4	Under 1 years old	3359(3.1%)
5	Under 5 years old	17768(16.4%)
6	Under 15 years old	50919(47%)
7	Female 15-49 years old	24268(22.4%)
8	Pregnancy	3792(3.5%)
9	Live birth	3358(3.1%)
10	Non-pregnant women	19501(18%)
11	Average house hold size	4.8
12	Dependency ratio	55%
13	Infant mortality rate	No data
14	Under 5 mortality rate	No data
15	Crude birth rate	No data
16	Crude death rate	No data

Maternal Health Service Coverage

Anti natal care (ANC) services of the first two quarter achievement in 2015 based on World Health Organization (WHO) four times visit for pregnant woman was: ANC 1st 106%, ANC 4th, 69%, Delivery 28% and 66% PNC. Trends of ANC to PNC of Dugda Dawa woreda are shown in the following figure.

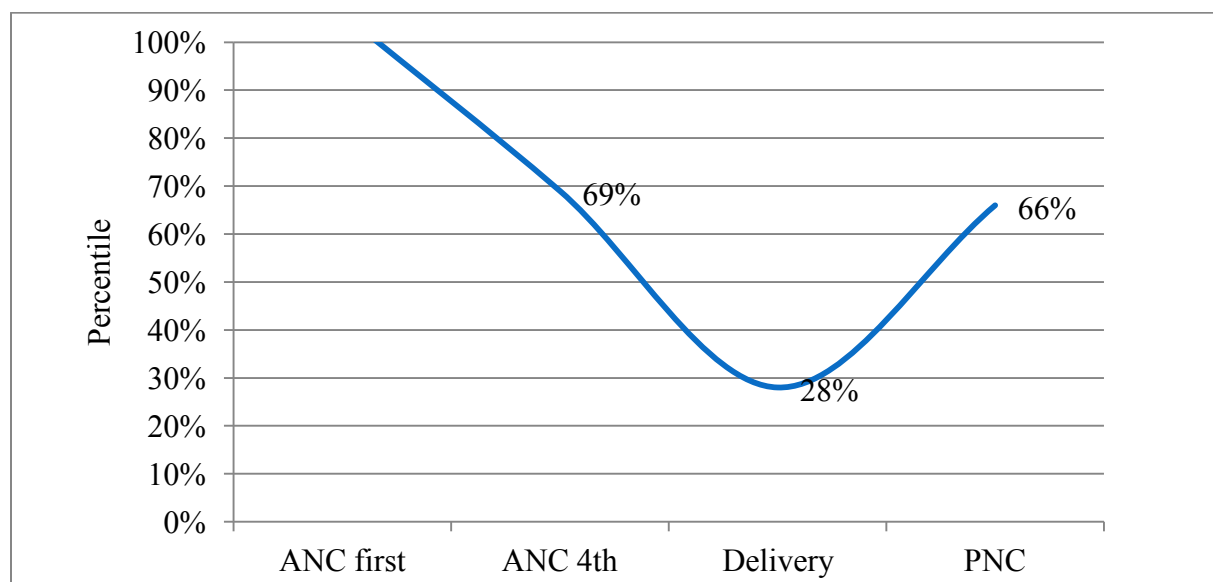


Figure 30: Trends of ANC first to PNC in past six month in Dugda Dawa Woreda Borana Zone Oromia Region April 2015

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Immunization coverage: The first two quarter of 2015 immunization coverage of the district was penta1 98% Penta3 94% and measles 94%.The following table shows vaccination coverage of the district

Table 18: The immunization coverage of Dugda Dawa woreda Borana Zone Oromia Region 2015

S.NO	Type of immunization	Coverage (%)
1	Penta 1	98
2	Penta3	94
3	Pcv1	95
4	Pcv3	91
5	Measles	85
6	PAB	73
7	Fully immunization	82

Hygiene and Environmental Health service

Dugda Dawa woreda is desert area. Safe drinking water coverage of the district was 72% and Latrine service coverage was 67%.No data for latrine utilization and no kebele declared as open defecations free (ODF) in the district.

Disease Statistic

The top ten leading cause of morbidity in adult visit in Dugda Dawa woreda from the first to tenth were pneumonia, typhoid fever, Helementasis, dyspepsia, Upper respiratory tract infection, sexually transmitted infection, Acute febrile illness, Diarrhea without blood, and Diarrhea with blood

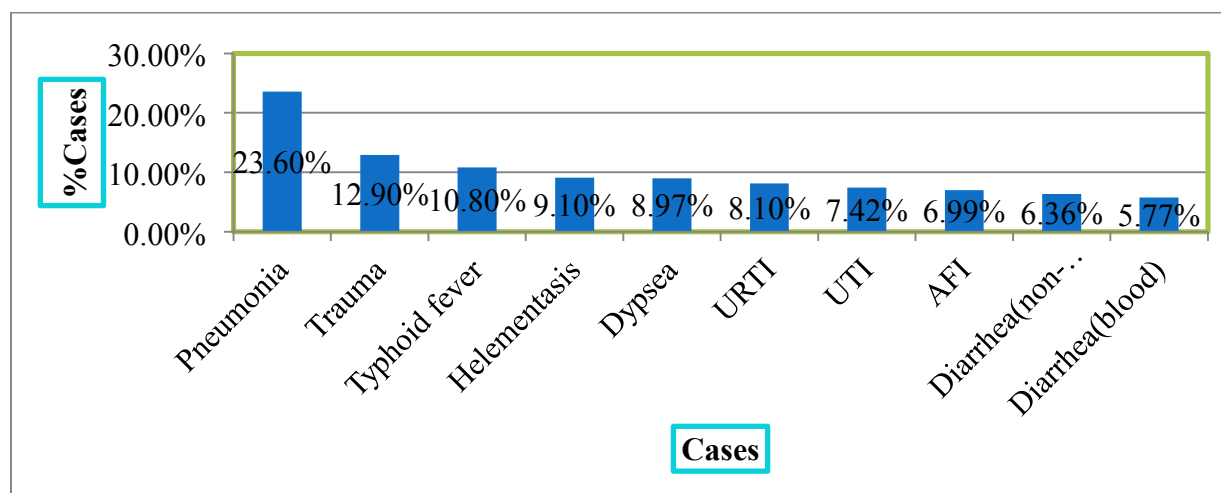


Figure 31: Top ten disease of morbidity in in adult OPD in Dugda Dawa woreda of Borana Zone Oromia Region 2015

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The top leading cause of morbidity in under five year are pneumonia, diarrhea without blood, Diarrhea with blood, malaria plasmodium vivax(PV), malaria plasmodium falciparum (PF) Acute febrile illness, clinical malaria, acute respiratory tract infection and others.

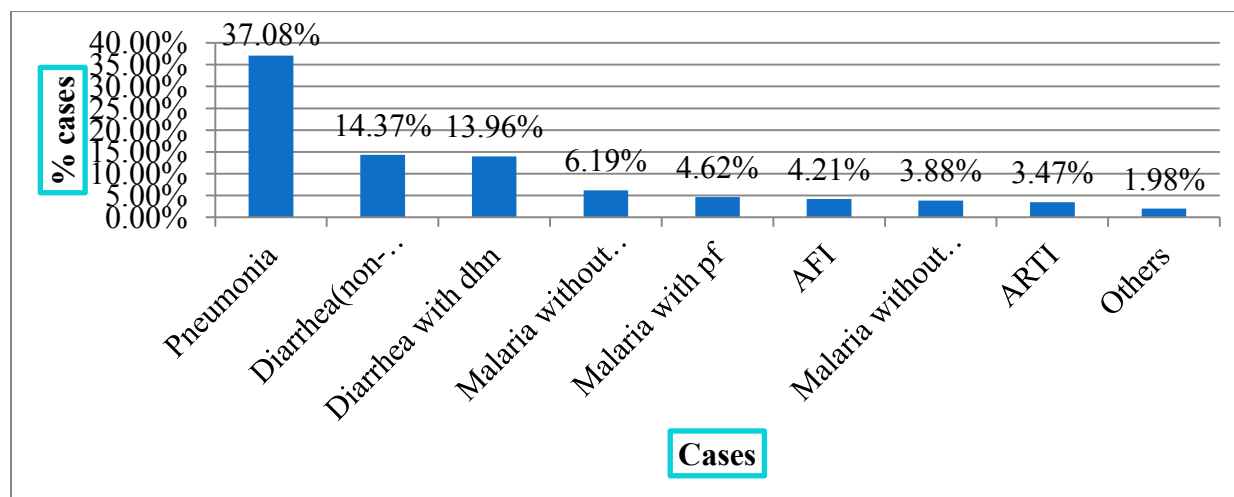


Figure 32: Top ten Diseases of age less than five years morbidity in Dugda Dawa woreda of Borana zone Oromia Region, Ethiopia, 2015

Tuberculosis and Leprosy

Two quarter plan and achievement of all form of tuberculosis (TB) in 2015 were 138 and 84 respectively. Among 84 cases, 42 cases were pulmonary positive, 23 pulmonary negative, 18 extra pulmonary and one Relapsing cases were reported. Regarding to treatment parameter, Among 29 cases of 2014 TB cases, 26 cases were cured and 3 cases were died. Among 25 pulmonary negative cases 24 cases complete treatment and one case died. From 6 extra pulmonary TB cases all are completed treatment.

Malaria

A total of 2564 malaria cases were treated in outpatient department. Among these only 361 cases were confirmed by microscopy or Rapid diagnostic test (RDT) as malaria cases with Slide positivity rate was 14%; the rest treated clinically. Sex distributions of cases were 162 female and 199 male. Less than five years were 34 and the rest 327 above 5 years. Regarding to species, 192 PF and 169 PV cases were identified. Isecticide treated nets (ITNS) distribution and utilization of the woreda were 94% and 72% respectively. All Kebeles of Dugda Dawa woreda is malaria endemic and only 6 Kebeles were sprayed in 2014 due to shortage of chemical spray.

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HIV/AIDS

In all 57 schools there were school community conversations (SCC). In All Kebeles there were community conversation, in six month (3046(112%), 1933(102%) 4487(75%) voluntary counseling and testing (VCT) prevention of mother to child transmission (PMTCT) and provider initiative HIV/AIDS counseling and testing (PIHCT) conducted respectively. A total 1000 condom distributed in previous six months in the districts.

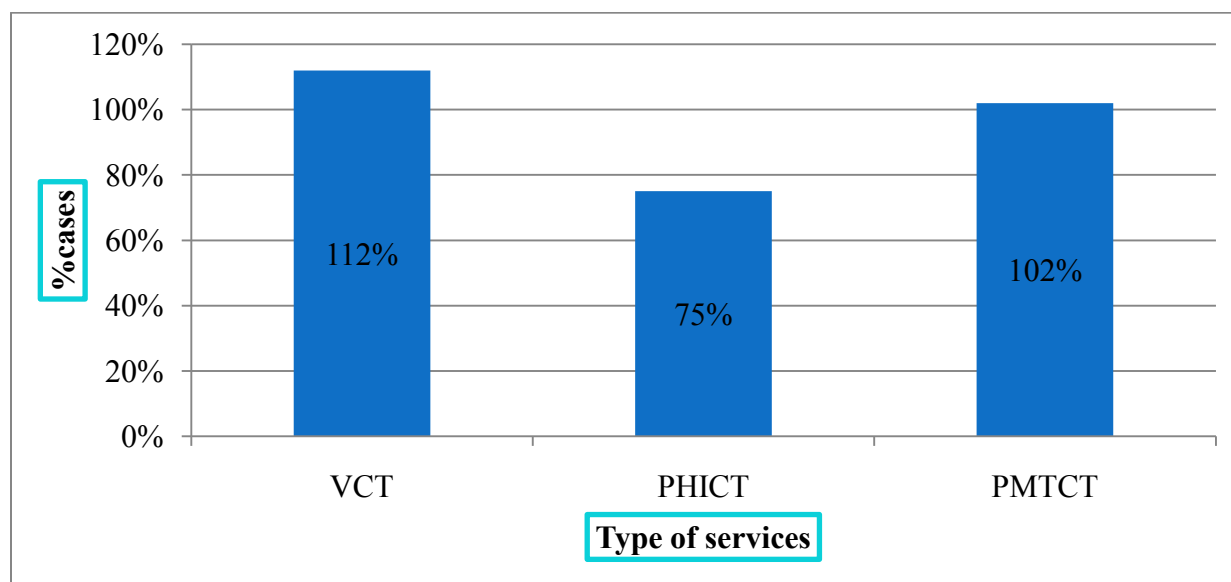


Figure 33: Indicates VCT, PIHCT and PMTCT performance of Dugda Dawa woreda Borana zone Oromia Region 2015

Disaster and outbreak Occurred.

In this woreda recurrent attack of drought was reported in 2006, 2010, and 2015, besides this drought, there was measles outbreak. During assessment of health profile also, there was measles outbreak in the districts. By taking line list of measles outbreak the investigator conducted data analysis and gave feedback for both health center and woreda health office. The following line graph indicates measles outbreak in Dugda Dawa woreda of Borana zone.

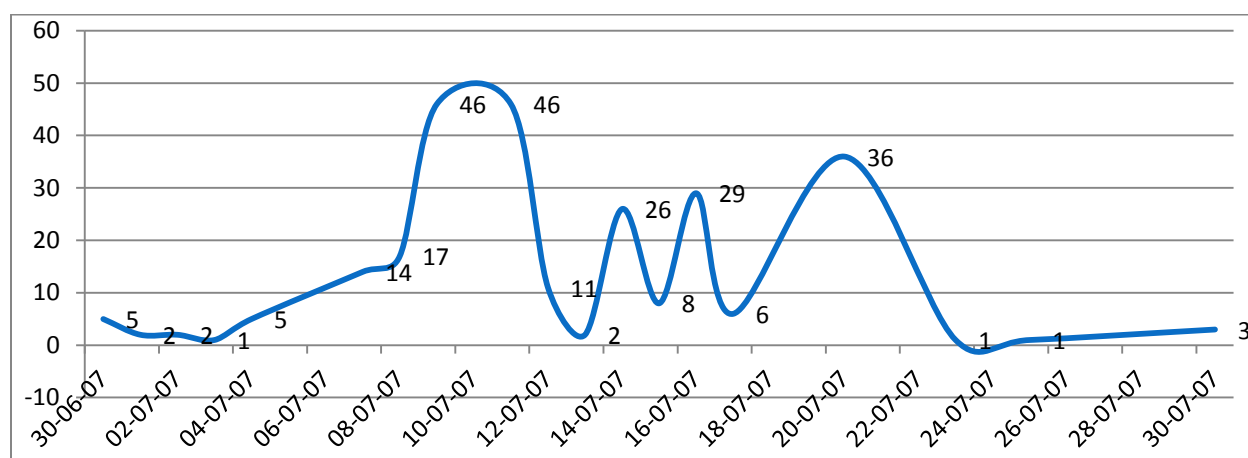


Figure 34: Shows trend of measles cases in Dugda Dawa woreda of Borana zone Oromia Region Ethiopia, 2015

In previous six months there were 341 new severe acute malnutrition (SAM) cases in the districts. The following line graph indicates trends of malnutrition cases in Dugda Dawa woreda

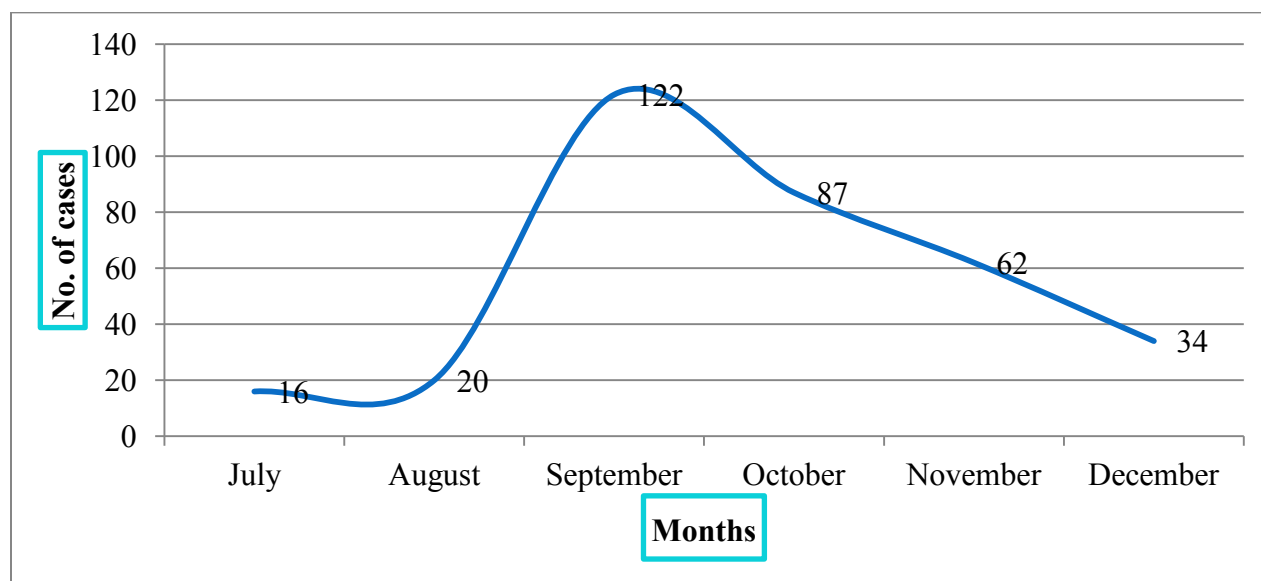


Figure 35: Trends of malnutrition cases in Dugda Dawa woreda of Borana zone Oromia Region Ethiopia, 2015

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Budget allocation for woreda health office

In 2015, a total of 5,431,023 ETB was allocated for the woreda health office. Of this total budget, 3766, 653(69%) had allocated for salary, 801,711(14.76%) for running costs, 540,000(9.94%) for purchasing of medicine and the rest 323,259 (5.95%) for construction of health post. During the same year, 388,549.70 ETB sourced from different donors.

Discussion

The health Workforce density in Dugda Dawa Woreda was .94 per 1000 population. This study was also similar with study conducted nationally in Ethiopia which indicated that the health workforce density (.084 to 1.3 per 1000 population) (9). However, the doctor, health officer, nurse and midwife to population ratio is 0.36 per 1000 population which is low related to national 0.7(9). So in the woreda the health centers have no the expected number of health professionals in each field of study. In this study Antenatal care 4th (ANC), Delivery and Post natal care was 69%, 28% and 66% respectively and it is above nationally reported from Mini DHS which was 32%, 16% and 13% respectively(4). This might be due to commitment of government coupled with strong community mobilization through health developmental army(HAD). Pneumonia was a Woredas public health problem leading by 23.6% and 37% of the total diseases reported at outpatient visited in adult and under five departments respectively. Even though malaria, pneumonia and diarrhea are among ten top diseases in the woreda, there was no death reported due to those diseases in the past one year. This may be due to lack awareness on death register trend in the districts. Two quarter plan and achievement of all form of Tb in 2015 are 138 and 84 respectively. Among 84 cases: 42 pulmonary positive, 23 pulmonary negative, 18 extra pulmonary and 1 Relapsing cases obtained. Tuberculosis detection rate of the woreda was 60% which is above national (53.7%) and below 70% recommended by WHO. When evaluating treatment parameter, Among 29 cases of 2014 TB cases, 26 cases were cured and 3 cases were died. Among 25 pulmonary negative cases 24 cases complete treatment and 1 case died. From 6 extra pulmonary TB cases all are completed treatment. Totally 4 death were reported in this district from 29 cases. This may be due to lack of early dictation of Tb cases, which need special attention. School community conversation (SCC) should be started from grade five students according to ministry of education. But in this district SCC was started from grade one .This is due to grade one students are old age. So that SCC around pastoralist

area like Guji and Borana zone of Oromia Region need special attention. A total of 2564 cases were treated as malaria. Among these only 361 cases were confirmed by microscopy or RDT as malaria cases with Slide positivity rate was 14%; the rest treated clinically. Malnutrition and measles were community's priority problem in the district. Eight community measles death was reported in the district at the time of health profile data collection. All health posts and one health center found in the district was without electric power supply and they use kerosene for refrigerators. This may affect vaccine potency and further lead to low sero conversion of vaccinated children.

Limitations

Lack or absence of some health data (mortality, ethnic, grouped) at woreda level

Conclusion

Pneumonia is a top leading cause of outpatient morbidity in adults and pediatrics in the woreda in 2015. Diarrhea, upper respiratory tract infection, and all types of malaria are among top ten diseases that cause outpatient morbidity in the woreda. Regarding tuberculosis, the case detection rate of the woreda was below the recommendation of WHO. In addition four deaths were reported. Even though ITN coverage was increased yearly, expanded health facility with increased number of health professional and indoor residual spraying was conducted as an interventions activity and preventive measures in the last year, malaria was still one of the causes of morbidity among the ten top diseases in the woreda. Severe acute malnutrition is a major public health problem of the woreda. Most of the Kebeles in the woreda were hot spot areas for malnutrition. In the woreda the health center have no the expected number of health professionals in each field of study.

Recommendations

- Treatment of acute febrile illness should be supported with specific laboratory diagnosis at health facility.
- Direct observation and treatments (DOTs) program should have to be started in all health facilities and more efforts have to be done on the TB case detection rate and will improve the follow up of the patient and the reporting system of all the health facilities in the woreda.
- Special attention should have to be given to communities practices on ITN utilization and measures taken to sprayed houses by health extension workers.
- OTP, TSF and CBN programs working on nutritional activities should have to be strengthened in all health facilities.
- Attention should have to be given to human power employment to increase workforce density of district.
- Health center and health posts without electric supply should have to use generators power.

References

- [1]England: public health observatories August 04, 2015
- [2]The National Academies Press: Improving Health in the community, 1997.
- [3]Ethiopian Field Epidemiology Training Program Manual 2012
- [4] The Ethiopian Mini Demographic and Health Survey Central Statistical Agency
Addis Ababa, Ethiopia August 2014.
- [5] Federal Ministry of Health Annual administrative report 2014
- [6] Ethiopian National Malaria Indicator Survey (MIS) 2011
- [7]Ethiopian Demographic health survey EDHS 2011
- [8](Revised HRH strategy-FMOH, 2014).

Chapter-V
Scientific
Manuscripts for
Peer Reviewed
Journals

5.1 Measles Outbreak investigation Gechi District IluAbabora zone – Oromia Region, Ethiopia, 2016

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Abstract

Introduction: Measles is one of the communicable diseases still causing preventable mortality and morbidity in the country. We received reports of a measles outbreak in the Gechi District of IluAbabora zone Oromia region in Ethiopia. We investigated to confirm the outbreak, identify risk factors, and implement control measures.

Methods: We used the PHEM guide line case definition to define a suspected measles case-patient as any person with fever and maculopapular rash and either cough, coryza, or conjunctivitis or any person in whom a clinician had suspected measles. We conducted an active case investigation from 22 January –7 February 2016 in the affected district using line lists and questionnaires and compared cases with controls. Five blood specimens were collected for laboratory confirmation.

Results: We identified 394 laboratory confirmed or epidemiologically linked measles patients in the area. Out of five sample tested four were positive for measles specific IgM. The median age of the measles patients was 6 (ranges: three months to 45 years). We compared 60 patient-cases to 120 control subjects and found that prior vaccination (Adjusted odds ratio (AOR) =0.43, 95% confidence interval (CI): (0.22-0.84) was protective of disease. Recent contact with a measles patient (AOR= 9.38, 95%CI: (4.43-19.83) and travel history (AOR= 9.39, 95%CI (2.54-34.76) were independent risk factors associated with higher rates of disease.)

Conclusion: Number of measles cases were increasing in Children aged 5-14 including above 15 years of population. Therefore, the strategy started to incorporate less than 15 years to measles campaign by the Ministry of Health (MoH) should continues at all level (woredas, zonal and regional) to improve vaccination coverage . In addition the woreda health office has to improve

routine immunization in the population in collaboration with stakeholders to prevent spread of an outbreak and occurrence of further outbreak in the woreda as soon as possible.

Key words: Measles, Outbreak, Gechi, Oromia, Ethiopia.

Introduction

The earliest written description of measles is classically attributed to the Persian born physician Abu Becr (Rhazes) in the 10th century. Rhazes was the first to differentiate measles from smallpox and considered the former to be more dreaded. Although he recognized both the cyclical and seasonal nature of the disease, it was not until the 17th century that Thomas Sydenham of London identified the infectious nature of measles. The studies of Peter Panum in the Faroe Islands in 1846 showed that the disease was acquired solely by direct transmission. Outbreaks of measles occurred for the first time in the South Pacific during the mid and late 19th century, with devastating results among the Fijians and New Zealand Māori. In 1954 Enders and Peebles in the USA reported the first successful isolation and propagation of the measles virus in human and monkey kidney cells. This led to the production of live attenuated measles vaccine, which was first licensed for use in the USA in 1963(1). Measles is one of the communicable diseases still causing preventable mortality and morbidity in the country. Measles morbidity and mortality reduction strategies

include improving routine vaccination coverage, providing a second opportunity for measles vaccination through supplementary immunization activities (SIAs), improving measles-case management, and establishing case-based measles surveillance. Since 2002, Ethiopia adopted these regional goals and strategies and has been taking important steps to control measles (2). Measles is a highly contagious virus that lives in the nose and throat mucus of an infected person. It can spread to others through coughing and sneezing. Also, measles virus can live for up to two hours in an airspace where the infected person coughed or sneezed. If other people breathe the contaminated air or touch the infected surface, then touch their eyes, noses, or mouths, they can become infected. Measles is so contagious that if one person has it, 90% of the people close to that person who are not immune will also become infected. Infected people can spread measles to others from four days before through four days after the rash appears. Measles is a disease of humans; measles virus is not spread by any other animal species (3). Measles is an acute viral respiratory

illness. It is characterized by a prodrome of fever (as high as 105°F) and malaise, cough, coryza, and conjunctivitis -the three “C”s -, a path gnomonic anathema (Koplik’s spots) followed by a maculopapular rash. The rash usually appears about 14 days after a person is exposed; however, the incubation period ranges from 7 to 21 days. The rash spreads from the head to the trunk to the lower extremities. Patients are considered to be contagious from 4 days before to 4 days after the rash appears. Of note, sometimes immunocompromised patients do not develop the rash (4). Measles is thought that measles virus (MV) enters the host by infection of alveolar macrophages and/or dendritic cells in the airways, and is amplified in local lymphoid tissues. Viremia mediated by infected CD150⁺ lymphocytes results in systemic dissemination. Infection of lymphocytes and dendritic cells in the respiratory sub mucosa facilitates basolateral infection of epithelial cells via the newly identified receptor Nectin-4. Concomitant and extensive epithelial damage may contribute to efficient transmission to the next host (5). The incubation period is approximately 10–12 days from exposure to the onset of fever and other nonspecific symptoms and 14 days

(with a range of 7–18 days), from exposure to the onset of rash(1). Measles can be a serious in all age groups. However, children younger than 5 years of age and adults older than 20 years of age are more likely to suffer from measles complications. Common measles complications include ear infections and diarrhea. Whereas Severe Complications such as pneumonia (infection of the lungs) and encephalitis (swelling of the brain) are mentionable; in addition to these Measles may cause pregnant woman to give birth prematurely, or have a low-birth-weight baby (6). Despite tremendous achievements towards global measles mortality reduction and measles elimination goals, globally, in 2010, there were 327,305 measles cases reported and an estimated 139,300 measles deaths (i.e., approximately 380 deaths/day) [7]. The resurgence of measles outbreak in Africa these last few years has caused much suffering and many deaths. More than 200,000 cases and 1400 death were officially reported for 2010. Taking into account generalized under reporting real numbers could be 10 or 20 times higher (8). In 2013, 4780 confirmed measles cases were reported nationwide in Ethiopia (9). In 2015 Oromia Region reported 21,170 suspected measles cases.

Among these cases 1612(8%) were from Ilu Ababora zone (10). An October 4, 2015, the first case was recognized by health staff of Chara health center. The case was from Bedele woreda site which is adjacent to Chara health center of Gechi district. He was a seventeen years old male patient with unvaccinated status. He had no take a trip history to other place before the onset of the illness. The health center staff was not reported to neither Gechi health office nor to Bedele woreda. In December 1, 2015 outbreak investigation team organized and visited to the site and identified about 49

suspected cases. The team started to treat cases by Amoxicillin, vit.A, TTC, ORS and Anti pyretic accordingly; but the cases started to expanded to others Kebeles including Mucha Chara,Konoso ,Coptu ,Haro and Didessa.Finally the district health office asked Oromia Regional Health Bureau to investigate measles like illness dramatically expanding in the district. So that we EFETP resident plan to investigate measles like illness. This study was conducted to investigate cause of measles, risk factors and to give put direction for measles prevention and control measures.

Methods

Study area

Gechi district is one of the 24 districts of Ilu Aba Bora Zone, Oromia Region. It is found in 138 km from zonal town Matu and 480 km from Addis Ababa. The three highly affected Kebeles (Chara, Mucha and Konoso) are under Chara Health center and located 22 km away from the town of Gechi Woreda. Administratively the woreda is divided in to 33 Kebeles (32 rural and 1 urban).Among 32 rural kebele eight of them

are inaccessible by car. In the district there are 4 health centers, 32 health posts and 4 private clinics; but there is no hospital in the district. Projected population of 2016 are 90314(82028 rural and 886 urban), male 44254 female 46060, under one 2908, and under five 14450. The physical health service coverage of the woreda is 111% by health center and 172% by health post

Descriptive Epidemiology

We used the National Measles Guide lines case definition to define a suspected measles case-patient as any person with fever and maculopapular rash and either cough, coryza, or conjunctivitis or any person in whom a clinician had suspected measles. A laboratory confirmed case-patient was defined as a patient who tested positive for measles specific IgM antibodies. An epidemiologically linked case-patient was defined as a patient without laboratory testing that met the measles case definition and either had contact with a laboratory-confirmed case or lived in the same district of a laboratory-confirmed case and had onset of symptoms within a one-month period of a laboratory confirmed case(1).The

Case-Control Study

From 22 January to 7, February 2016 the investigator conducted a case-control study and compared measles case-patients with two control subjects recruited from the closest house hold. We designed a structured questionnaire in English and translated to the local language “Afan Oromo” for collecting necessary information. We made

Data Analysis

Data was entered into Epi-Info version7:1:0.6. If records were found out of

investigator reviewed records, including case based reports and line lists from health center, the district health office, zonal health department and the regional health bureau. We conducted an active case search from 22 January to 7 February 2016 in the affected district using line lists and questionnaires. The investigator worked with health extension worker, and health center staff with the involvement of community volunteers, to identify additional patients with possible measles and refer them for evaluation. The investigator received permission for the investigation from the district health office and obtained oral consent from all subjects enrolled under the case-control study.

house-to –house investigations to identify measles case-patients and administer the questionnaire. Demographic characteristics of both case-patients and controls such a risk factors for measles transmission, complication and mortality were collected in the questionnaire.

range; it was rechecked with the corresponding questionnaire, accordingly

correction methods was taken. Descriptive statistics and Odds ratios with 95% confidence intervals were calculated to compare risk factors among cases and controls. Age Specific Attack Rates were calculated by taking population of the district from Gechi District Health Office and the conversion factor for each age group was taken from the 2007 population and housing census.

Results

Descriptive epidemiology

An October 4, 2015, the index case was recognized by health staff of Chara health center. The case was from Bedele woreda site which is adjacent to Chara health center of Gechi district. He was a seventeen years old male patient with unvaccinated status. He had no take a trip history to other place before the onset of the illness. The epidemic curve was a multi-peak with sharp rise and gradual fall that indicated a propagative type of outbreak. The investigator identified 394

Conditional logistic regression (clogit commands) was utilized to identify independent risk factors associated with contraction of measles. Variables that had significant associations in the bivariate analysis, a confidence interval excluding one ($P\text{-value} \leq 0.05$) were included in a multivariate model, followed by a step-down procedure to remove those factors not contributing significantly ($P < 0.05$).

suspected cases and no deaths in ten Kebeles of the district from 4 October 2015 to 19 February 2016; ninety eight of the patients (25%) were from one kebele, Chara (incidence rate of 16.6 per 1000 population) (Figure 1). There were four laboratory confirmed and 390 epidemiologically linked cases. Four out of the five the blood tests performed were positive for measles specific IgM antibodies.

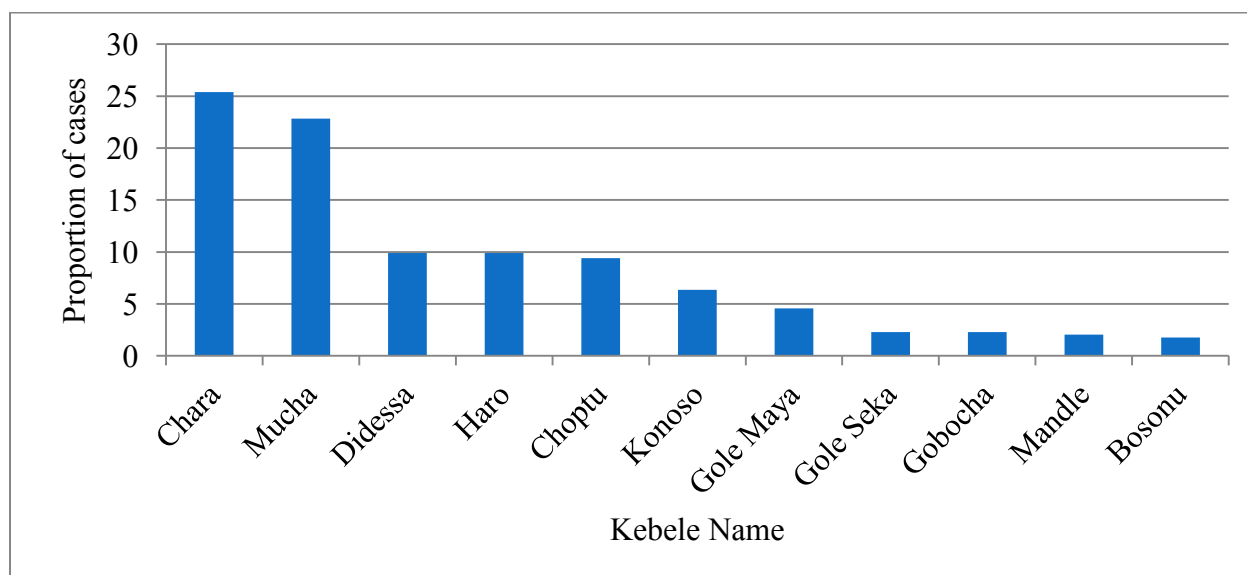


Figure 36: Distribution of Measles cases by Kebele, Gechi District, Ilu Ababora zone, Oromia Region, Ethiopia 2016.

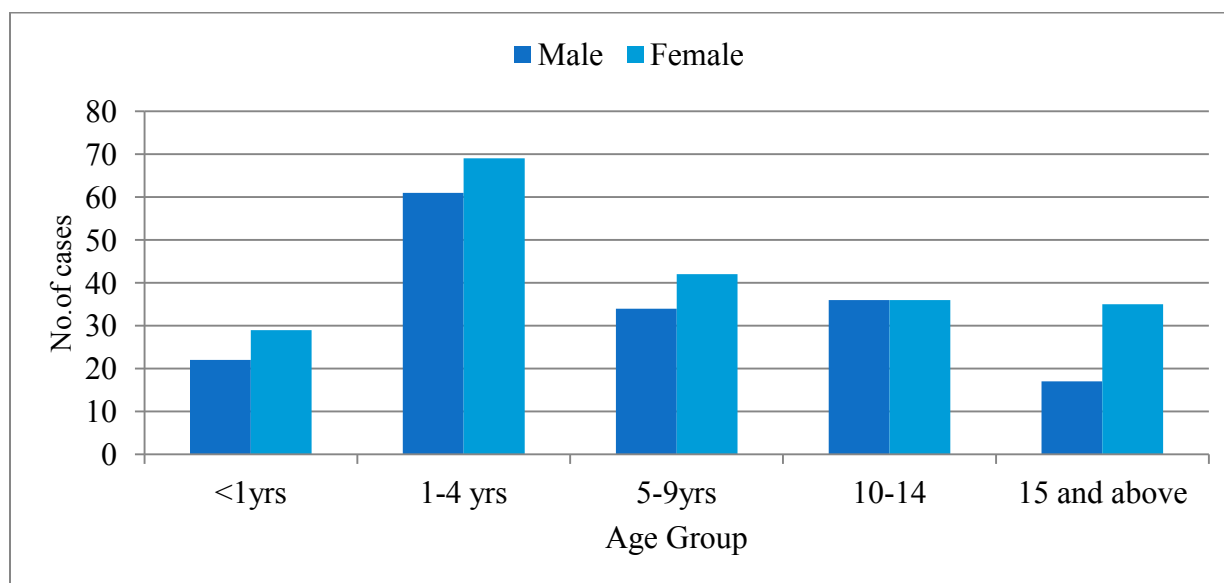


Figure 37: Sex and age distribution of measles cases, Gechi District, IluAbababora zone Oromia Region, Ethiopia 2016

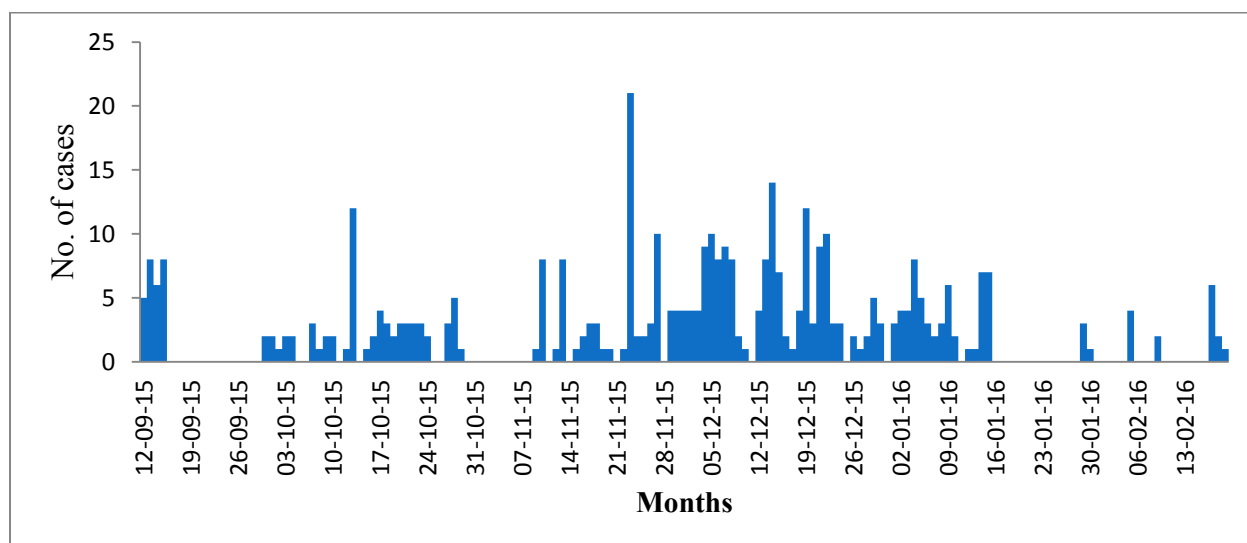


Figure 38: Number of measles cases by date of rash onset, Gechi District, IluAbabora zone, Oromia Region, Ethiopia 2016

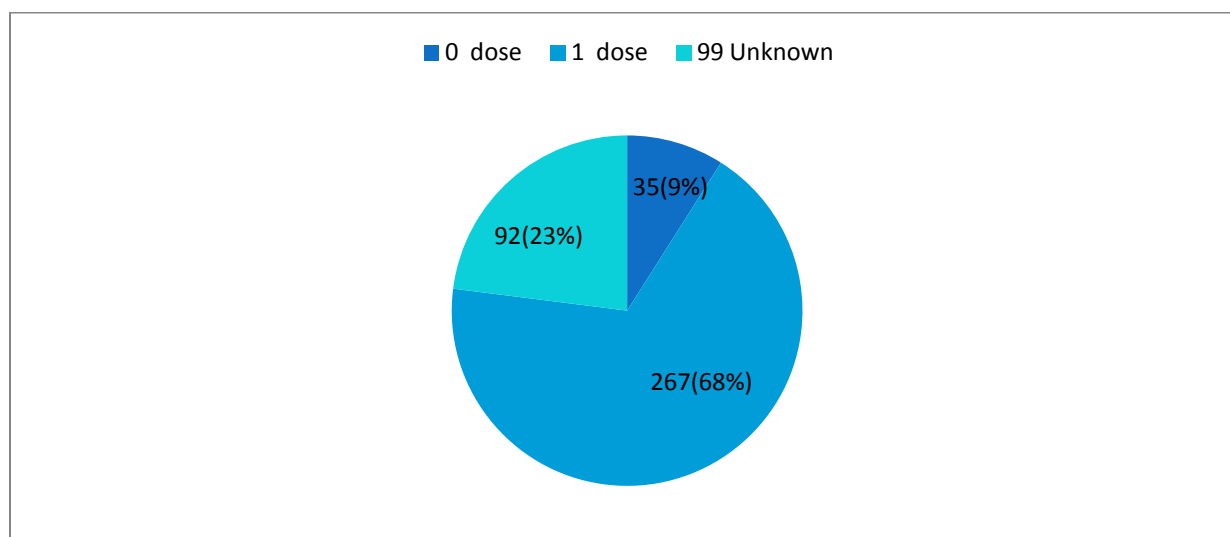


Figure 39: Vaccination status of Measles cases in Gechi woreda Ilu Ababora zone, Oromia Region, Ethiopia, 2016

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Analytic epidemiology

A total of 60 cases and 120 controls were selected from the community to identify the risk factors for measles outbreak in affected Kebeles of the Gechi Woredas, IluAbabora Bora Zone.

Table 19: Socio- demographic characteristics of measles case and controls in Gechi District, Ilu Ababora Zone Oromia Region, Ethiopia, 2016

S/No	Variable Name		Cases No (%)	Control No (%)
1	Religion	Muslim	58(96)	102(85)
		Orthodox	1(2)	4(3)
		Protestant	1(2)	14(12)
2	Ethnicity	Amhara	0(0)	4(3)
		Oromo	60(100)	116(97)
3	Occupation	Farmer	1(2)	1(1)
		Housewife	3(5)	2(2)
		Not applicable	33(55)	63(52)
		Others	22(36)	53(44)
		Unemployed	1(2)	1(1)
4	Sex	Female	31(52)	47(39)
		Male	29(48)	73(61)
5	Level/education	KG	1(2)	1(1)
		Not applicable	29(48)	59(49)
		Primary	29(48)	58(48)
		secondary	1(2)	2(2)

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Table 20: Bivariate analysis of measles outbreaks in Gechi Woreda, Ilu Ababora Zone, Oromia Region, Ethiopia from 12/2/-17/3/2016

S/N	Variable		Cases no (%)	Control no (%)	Crude OR (95%CI)	P-Value
1	Being vaccinated	Yes	26(43.33)	84(70%)	0.3277(0.17-0.62)	.00054
		No	34(56.67)	36(30%)		
2	Contact with measles cases	yes	42(70%)	25(21%)	8.78(4.33-17.79)	0.0003
		no	18(30%)	94(79%)		
3	Knowledge on mode of transmission	Yes	24(40%)	79(66%)	0.35(.18-.66)	0.0001
		No	36(60%)	41(34%)	1.66(.89-3.10)	0.11
5	Educational level of family	Yes	32(53.33)	67(55.83)	.90(.48-1.68)	.75
		No	28(46.67)	53(44.17)		
6	History of travel prior to Two weeks	yes	13(21.67)	4(3.33)	8.02(2.49-25.86)	.00007
		No	47(78.33)	116(96.67)		
7	Over crowdedness(≥ 6)	Yes	34(56.67)	42(35.00)	2.43(1.29-4.58)	0.006
		No	26(43.33)	78(65.00)		

Table 21: Bivariate vs. multivariate analysis of independent factor associated with measles outbreak among cases and controls of Gechi Woreda, Oromia Region, Ethiopia 2016

S/NO	Risk factors	Crude OR(95%CI)	Adjusted OR(95%CI)	Adjusted P-value
1	Being vaccinated	0.33(0.17-0.62)	0.43(0.22-0.84)	0.02
2	Awareness on Measles	0.35(0.18-0.66)	0.46(0.23-0.91)	0.03
3	Contact with cases	8.78(4.33-17.79)	9.38(4.43-19.83)	0.0001
4	Travel History	8.02(2.49-25.86)	9.39(2.54-34.76)	0.0008

Laboratory result of the outbreak

Five blood samples were collected from five patients in Gechi Woreda of Ilu Ababora Zone and sent to the EPHI for confirmation. Four specimens were tested positive for measles IgM and the fifth was an epidemiologically linked case during the specified outbreak period.

Interventions taken

Measles outbreak was identified and characterized. Practical assistance was given for health workers on case management. Cases were managed accordingly by distributing supportive treatments (Antibiotics, tetracycline ointment, oral rehydrating salt, Vitamin A, and anti-pyretic) both at house hold and health facility level. Routine surveillance was enhanced and the situation was closely followed at each level on a daily bases. We gave intensive health education for the community members and students in areas

where the community are mostly assembled like, church, schools, local meetings as well as at house hold level while searching for active cases to prevent the transmission of the disease, motivate health seeking behavior and treatment if there is sign and symptoms of measles. The zone has started closely working with the affected and the entire neighboring woredas to prevent/control the outbreak from spreading to other areas, and alarming the community, health extension worker and community leader to strength the local surveillance system. In addition active surveillance has been conducted in neighboring kebeles of the woreda. The measles vaccination coverage within the specific kebeles was reviewed and bordering villages with low vaccination coverage were vaccinated. Schools in the highly affected area were closed to minimize mode of transmission

Discussion

Four out of the five the blood tests performed were positive for measles specific IgM antibodies in the district and outbreak was declared. This is similar with the national measles guide line threshold, five suspected cases or three laboratory confirmed cases were needed to declare an outbreak of measles. Therefore, we confirmed the existence of measles outbreak in the district with a prevalence of 4.4/1000 and 80% IgM positive among a total of five clinically measles suspected cases from 4 October/2015-7 February/2016 (11). We identified 394 suspected cases with no deaths in ten Kebeles of the district from 4 October 2015 to 7 February 2016; the overall attack rate (AR) and case fatality rate (CFR) of the district was (0 and 4.4) respectively. In Ethiopia, the expected case-fatality rate is between 3% and 6%; the highest case-fatality rate occurs in infants 6 to 11 months of age, with malnourished infants at greatest risk. These rates may underestimate the true lethality of measles because of incomplete reporting of outcomes of measles illness. In certain high-risk populations, case-fatality rates as high as 30% have been reported in infants aged less than 1 year of age. The prevalence of

measles cases in Ethiopian is one per 1000 persons (1). The similarity of the two study was concerning to prevalence of measles cases; but, regarding to case CFR this study shows zero(0) result this might be due to incomplete reporting of death cases or good case management. As multivariate analysis of this Gechi Woreda outbreak investigation shows, being vaccinated for measles infection and knowledge on preventive aspect of measles vaccine were protective factor for developing the disease and statically significance with an Adjusted odd ratio (AOR) of 0.43(95% CI = 0.22-0.84, P= 0.02), and 0.46(95%CI=0.23-0.91, P=0.03) which is similar with the study done in Dhaka, Bangladesh (12). In this study contact with measles case and travel history were factors that remained independently associated with contracting measles in Gechi district with AOR=9.38(95%CI: 4.43-19.83, P=0.001) and AOR=9.39(2.54-34.76) respectively. It was similar with study conducted in Zaka district (13). This all factors may contribute to the occurrence of measles outbreak in Gechi District. As a response of an outbreak, cases were treated to prevent further spread; and reduce morbidity and mortality relate to measles.

Ongoing active surveillance was enhanced and continued in the community by HEWs and the situation was closely followed at each level on a daily bases. Health education was given for the community members of the affected and adjacent kebeles on the mode of transmission, treatment, prevention methods, to enhance their health seeking behavior.

Conclusions and recommendations

Number of measles cases were increasing in Children aged 5-14 including above 15 years

of population. Therefore, the strategy started to incorporate less than 15 years to measles campaign by the Ministry of Health (MoH) should continues at all level (woredas, zonal and regional) to improve vaccination coverage . In addition the woreda health office has to improve routine immunization in the population in collaboration with stakeholders to prevent spread of an outbreak and occurrence of further outbreak in the woreda as soon as possible.

Reference

- [1]. EHNRI; FDRE, Guide lines on Measles Surveillance and Outbreak Management, January 2012 Addis Ababa, Ethiopia
- [2]. In: J Chin (ed). 2000. Control of Communicable Diseases Manual (17th edition). Washington: American Public Health Association
- [3]. WHO: National Center for Immunization and Respiratory Diseases, Division of Viral Diseases 2014
- [4]. CDC. Prevention of Measles, Rubella, Congenital Rubella Syndrome, and Mumps, 2013: Summary Recommendations of the Advisory Committee on Immunization Practices (ACIP). MMWR 2013; 62(RR04); 1-34.
- [5]. Rory D de Vries¹, Annelies W Mesman, Teunis BH Geijtenbeek, W Paul Duprex, Rik L de Swart The pathogenesis of measles 2012
- [6]. National Center for Immunization and Respiratory Diseases, Epidemiology and Prevention of Vaccine-Preventable Diseases 2015
- [7]. VPD Surveillance Manual, 6th Edition, 2013 Measles: Chapter 7-1
- [8]. Medicines Sans frontiers-Operational center Brussels Factsheet-February 2012
- [9]. World Health Organization (WHO). Summary of WHO Position Papers – Recommended Routine Immunizations - updated. 26 February 2014; Available from :<
<http://www.who.int/immunization/documents/positionpapers/>>.
- [10]. Akalu HB (2015) Review on Measles Situation in Ethiopia; Past and Present. J Trop Dis 4: 193. doi:10.4172/2329-891X.1000193
- [11]. Public Health Emergency Management Guidelines for Ethiopia 2012
- [12]. Syed M. Akramuzzaman, et al., Measles vaccine effectiveness and risk factors for measles in Dhaka, Bangladesh; Bulletin of the World Health Organization. 2002. p. 776-782.
- [13]. Kufakwanguzvarova W Pomerai et al. Measles outbreak investigation in Zaka, Masvingo Province, Zimbabwe, 2010

5.2 Quadriplegia Rabies Post Exposure Vaccination, Shashemene District, West Arsi zone, Oromia, Ethiopia, 2015

Abstract

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Background: Rabies is a serious disease. It is caused by a virus. Rabies is mainly a disease of animals. Humans get rabies when they are bitten by infected animals. There are two clinical manifestations of rabies – frantic and paralytic. Frantic rabies is most common form of human rabies.

Case Report: Sudden Quadriplegia was detected in a 28 year-old male patient who had taken the medication for rabies immunization. A case report study design with retrospective review of medical records was conducted.

Conclusion: This study presents a case report of sudden Quadriplegia developed after rabies immunization - no other etiological factors were detected and clinical management is discussed in light of the literature.

Key Words: Quadriplegia, rabies, side effect, vaccination, Shashemene, Oromia, Ethiopia

Introduction:

The Greeks called rabies lyssa or lytta which means frenzy or madness. They named human rabies hydrophobia which means fear of water, a symptom shown by rabies victims. Rhabdovirus is Lyssavirus genus. The family Rhabdoviridae consists of more than 185 different viruses isolated from both plants and animals. Rabies is susceptible to disinfectants and inactivated by drying. Rabies virus found in all over the worldwide except Australia, Antarctica, and some islands. The genus Lyssavirus has only one major sero group [1]. Rabies is a person bitten by suspected rabid dog and presented with fever, nausea, vomiting, agitation, pharyngeal spasms (hydrophobia/aerophobia) [2]. Rabies is a serious disease. It is caused by a virus. Rabies is mainly a disease of animals. Humans get rabies when they are bitten by infected animals [3].

Rabies is a viral disease that affects the central nervous system (CNS) of Mammals and has an extremely high case fatality rate [4]. Rabies is a disease transmitted from animals to humans. There are two clinical manifestations of rabies – frantic and paralytic. Frantic rabies is most common form of human rabies [5]. There are different types of side effect following post

exposure vaccination: like Burning, crawling, itching, numbness, prickling, "pins and needles", tingling feelings, confusion, cough, difficulty in moving, difficulty swallowing, feeling of discomfort, inflammation of joints, irritability lack or loss of strength, muscle pain, stiffness, or weakness, paralysis or severe weakness of legs, puffiness or swelling of the eyelids or around the eyes, face, lips, or tongue, rash, seizures, shortness of breath, skin rash, hives, or redness, stiffness of arms, legs, or neck, swollen, painful, or tender lymph glands in the neck, armpit, or groin tightness in chest, unusual tiredness, vomiting, fast heartbeat. More common post exposure vaccinations side effect include: Chills, dizziness, fever, general feeling of discomfort or illness, headache, itching, pain, redness, or swelling at the injection site, muscle or joint aches, nausea, stomach or abdominal pain [6]. The World Health Organization estimates that 59,000 people die from rabies annually (or 160 people a day) and approximately 15 million people

receive treatment after being exposed to animals suspected of having rabies. The greatest threat of rabies occurs in the world's poorest regions, Africa and Asia, where domestic dog vaccination is not widely implemented and access to post-exposure treatment is limited. Rabies remains a notoriously neglected and under-reported disease in the most affected countries, largely because healthcare in these regions tends to be severely limited and most victims die at home.

The Global Alliance for Rabies Control also estimates an enormous global economic burden, reaching 8.6 billion USD annually. The vast majority of this burden is shouldered by Africa (36.4%) and Asia (59.6%) [7]. A retrospective record review conducted in Ethiopian public health institute (EPHI) shows that 20414 suspected rabid animals were clinically examined and the overall post exposure treatment for humans was 17204 within and around Addis Ababa in the period of 2001-2009. Among 3460 animal brains investigated in the laboratory with fluorescent antibody test (FAT) 75% were confirmed as rabies positive. The production and distribution of anti-rabies vaccine reached 130,673 treatment doses for human vaccine and

85,055 doses for animal respectively. The recorded data indicated the underestimate of rabies diagnosis, post exposure prophylaxis and fatal human cases, which could be attributed due to the absence of national rabies surveillance system vaccine [8].

In August 17/2015 there was a call from Shashemene district to Oromia Regional Health Bureau (ORHB) for anti-rabies drugs need for rabid individuals in one of Shashemene district kebele , Alache Arabate. The Bureau informed the health office as there was anti rabies drug in Arsi Negele District which was taken from Ethiopian Public Health Institute (EPHI) in that similar month for people who eat rabid oxen meat in the district. Shashemene district health office took anti rabies drug from there and started to treat suspected individuals with it in Malka Oda Hospital of Shashemene town. In the course of treatment a 28 years female patient developed progressive paralysis. After her paralysis, there was a dilemma in the family of the women whether the paralysis was due to vaccine or health professional mistake. For the second time Shashemene district health office call to ORHB for assistant to differentiate whether the Paralysis was due to Vaccine or health professionals fault. By

Considering this issue ORHB, PHEM core processes send me to the site to differentiate whether the Paralysis was due to vaccine or health professionals' error. This study is

Methods and Materials

Study Area

Shashemene rural is one of the 15 districts' found in the West Arsi zone of Oromia National Region state which is situated to the Southern part of the Region. The district has 76788 km² area and 250km distance from capital city of the region Addis Ababa. It shares boundaries with Arsi Negele to north, Kofale to the east, Shalla to the west and Wondo and Bashan Guracha Districts to the south. Shashemene woreda has no urban kebele and there are 38 rural Kebeles with total population of 251225, projected from 2007 population census [4]. Entire population live in rural areas, and most of the people in the district are subsistence farmers. In the district there are one district health office, 7 health centers and 38 health posts. District population get hospital health services from two hospitals found in Shashemene town called Shashemene Referral Hospital and Malka Oda Hospital. Case was defined by WHO case definition of Rabies as Suspected: A case that is compatible with the clinical case definition.

designed to assess course of development of quadriplegia in a woman received rabies vaccine after exposure

Probable: A suspected case plus history of contact with a suspected rabid animal.

Confirmed: A suspected case that is laboratory-confirmed and human exposure to rabies as Possible exposure: A person

who had close contact (usually a bite or scratch) with a rabies-susceptible animal in (or originating from) a rabies-infected area.

Probable exposure: A person who had close contact (usually a bite or scratch) with an animal displaying clinical signs consistent with rabies at time of the exposure, or within 10 days following exposure in a rabies-infected area and Exposed: A person who has had close contact (usually a bite or scratch) with a laboratory-confirmed rabid animal [13]. Finally operational definition of Quadriplegia/ Tetraplegia defined as paralysis caused by illness or injury that results in the partial or total loss of use of all their limbs and torso [14].

A case report study design with retrospective review of medical records was conducted to investigate cause of quadriplegia rabies post exposure vaccination. Data was collected by open

ended questionnaires developed to assess socio demography, contact history, clinical sign and symptoms, family history and illness related to paralysis and food intake of the patient in the course of paralysis. Data was analyzed descriptively based on specific objectives and narration was done from result obtained.

Ethical consideration

Results

Alache Arabate is one of Shashemene rural district kebele of West Arsi zone Oromia Region .In this kebele in August 17/2015 an eleven years old male child was bitten by a dog in neighborhood. The dog was characterized by unprovoked aggression, eating chicken and running towards the cars since their home is around the street. Finally the dog was killed by car accident in August 18/2015.

Families of the child took him to Jorro clinic, one of medium private clinics found in Shashemene town. Health professionals of the clinic treated the child by prochain pencil line injection for five days and returned back to home. The family also visited one of nearby traditional healer; took drinking type traditional medicine for the child and start to treat the child with it. The child developed abdominal discomfort after

Permission Letter to conduct investigation of Quadriplegia was written to West Arsi zone health department by Oromia Regional Health Bureau Research Review committee and again West Arsi zone health department was written similar letter to Shashemene district health office. Finally, informed consent was obtained from parents of the patient.

three days of taking the traditional drinking medicine; then stopped to take it. After forty nine days(i.e. October 1/2015) the child developed sign and symptoms of rabies including burning sensation which started from sole of bite leg and gradually progress to the upper leg, thirsty with hydrophobia ,illusion, lack of sleepiness, difficulty to urinate and weight loss. Family took the child to Shashemene referral hospital; discuss the issue with physician and the physician disclosed that treating the child is impossible and return back to the home by prescribing anti pain for the child .Before his death in October 2/2015 the child bite 4 people. Among these people only one person took anti rabies Vaccine the remaining three people treated by traditional medicine. Two children in the village shared candy with the affected child and were

treated with traditional medicine. Five people directly had direct contact with saliva of affected child on intact skin and started to take ant rabies vaccine. Among these persons a twenty-Eight year-old woman, Oromo in ethnic after received a total of thirteen doses of Phenol zed ant rabies vaccine before the development of any symptoms. These thirteen doses of phenol zed ant rabies vaccine were administered according to schedule in the subcutaneous of umbilical, starting from the day of the contact. She had a history of fever, and back pain for one day before onset of paralysis. Her past history elicited an incident contact of saliva of child with symptom of rabid dog in her right hand (grade I) three weeks back. Apart from this there was no recent history of nerve illness, medication use, head trauma, stroke, increased blood pressure or systemic illness. She had no family history of paralysis. The common food intake in their home was “teff injera” with” shiro wot” and no history of food intake changed in that three previous months. She used tap water for drinking and she has no history of alcohol intake. The patient had complained of back pain, history of tingling, numbness at the lower

extremities but there was no history of hydrophobia, Photophobia or behavioral changes. Clinical examination revealed a febrile, alert, and conscious woman. Her temperature was 36.8 °C; pulse rate was 86/min, blood pressure 100/50 mm Hg, respiratory rate 20/min, and SPO₂ 92%. Neurological examination detected that difficulty of urination. Laboratory investigations showed hemoglobin: 11.4 g/dL, white cell count 81800/cu.mm (neutrophil: 57.8%, lymphocyte: 9.6%, eosinophil: 0.00%), platelet count: 1, 87000/cu.mm. Conservative management was started but rapid progression of paralysis occurred over the next two days. There was involvement of respiratory muscles as well as features of bulbar palsy. The patient was put on ventilator support in intensive care unit in Black Lion Hospital. She admitted in Black Lion Hospital in October 16/2015 and discharged in January 11/2016 after she indicated improvement on respiratory system, but still she can't move her both upper and lower limb. Now she is on physiotherapy treatment and still she can't move her upper and lower limb.

Discussion

The woman directly had direct contact with saliva of rabid child on intact skin (grade I) and visited hospital for treatment. The physicians without taking appropriate history of contact status of the woman initiated anti rabies vaccine. After receiving thirteen dose of anti rabies vaccine the woman developed quadriplegia. Three type of exposure to rabies based on WHO category

Category I, is touching or feeding of animals licks on intact skin type of exposure is none and treatment is not recommended if reliable case history is available. Category II, is nibbling of uncovered skin minor scratches or abrasions without bleeding type of exposure is minor administer vaccine immediately stop treatment If animals remain healthily throughout observation period of 10 days or if animals euthanized and found to be negative for rabies by appropriate laboratory techniques. Category III, single or multiple Trans dermal Bites or Scratches Contamination of mucus membrane with saliva (Licks) type of exposure is severe administer rabies immunoglobulin and vaccine immediately

stop treatment If animals remain healthily throughout observation period of 10 days or is killed humanely and is found to be negative for rabies by appropriate laboratory techniques [9]. In our case report treatment is started in category one which is not recommended to anti rabies vaccination by WHO criteria. This might be due to lack of health professional awareness on rabies vaccination criteria or fearing of hundred percent cases fatality rate of the diseases. Human rabies infections are divided into two forms: furious (or encephalitic), and paralytic (or dumb). The furious form presents with the hydrophobia, delirium and agitation that create the common picture of rabies. About a fifth of patients presents with the paralytic form and have little clinical evidence of cerebral involvement until late in their course. The spinal cord and brain stem bear the brunt of the illness in the paralytic form. In contrast to the furious form Paralytic rabies patient lack hydrophobia, aerophobia, hyperactivity, or seizures. Their initial findings suggest an ascending paralysis, resembling acute inflammatory polyneuropathy (the Guillain-

Barre syndrome), or a symmetric quadriplegia. Weakness may be more severe in the extremity where the virus was introduced. Meningeal signs (headache, neck stiffness) may be prominent despite a normal sensorial. As the disease progresses, the patient becomes confused and then declines into coma. The major differential for furious rabies is viral encephalitis. In the absence of exposure to a rabid animal, and if hydrophobia and hyperactivity are not prominent, it may be difficult to distinguish among these possibilities. CSF and electroencephalographic findings in rabies may mimic those of herpes simplex encephalitis; some patients receive empirical therapy with acyclovir while awaiting a more secure diagnosis. Tetanus or strychnine poisoning should be considered. Paralytic rabies may resemble acute inflammatory polyneuropathy, transverse myelitis, or poliomyelitis (9). Our case report is similar with this study by lacking hydrophobia, aerophobia, hyperactivity, or seizures and ascending paralysis. Furious and Paralytic type are 80% and 20% respectively (9). In both circumstance death

Limitations

Lack of post prophylaxis related paralysis study without direct contact in our country

is due to Cardio-Respiratory failure. Survival is 3-5 days in furious type and 7-21 days in paralytic. In our case report the woman stay for three months in the hospital and she also still alive. This might be the paralysis is not related to rabies case and it is related to vaccine. N. Panicker,(etal.) (2004) in India examined Diagnostic dilemma in flaccid paralysis following anti-rabies vaccine. They found that a neuro-paralytic syndrome following Pasteur's post-exposure rabies immunization was first recognized in 1889. Even though modified vaccines have been developed, Sample vaccine is still used commonly because of its low cost and easy availability. Sample vaccine is a suspension of phenol or beta-propionolactone killed virus in sheep brain. They also found incidence of a neurological complication with Sample vaccine is approximately 1 per 220(10). In our country this suspension of phenol has been used even though, it has high complication. This might be due to absence of data indicating magnitude of risk of this vaccine in our country or economic problem.

may lead to inappropriate conclusion. Three fore study related to Rabies vaccination should be initiated to minimize discrepancy.

Conclusion

Health professionals begin treatment of suspected rabies without taking appropriate history and diagnosis due to 100% fatal behavior of the disease or lack of awareness on rabies; this increases drug side affected expected for normal rabies case like paralysis. On the other hand, anti rabies vaccine used in our country has, high side effect, but this is hidden due to poor rabies surveillance system Anti rabies drug is

contributing factor for quadriplegia in this study.

The clinical diagnostic techniques and the available vaccines must be improved. All possible efforts have to be made by the government and other bodies to increase health professionals and community awareness on prevention and control of the disease. In addition, further study is needed to investigate factor contributing to Paralysis in rabies vaccination to minimize the risk

References

- [1]. Centers for Disease Control and Prevention.CDC. Compendium of Animal Rabies Prevention and Control, 2011 National Association of State Public Health Veterinarians, Inc. (NASPHV)
- [2]. Federal Democratic Republic of Ethiopia Public Health Emergency Management, Guidelines for Ethiopia. Ethiopian Health and Nutrition Research Institute Public Health Emergency Management Centre, February 2012, Addis Ababa, Ethiopia
- [3]. Centers for Disease Control and Prevention. CDC twenty four seven. Saving Lives, Protecting People Rabies vaccine information statement-2009
- [4]. Rabies and Rabies Related Lyssa viruses-2012
- [5]. (WHO Asia 2006)
- [6]. Mayo Foundation for Medical Education and Research (1998-2015)
- [7]. World fact sheet ET(01/09/2015)
- [8]. The status of rabies in Ethiopia: A retrospective record review (2001-2009)
- [9]. The Advisory Committee on Immunization Practices (ACIP-2006)
- [10]. J. N. Panicker, (etal). Diagnostic dilemma in flaccid paralysis following anti rabies vaccine (2004)
- [11]. Indian Journal of Medical Microbiology (2011) 29(2):178-91
- [12]. (Infectious Disease Epidemiology Section Office of Public Health, Louisiana Department of Health & Hospitals 800-256-2748 (24 hr. number).
- [13]. "WHO recommended standards and strategies for surveillance, prevention and control of communicable diseases" 2013.
- [14]. From Wikipedia, the free encyclopedia

Chapter-VI
Abstracts for
Scientific
Presentation

6.1.1 Measles Outbreak in_ Chiro woreda, West Hararge zone, Oromia Region, Ethiopia, 2015

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Abstract

Background: Measles is highly contagious viral disease and is one of the leading causes of death in children worldwide. There was a call from Chiro woreda for possible assistance to investigate measles like illness affecting the community. We investigated to verify the existence of measles outbreak in the woreda and assess factors contributing to the outbreak.

Method: Case-control study supported by descriptive cross-sectional study design was conducted on January 2015 in Chiro woreda. Cases were identified by Public Health Emergency management Guideline (PHEM) case definition and compared each of them to two unmatched controls recruited in the household of the closest neighbors. A total of 180 samples interviewed where 60 were cases. The outbreak was confirmed by laboratory. Data collection instrument was prepared .Bivariate and multivariate analysis was conducted and odd ratio with 95%CI significant statistical association was declared at <0.05 P-value.

Result: A total of 173 cases (attack rate 82/100,000) and one death (case fatality rate 578/100,000) were identified .Of the cases 54(90%) out of 60 were less than 5 years of age. Measles vaccination coverage for 2014 was 74%. The statistically significant variables are family size, Educational level of mother, Contact with measles cases and vaccination status.

Conclusion: Less than 5 years of age were affected by the outbreak. Low community awareness and low vaccination coverage was prone contributing to the outbreak. Under tacking supplementary immunization, maintaining routine vaccination coverage increasing communities understanding reduce measles outbreak.

Key words: Measles outbreak, Case-control, Chiro, Oromia, Ethiopia, 2015

6.1.2 Quadriplegia Rabies Post Exposure Vaccination, Shashemene District, West Arsi zone, Oromia, Ethiopia, 2015

1. EFETP, Addis Ababa University, School of Public Health
2. Ethiopian Public Health Association and EFETP Coordinator
3. Addis Ababa University EFETP Coordinator
4. Addis Ababa University EFETP Coordinator
5. Oromia Regional Health Bureau PHEM Core process

ABSTRACT

Background: Rabies is a serious disease. It is caused by a virus. Rabies is mainly a disease of animals. Humans get rabies when they are bitten by infected animals. There are two clinical manifestations of rabies – frantic and paralytic. Frantic rabies is most common form of human rabies.

Case Report: Sudden Quadriplegia was detected in a 28 year-old male patient who had taken the medication for rabies immunization. A case report study design with retrospective review of medical records was conducted.

Conclusion: This study presents a case report of sudden Quadriplegia developed after rabies immunization - no other etiological factors were detected and clinical management is discussed in light of the literature.

Key Words: Quadriplegia, rabies, side effect, vaccination, Shashemene, Oromia, Ethiopia

6.1.3 Assessment of Control Measures and Trends of Malaria in Oromia Regional state, Ethiopia 2015

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2. Ethiopian Public Health Association and EFETP Coordinator

Abstract

Introduction: Malaria is one of the most important health issues in Ethiopia. Approximately 60 percent of Ethiopia's population lives in malaria-endemic areas. In 2014, according to the Ministry of Health, malaria was one of top ten leading cause of morbidity and health facility admissions, accounting for 5.3 and 2.4 percent respectively. Between 2000 and 2013, an expansion of malaria interventions helped to reduce malaria incidence by 30% globally, and by 34% in Africa. During the same period, malaria mortality rates decreased by an estimated 47% worldwide and by 54% in Africa. In the under-five age group, mortality rates have declined by 53% globally, and by 58% in Africa. This study is designed to assess control measures and trends of malaria in Oromia Region.

Method: A, retrospective record review for the period of 2011 to 2015 GC was carried out at Oromia Region using the available control measures and malaria cases data from Regional Malaria, PHEM and Planning department. Descriptive cross-sectional study was used to analyze the five year control measures and trends of malaria in Oromia Region.

Conclusion: Increasing number of health facility, with increased human power and applying malaria prevention and controlling measures decrease morbidity and mortality related to malaria illness

Chapter-VII
Narrative
Summary of
Disaster
Situation

7.1 Emergency Need Assessment Report of Health and Nutrition in West Arsi, North and East Shoa zones Oromia Region, Ethiopia 2015

Summary of Key Findings

The Oromia regional state hosts a total population of 31,294,992 Within 18 and 12 rural and urban administrative zones respectively.

Health: Most of the public health emergencies in the region emanate from presence of low immunization coverage. The major hazards are Cholera, measles, and malaria. The public health tools such as surveillance system, coordination and emergency preparedness and response plan are not functional as needed and equipped with budget. There is very low Public health emergency management data analysis at Woreda and Zonal level.

Nutrition: In the visited zone OTP and SC. programs are established except Adamitulu Jiddo Kombolcha woreda of East Shoa zone with no single Sc. The past five months namely January, February, March, April and May data revealed that there are dramatic increases of severe acute malnutrition (SAM) cases in three zones in general and West Arsi zone in special. In three visited zones there is no supplementary feeding program which is used to support moderate acute malnutrition and given for those child discharged from OTP program. This lead to increased number of re-admits ion cases and also there is no food for care taker.

Introduction

Belg emergency need assessment is an assessment conducted once in a year in all regions in accordance to & under leadership of the federal disaster response management & food security coordination agency through its structure. Based on this, the team comprising of NGOS, UN agencies and other government bureaus conducted the emergency need assessment in Oromia region from 19 June to 5 July 2015. Oromia is the largest region in Ethiopia. Its capital City is Finfinne. The region is sharing boundaries with all regions except Tigray Regional state. Administratively the region is divided into 18 rural and 12 urban administrative zones totally 30 zones in number. There are around 337 Woredas in it .Total Kebeles in Oromia are 6583. In Oromia Region there are around 43 governmental hospitals, 67 NGO hospitals, 1297 health center, 6583 health post and 615 other health facilities(1). Its population is 31,294,992 projected from 2007 Central Statics Agency population and housing census. Among total population female comprise 51 %(2). Area of the region is about 298,164.29 km².The study was conducted in three Belg productive zones including West Arsi, North and East Shoa. In general the region had been exposed to measles outbreak and drought in this year. Belg emergency need assessment is crucial to forecast and assess the magnitude of the emerging threats and accordingly to make necessary interventions, plans and preparations so that to early prevent unnecessary life and socio-economic harm.

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Objectives

- The main objectives of the non-food components of the assessment are:
- Assess the extent, type, magnitude, severity and likely of the different hazards (drought, human epidemics, conflict, floods, etc) and risks to the populations in the most vulnerable Woredas (including identifying the most vulnerable populations) for Health, Nutrition, WASH and education related emergencies in Oromia region (June 19 up to July, 2015).
- Assess the existing capacity of the basic social services such as health, nutrition WASH and education to address the emergencies likely to occur. It also determines the shortcoming (gap) in the capacity of the existing services to address the problem.
- Identify areas where emergency assistance might be needed and come up with reasonable estimates of the size of the population needing emergency assistance and the duration of assistance.
- Based on the findings on the assessment of risks for, and the need to address potential emergencies and develop necessary plans for fostering preparedness sectors to adequately address the potential emergencies

Methodology

- Data was collected on key indicators that have impacts on human health and basic social service.
- Use of structured questionnaires for all sectors and conduct meeting discussions with officials undertake interview with zonal and woreda officials.
- Review of existing relevant documents (secondary data) based on the agreed tools

Results

Health and Nutrition summary for West Arsi, East and North Shoa zones, 2015

West Arsi

Health

The total population of West Arsi zone is 2,405,588 (1,184,784 male and 1,223,804 female) of which 122,640 live in urban and 2,285,940 in rural area. There are 364 Kebeles of which 331 are rural and 33 are urban.

The top five causes of morbidity in the under five are: pneumonia, diarrhea (non bloody), acute respiratory tract infection, and Diarrhea with no dehydration in order of occurrence. The top five

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causes of morbidity in the above 5 are acute febrile illness, pneumonia, acute upper respiratory tract infection, dyspepsia and typhoid fever in order of occurrence

Penta 1 coverage of the zone in 2014 is 104% while penta 3 is 95.7%. The measles coverage is 92%. Meningitis vaccination was conducted in October 2014 where 101% of the target population was inoculated with the antigen. Latrine coverage in the zone is 92% with 463,945 latrines constructed out of the target of 501,789.

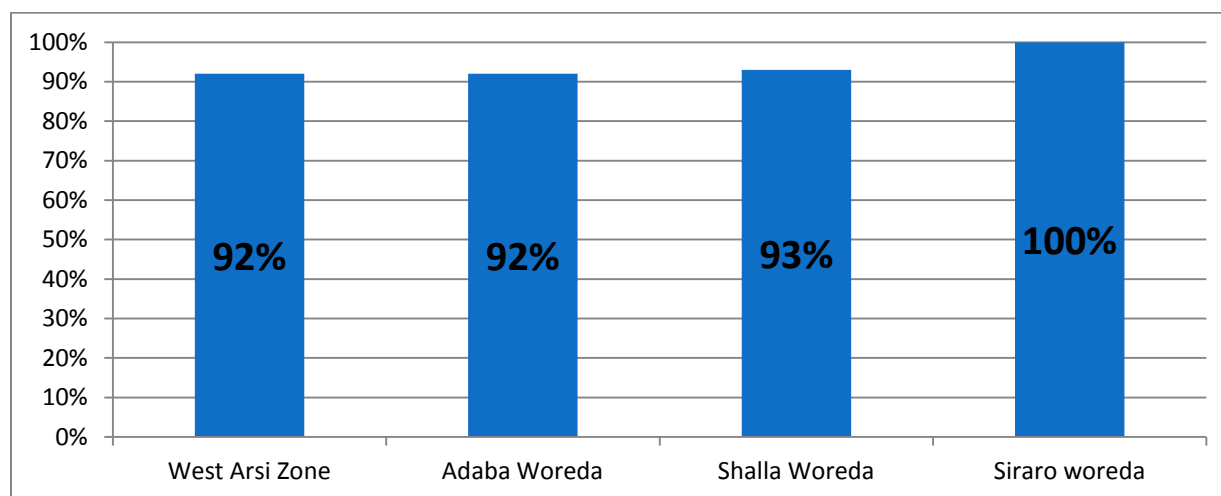


Figure 40 : Latrine coverage of the visited Woredas of West Arsi zone Oromia Region, Ethiopia, 2015

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In West Arsi zone among 331 kebeles 102(31%) are open defecation free kebeles(odf) Siraro woreda 10 kebele out of 28 (36%), Shalla woredas 7 kebeles out of 38 (12%) and Adaba woreda 3 kebeles out of 24(12.5%) are odf kebeles.

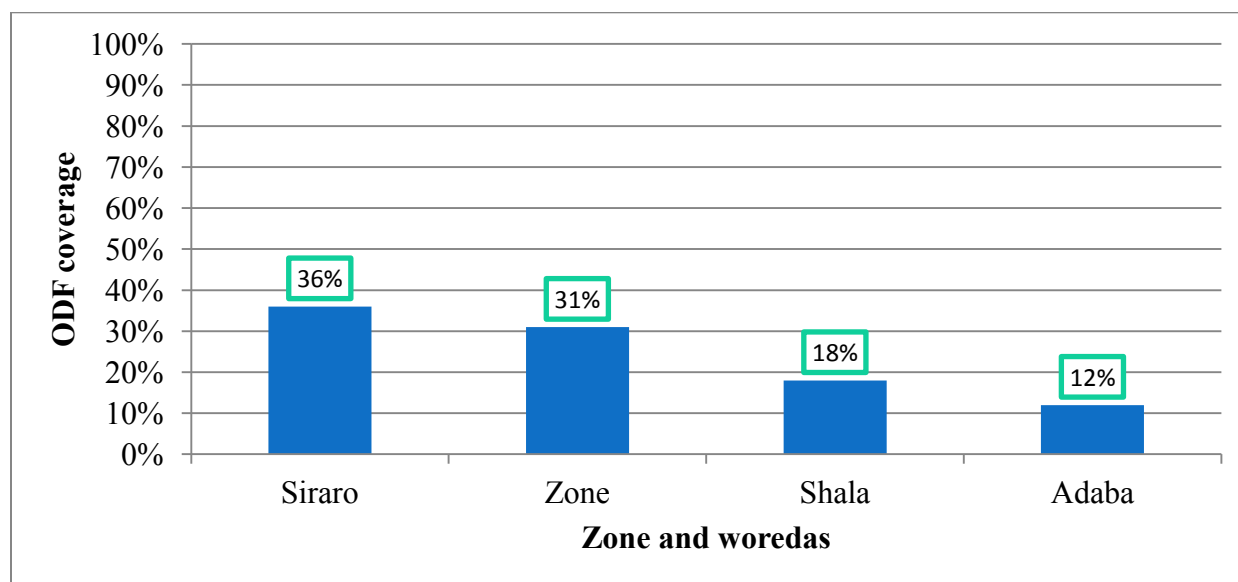


Figure 41: ODF kebeles of visited woreda compared with zonal average in West Arsi zone, Oromia 2015

Seven out of 15 Woredas are malarious. The zone has implemented malaria intervention (distribution of ITN's and IRS in 2014. The ITN coverage for 2014 was 97% and the IRS coverage was 33%. The following graph shows the malaria trend of Siraro and Shalla Woredas

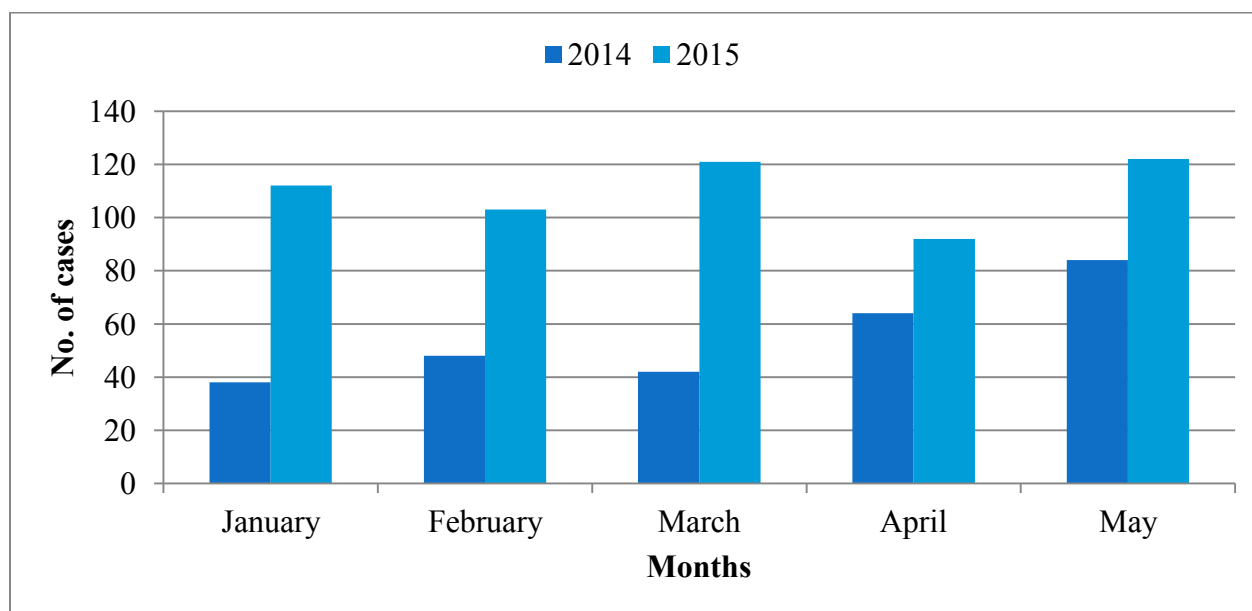


Figure 36: Trend of Malaria cases in Siraro Woreda, West Arsi zone Oromia Region, Ethiopia (2014 and 2015)

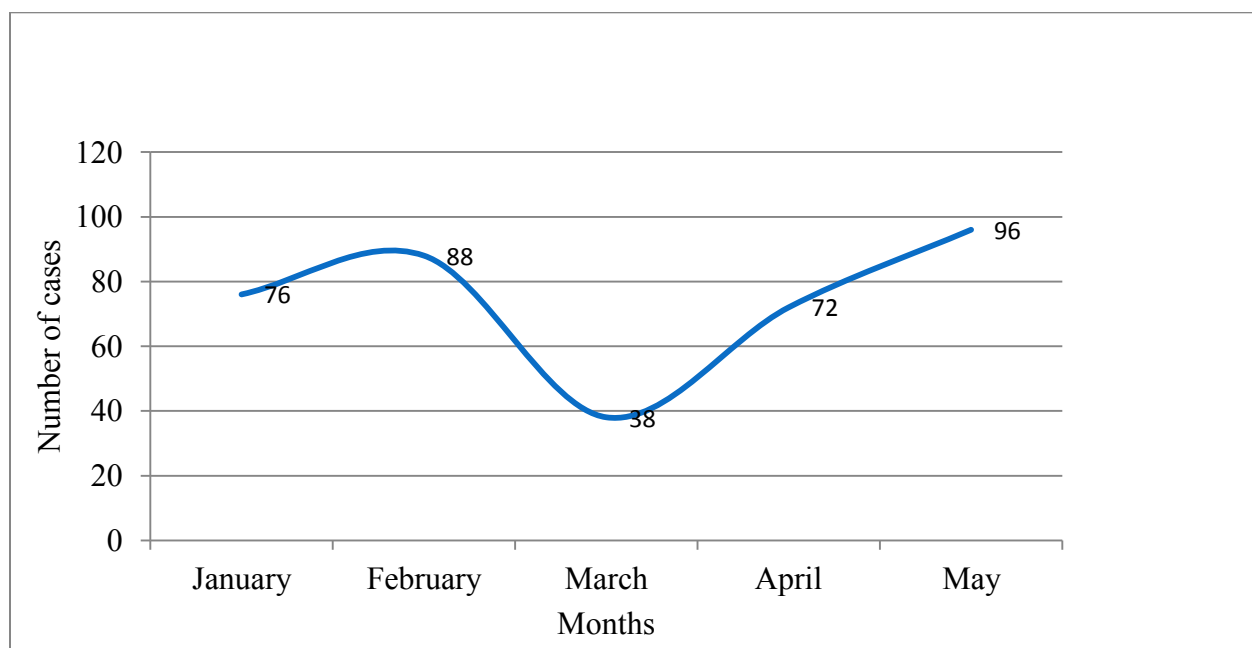


Figure 42: Trend of Malaria in Shalla Woreda, West Arsi zone Oromia region, Ethiopia 2015

In view of the current Belg rainfall delay and decline, the zone is experiencing both food shortage (Human and pasture for livestock) and safe drinking water for humans and water for livestock. Six Woredas are particularly severely affected: Shashemene, Shalla, Siraro, Adaba, Arsi Negele and Wondo. The team visited three of the six Woredas namely Shalla, Siraro and

Adaba. These Woredas revealed that there is serious shortage of food and drinking water for both their residents and livestock. Both the delay and reduction in rainfall in this Belg as well as poor productivity in the previous Maher season have resulted in food insecurity with resultant rampant severe acute malnutrition (SAM) where for instance the number of cases has doubled in Ginbot 2015 compared to the same month in the previous year. Moreover, chronic drinking water shortage coupled with failure of scheme water table recharging as well as frequent pump damage due to low water table has forced the affected population to resort to long distance travel (5- 25 Km) to fetch water (paying 10-15 birr/ 20 liter Jerkin) or drink untreated and unsafe pond water when the delayed rainfall fill ditches in the villages. There were outbreaks of Measles in two of the visited Woredas (Siraro, 28 cases and zero death; Shalla 21 cases and zero death). There is no ongoing outbreak. Efforts were exerted at strengthening coordination mechanism from the zone to the community level. However, the zone has reported that there is huge shortage of key medications and supplies required for major outbreak prone diseases such as AWD, Measles, malaria and meningitis. Inquiry into emergency preparedness in the visited Woredas revealed that all the three Woredas lack TTC eye ointments, RDT for malaria, LP set for meningitis and CTC for Cholera management, Shalla lacks amoxicillin syrup and vitamin A, Siraro lacks ringer lactate and Doxycycline while Adaba lacks Coartem and RDT. The visited Woredas do not have functional Taskforce which meets regularly. They also lack emergency response fund. Functional Rapid Response Teams (RRTs) exist in all the visited Woredas. Visits to health facilities in the visited Woredas and discussion with health facility workers and review of patient registers have disclosed that there is increase in diarrhea cases (see Fig below for instance) commensurate with the existing situation on the ground: food security problem and drinking water shortage. The team has warned the zone and respective Woredas that the shortage of water with the rampant malnutrition situation will expose the population to a number of communicable

diseases including water borne and vaccine preventable ones

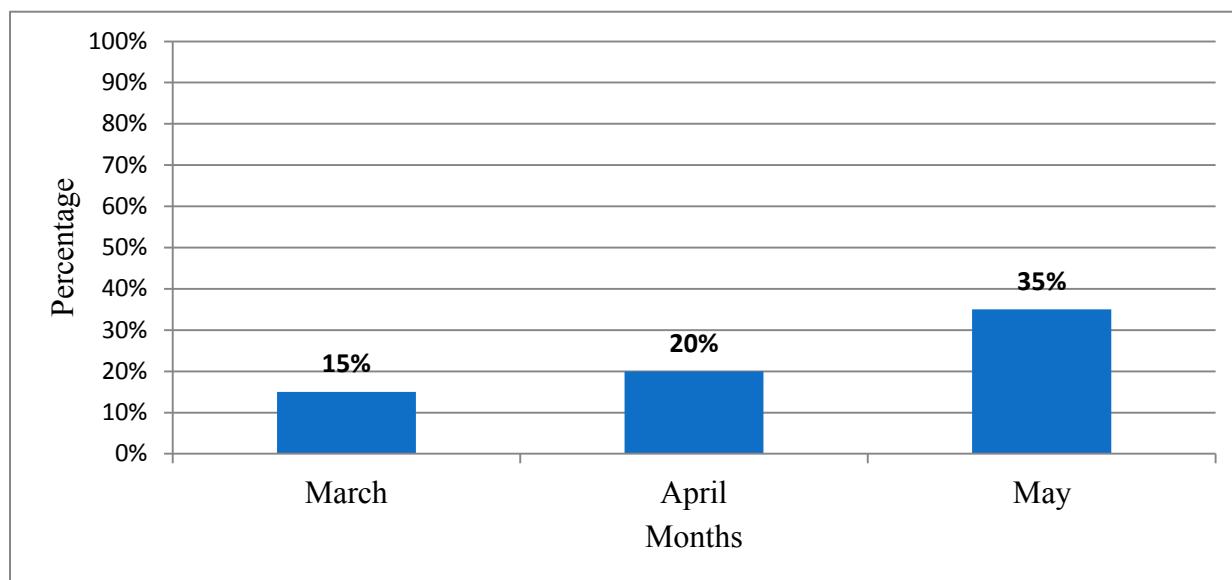


Figure 43: Percentage of Diarrheal cases of three consecutive months' consultations in Shalla woreda of West Arsi zone, Oromia, 2015

West Arsi

Nutrition

In West Arsi zone trends of both OTP and SC. cases increased dramatically. Figure blow indicate this fact

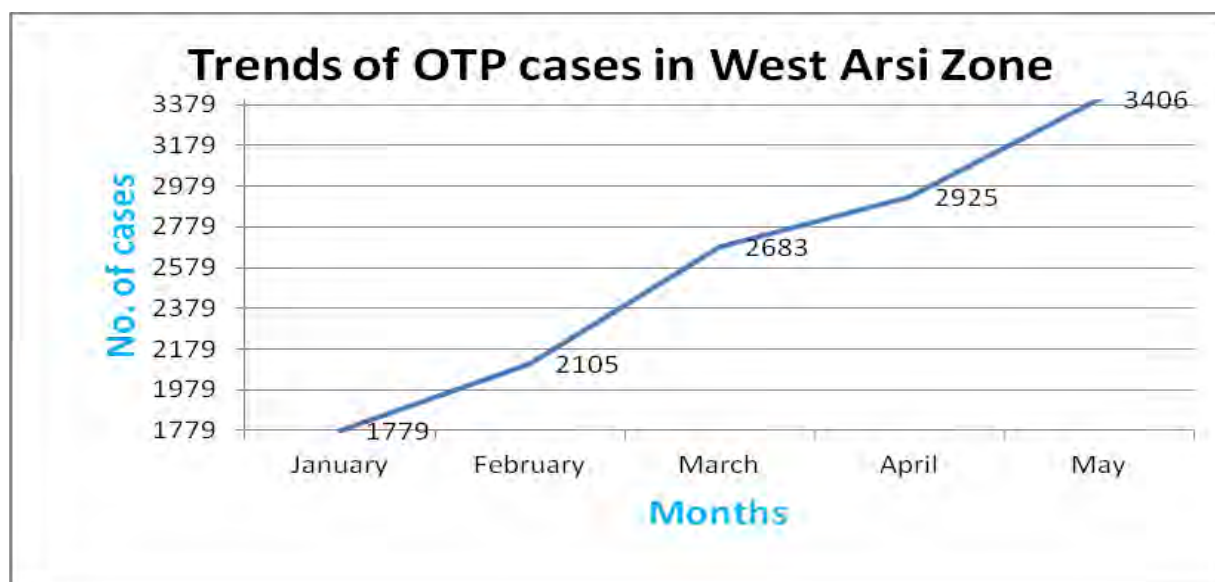


Figure 44: Trends of OTP cases in West Arsi zone Oromia region, Ethiopia, 2015

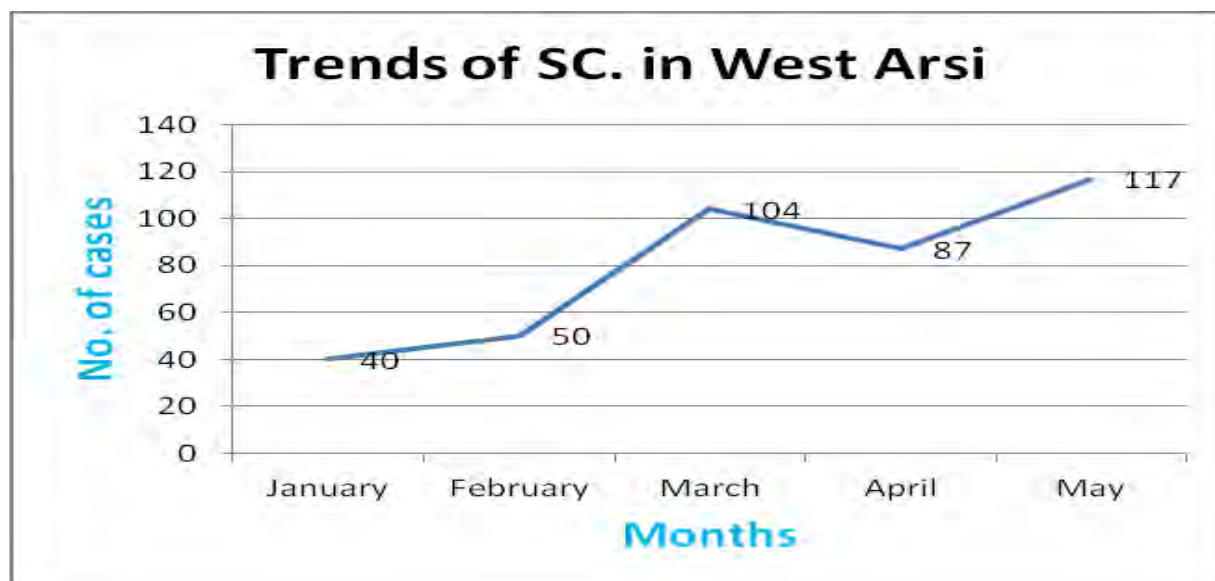


Figure 45: Trends of Sc. cases in West Arsi zone Oromia region, Ethiopia 2015

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Of the under five screened in May 2015 CHD (third round), 8934 out of 36, 0838(2.5%) were found to be MAM cases while 2546 out of 36, 0838 (0.7% were SAM cases (0.5% Miasmic and 0.2% edematous). The screening coverage was 104.6% for the under five. The screening of pregnant and lactating revealed that 7301 out of 81,283 (9%) of the screened (are moderately malnourished. The number of cases seen at OTP and SC in May 2015 is double that of the same month in 2014 according to the Zone focal person. Similarly the SAM cases at the visited Woreda are showing increasing trend as shown in the figure below.

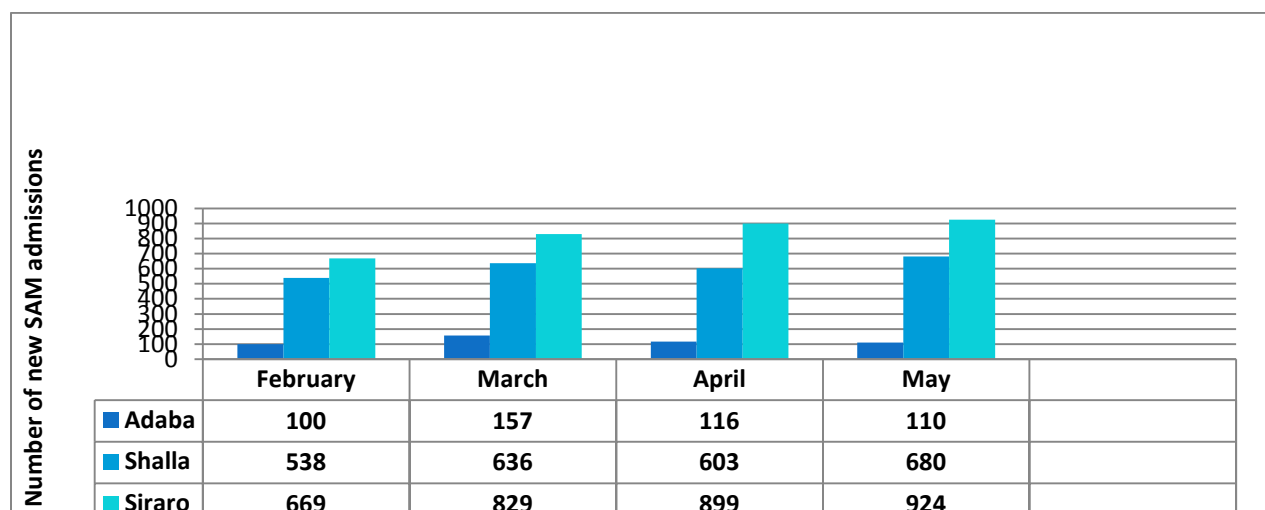


Figure 46: Trends of New SAM admissions in the three visited Woredas of West Arsi zone Oromia Region, Ethiopia 2015

Some of the visited Woredas reported that there is shortage of RUTF and F100 currently. They also raised their concern about shortage of food for care takers of the SAM cases in SC.

North Shoa

Health

The total population of North Shoa is 1,467,555 (734,637 male and 732,918 female) of which 763,048 live in urban and 1,304,507 in rural North Shoa. Of its population 241,119 are under five. There are 267 functional health posts, 51 functional Health centers and 2 hospitals.

In view of the current Belg rainfall delay and declined, the zone is experiencing both food shortage (Human and pasture for livestock) and safe drinking water for humans and water for livestock. Two of the most affected Woredas namely Degem and Jidda were visited by the team. These Woredas revealed that there is serious shortage of food and drinking water for both their

residents and livestock. There was no outbreak of Measles in the past five months. Efforts were exerted at strengthening coordination mechanism from the zone to the community level as there is an ongoing measles outbreak in other adjoining zones. The zone has reported that they lack all the major drugs and supplies for outbreak prone diseases such as AWD, Measles, malaria and meningitis. Inquiry into emergency preparedness in the visited Woredas revealed that all the two Woredas have all the major drugs and supplies for emergency prone diseases except LP set and RDT for meningitis and CTC kit for Cholera. No major risk factors for malaria in Jidda Woreda and thus no reports of malaria cases. Degem is endemic to malaria (seven Kebeles with a population of 55,016 are malarious) and have breeding sites in the form of stagnant water and interrupting rivers. There is also report of depleted control and prevention. Degem has 86% latrine coverage and 72% utilization.

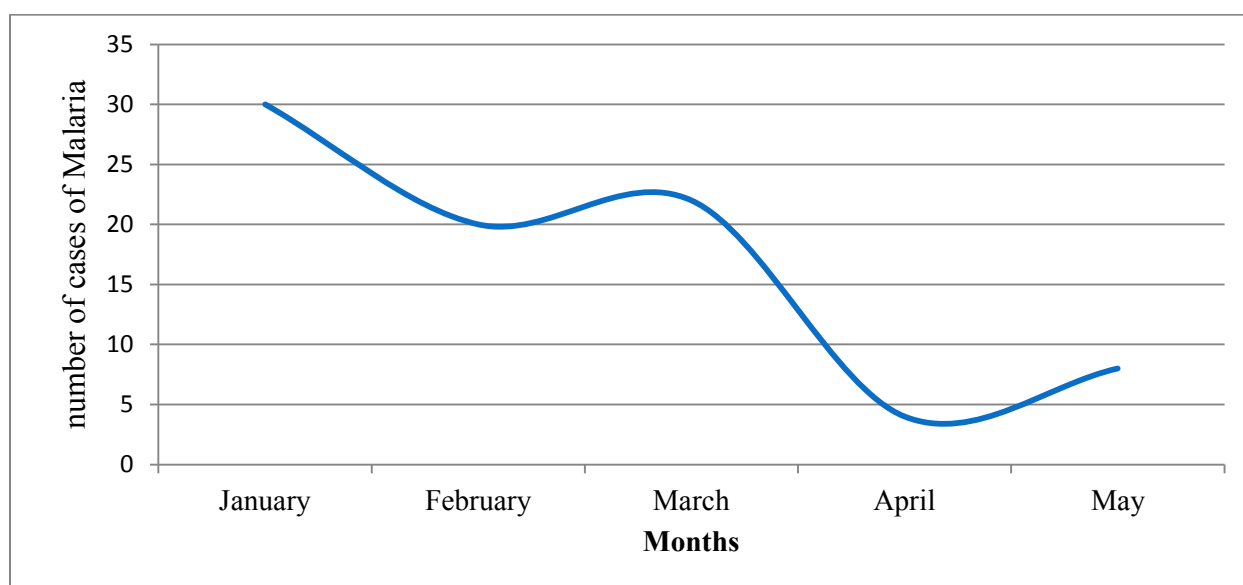


Figure 47: Malaria trend in Degem Woreda of North Shoa zone Oromia Region, Ethiopia 2015.

Nutrition

Of the under five screened (214,822) in May 2007 CHD, 1% (2,758 children) were found to be MAM cases while 0.26 % (560 children) were SAM cases. The screening coverage was 98% for the under five. The screening of pregnant and lactating woman revealed that 3% of the screened (36,835) are moderately malnourished with a screening coverage of 68%.None of the visited Woredas (Degem and Jidda) have SCs. There is no mechanism where the SAM cases on discharged get supplementary feeding as the program does not exist. However, the trend of new

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admissions in the zone compared to last year does not show any significant changes. The number of new admissions in May has shown increase by 58 cases compared to April 2015 EC. In the visited Woredas, the trend is one of decreasing as shown in the figure below.

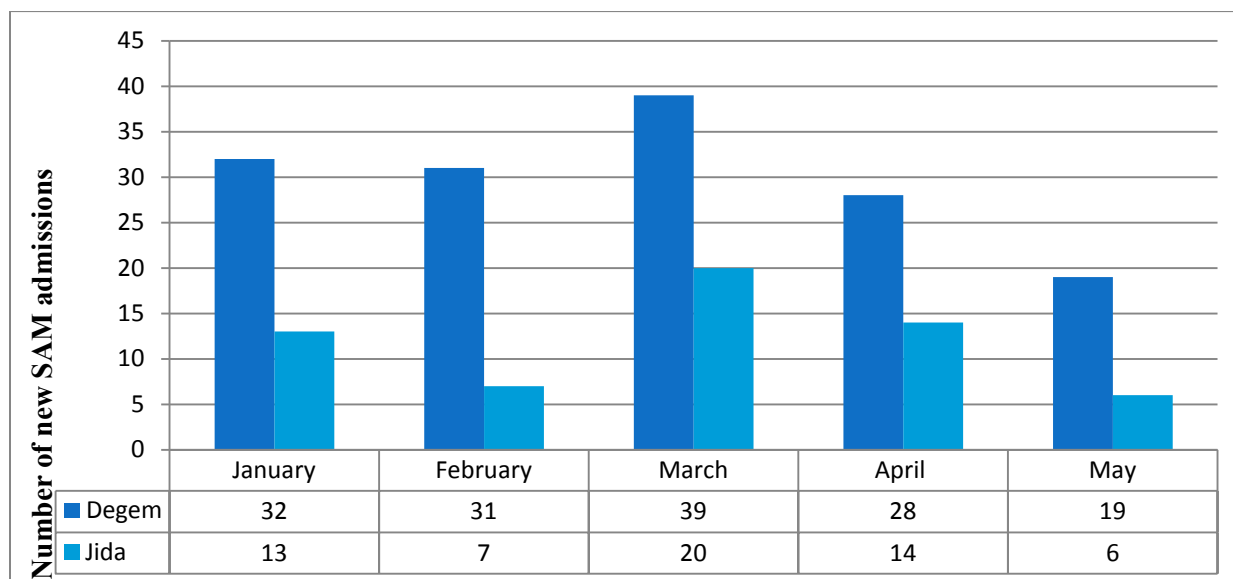


Figure 48: Trends of New SAM admissions in the two visited Woredas of North Shoa Zone Oromia region, 2015

Some of the visited woreda reported that there is shortage of RUTF and F75 F100 currently. They also raised their concern about shortage of food for care takers of the SAM cases in SC.

East Shoa

Health

The total population of East Shoa zone is 1,439,995 (705,598 male and 734,397 female) of which 312,301 live in urban and 1,120,864 in rural East Shoa. There are 331 Kebeles of which 291 are rural and 40 are urban. There are 291 health posts, 60 Health centers and 2 hospitals.

In three visited woreda Namely Adamitulu Jiddo Kombolcha, Adama and Fantale diarrhea is within top five morbidity where top one in Fantale woreda top three in Adamitulu Jiddo Kombolcha and top two in Adama woreda. Penta 1 coverage of the zone in 2014 was 91 % while penta 3 was 93%. The measles coverage is 84% Meningitis vaccination was conducted in October 2014 EC. Latrine coverage in the zone is 87% with 260,999 latrines constructed out of the target of 299,998.

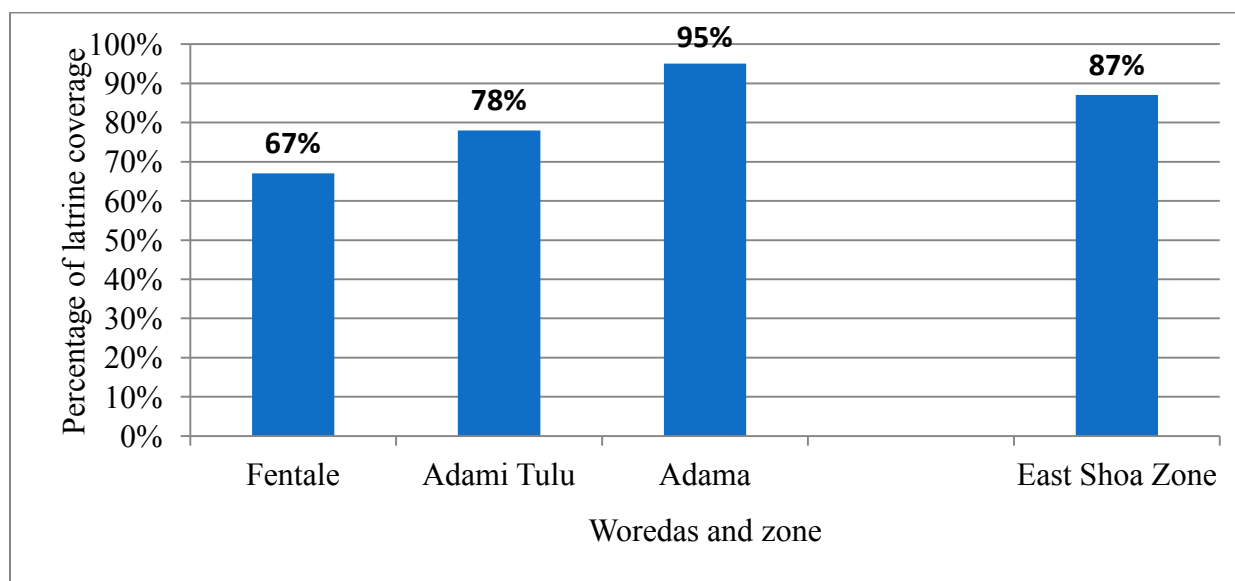


Figure 49: Latrine coverage of three visited Woredas compared with the zonal average in East Shoa Zone, Oromia, 2015

Twelve out of 13 Woredas are malarious. The zone has implemented malaria intervention (distribution of ITN's and IRS in 2014). The ITN coverage for 2014 was 86% and the IRS coverage was 80%. In view of the current Belg rainfall delay and prolonged dry spell, the zone is experiencing both food shortage (Human and pasture for livestock) and safe drinking water for humans and water for livestock. Four Woredas are particularly severely affected: Fantale, Adamitulu, Jiddo Kombolcha Adama and Boset Woredas. The team visited three of the four Woredas namely Fantale, Adamitulu Jiddo Kombolcha and Adama Woredas. These Woredas revealed that there is serious shortage of food and drinking water for both their residents and livestock. The zone has reported 146 measles cases and 12 community deaths in the past three months with case fatality rate of 8.2%. There were outbreaks of Measles in the visited Woredas. There is no ongoing outbreak. Efforts were exerted at strengthening coordination mechanism from the zone to the community level. However, the zone has reported no shortage of key medications and supplies required for major outbreak prone diseases such as AWD, Measles, malaria and meningitis. Inquiry into emergency preparedness in the visited Woredas (Fantale, Adamitulu and Adama Woredas) revealed that all the three Woredas have no significant shortage of major emergency drugs and supplies except LP set and RDT for meningitis and CTC kit for AWD.

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All the visited Woredas (Fantale, Adamitulu and Adama Woreda) are all endemic to malaria and have breeding sites in the form of stagnant water and unprotected irrigation areas. The three Woredas have adequate ITN coverage. Adamitulu has latrine coverage of 78%, latrine utilization of 95% and safe water coverage of 86%.

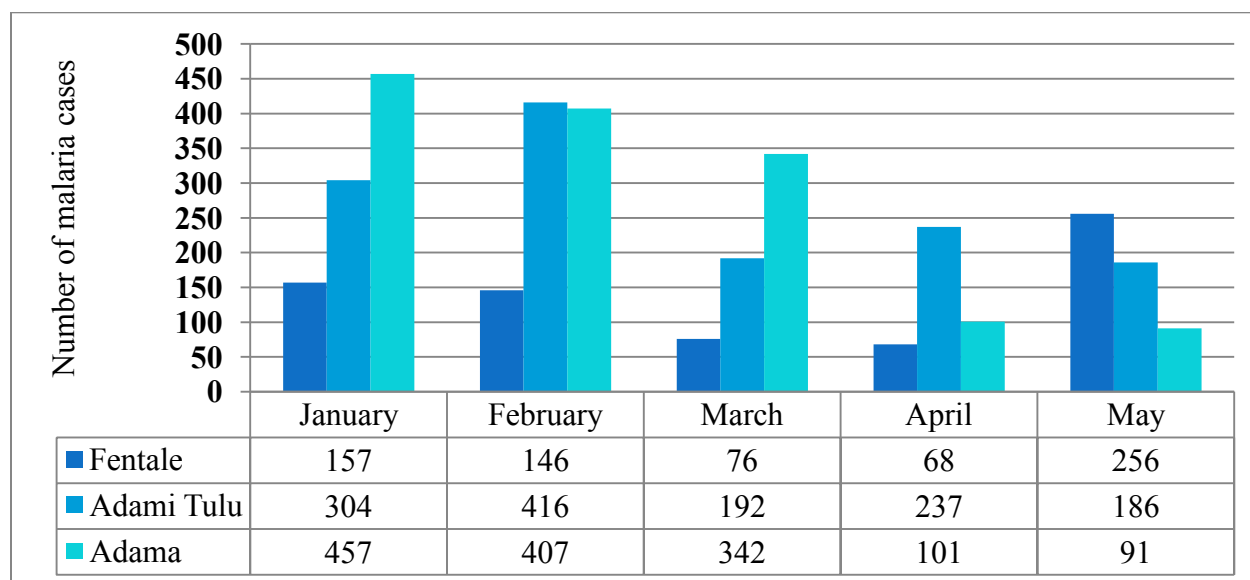


Figure 50: Malaria trend in the visited Woredas of East Shoa zone Oromia region

Visits to health facilities in the visited Woredas and discussion with health facility workers and review of patient registers has disclosed that there is increase in diarrhea cases commensurate with the existing situation on the ground: food security problem and drinking water shortage. The team has warned the zone and respective Woredas that the shortage of water with the rampant malnutrition situation will expose the population to a number of communicable diseases including water borne and vaccine preventable ones.

Nutrition

Of the under five screened (243,008) in May 2015 CHD, 0.7% (1,680 children) were found to be MAM cases while 0.2 % (445 children) were SAM cases with 100% screening coverage. The screening of pregnant and lactating woman revealed that 830(1.6%) of the screened (51,861) are moderately malnourished with a screening coverage of 100%. Since January 2015 the SAM Admissions has been dramatically increasing in Adamitulu.

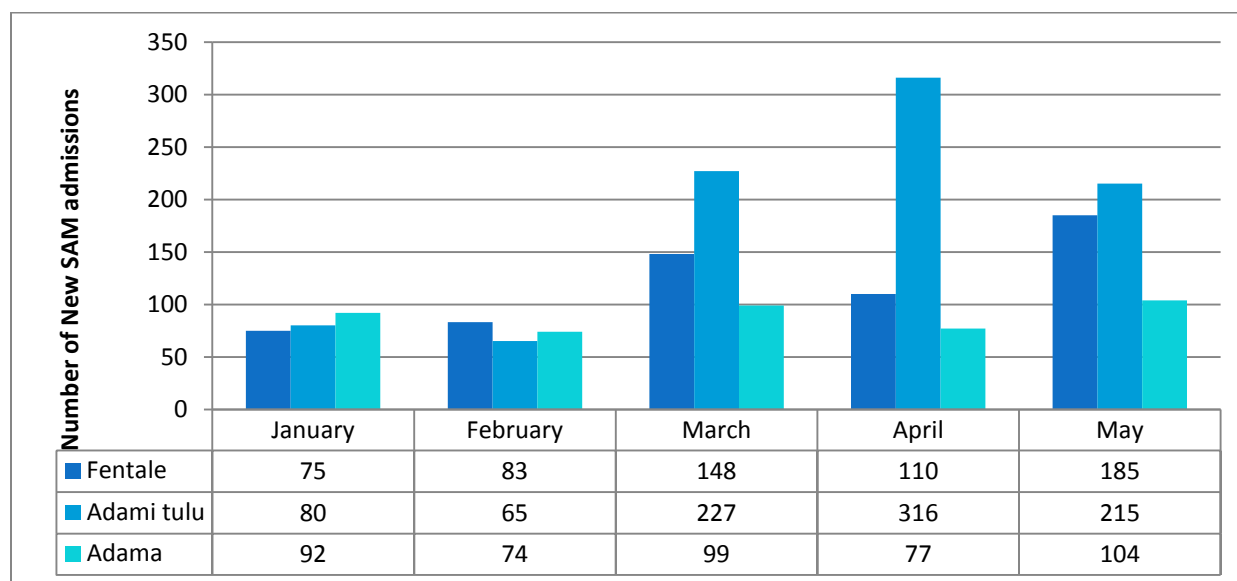


Figure 51: Trends of new SAM admissions in the visited Woredas of East Shoa zone Oromia Region, 2015

There is no SC service in the Woreda despite high level of SAM. Complicated SAM cases have been referred to Batu and kuyera hospitals which are very far for the beneficiaries. There is no mechanism where the SAM cases on discharged get supplementary feeding as the program does not exist. There was no RUTF for the one and half months. Similarly the new admission SAM cases has been increasing in Adama Woreda. There was no RUTF in the past one month. No SC service and supplementary feeding program exist in the Woreda. In Fantale Woreda likewise, SAM admissions has been showing sharp increase. There is no Supplementary feeding program in the Woreda. There is SC service in one of the health centers but there is no F75 and F 100.

Conclusion

Most of the public health emergencies in the region emanate from presence of low immunization coverage. The root cause of malnutrition is delay and reduction in rainfall in this Belg as well as poor productivity in the previous Maher season according to local community explanation.

Recommendations For health and nutrition

Strengthen disease surveillance system:-There is a need to provide supportive supervision and on-the-job training on data, recording, analysis and reporting.

Coordination and Rapid response teams: - There is a need to strengthen the rapid response team through provision of refresher training, allocating operational budget for RRT, transport, and strengthening Woreda emergency task forces with regular meeting with minutes.

Disease prevention activities; - There is a need to strengthen the disease prevention activities in general and routine immunization programs in particular. Guidelines for measles, malaria, meningitis, AWD, Ebola, SAM management and PHEM guidelines should be distributed to all health facilities.

Strengthen linkage between health centers with health post.

Preposition some key emergency drugs and medical supplies at zonal and Woreda level.

Health education geared at household water treatment and availing of water treatment chemicals as people is using untreated and unsafe water sources.

Refresher training for health workers: - There is a need for refresher training on PHEM, CMAM as there is high staff turnover and most of the remaining in some of the visited Woredas is not given refresher training.

Establish SCs at appropriate health centers in Woredas where the SAM rates are high

Ensure continued supplies of RUTF, F75 and F100.

Provide the entire necessary format at OTP and SCs

Promote NGOs working on this area

Reference

- [1].Min DHS 2014
- [2].BT/2014/ Ethiopian country report.
- [3].Oromia Region Annual PHEM Report 2014
- [4].CSA.Housing and population census of Ethiopia, 2007

Chapter-VIII
Proposal for
Epidemiologic
Research
Project

8.1 Assessment of factors contributing for poor cold chain management in West Arsi zone, Oromia Region, Ethiopia, 2016

Executive Summary

Background: Appropriate cold chain management and reduction in vaccine wastage is an important concern in maintaining an effective national immunization program. Vaccine wastage and poor cold chain management is a common problem for all immunization programs especially in developing country. Assessing the cold chain management system and causes of vaccine wastage can help government and stakeholder to effectively target efforts to reduce vaccine potency failures and minimize unnecessary extra service delivery costs

Objective: To assess factors contributing for poor cold chain management in West Arsi zone, Oromia Region, Ethiopia, 2016

Methods: We will conduct a cross sectional study of cold chain management system in health facilities from 1st September to 1st October 2016. Of all 103 health facilities, 51 government health facilities providing immunization activity will be included in the study using lottery method. Data collectors will be trained for one day in general aspects of data collection instruments. The number of data collectors will be 8 health professionals with 2 supervisors. Data collection methods will include questionnaires, observations and document review. This research proposal will be approved by the Oromia Regional Health Bureau research review committee. Interviews will be performed after explaining the objective of the study to health professionals and obtained the consent of the respondents to probe during in-depth interview. Data will be entered, and cleaned using Epi info software version 7.1. Then data will be analyzed and presented using figures and tables preceded by narration

Study Budget: To conduct this study a total of 130,240 ETB, Birr is required.

Introduction

Cold chain is the system that is used to store and distribute vaccines in a high-quality condition to end users. It consists of a chain of links that are designed to keep vaccines within World Health Organization (WHO) recommended temperature ranges, from the point of manufacture to the point of end users [1]. A cold chain is a temperature-controlled supply chain. An unbroken cold chain is a constant series of storage and distribution activities which maintains a given temperature range. It is used to help extend and ensure the shelf life of products such as fresh agricultural product, seafood, frozen food, photographic film, chemicals and pharmaceutical drugs like vaccine [2]. Vaccines need to be kept in a constricted temperature range from the point of manufacture to their use in an immunization session [3]. All vaccines can be stored at positive temperatures (between +2 °C and +8 °C). However, only some vaccines can be stored at negative temperatures (between -15 °C and -25 °C) accordingly. Vaccines that have been exposed to temperatures above +8 °C may lose their potency over time. The suggested maximum length of storage is 6–12 months at national level, 3 months at regional level, 1–3 months at district level and 1 month or less at health-facility level. In addition, the Vaccine vial Monitor (VVM) status and expiry dates of vaccines must be monitored and respected. If it is suspected that vaccines have been exposed to freezing temperatures, perform the “shake test” before deciding whether to use the vaccine or not. A VVM does not indicate if a vaccine has been frozen. Each vial shows an expiry date. Never use vaccines when the expiry date has passed, even if the VVM shows no heat damage. In general, always apply the earliest-expiry-first-out (EEFO) principle [4]. If diluents are included in the vaccine packaging, store it between +2 °C and +8 °C. However, if diluents are supplied separately, it can be stored outside the cold chain but must be cooled before use, preferably for a day or for a period of time sufficient to ensure that the vaccine and diluents are both at temperatures between +2 °C and +8 °C when they are reconstituted. Never freeze diluents [5]. All persons and companies including fabricators, packagers/labelers, distributors, importers, and wholesalers share responsibility for ensuring that appropriate storage and transportation conditions are maintained from the point of manufacturing up to the delivery of the drug products to the final distribution point. (E.g. pharmacy, hospitals, clinics, retail stores, etc)[6]. If a vaccine loses some or all of its potency due to exposure to heat; its outward appearance may be unchanged. Previously, a laboratory test was needed to determine whether it

could still be used. The Cold Chain Monitor Card was the first device to give a visual indication of possible loss of potency in a carton of vaccine because of exposure to temperature. In 1996, a new kind of monitoring device became available which gives a visual indication of vaccine potency for individual vials of foreign manufactured oral polio vaccine (OPV). The Vaccine Vial Monitor (VVM) is a small indicator attached to each vial, which keeps a constant record of its exposure to heat. If the vaccine is exposed to temperatures above $+8^{\circ}\text{C}$, the indicator progressively changes color, and gives health staff an immediate warning that the vaccine has been damaged. In 1997, this type of indicator was only used on OPV vials, but similar indicators are being developed for other vaccines also [7]. Multi-dose vials of vaccine opened at outreach sites must be discarded at the end of the program. Multi-dose vials of BCG and Measles vaccine (which are reconstituted before use) must be discarded at the end of each immunization session or at the end of 6 hours, whichever comes first [8]. Lack of cold chain maintenance skills at lower level was a persistent problem and it was one of the problems identified and reported in the Health Sector Developmental Program (HSDP) III mid-term review (2008) [9].

The cold chain is a shared responsibility that begins from the time the vaccine is manufactured, and ends when the vaccine is administered to the recipient. A cold chain breach (CCB) occurs when the temperature falls outside of the recommended $+2^{\circ}$ to $+8^{\circ}\text{C}$ temperature range at any point during the cold chain process. Common breaks in the cold chain occur through refrigeration failure, power outage, overheating of vaccines during transportation, and freezing of vaccines [10]

Statement of the Problem

The main concern is to indicate a logistics and stock management information system to optimize the cold chain management in West Arsi zone. As for all national vaccine supply chains, the vaccine's Sensitivity to heat poses a risk of waste, especially for the health facilities. The current system is paper based and includes the use of stock cards which is predominant in most health centers. This system is very inefficient and prone to errors (including record errors), and cannot forecast demand of inventory and makes it boring to extract useful information for decision making at any level of the supply chain. West Arsi zone has switched to use a number of vaccines like the single dose pentavalent, the pneumococcal and recently introduced Rota vaccine. These vaccines are bulky and more expensive both to purchase and store. Thus, it is essential that an improved and efficient logistics system is put in place to reduce waste, stock outs, overstocking, and expired stock, and to improve on decision and information flow between the national cold chain storage, the regional health facilities, and every level of the vaccine supply chain. In addition to these, west Arsi zone health department has known by high (100%) immunization coverage among the eighteen zone found in Oromia region for past three consecutive years .On the other hand, there were measles outbreak in the similar three consecutive years in this zone .Poor cold chain management system could be one of the reasons for this and needs to be assessed.. For this reason, the researcher is planning to conduct assessment of cold chain management status and factors contributing to poor cold chain system.

Literature Review

In this section the researcher reviewed different studies conducted on consequences brought about by poor cold chain management system, poor vaccine storage and handling to the community. The section also assesses various research studies and reports conducted globally including Africa and Ethiopia. In addition, some common types of vaccines currently available in routine immunization at healthcare facility for human being were reviewed.

A study conducted in forty health facilities of Cameroon regarding Program on immunization and cold chain monitoring indicated that twenty nine (72.5%) out of 40 health facilities had at least one refrigerator (Front-loading refrigerator with freezer on top or Ice Lined Refrigerator (ILR)). Twenty one (52.5%) of them had at least one freezer. Access to power supply was reported in 34 (85.0%) health facilities. The power supply was reported to be permanent in only 7 (20.6%) of health facilities. It was noted that the temperature was not systematically recorded on charts twice daily as required on the chart in 11 (40.7%) of the 27 health facilities with temperature monitoring charts on refrigerator. During the period of two months preceding the study, only 16 (59.3%) of these 27 health facilities, recorded daily temperatures within the recommended range. For the same period, 11 refrigerators (40.7%) recorded 72 times the temperatures out of the recommended range. Actions taken after these failures were not documented. Up to 7 (25.9%) of the 27 refrigerators assessed had temperatures out of the recommended range. It was noted that up to 6 (20.69%) health facilities had wrong packing of vaccines and diluents in the refrigerator. These included: not arranging vaccines so as to facilitate air circulation and reading of their identification, as well as expired date; not marking and arranging separately vaccines brought back from immunization session; and not storing vaccines in locations appropriate to the style of refrigerator used (e.g.: for ILR refrigerator, storing adsorbed vaccines (DTP, TT, HepB) on the top, OPV and freeze dried vaccines (measles, BCG) on the bottom). In 4 (13.79%) of the health facilities there were some vaccines without label in the refrigerator. Nevertheless, no vaccine with an expired date was found. It was noted that up to 23.30% of health centers did not received any supervision during the vaccination campaign that preceded this evaluation [11].

Rao S, Naftar S, Baliga S, and Unnikrishnana B 2012 conducted a cross sectional study on Evaluation, Awareness, Practice and Management of Cold Chain at the Primary Health Care

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Centers in Coastal South India. The result showed that availability of vaccine storage coverage like Ice lined refrigerator, Deep freezers, Frozen ice packs, Generator, Automatic voltage stabilizers, Dial thermometers, Temperature chart, Vaccine storage in the refrigerator and Presence of other items with vaccines was above 85%(ranges from 85.7% to 100%)[12]

In 2004, Peru conducted an inventory assessment of cold chain equipment using a WHO rapid data collection tool. They found that over 5,000 new or replacement refrigerators would be needed to provide adequate storage capacity at health centers [13].

A. Munir Bankole, Kola-Korolo Olusegun, N. Bankole Marian, Iboma Godswill,

O. Adeluola Adebawale, A. J. Shittu Lukeman, Olonire Olufemi, Tayo Adetokunbo and and A. Mariam Odunaiye, 2010 conducted a cross-sectional study in Lagos Nigeria, on the impact of health facility monitoring on cold chain management practices between September 2007 and March 2009, during the first monitoring visits, a total of 900 (90%) out of 1000 vaccine storage equipment (fridge) in the HFs either had mechanical failure with virtually non-existent electricity supply. A total of 2000 (95%) HWs had little or no knowledge of VVM indicator. A common practice was the sharing of same fridge for vaccines with other things such as laboratory reagents and drugs. A total number of 12,000 (80%) vials were either in stage 3 or 4 of VVM or had VVM indicator removed. Thermometer was only sighted in 200 (20%) fridges with no temperature charts on the storage devices .Expiry dates of all vials screened were intact. However, between March and September, 2009 during revisits, 480(92%) out of 520 fridges screened in the HFs had good mechanical functions with back up electricity supply where national electricity failed. A total of 1050 (84%) out of 1250 HWs interviewed now had good knowledge of VVM indicator with only 280 (9.3%) out of the 3000 vaccines vials found in stock in stage 3 or 4 of VVM or had the VVM label removed . Vaccine expiry dates were intact but no temperature charts were available on all the 180 (35%) fridges that had thermometer for temperature measurement. Of note was the fact that the average time spent in each facility during first visit which was about 40 min, was almost reduced by two-third during revisits. Most of the HWs interviewed and possibly trained during first visit were also met during revisits, but a few others who were not met during first visit were met during revisits. However, there knowledge was similar. Furthermore, majority of the HWs in the HFs claimed they no longer stock more vaccines than what they could use for each immunization day and that excess was always

returned to the Public Health centers in the nearest Local Government Areas (LGAs) for effective storage [14].

The vaccine management assessment conducted in December 2009 assessed 2 Central Vaccine Stores (CVS), 13 Regional Vaccine Stores (RVS), 14 District Vaccine Stores (DVS), and 28 Health facilities based on 11 standard criteria (MOHSW, 2010). The overall average score on vaccine management performance was 79% for all levels. The National level was 89%, Sub-national level was 74% (RVS/DVS) and for Service level was 75%. The assessment established that the vaccine arrival procedure is good, the health workers have high knowledge on the use of Vaccine Vial Monitors (VVM) and the Multi Dose Vial Policy (MDVP). However, vaccine storage temperatures, vaccine stock management, effective vaccines delivery and correct diluents use for freeze dried vaccines need to be improved [15]. In view of the above studies conducted in Ethiopia, it is observed that previous assessment studies focused on vaccine management in totality and there is no specific study that has been done with a special attention to assessment of factors contributing for poor Cold chain management in West Arsi zone, 2016

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Objectives

General Objective

To assess the vaccines management system in government health facilities in the West Arsi zone Oromia region, Ethiopia 20116

Specific Objectives:-

To determine the average stock out length at the health facilities

To assess the storage conditions of vaccines at the health facilities

To determine the level of knowledge and practice of the health workers on storage and handling of vaccines

To identify profession of personnel involved in handling and dispensing vaccines at health facilities

Methods and Material

Study area

West Arsi zone is one of the eighteen rural zones found in Oromia Region. It is established as independent zone by receiving woredas' from Bale and East Shoa zones in 2006 making its center of administration as Shashemene town. Historically the name Shashemene came from combination of two "Afan Oromo" words "Shashe" (Name of women) and "Mene" (house) Meaning house of Shashe which is used as local 'tale' trading center (West Arsi zone Culture and Tourism Office).

West Arsi zone is located at a distance of 250 km from Addis Ababa to the Southern part of the Region. It shares common boundaries with Southern Nation Nationalities People Representatives (SNNPR) and Guji Zone at South, East Shoa zone at North, Bale & Arsi zone at East and SNNPR at West. Total catchment area of the zone is 12,556 Sq. KM. Three ecological climate are found in the zone 45.5% High land, 39.6% Mid-Land and 14.9% Low Land. Administratively West Arsi zone is divided into 15 districts (12 rural and 3 urban) and 324 kebeles (312 rural and 12 urban). Projected population of 2016 is 2, 450, 412, with under- five children 401867 and under one year's 85764 .Of the total population 1249710 are female which gives sex ratio of 1:1. Annual growth rate of population is 2.9%. A total of 87 health facilities, of which 2 hospitals, 80 health centers and 5 health post providing immunization program directly

from their cold chain. The other health facilities especially health post offer immunization services by taking vaccine from their respective primary health care unit (health centers)

Study Period

The study will be conducted from 1st September –30, October 2016 in West Arsi zone Oromia Region Ethiopia, 2016

Study Design

A facility based quantitative and qualitative cross sectional study will be conducted to assess the factors contributing for poor cold chain management system in West Arsi Zone, Oromia, Ethiopia.

Source population

All 103 Cold chain found in government organization (2 hospitals ,80 health centers and 5 health posts,16 district health offices and zonal cold chain) providing immunization and managing cold chain activity will be included in the study.

Study unit

Organization included in the study based on desired sampling method

Inclusion criteria

Pharmacist in-charges of the healthcare facility vaccines store or any other health personnel employed as in-charges of the vaccines and cold chain store in respective healthcare facilities for a period of not less than 3 months, immunization focal person, health facility having refrigerator will be included in the study.

Exclusion criteria

Those healthcare personnel who were unwilling to participate and those who were on leave during the study and organization without functional refrigerators will be excluded from the study.

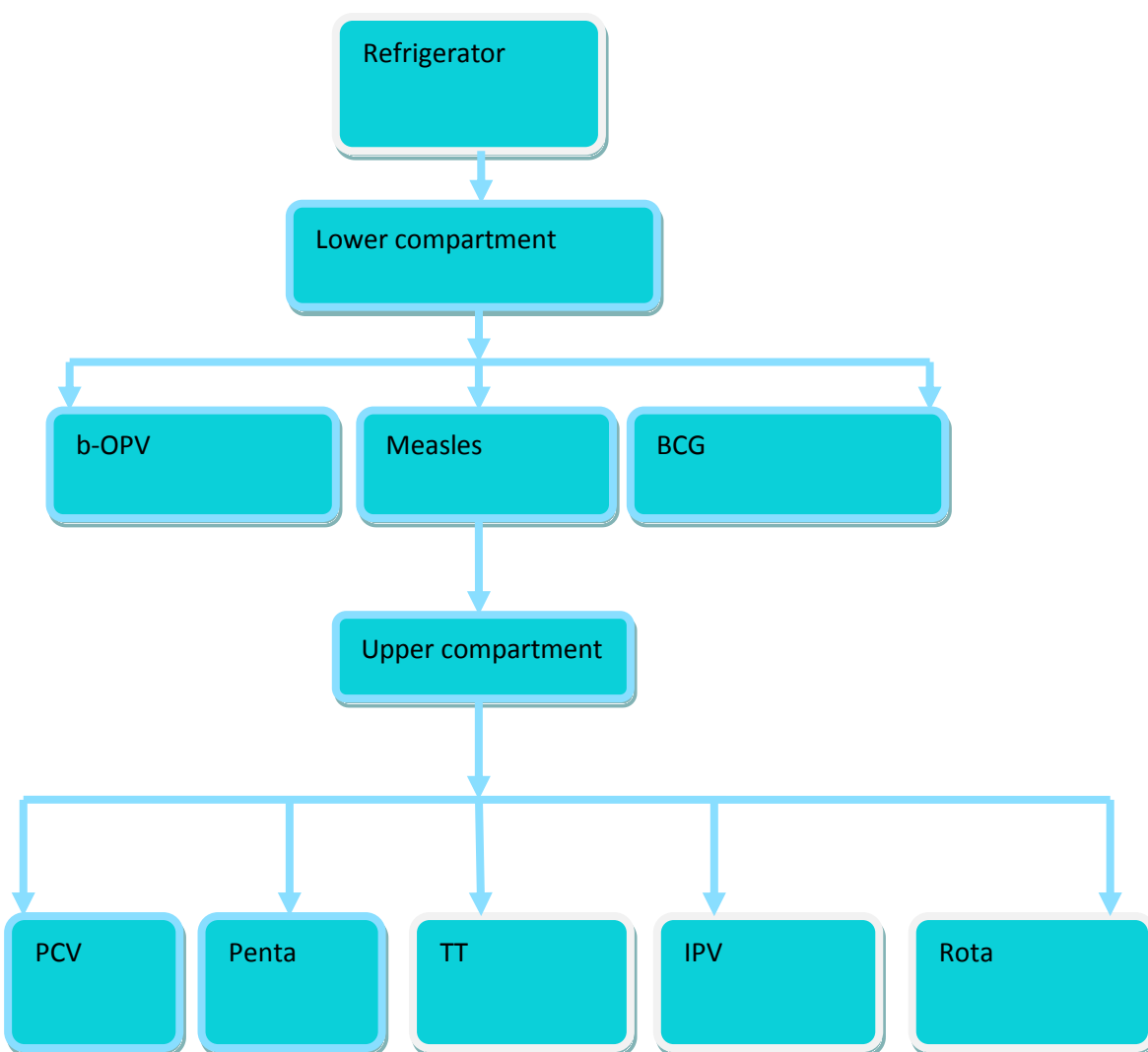


Figure 52: The schematic presentation of cold chain system with lower and upper compartment including distribution of vaccine

Sampling procedures and Sample Size determination for health facility

Sample size will be determined based on 80% power, 95% CI, Risk ratio 2.8 and Vaccine storage in the refrigerator was not proper in 73.4% HFS [16] by using EPI Info Fleiss W/CC gives 51 sample size. A total of 51 out of 103 government health facilities will be included in the study. The study will include zonal and woreda levels vaccine stores and employs. A multi- stage sampling technique will be used to select health facilities and ensure representation in each district.

A total of 51 government health facilities will be included in the study to represent 103 healthcare facilities.

At zonal level – 1 zonal Vaccine Store were assessed

At woreda level – 15 districts Vaccine Stores will be assessed

Randomly selecting public healthcare facilities from districts

Step 1: The district public hospitals will be included in the study.

Step 2: The selection of second facility will be identified by listing all primary health facilities in the district and randomly selected one.

Step 3: Number they remained primary health facilities

Step 4: Calculate the sampling interval. For example if there were 10 public health facilities in the district and 5 were to be chosen. The sampling interval will be calculated by dividing the total number of facilities by the number selected, $10/5=2$

Step 5: Identify the third, fourth, fifth up to tenth facilities

The same process illustrated above was used to select public health facilities in each of the 15 geographic districts included in the survey.

Sample size calculations for respondents

Population size, n in each of the selected levels information will be collected from the following:-

At zonal level will be =2 people

At district level = 2 people * 15 districts =30 people

At healthcare facility level personnel in charge of vaccine storage and immunization focal persons = 2 people

Healthcare facilities that will be selected in the zone = 35

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People that will be interviewed at governmental health facilities= $35 \times 2 = 70$

Total numbers of people who will be interviewed are 102 and assessment will be on 51 government health facilities.

Data collection procedure

The data collection tool will be developed from the cold chain supervision framework in the Standard operation program (SOP) on expanded program on Immunization (EPI) in Ethiopia. It will be pre-tested in health facilities providing immunization (where such facilities will be excluded from the main study), reviewed and the last version will be adopted by authors to collect data. In addition, cold chain management guideline and observation check list will be engaged. Data collectors will be 8 health professional and 2 supervisors (one supervisor to four data collectors). All data collectors and supervisors will health professionals who had been previously involved in EPI activities at different level and out of study area will be trained for one day and evaluated before their involvement in the data collection process. Data will be collected by Interview, observation of the cold chain and by reviewing related documents. This will be done on the availability of cold chain equipment, power supply, ice packs, temperature record sheets and thermometer. Information on vaccines and diluents storage conditions, temperature recording and its variations out of recommended ranges in two previous months and at the moment of evaluation will also collected. In addition, it will be verified and recorded if ice packs will adequately dispose and if food or other non recommended products will be found in the refrigerator

Variables

Dependent Variables

Poor cold chain management system

Independent Variables

Access to power supply

Recording daily temperatures within the recommended range

Wrong packing of vaccines

Diluents in the refrigerator

Supportive supervision

Knowledge of health personnel working on refrigerator

Qualitative part:

Ten Key informants will be selected based on their exposure to immunization or cold chain management system from the Study area and these will be communicated and brought others until saturation reached. Data consisted of empirical observation of practices such as, the opening and closing of the fridge, the presence of temperature monitoring charts, the reading of thermometers and the presence of other products than vaccines in the fridge. As the logbook constitutes a valuable source of information, it was carefully and empirically studied to identify issues related to information on cold chain management system. To assess vaccine distribution from the zone to district and district to the health facility stage, the vaccine distribution and routine reports at the district level were reviewed by comparing the activities performed and the amount of vaccines physically received by the health facility. Deposits located in the main health facility, were also observed to try and understand cold chain practices at this level.

Data Analysis

Data will be entered, edited and cleaned using Epi info software version 7.1. Then data will be analyzed and presented by using tables and figures. Bivariate and multivariate logistic regression analysis will be conducted to explore factors associated with poor cold chain management.

Pre-Testing of Tools

The data collection tools (interview and facility indicator forms) will be tested at 3 different facilities in order to validate them prior to roll out to a larger scale. Data collecting tools will be modified accordingly upon completing the pilot study.

Ethical Issue

All study participants will be sought informed consent about the purposes of the study and they express their volunteer prior to enrolment. The name of the study participants will not be mentioned and any information received will be used only for the study purpose to keep the confidentiality. The study will be receiving ethical approval from the Oromia Regional Health Bureau Ethical Committee. Also cooperation letter from West Arsi zone health department to respective District health office will be received. The finding of this study will benefit both the study participants and the community at large.

Dissemination, notification, and report of results

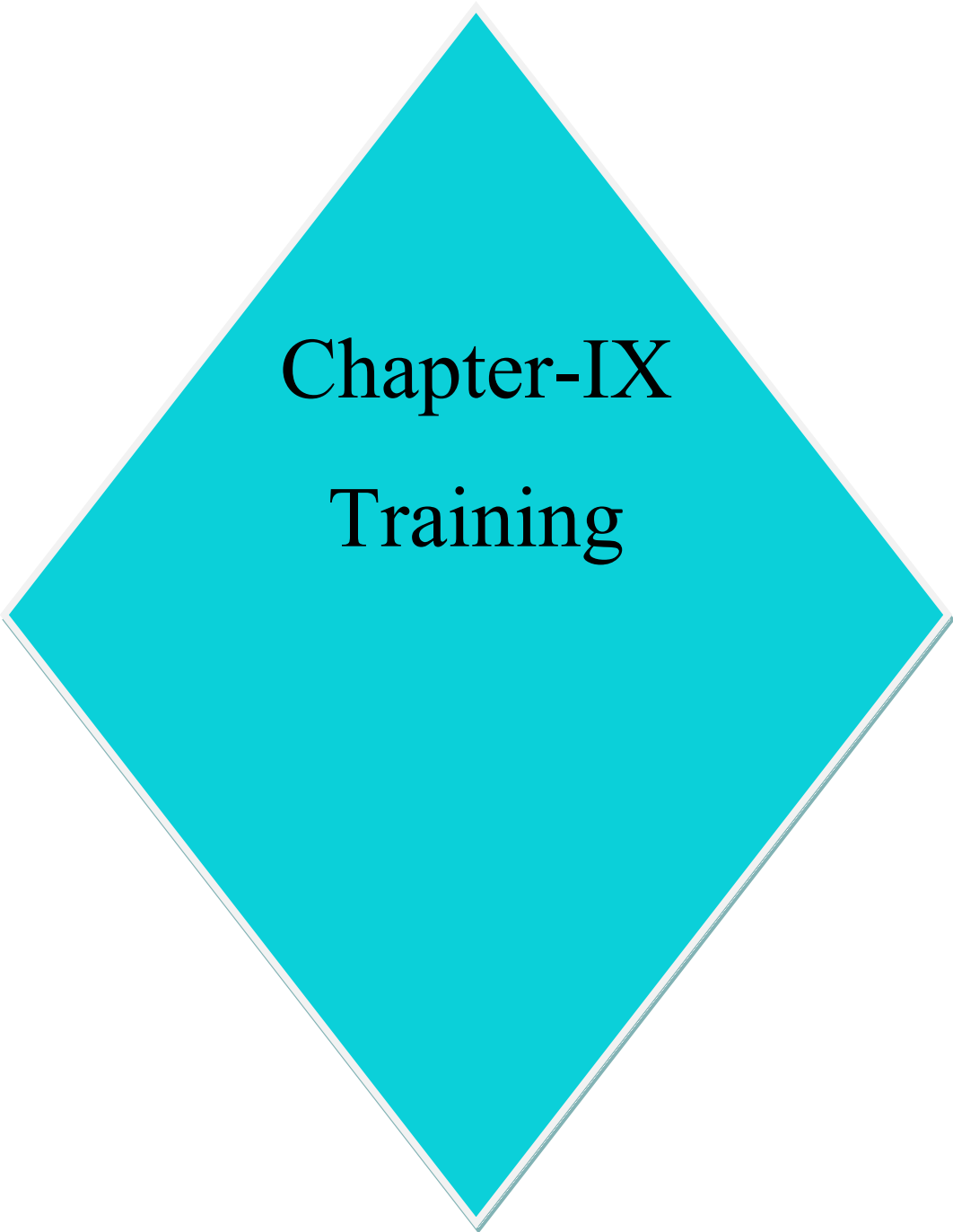
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The result of this study will be disseminated to relevant bodies such as EPHI, Addis Ababa University, EPHA, Oromia Regional Health Bureau, West Arsi zone and respective woredas and all other concerned parties through email and hard copy. Also the findings of this study will be made ready for possible publication in a reputable journal.

Reference

- [1].WHO, **Immunization in practice Module: 2, 2014**
- [2].Cold chain." Definitions. Net. STANDS4 LLC, 2016. Web. 6 Apr. 2016.
<http://www.definitions.net/definition/cold_chain>
- [3].UNICEF/South Sudan/Pflanz A health worker administers a vaccination to a wincing boy in Upper Nile State, South Sudan 2014.
- [4].Module 1: Cold chain, vaccines and safe-injection equipment management
- [5].Health Canada (HPFB Inspectorate):«Guide 069, Guidelines for temperature Control of Drug Products during Storage and Transportation »; 2005.
- [6].GUIDE Implementing a Cold Chain for Safe Sample Transport and Storage v. 22 July 2013 Prepared by David Wolking, UC Davis One Health Institute and the PREDICT One Health Consortium.
- [7].World Health Organization, Geneva, Global Programme for Vaccines and Immunization Expanded Programme on Immunization 1998
- [8].Immunization Policy ministry of Health Government of Southern Sudan Juba September 2009.
- [9].Ethiopia National Expanded Program me on Immunization Comprehensive Multi-year Plan 2011 – 2015 Federal Ministry of Health Addis Ababa December, 2010
- [10].Vaccine Cold Chain Guidelines 2006

- [11].Jérôme Ateudjieu Bruno Kenfack, Blaise Wakam Nkontchou and Maurice Demanou, Program on immunization and cold chain monitoring: the status in eight health districts in Cameroon Ateudjieu et al. BMC Research Notes 2013, 6:101
- [12]Rao S, Naftar S, Baliga S, Unnikrishnana B. Evaluation, Awareness, Practice and Management of Cold Chain at the Primary Health Care Centers in Coastal South India. *J Nepal Paediatr Soc* 2012; 32(1):19-22.
- [13].Final Report ,Cold Chain Workshop UNICEF Regional Office for Latin America &the Caribbean (UNICEF-TACRO) Program for Appropriate Technology in Health (PATH) Panama City May 31–June 2, 2006
- [14]. (Munir Bankole, et al) the impact of health facility monitoring on cold chain management practices in Lagos, Nigeria, 2010
- [15].Comprehensive Multi-year Plan 2011 – 2015 federal ministry of health Addis Ababa December, 2010
- [16].Y. Brehane. Cold chain status at immunization in Ethiopia, East African Medical Journal Vol 77 No 9 September 2000



Chapter-IX

Training

**9.1 Narrative summary of cholera training given to Shashemene Town Administrative
Health office, Oromia Region, Ethiopia March 25-26/2016**

Summary

Introduction: Training, in the most simplistic definition, is an activity that changes people's behavior. Increased productivity is often said to be the most important reason for training. But it is only one of the benefits. Training is essential not only to increase productivity but also to motivate and inspire workers by letting them know how important their jobs are and giving them all the information they need to perform those jobs. The objective of this study is to strengthen health workers knowledge and skill on general Cholera prevention and Treatment, so that they cascade to community level.

Method: Pre and post tests, power point presentation, discussion and experience sharing question and answering (oral) was conducted from 25 -26 March 2016. Data was collected by using both face to face discussion and pre and post tests .Standard questionnaire was used for pre and post tests for evaluating knowledge of trainees. Training area was selected based on the gaps they had on cholera prevention and control method and by fearing propagative characteristics of cholera to the Shashemene town from Guji, Borana and Arba Minch zones or used purposive method and trainees were selected on Cholera treatment center convenience basis. A total of 56 trainees were selected.

Results: Mean, Median, and mode of pre and post tests were (8.8, 9, 9) and (13.5, 14, 15) respectively. 4 to 13 pre test and 9 to 16 post test ranges registered with 2.2 and 1.8 standard deviation in pre test and post tests respectively.

Conclusions: The training was completed with improved knowledge of trainees with mean range of score(8.8 to 13.5),Range of standard deviation (2.2 to 1.8) good discipline, full attendance and active participation of the participant as well as effective in addressing the objective. We recommended that cholera surveillance should be strengthened and kebeles with poor environmental sanitation should be identified, mapped and strictly followed. Community should be mobilized on cholera prevention and control and fair distribution mechanisms of water within kebele should be applied.

Introduction

Training is an activity leading to skilled behavior. It is the result of good upbringing (especially knowledge of correct social behavior). Training is also the act, process, or art of imparting knowledge and skill. It is Repetition of an action so as to develop or maintain one's skill [1]. Training is transferring information and knowledge to employers. It is equipping employers to translate that information and knowledge into practice with a view to enhancing organization effectiveness and productivity, and the quality of the management of people. Usually training should be considered along with education policies and systems which are crucial to the development of human resources [2]. Training, in the most simplistic definition, is an activity that changes people's behavior. Increased productivity is often said to be the most important reason for training. But it is only one of the benefits. Training is essential not only to increase productivity but also to motivate and inspire workers by letting them know how important their jobs are and giving them all the information they need to perform those jobs [3].

Training Management Cycle: A training management cycle can be divided into three major steps: Step 1: Planning; Step 2: Implementation; and Step 3: Evaluation [4]. Training evaluation is assessing the effectiveness of the training program in terms of the benefits to the trainees and the company. It is a process of collecting outcomes to determine if the training program was effective [5]. The significance and value of training has long been recognized. Consider the popular and often repeated quotation, "Give a person a fish and you feed him for a day. Teach a person to fish and you feed him for a lifetime." This simple but profound saying is attributed to the wisdom of Confucius who lived in the 5th century BC. Given today's business climate and the exponential growth in technology with its effect on the economy and society at large, the need for training is more pronounced than ever. Generally benefits of training are the following: increased job satisfaction and morale, increased motivation, increased efficiencies in processes, resulting in financial gain, increased capacity to adopt new technologies and methods, increased innovation in strategies and products and reduced employee turnover [6]. Pre- and post-tests are used 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 participants' post-test scores to their pre-test scores enables you to see whether the training was successful in increasing participant knowledge of the training content [7]. In Borana and Guji zones of Oromia region and Arba Minch zone of Southern Nation Nationality and people Representatives (SNNPR) there is Cholera outbreak/epidemic. Shashemene town is entry point for these three zones. By considering this issue Shashemene town administrative health office in collaboration with Oromia Regional Health Bureau (ORHB) prepared two days cholera training for health worker in Rift Valley Hotel.

Literature review

Measures of Central Location

A measure of central location provides a single value that summarizes an entire distribution of data. Measures of central location include the mode, median, arithmetic mean, midrange, and geometric mean. The mode is the value that occurs most often in a set of data. It can be determined simply by tallying the number of times each value occurs.

The median is the middle value of a set of data that has been put into rank order. Similar to the median on a highway that divides the road in two, the statistical median is the value that divides the data into two halves, with one half of the observations being smaller than the median value and the other half being larger. The median is also the 50th percentile of the distribution. The arithmetic mean is the value that is closest to all the other values in a distribution.

Measures of Spread

Spread, or dispersion, is the second important feature of frequency distributions. Just as measures of central location describe where the peak is located; measures of spread describe the dispersion (or variation) of values from that peak in the distribution. Measures of spread include the range; inter quartile range, and standard deviation.

Range

The range of a set of data is the difference between its largest (maximum) value and its smallest (minimum) value. In the statistical world, the range is reported as a single number and is the result of subtracting the maximum from the minimum value. In the epidemiologic community, the range is usually reported as “from (the minimum) to (the maximum),” that is, as two numbers rather than one.

Inter quartile range

The inter quartile range is a measure of spread used most commonly with the median. It represents the central portion of the distribution, from the 25th percentile to the 75th percentile. In other words, the inter quartile range includes the second and third quartiles of a distribution. The inter quartile range thus includes approximately one half of the observations in the set, leaving one quarter of the observations on each side.

Standard deviation

The standard deviation is the measure of spread used most commonly with the arithmetic mean. Subtracting the mean from each observation and then summing the differences adds to 0. This concept of subtracting the mean from each observation is the basis for the standard deviation. However, the difference between the mean and each observation is squared to eliminate negative numbers. Then the average is calculated and the square root is taken to get back to the original units.

Standard error

The standard deviation describes variability in a set of data. The standard error of the mean refers to variability we might expect in the arithmetic means of repeated samples taken from the same population. The standard error assumes that the data you have is actually a sample from a larger population. According to the assumption, your sample is just one of an infinite number of possible samples that could be taken from the source population. Thus, the mean for your sample is just one of an infinite number of other sample means. The standard error quantifies the variation in those sample means [8].

Objectives

General objective

To strengthen Health workers knowledge and skill on general Cholera prevention and Treatment, so that they cascade to community level,

Specific objectives

To strength surveillance systems of Cholera cases

To improve the health workers' ability on cholera prevention and control

To increase community's awareness on use of appropriate hygiene (food, water, personal)

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Methods

Training component

Pre and post tests

Power point presentation

Discussion and experience sharing

Question and answering (oral)

Participant selection criteria

Participants were selected based on Cholera cases management in CTC

S/No	Type of professionals	Numbers of participants
1	Physician	2
2	Health officers	5
3	PHEM focal persons	6
4	Nurses all type	6
5	Emergency team	6
6	Urban health extension worker	8
7	Town administrative health office staff	17
8	Guards	4
9	Cleaners	2

Training period

Training was conducted from March 25-26/2016.

Venue

Rift Valley Hotel, Shashemene Town, Oromia Region

Results

Trainee profiles

A total of 56 trainees were participated in this training from the town Administrative health office. Among a total of trainees 39(69.6%) were males. Participants were from health facility and town administration health office. Discussion with trainees disclosed that there is unfair distribution of water within town kebeles and there are poor sanitation and hygiene variety

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within kebeles. For example 09 kebele is characterized by densely populated and poor environmental sanitation.

Training topics covered

Epidemiology of cholera

Cholera case management

CTC establishment

Cholera Surveillance/ outbreak investigation

Trainers

A total of four trainers and facilitators, Sr. Fantu Banjaw from Shashemene town administrative health office(PHEM),Dr.Habtam Geleshe from Shashemene referral hospital, Mr.Birihanu Arada from West Arsi zone health department(PHEM) and Mr.Gosaye Beriso EFETP resident from Oromia Regional Health Bureau field base were participated on giving training.

Table 22 Cholera training for health worker, Shashemene Town Administrative health Office schedule, March, 25-26/2016

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Table 23: Training Schedule, Shashemene town Administrative health office,

Time		Presenters	Facilitator
2:30-3:00	Registration	Town Health office	Ararsa
3:00-3:20	Opening speech and objective of the training	Sr. Genet K. deputy head	
3:20-3:40	Pre tests	Gosaye	Ararsa
3:40-4:30	Epidemiology of cholera	Sr.Fantu PHEM focal person	
4:30-5:00	Tea break	Town Health office	
5:00-6:00	Epidemiology of cholera	Sr.Fantu PHEM focal person	
6:00-6:30	Question and Answers		Fantu&Gosaye
6:30-8:00	Lunch	Private	
8:00-10:00	Cholera case management	Dr.Habtamu.G.	Sr.Fantu
10:00-10:30	Tea Break	Town Health office	
10:30-11:30	Question and Answers	Dr.Habtamu.G&Mr.Birihanu	
2:30-4:30	CTC establishment	Brihanu Areda	Dr.Habtamu
4:30-5:00	Tea break	Private	
5:00-6:00	CTC establishment	Brihanu Areda	

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6:00-6:30	Question and Answers	Brihanu Areda & Dr.Habtamu	
6:30-8:00	Lunch	Private	
8:00-10:00	Cholera Surveillance/ outbreak investigation	Gosaye B.	Sr.Fantu
10:00-10:30	Tea break	Town Health office	
10.30-11:15	General discussion	Sr.Genete & Mr.Endargachew deputy Mayor of the town	
11:15-11:30	Post Tests	Gosaye	
11:10-11:30	Closing speech	Mr. Endargachew deputy Mayor of the town	

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Table 24: Pre and post test result of 37 trainees who took pre and post test, Shashemene town administrative health office, Oromia, March, 2016

S/N	CODE	PRE TEST RESULT	POST TEST RESULTS
1	001	9	16
2	002	7	10
3	003	6	11
4	004	11	12
5	005	9	14
6	006	8	12
7	007	10	14
8	008	4	13
9	009	12	13
10	000	9	15
11	0011	9	13
12	0012	10	14
13	0013	11	10
14	0014	9	14
15	0015	7	15
16	0016	9	13
17	0017	8	14
18	0018	4	13
19	0019	7	9
20	0020	9	15
21	0021	8	14
22	0022	9	13
23	0023	6	12
24	0024	11	15
25	0025	5	12
26	0026	8	11
27	0027	11	15
28	0028	9	15
29	0029	8	14
30	0030	11	15
31	0031	13	16
32	0032	11	16
33	0033	10	15
34	0034	9	14
35	0035	11	15
36	0036	7	11
37	0037	11	15

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Table 25: Frequency distribution pre test result of cholera case management training given in Shashemene town administrative health office, Oromia, March 2016

S/no	Pre test result	Frequency	Percent
1	4	2	5.4
2	5	1	2.7
3	6	2	5.4
4	7	4	10.8
5	8	5	13.5
6	9	10	27.0
7	10	3	8.1
8	11	8	21.6
9	12	1	2.7
10	13	1	2.7
total	85	37	100

Table 26: Frequency distribution of post test result of cholera case management Shashemene town administrative health office, Oromia March, 2016

S/no	Post test result	Frequency	Percent
1	9	1	2.7
2	10	2	5.4
3	11	3	8.1
4	12	4	10.8
5	13	6	16.2
6	14	8	21.6
7	15	10	27.0
8	16	3	8.1
total		37	100

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Measures of Central Location

A measure of central location provides a single value that summarizes an entire distribution of data. Measures of central location include the mode, median, arithmetic mean, midrange, and geometric mean. The mode is the value that occurs most often in a set of data. It can be determined simply by tallying the number of times each value occurs. The median is the middle value of a set of data that has been put into rank order. Similar to the median on a highway that divides the road in two, the statistical median is the value that divides the data into two halves, with one half of the observations being smaller than the median value and the other half being larger. The median is also the 50th percentile of the distribution. The arithmetic mean is the value that is closest to all the other values in a distribution (8). The following table shows mean median and mode of pre and post tests of cholera training.

Table 27: Mean, median and mode of pre and post test of cholera training given in Shashemene town administrative health office, Oromia, March 2016

Measure of Central Tendency	Pre tests	Post tests
Mean	8.8	13.5
Median	9	14
Mode	9	15

Measures of Spread

Spread, or dispersion, is the second important feature of frequency distributions. Just as measures of central location describe where the peak is located; measures of spread describe the dispersion (or variation) of values from that peak in the distribution. Measures of spread include the range; inter quartile range, and standard deviation.

Range

The range of a set of data is the difference between its largest (maximum) value and its smallest (minimum) value. In the statistical world, the range is reported as a single number and is the result of subtracting the maximum from the minimum value. In the epidemiologic community, the range is usually reported as “from (the minimum) to (the maximum),” that is, as two numbers rather than one (8). The range of pre and post test were (4 to 13) and (9 to 16) respectively.

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Inter quartile range (pre tests)

The inter quartile range is a measure of spread used most commonly with the median. It represents the central portion of the distribution, from the 25th percentile to the 75th percentile. In other words, the inter quartile range includes the second and third quartiles of a distribution. The inter quartile range thus includes approximately one half of the observations in the set, leaving one quarter of the observations on each side (8).

Step 1. Arrange the observations (pre test results) in increasing order.

4 4 5 6 6 7 7 7 7 8 8 8 8
8 9 9 9 9 9 9 9 9 9 9 10 10,
10 11 11 11 11 11 11 11 11 11 12 13

Step 2. Find the position of the 1st and 3rd quartiles. Note that the distribution has 37 observations.

$$\text{Position of } Q1 = (n + 1) / 4 = (37 + 1) / 4 = 9.5$$

$$\text{Position of } Q3 = 3(n + 1) / 4 = 3(37 + 1) / 4 = 28.5$$

Thus, Q1 lies 1/2 of the way between the 9th and 10th observations, and Q3 lies 1/2 of the way between the 28th and 29th observations

Step 3. Identify the value of the 1st and 3rd quartiles (Q1 and Q3). Value of Q1: The position of Q1 is 9 1/2 therefore; the value of Q1 is equal to the value of the 9th observation plus 1/2 of the difference between the values of the 9th and 10th observations:

Value of the 9th observation: 7

Value of the 10th observation: 8

$$Q1 = 7 + 1/2(8 - 7) = 7 + 1/2(1) = 7.5$$

Value of Q3: The position of Q3 was 28 1/2; thus, the value of Q3 is equal to the value of the 28th observation plus 1/2 of the difference between the value of the 28th and 29th observations:

Value of the 28th observation: 11

Value of the 29th observation: 11

$$Q3 = 11 + 1/2(11 - 11) = 11 + 1/2(0) = 11 + 0 = 11$$

Step 4. Calculate the inter quartile range as Q3 minus Q1.

$$Q3 = 11$$

$$Q1 = 7.5$$

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Inter quartile range = $11 - 7.5 = 3.5$

As indicated above, the median for the pretest was 9. Note that the distance between Q1 and the median is $9 - 7.5 = 1.5$. The distance between Q3 and the median is $11 - 9 = 2$. This indicates that the the result of pre tests data was skewed slightly to the right.

Inter quartile range (post test)

Step 1. Arrange the observations in increasing order.

9 10 10 11 11 11 12 12 12 12 13 13 13
13 13 13 14 14 14, 14, 14, 14, 14, 14, 15, 15
15, 15, 15, 15, 15, 15, 15, 15, 16, 16, 16,

Step 2. Find the position of the 1st and 3rd quartiles. Note that the distribution has 37 observations.

Position of Q1 = $(n + 1) / 4 = (37 + 1) / 4 = 9.5$

Position of Q3 = $3(n + 1) / 4 = 3(37 + 1) / 4 = 28.5$

Thus, Q1 lays 1/2 of the way between the 9th and 10th observations, and Q3 lies 1/2 of the way between the 28th and 29th observations

Step 3. Identify the value of the 1st and 3rd quartiles (Q1 and Q3). Value of Q1: The position of Q1 is 9 1/2 therefore; the value of Q1 is equal to the value of the 9th observation plus 1/2 of the difference between the values of the 9th and 10th observations

Value of the 9th observation: 12

Value of the 10th observation: 12

$Q1 = 12 + 1/2(12 - 12) = 12 + 1/2(0) = 12$

Value of Q3: The position of Q3 was 28 1/2; thus, the value of Q3 is equal to the value of the 28th observation plus 1/2 of the difference between the value of the 28th and 29th observations

Value of the 28th observation: 15

Value of the 29th observation: 15

$Q3 = 15 + 1/2(15 - 15) = 15 + 1/2(0) = 15 + 0 = 15$

Step 4. Calculate the inter quartile range as Q3 minus Q1.

$Q3 = 15$

$Q1 = 12$

Inter quartile range = $15 - 12 = 3$

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As indicated above, the median for the pretest was 14. Note that the distance between Q1 and the median is $14 - 12 = 2$. The distance between Q3 and the median is $15 - 14 = 1$. This indicates that the result of post tests data was skewed slightly to the left.

Standard deviation

The standard deviation is the measure of spread used most commonly with the arithmetic mean. Subtracting the mean from each observation and then summing the differences adds to 0. This concept of subtracting the mean from each observation is the basis for the standard deviation. However, the difference between the mean and each observation is squared to eliminate negative numbers. Then the average is calculated and the square root is taken to get back to the original units (8).

Step 1. Calculate the arithmetic mean. It is already calculated that mean is $=8.8$

Step 2. Subtract the mean from each observation. Square the difference

Table 28: shows subtracting mean from each value and squaring the difference to get standard deviation of pre test.

S/No	Value of pre tests	Minus mean(8.8)	Difference	Difference square
1	4	-8.8	-4.8	23.04
2	4	-8.8	-4.8	23.04
3	5	-8.8	-3.8	14.44
4	6	-8.8	-2.8	7.84
5	6	-8.8	-2.8	7.84
6	7	-8.8	-1.8	3.24
7	7	-8.8	-1.8	3.24
8	7	-8.8	-1.8	3.24
9	7	-8.8	-1.8	3.24
10	8	-8.8	-0.8	0.64
11	8	-8.8	-0.8	0.64
12	8	-8.8	-0.8	0.64
13	8	-8.8	-0.8	0.64
14	8	-8.8	-0.8	0.64
15	9	-8.8	0.2	0.04
16	9	-8.8	0.2	0.04

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17	9	-8.8	0.2	0.04
18	9	-8.8	0.2	0.04
19	9	-8.8	0.2	0.04
20	9	-8.8	0.2	0.04
21	9	-8.8	0.2	0.04
22	9	-8.8	0.2	0.04
23	9	-8.8	0.2	0.04
24	9	-8.8	0.2	0.04
25	10	-8.8	1.2	1.44
26	10	-8.8	1.2	1.44
27	10	-8.8	1.2	1.44
28	11	-8.8	2.2	4.84
29	11	-8.8	2.2	4.84
30	11	-8.8	2.2	4.84
31	11	-8.8	2.2	4.84
32	11	-8.8	2.2	4.84
33	11	-8.8	2.2	4.84
34	11	-8.8	2.2	4.84
35	11	-8.8	2.2	4.84
36	12	-8.8	3.2	10.24
37	13	-8.8	4.2	17.64

Step 3. Sum the squared differences=163.68

Step 4. Divide the sum of the squared differences by (n – 1). This is the variance.

Variance = $163.68 / (37 - 1) = 168.68 / 36 = 4.7$ value squared

Step 5. Take the square root of the variance. The result is the standard deviation.

Standard deviation = square root of 4.7 = 2.2 values

Standard deviation (post test)

Step 1. Calculate the arithmetic mean. It is already calculated that mean is =13.5

Step 2. Subtract the mean from each observation. Square the difference

Table 29: shows that subtracting mean from each value and squaring the different to calculate standard deviation of post test result

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S/No	Value of post tests	Minus mean(13.5)	Difference	Difference square
1	9	-13.5	-4.5	20.25
2	10	-13.5	-3.5	12.25
3	10	-13.5	-3.5	12.25
4	11	-13.5	-2.5	6.25
5	11	-13.5	-2.5	6.25
6	11	-13.5	-2.5	6.25
7	12	-13.5	-1.5	2.25
8	12	-13.5	-1.5	2.25
9	12	-13.5	-1.5	2.25
10	12	-13.5	-1.5	2.25
11	13	-13.5	-0.5	0.25
12	13	-13.5	-0.5	0.25
13	13	-13.5	-0.5	0.25
14	13	-13.5	-0.5	0.25
15	13	-13.5	-0.5	0.25
16	13	-13.5	-0.5	0.25
17	14	-13.5	0.5	0.25
18	14	-13.5	0.5	0.25
19	14	-13.5	0.5	0.25
20	14	-13.5	0.5	0.25
21	14	-13.5	0.5	0.25
22	14	-13.5	0.5	0.25
23	14	-13.5	0.5	0.25
24	14	-13.5	0.5	0.25
25	15	-13.5	1.5	2.25
26	15	-13.5	1.5	2.25
27	15	-13.5	1.5	2.25
28	15	-13.5	1.5	2.25

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29	15	-13.5	1.5	2.25
30	15	-13.5	1.5	2.25
31	15	-13.5	1.5	2.25
32	15	-13.5	1.5	2.25
33	15	-13.5	1.5	2.25
34	15	-13.5	1.5	2.25
35	16	-13.5	2.5	6.25
36	16	-13.5	2.5	6.25
37	16	-13.5	2.5	6.25

Step 3. Sum the squared differences=117.25

Step 4. Divide the sum of the squared differences by (n – 1). This is the variance.

Variance = $117.25 / (37 - 1) = 117.25 / 36 = 3.3$ value squared

Step 5. Take the square root of the variance. The result is the standard deviation.

Standard deviation = square root of 3.3 = 1.8 values

Standard error of the mean (pre test)

The standard deviation describes variability in a set of data. The standard error of the mean refers to variability we might expect in the arithmetic means of repeated samples taken from the same population. The standard error assumes that the data you have is actually a sample from a larger population. According to the assumption, your sample is just one of an infinite number of possible samples that could be taken from the source population. Thus, the mean for your sample is just one of an infinite number of other sample means. The standard error quantifies the variation in those sample means (8).

Step 1. Calculate the standard deviation. Already calculated=2.2

Step 2. Divide the standard deviation by the square root of the number of observations (n).
 $= 2.2 / (37)^2 = 0.0016$

Standard error of the mean (post test)

Step 1. Calculate the standard deviation. Already calculated=1.8

Step 2. Divide the standard deviation by the square root of the number of observations (n).
 $= 1.8 / (37)^2 = 0.0013$

Discussion

All of trainees were attended the full training days. At the end of specific topic presentation most trainees were actively participated on discussion either by asking question or answering, and sharing their experience. The training was aimed to build the capacity of health workers on Cholera prevention and control based on the need of Shashemene town administrative health office and Oromia Regional Health Bureau so that prevention and control strategy will be cascaded to community level. The trainees were also evaluated quantitatively through the pre and post tests and qualitatively by discussion, question and answering as well as sharing their experience so that they completed the training with good performances. However, the training was conducted within two days for all topics which is not adequate time and limited some of our discussions.

The mean has excellent statistical properties and is commonly used in additional statistical manipulations and analyses. One such property is called the centering property of the mean.

When the mean is subtracted from each observation in the data set, the sum of these differences is zero (i.e., the negative sum is equal to the positive sum). Because of this centering property, the mean is sometimes called the center of gravity of a frequency distribution. If the frequency distribution is plotted on a graph, and the graph is balanced on a fulcrum, the point at which the distribution would balance would be the mean. The arithmetic mean is the best descriptive measure for data that are normally distributed. On the other hand, the mean is not the measure of choice for data that are severely skewed or have extreme values in one direction or another. Because the arithmetic mean uses all of the observations in the distribution, it is affected by any extreme value (8). In both pre and post tests mean was calculated and the result showed that 8.8 and 13.5 respectively with the mean range of (8.8 to 13.5). The result was out of sixteen as already explained before, the result also shows that training improved knowledge of trainees from 8.8 mean to 13.5.

The mode is the preferred measure of central location for addressing which value is the most popular or the most common. In both pre and post tests mode was calculated and the result revealed that 9 and 15 which indicated dramatic changes.

The median is a good descriptive measure, particularly for data that are skewed, because it is the central point of the distribution (8). 9 and 14 was calculated as pre and post tests median

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respectively and showed that in pre test half of the trainees score 9 point and above where as in the post test half of the trainees score 14 and above out of 16 point. This indicates training shows great improvement.

The range of a set of data is the difference between its largest (maximum) value and its smallest (minimum) value. The range of pre and post test were (4 to 13) and (9 to 16) respectively. There were improvements of minimum and maximum values (9, 16) besides these gaps between trainees shortened from 9 to 7.

The standard deviation conveys how widely or tightly the observations are distributed from the center. Standard deviation of pre and post test calculated (2.2&1.8) respectively. This indicates that in pre test the score of trainees was somewhat far from mean value than post test score.

Limitation of the study

Inadequate training day (needs at least 3-4 days)

Absence of CTC site for practical observation

Conclusion and recommendations

The training was completed with improved knowledge of trainees with mean range of score(8.8 to 13.5),Range of standard deviation (2.2 to 1.8) good discipline, full attendance and active participation of the participant as well as effective in addressing the objective. The trainers were also very concerned and prepared well on the topics accordingly to share their experiences for the trainees. Based on the daily evaluation from the trainee we recommended the Shashemene town administrative health office and Regional health bureau to open CTC center in Shashemene town. We also recommended that cholera surveillance should be strengthened and kebeles with poor environmental sanitation should be identified, mapped and strictly followed. Community should be mobilized on cholera prevention and control and fair distribution mechanisms of water within kebele should be applied.

Reference

[1]. Training - definition of training by the Free Dictionary

- [2]. Developing the training role of an employers' organization by Syrian de Silva International Labor Office January 1997
- [3]. Anonymous, 1998
- [4]. Manual on Training Evaluation
- [5]. Human Resources Training and Individual Development February 11/2009: Training Evaluation
- [6]. McNamara (n.d.)
- [7]. Guidelines for pre- and post-testing: A Technical Implementation Guide January 2009
- [8]. Principles of Epidemiology in Public Health Practice Third Edition

Chapter-X
Epidemiological
Bulletin

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Oromia Regional Health Bureau, PHEM core process

WEEKLY PHEM Bulletin (WHO WEEK 52, 2015)

I. Introduction

This bulletin serves to summarize weekly surveillance data and performance of ORHB/PHEM on epidemic prone diseases and other public health emergencies. It comprises completeness, timeliness and reporting trends of priority diseases and present response activities. It also provides feedback on surveillance activities for week 52, 2015 GC.

II. Weekly Surveillance Report

Report completeness and timeliness of government health facilities were 91% and 84% respectively. Kelem Wollega, North Shoa and Burayu Town were late reporter in this week. Completeness of Bale, North Shoa and South West Shoa were below the target with 78%, 75% and 67% respectively.

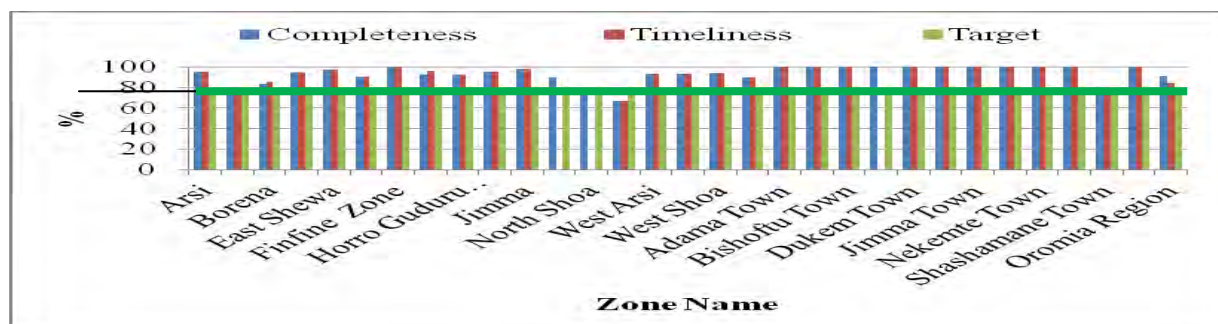
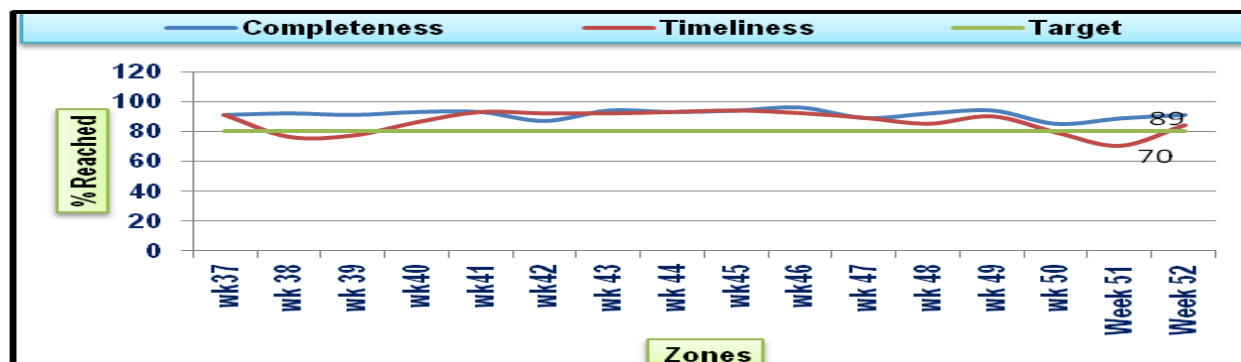


Figure 53: Report Completeness and Timeliness by Zones, Oromia Region, Ethiopia, WHO week 52, 2016

Regional Report Completeness and Timeliness of the past sixteen consecutive weeks were above the target except for the Timeliness of week 38, 39, 50 and 51 (Fig: 2).



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Figure 54: Trends of Regional Surveillance report completeness and Timeliness by WHO week 52, Oromia, Ethiopia, 2015

III. Diseases Condition

1. Malaria

In this week, a total of 3289 clinical and confirmed malaria cases were reported. Among the total, 3201 (97%) of them were confirmed malaria cases. Of the total confirmed, 1793 (56%) of them were Plasmodium falciparum. Confirmed malaria cases were decreased by 171 (5%) as compared to week 51. A total of 22541 cases were laboratory tested, yielding a positivity rate of 3372 (15%). Among the total confirmed malaria cases, the highest number of cases were reported from East Shewa Zone 461(14.4%) followed by West Wollega 361 (11.3%), Borana 269 (8.4%), West Showa 196 (6.1%) HGW 189(5.9%) and IluAbabora 187(5.8%),. Adama, Boset, Fantale and Metahara from East Showa, Abaya, Glena and Telltale from Borana, Nejo Rural, Ana sibu and Kondala from West Wollega, Yayyo, Darimu and Chewaka from Ilubabor, Gindeberet Nono and Jaldu from west Showa, Abe Dongoro, Guduru and Hababa Guduru from Horo Guduru Wollega Zones were woredas which have high confirmed case load that need attention. Trends of clinical and confirmed malaria cases for the last fifteen consecutive weeks are indicated below (Fig:3).

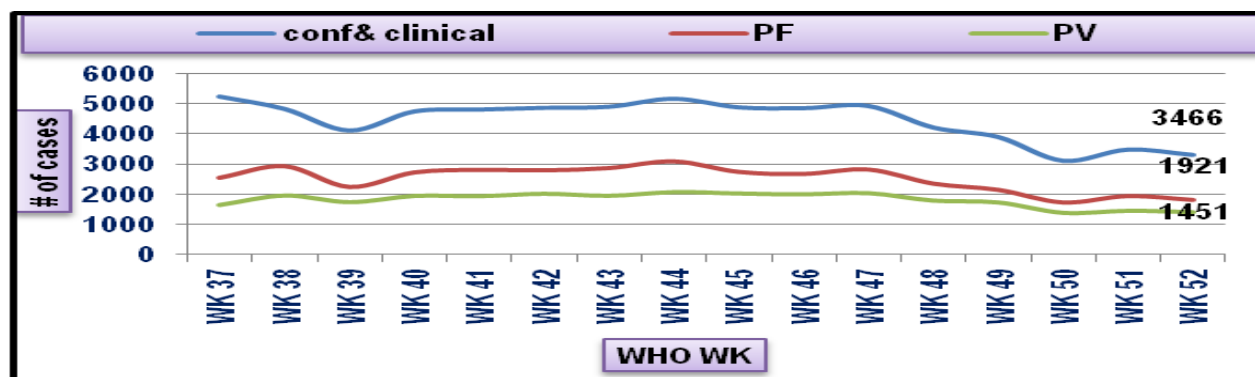


Figure 55: Trends of clinical and confirmed malaria Case by week, Oromia Region, Ethiopia WHO week 52/2015

Confirmed malaria cases of the last six consecutive weeks of selected zones are shown below.

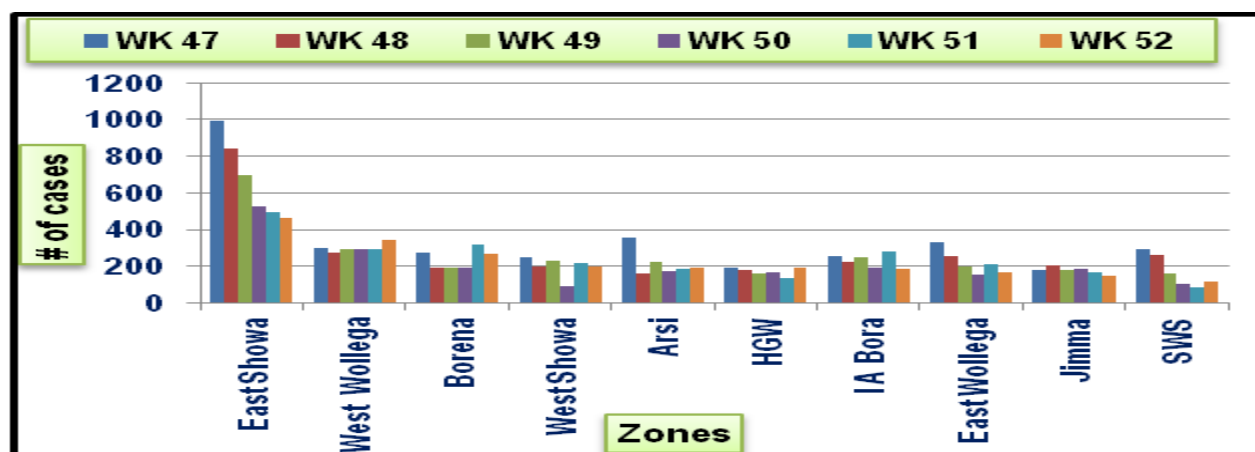


Figure 56: Trends of confirmed malaria cases by zone, Oromia, Ethiopia WHO week 52/2015

2. Dysentery (Diarrhea with Blood)

In this week, a total of 1482 dysentery cases were reported. It was similar to week 51. Highest number of cases was reported from East Shoa 138 (9.3%), zone followed by Borana 127 (8.5%), Bishoftu town 125 (8.4%) East Hararge 100 (6.75%) and Guji zones. Modjo, Adama and Dugda from East Shoa, Das, Miyo and Moyale from Borana Zone, Haromaya Town, Kersa and Chinaksen from East Hararge and Negele Town, Goro Dola and Uruga were woredas contributing high number of Dysentery. The occurrences of AWD epidemic in this area for the last five to six years and the currently existence of outbreak in Moyale woreda of Borana zone should be taken into account and every diarrhea case should strictly be seen and managed properly. Trends of fourteen consecutive weeks of Dysentery cases are shown below.

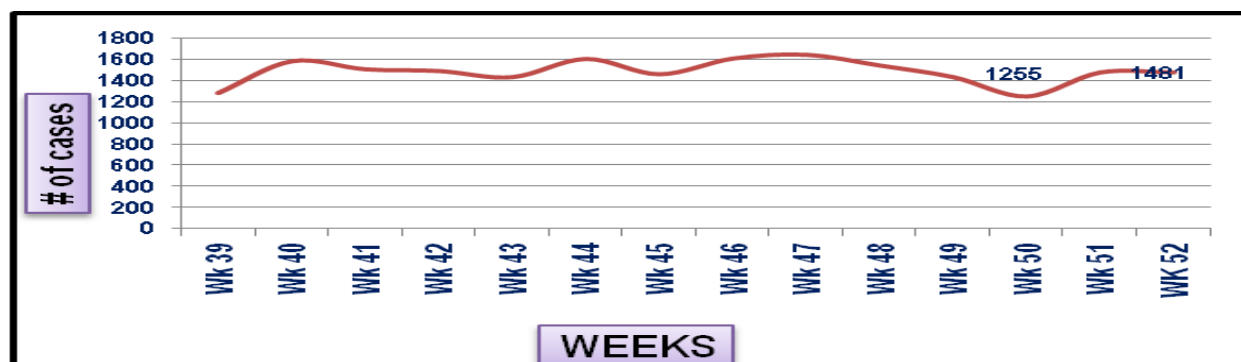


Figure 57: Trends of Dysentery cases by WHO week, 52 Oromia Region, Ethiopia, 2015

5. Measles

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In this week, a total of 258 suspected Measles cases reported to the region from different zones. The suspected cases were increased by 87(51%) as compared to week 51. Majority of the cases were reported from Kelem Wollaga,112(43%) IluAbabora 51(19.8%),Guji 21(8.1%),West Wollega 18(7%) and Borana 14(5.4%).Sayo,Dale Waber,D/Dola Hospital from Kelem Wollega,Darimu,Chora and Gechi from IlluAbabor,Adola Rade,Hambala and Shakiso from Guji ,Najo Rural, and Kondala from West Wollega and Galana,Yabello Hospital,Yabelo Rural, and Bule Hora Hospital from Borana zone were woredas and Hospitals that contributed for high number of suspected measles cases which need attention. Trends of eleven consecutive weeks of suspected Measles cases are shown below.

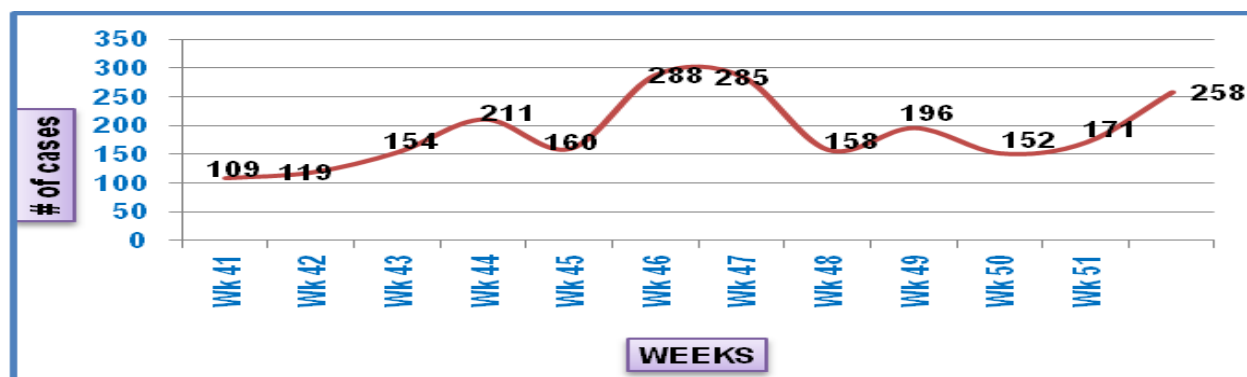


Figure 58: Trends of suspected Measles cases by WHO week, 52 Oromia Region, Ethiopia, 2015

4. AFP/Polio

In this week, five suspected AFP cases were reported to region. Jimma zone reported two cases whereas Kellam Wollega, Finfine and Adama Town were reported one case each.

5. Malnutrition

In this week, a total of 1632 new SAM cases were reported to the region and decreased by 53 (3.14%) as compared to week 51 (fig.7). Among the total cases, 159 (9.7%) of them were treated at stabilization center. The highest number of cases were reported from East Hararge Zone 364 (22.3%), followed by West Arsi 217 (13.3%), West Hararge 199 (12.2%), Guji 160 (9.8%), Arsi 209 (12.8%). Girewa, Fedis and Kersa woredas from East Hararge zone, Siraro, Shshamane and Shalla from West, hole Jeju and Merti from Arsi, Gemechis Miesso, and Daro Labu from West Hararge, and Liben, Kersa and Adola Rade from Guji zone were woredas which have high number of case load that need strict follow-up.

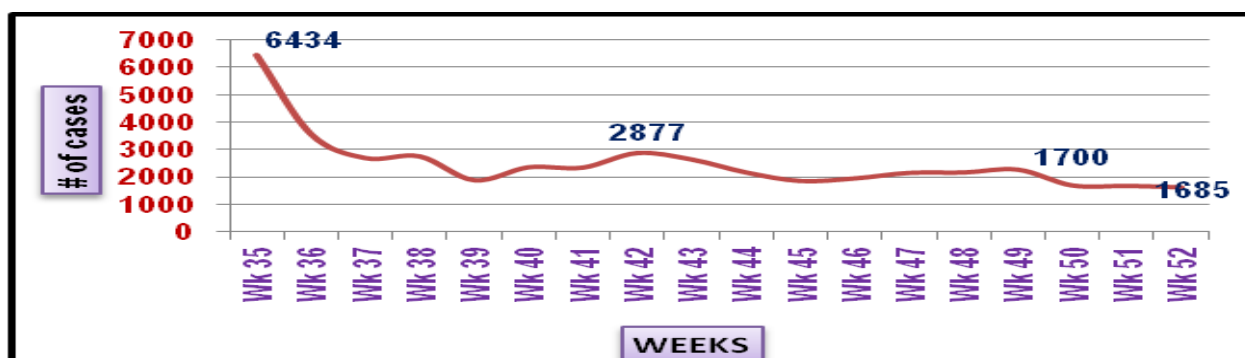


Figure 59: Trends of SAM cases by WHO week 52 Oromia Region, Ethiopia, 2015

7. Meningococcal Meningitis

In this week, four suspected Meningococcal meningitis case was reported to the region. Two Cases were reported from Yebello Hospital of Borana zone, one case from Goba Town of Bale zone and one case from Shambu town of HGW zones. There was past history of Meningitis outbreak in Wadara woreda of Guji zone. Moreover, Cases of Meningitis occur in Oromia almost every year and Epidemics of meningitis are unpredictable and can occur any time. Therefore, for every suspected Meningococcal meningitis case attention should be given and seen strictly.

8. Rabies

A total of six suspected rabies cases were reported to region in this week. Three cases reported from Bule Hora Hospital of Borana zone .Munesa and Merti woredas reported two and one cases from Arsi zone respectively.

9. Anthrax

No Anthrax case reported to the region in this week.

10. Relapsing Fever

In this week, a total of thirty three Relapsing fever cases were reported. Among these sixteen cases were from Anna Sora of Guji zone, fourteen cases from Merti woreda of Arsi zone and three cases reported from Miyo woreda of Borana zone.

11. Maternal Deaths

Five maternal deaths were reported to the region in this week. Gadab-Hasasa, Kofale and Siraro woreda of West Arsi zone reported one death each. J/Arjo woreda of East Wollega zone and Malka Belo woreda of East Hararge zone reported one death each.

Best Practice

West Arsi and Borana zones are started to prepare weekly Bulletin and analysis there woreda and kebele level PHEM report. In others zones these activities are not yet started even though, there are increased trained human power and field Epidemiology field base at zonal level. In the second round growth and transformational plan data analysis should goes to zonal and woreda level to prevent any outbreak .So that, all zones and Town administration should start to use weekly bulletin of their own zone and Woredas.

IV. Response Activities

- Based on weekly surveillance report, feed-back is given to all zones and towns timely.
- Daily follow-up of rumors of epidemic prone diseases and other public health emergencies are followed regularly.
- Necessary effort has been caring out at all levels, In order to minimize the current emergency Nutrition problem
- AWD outbreak investigation and response is under way

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Oromia Regional Health Bureau, PHEM core process
WEEKLY PHEM Bulletin (WHO WEEK 11, 2016)



HIGH LIGHTS SAM and Dysentery OF THE WEEK

- Suspected measles, clinical and confirmed malaria cases were increased as compared to wk 10 . cases were increased.

I. Introduction

This bulletin serves to summarize weekly surveillance data and performance of ORHB/PHEM on epidemic prone diseases and other public health emergencies. It comprises completeness, timeliness and reporting trends of priority diseases and present response activities. It also provides feedback on surveillance activities for week 11, 2016 GC.

II. Weekly Surveillance Report

Report completeness and timeliness of government health facilities were 92 % and 84% respectively. All zones and towns reported timely, except Kelem Wollega and Bale zones. Completeness of all zones and towns were above the target except Bale zone%.

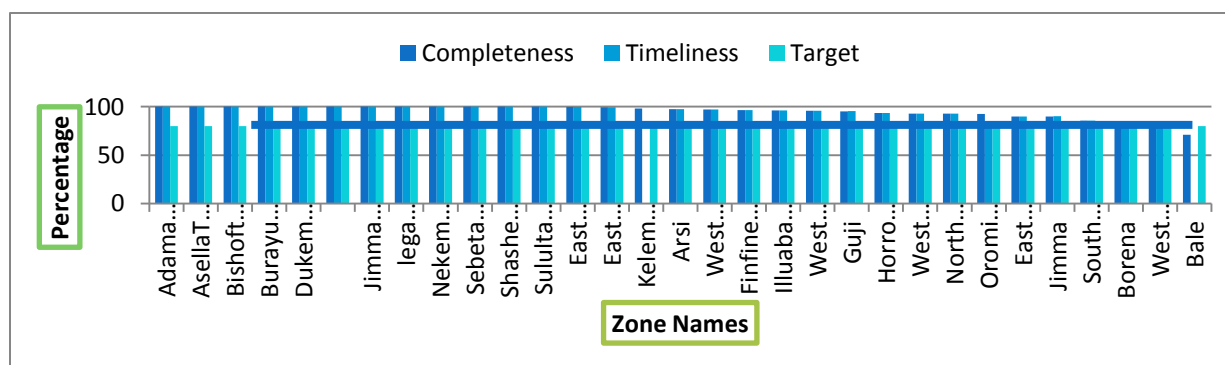


Figure 60: Report completeness and timeliness by zones, Oromia Region WHO Week 11, 2016
Regional report completeness and timeliness of the past fifteen consecutive weeks were above the target except for the timeliness of week 50, 51, 2, 5, 7 and 8.

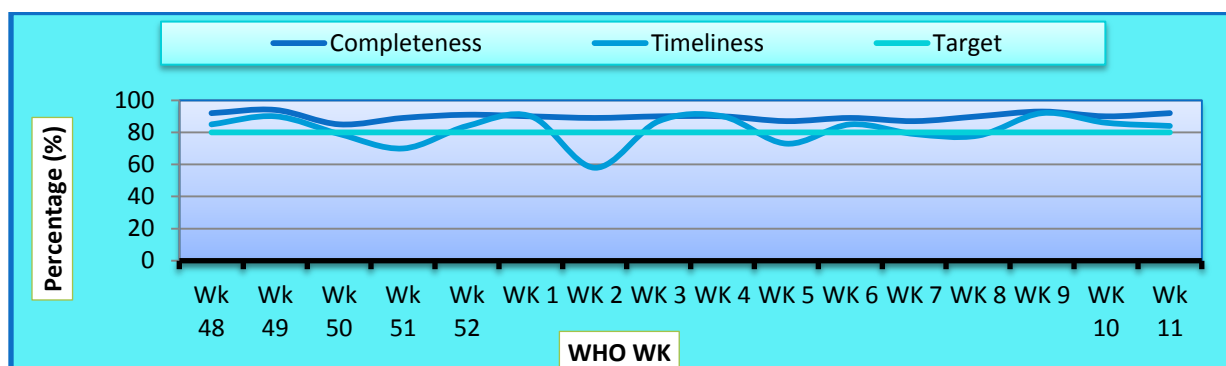


Figure 61: Trends of regional surveillance report completeness and timeliness by WHO week, 11 Oromia Region, Ethiopia, 2016

III. Diseases condition

1.Malaria

In this week, a total of 3080 clinical and confirmed malaria cases were reported. Among the total clinical and confirmed malaria cases 3002 (97.5%) of them were confirmed cases. Of the total confirmed cases 1,757 (58.5%) of them were plasmodium falciparum. Confirmed malaria cases were increased by 243 (8.8%) as compared to week ten. A total of 25,840 cases were laboratory tested, yielding a positivity rate of 11.6%. Among the total confirmed malaria cases, the highest number of cases was reported from Borana Zone 502 (16.7%) followed by East Shoa 423(14.1%), Jimma 211(7.2%) East Wollega 202 (6.7%), West Shoa 181 (6.03%) South West Shoa 176(5.9%) West Wollega 174(5.8%) and IluAbabora 151 (5.03%), Zones. Abaya, Galena, and Taltele from Borana Zone; Fantale, Boset and Adama from East Shoa Zone; Shabe, So koru and Nono Benja from Jima zone were woredas that contributed for high number of malaria cases. As compared to week ten, confirmed malaria cases were increased in Borena, East Shoa and East Jimma Zones. The on and off type of currently raining condition might favour for the increased number of cases. Therefore, strict follow-up is mandatory. Trends of clinical and confirmed malaria cases for the last twelve consecutive weeks are indicated below.

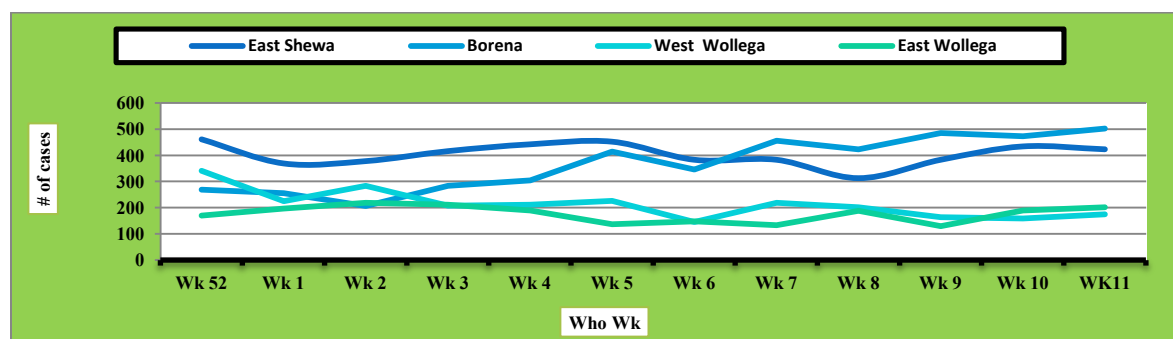


Figure 62: Trends of confirmed malaria case from week 52, 2015 to 11, 2016, Oromia Region, Ethiopia, 2016

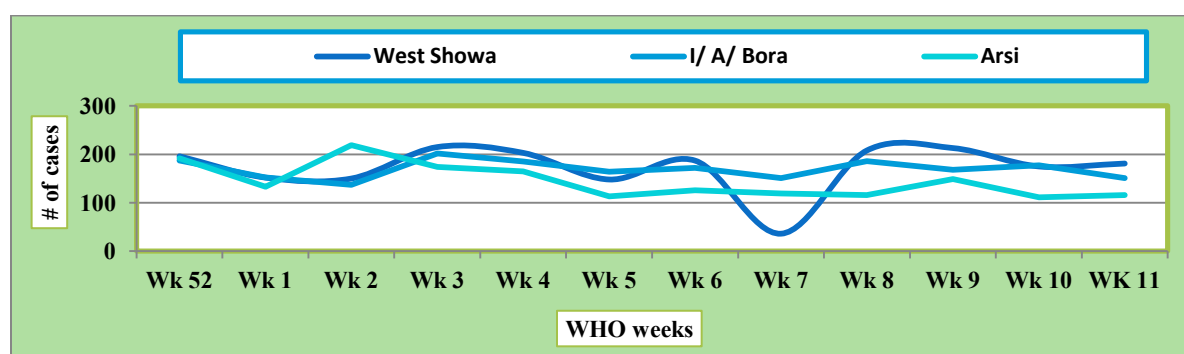


Figure 63: Trends of confirmed malaria cases by selected zones, week 52-11, Oromia Region, Ethiopia, 2016

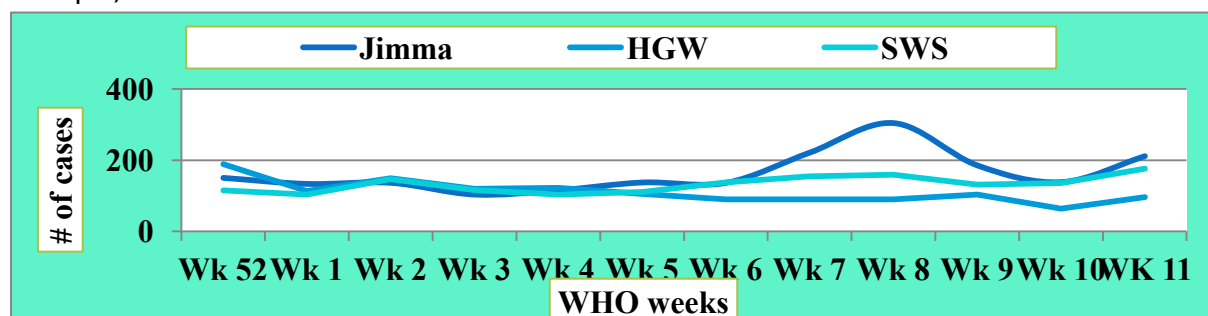


Figure 64: Trends of confirmed malaria cases by selected zones, week 52-11, Oromia, Region, Ethiopia, 2016

2. Dysentery (diarrhea with blood)

In this week, a total of 2019 dysentery cases were reported. Cases were increased by 160 (8.6%) as compared to week ten. The highest number of cases was reported from East Shoa Zone 184 (9.4%), followed by East Hararge 166(8.2%) Arsi 151 (7.5%), West Shoa 132(6.5%) Guji 130(6.4%), Jimma 117(5.8%) and Bale 107(5.3%) Modjo, Adama Tulu Jiddo Kombolcha, and

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Adama from East Shoa zone, Gursum, Kersa and Kombi from East Hararge and Diksis, Hetosa Zuway Dugda and Bale Gesger from Arsi zone were woredas that contributed for high number of dysentery cases. Trends of the last seventeen consecutive weeks of dysentery cases are shown below .

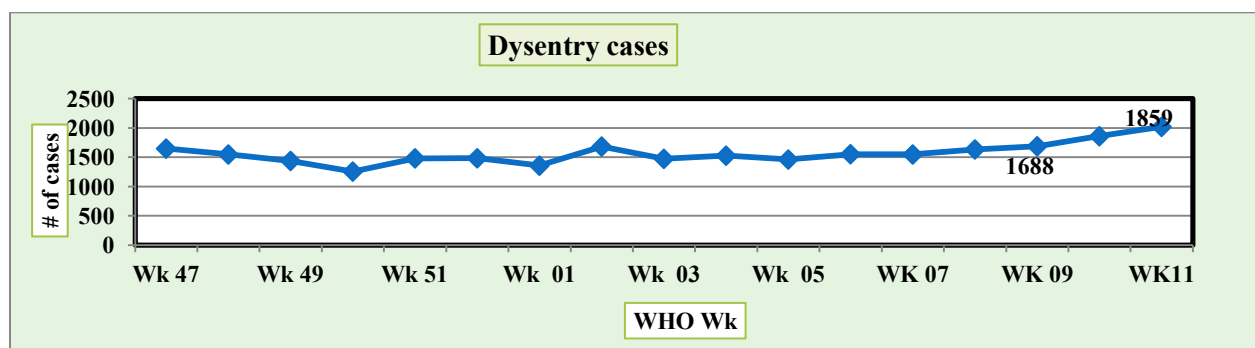


Figure 65: Trends of dysentery cases by week (Wk 47-11), Oromia Region, Ethiopia, 2016

3. Measles

In this week, a total of 152 suspected measles cases were reported to the region. The suspected cases were increased by 74 (53%) as compared to week 10. Majority of the cases were reported from Horro Guduru Wollega 46(30.2%) followed by Guji 35 (23%) Kelem Wollega 17(11.2%) and Jimma 11(7.2%) zones

Shakiso Town, Adola Rade and Odo Shakiso from Guji zone, Abaya Choman from Horro Guduru Wollega, Dale Weber from Kelem Wollega and Agaro town and Limu Hospital from Jima zone were woredas that contributed for high number of suspected measles cases. Trends of the past thirteen consecutive weeks of suspected measles cases are shown below.

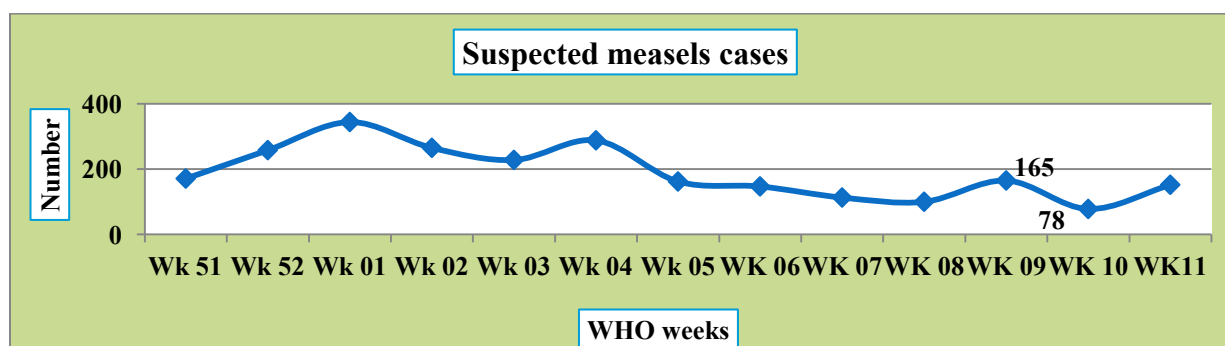


Figure 66: Trends of suspected measles cases by WHO week, 11, Oromia Region, Ethiopia 2016

4. AFP/Polio

In this week, a total of five suspected AFP cases were reported to the region. Nunu Kumba of East Wollega zone ,Jardaga Jarte of Horro Guduru Wollega,Matu town of Illu Aba Bora ,Nekemte town and Chelia woreda of West Shoa zones reported one case each.

5. Malnutrition

In this week, a total of 2443 new SAM cases were reported to the region. SAM cases were increased by 306 (14.3 %) as compared to week ten. Among the total cases, 325 (13.3%) of them were treated at stabilization center. The highest numbers of cases were reported from East Hararge 786 (32.2%), followed by West Hararge 397 (16.3%), West Arsi 391 (16%), Guji 163(6.7%) and Bale 153(6.3%) zones. Fedis(84), Girewa(83) , Haromaya(83) and Meta (94) from East Hararge, Chiro rural(53), Gemechis(58) and Meiso (74) from West Hararge, Siraro(96),Shalla(114) and Shashemene(134) from West Arsi Zone; Harana Buluk (30) ,Goro(29), and Barbere(16) from Bale Zone; and Hambala(27) Liban(32) and Adola Rade(22) from Guji Zone were woredas contributed for high number of SAM cases that need attention. Trends of the past eleven consecutive weeks of SAM cases were indicated below.

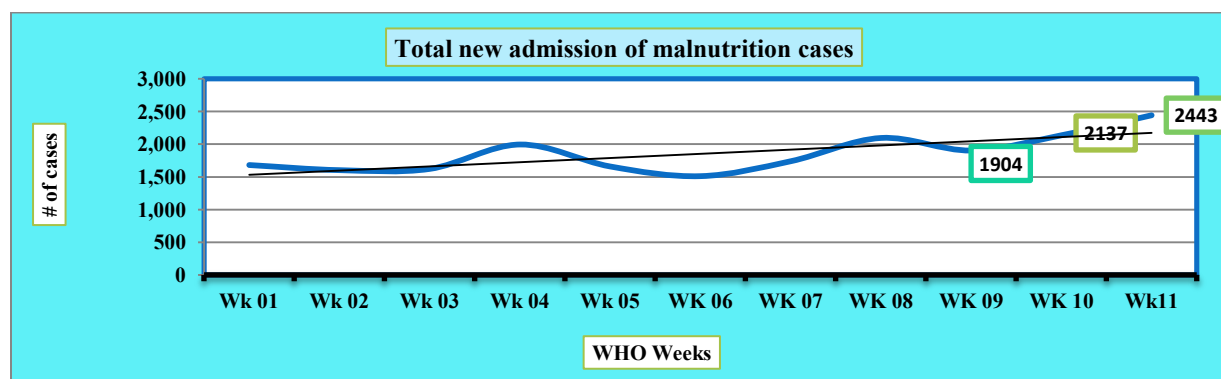


Figure 67: Trends of SAM cases by WHO weeks, Oromia Region, Ethiopia, 2016

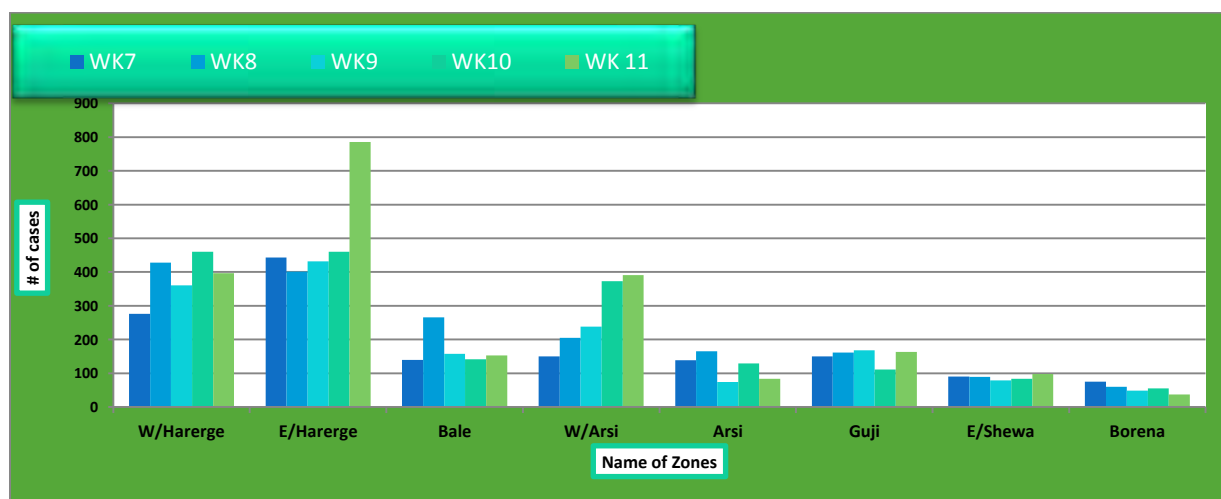


Figure 68: Trends of SAM cases by selected zones of Oromia Region, Ethiopia WHO week 11 2016

6. Meningococcal Meningitis

In this week, nine suspected meningococcal meningitis cases: Bale, West Hararge and Jimma Town reported one case each. Whereas, Borana and, IluAbabora zones reported two and three cases respectively to the region

7. Rabies

One suspected rabies case was reported from Munessa woreda of Arsi zone.

8. Anthrax

In this week no anthrax case was reported to region.

9. Relapsing fever

In this week, a total of fifteen relapsing fever cases were reported. Eight cases were reported from Negele town of Guji zone, six cases were from Merti woreda of Arsi zone and one case from Dilo woreda of Borana zone.

10. Maternal deaths

Five maternal death were reported the region. West Wollega, Kelem Wollega, North Shoa, East Hararge and East Shoa reported one cases each.

11. Response Activities

Based on weekly surveillance report, feed-back was given to all zones and towns timely.

Daily follow-up of rumors of epidemic prone diseases and other public health emergencies are followed regularly.

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- Necessary efforts have been carried out at all levels, in order to minimize the current nutrition emergency problem
- AWD outbreak investigation and response is under way
- Health and nutrition task force meeting is conducted, issues discussed and action points shared with partners

**Emergency
Health and
Nutrition
Preparedness
and Response**

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Introduction

The global climate information indicated that there will be an El-Nino effect which affects many countries globally including Ethiopia. The El-Nino effect will be manifested with shortage of rain and/or distractive type of rain fall. A number of Woredas in our country will be affected by the shortage of rain which lead to severe drought will further exacerbate the already existing poor nutritional status of the most vulnerable group mainly children, pregnant and lactating women. Hence, strong preparedness and response, and successful management of emergency health and nutrition program management are required at all levels. Ministry of health assigned 72 Ethiopian Field Epidemiology Training Program (EFETP) residents to all nationwide to strengthen coordination and collaboration related to El-Nino impact. As EFETP residents we assigned in Oromia National Regional state for three months and worked in Borana and Bale zones.

Objectives

To ensure that emergency health and nutrition preparedness is in place, appropriate response is given to; implementation is monitored in all the affected Woredas.

Key Activities

1. Conduct the existing health profile of the Woredas that are priority number 1, 2 and 3 by focusing on moderate and severe acute malnutrition, measles, malaria and diarrheal diseases;
2. Evaluation of the existing surveillance capacity of the Woredas that are priority number 1, 2 and 3 by focusing on moderate and severe acute malnutrition, measles, malaria and diarrheal diseases;
3. Ensure the necessary surveillance and malnutrition management guidelines, formats, standard operating procedures, monitoring tools etc are in place;
4. Support in preparation of contingency plan for the preparedness and the response to the emergency health and nutrition;
5. Provide technical assistance and also be part of it in surveillance data collection, collation, analysis and interpretation;
6. Produce scientific report of and present the results of routine weekly surveillance data and outbreak investigations to the PHEM unit and to the command post at field base and at woreda level;

7. Participates in the supervision and monitoring of regional surveillance;
8. Assist in capacity building of Surveillance staff and other health workers at different levels;
9. Monitoring and evaluation of overall implementation the program;
10. Coordination of the overall implementation of the response;
11. Provide technical in put in the effort to strengthen the capacity of the health sector in terms of early warning, preparedness, prevention, detection, response and rehabilitation of major health and nutrition emergencies.

Borana zone

Borana zone is one of eighteen rural zones of Oromia National Region State which is located in the southern part of the country with 565 Km from Addis Ababa. It shares common boundaries with SNNPR in North and East, Kenya in South and Guji zone of Oromia Region in West. In the zone there are 15 districts, with 269 Kebeles. Regarding to health facility there are 3 hospitals, 66 health centers, and 264 health posts.

In Oromia region 11 zones and 105 Woredas selected as priority number 1&2 for EL-nino related impact. In Borana zone among fifteen districts 12 districts identified as priority number 1&2

Methodology

Regular discussion with zonal and districts level taskforce committee, on impact of IL-non like emergency Nutrition and Health, discussion with zonal health department and analysis of Some special health data for appropriate action.

Major Activities

1. Awareness Creation

Orientation On El-nino impacts given for All 15 district health office head, Planning and monitoring officers, Finance and economic development(wofed) and 66 PHCU directories by using opportunity of Woreda based plan of 2008 EFY; All zonal cadre member and district task force committee also oriented on impact of El-nino at zonal level..

Woreda taskforce committee gives similar orientation to their respective district cadre members, kebele administrative body, Health extension workers, developmental agent (DA) Kebele women affairs and religious leaders at district level. Kebele administrative body gives similar orientation

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for their respective health developmental army (HAD) up to lowest structure of arms called network (1:5). Since there were Cholera outbreak in Kenya, attention given to that site and in Moyale town orientation also given for about 454 civil servant from both region 4 and 5. Similar orientation also given for 105 federal defense force.

Cholera

In Moyale town former Ebola joint taskforce committee organized from Oromia, Ethio Somali and Kenya reorganized as co- cholera –Ebola task force committee. This taskforce committee discusses issue of cholera daily by having regular meeting. The chair person and site of meeting recycle every other day. Eleven Technical committee established, under this joint Task force committee. High risk woredas like Moyale, Mio, Das, Dilo Dire and Taltele which are sharing boundaries with Kenya identified and mapped as suspected entry point for cholera case from Kenya to Oromia region, Ethiopia. Training of cholera prevention and control was given for 101 health professionals came from those 6 districts including district found in main road of Moyale to Hawasa town of SNNPR and 3 hospitals found in the zone. In the training medical directors of Hospitals, Woreda deputy head, PHEM and WASH focal persons including OPD and Laboratory health professionals from health facilities were involved. Cholera guideline distributed to all participants involved on training, cholera training also given for 11 Ebola technical group at Moyale site for one day; similar joint taskforce committees organize in Woredas sharing boundaries with Kenya. Community case definition distributed to all health posts. Cholera leaflet prepared by local language like Amharic, Somali and Afan Oromo and distributed for urban community of Moyale town. This leaflet distributed by using Red Cross Societies volunteers and Ebola workers. Regulatory department of zone and district started to visited governmental and private sector for prevention of cholera. Seventy Hotels and restaurant visited, warranty is given for seven of them because of high potential for infection. Sanitation campaign, conducted on Moyale town by the participation of Federal defense force and government employees. They developed by low to clean the town by 15 days interval. In some of visited Woredas There is shortage of Cholera kit like ORS, doxycycline, and Ringer lactate. CTC established in Moyale town and given to woreda health office with full responsibility



Figure 69: Cholera Treatment Center Established in Moyale Town of Borana zone Oromia
Region Ethiopia 2015

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Table 30: Latrine coverage and utilization of high risk districts in Borana zone of Oromia Region Ethiopia 2015

S/N	High risk woreda	Latrine coverage	Latrine utilization	Standard latrine	ODF Kebeles in NO.	Remark
1	Moyale	63	63	28	0	
2	Mio	66	66	37	7	
3	Dilo	21	19	19	2	
4	Dire	43	43	26	1	
5	Das	41	29	12	0	
6	Taltele	37	37	9	0	
zone		62	60	40	13	

Emergency Nutrition

Malnutrition Screening conducted in all Woredas of the zone. Targeted children for screening was 6-59 months and planned children for screening were 204,863, but screening completed with 101 %(205,198).The screening results indicated that a total of 12,552 Moderate Acute Malnutrition (MAM) and 887(830 MUAC<11 and 57 Edema) cases were identified. Regarding to pregnant and lactating women screening was completed by 149 %(75324/50,533) and 17,498 MAM cases were identified at zonal level. OTP services established in 268 health posts out of 269 health posts, 41 health centers started to provide both OTP and Sc.programe out of 66 and all three hospital begin to provide both OTP and SC. Services. Finally high risk woredas like Bule Hora, Abaya, Taltele, Dugda Dawa, Yebello, Malka Soda, and Galena identified and mapped for follow up.

Malaria

ITNS coverage and utilization of the zone was 91% and 71% respectively. Health education on malaria was planned to cover 67,234 HH, and completed with 62,629(93%) achievement. Malaria high risk woreda like Abaya, Galena and Taltele were identified and sprayed with Delta me trine

Recommendation

- Strengthen Taskforce committee at all level
- Strengthen Regulatory department for the prevention and control of any infection
- Increase Latrine coverage and utilization
- Avail Water treatment chemicals
- Scale-up the best practice of Sanitation campaign from Moyale town to others entry point Woredas.
- Health education on Environmental sanitation and personal hygiene.
- Monthly Quality malnutrition screening should continues
- Screened MAM as well as SAM cases should linked to services
- All health centers and hospitals should give both OTP and SC program
- All health posts should give OTP services

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- Strengthen referral system from community, health posts, health centers and hospital.
- Strongly check Nutritional Supply regularly.
- Intensive health education on ITNS utilization, IRS, Drainage of stagnant water. And use of Abet Chemical if it is available.
- Avail Malaria supply in all health facility.
- Increase inter collaborative work with each adjacent woreda
- Woreda and zone should stop measles epidemic which is swimming throughout the year in the zone

Bale zone

Bale is one of 18 rural zones in Oromia region which is located at the south east of Ethiopia with a distance is 435 km from Addis Ababa. The capital town of the zone is Robe. In the zone there are 21 districts and 385 kebeles. Bale zone shares common boundaries with:

Arsi in North, East Hararge in North East, Ethio Somalia Regional State in South East, Guji in South west and West Arsi in West. Area of the zone is 62,555 KM²; Altitude ranges from 300-4377 km above sealevel. Three ecological zone with highland 14.93%, mid land, 21.54%, and low land 63.53% are exist in the zone. Annual rain fall ranges from 900-1400mm.

Historical place like Dire Sheik Hussein, Sof-umer Cave Tulu Dimtu Mountain with 4377 meters and historical beginning site of Oromo people Mada Wolabu also found in this zone. Bale is also home of Tourism center such:-Bale Mountain National Park, Mountain Nyala, Red Fox and Harana Forest. Projected population of 2008 Ethiopian fiscal year of zone is 1757383. There are 4 hospitals, 84 health centres and 351 health posts. A total of 3026 staff employed under zone health office and providing services for community.

Community Mobilization

All district allocated emergency budget to control emergency related to EL-nino from government budget and community also developed strategy to mitigate impacts. Budget allocated by government and community participation were indicated blow.

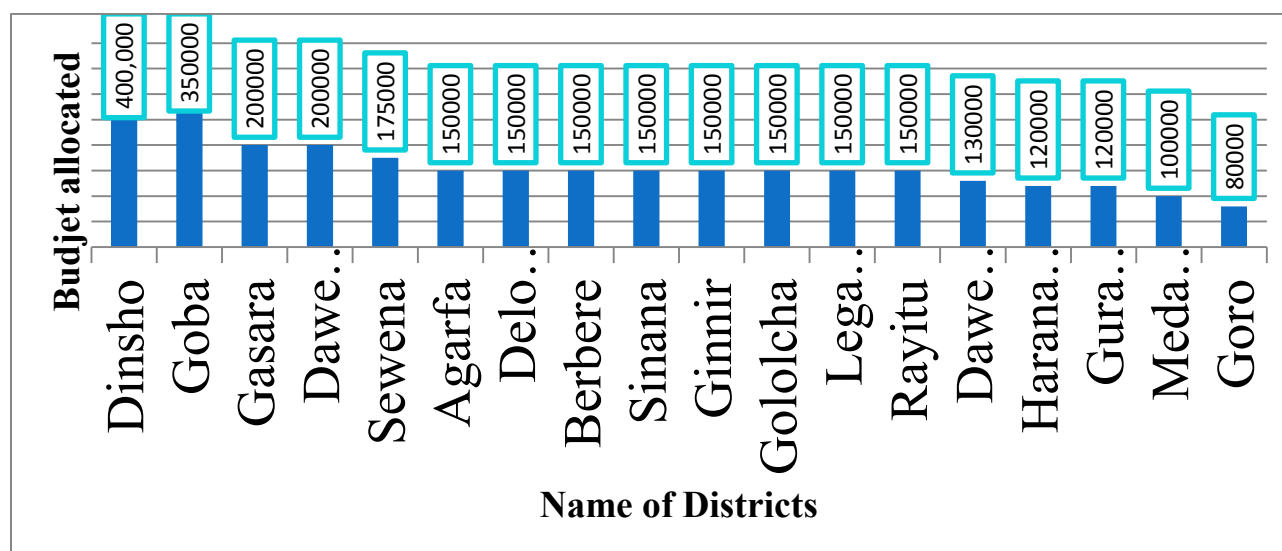


Figure 70: Emergency Fund Allocated by districts of Bale zone Oromia region Ethiopia, 2016

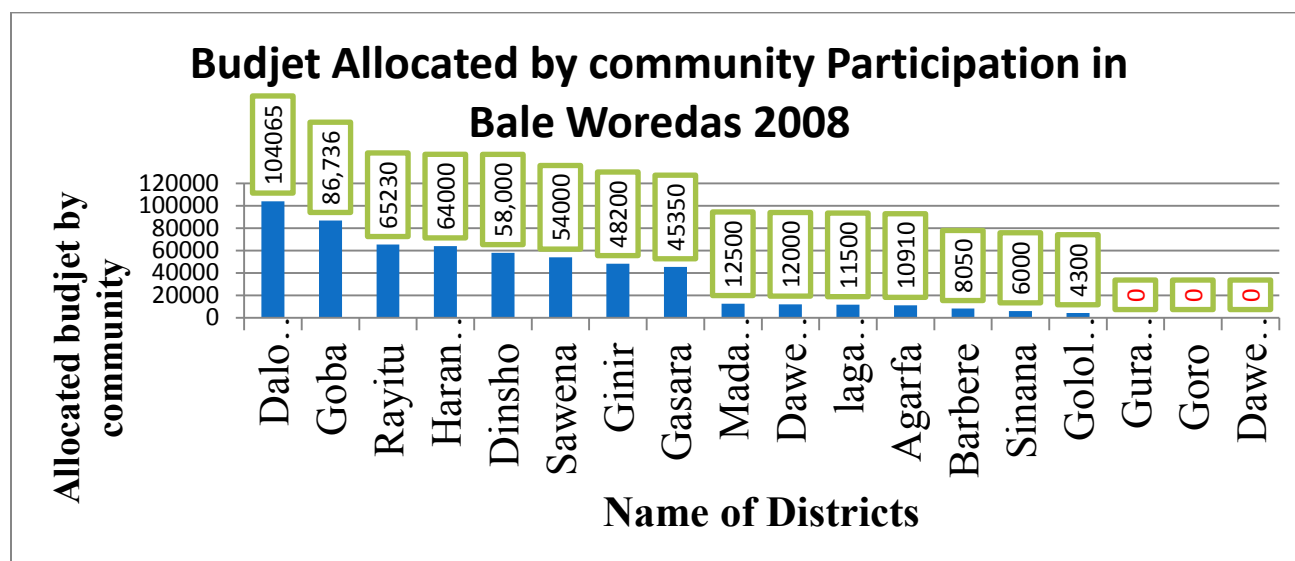


Figure 71: Emergency fund collected by community participation in Bale zone Oromia region Ethiopia 2016

WASH

To prevent water related disease, latrine coverage, latrine utilization, increasing open defecation free kebele and availing pure drinking water to community play major role. Latrine coverage, Latrine utilization and water coverage of Bale zone district indicated below.

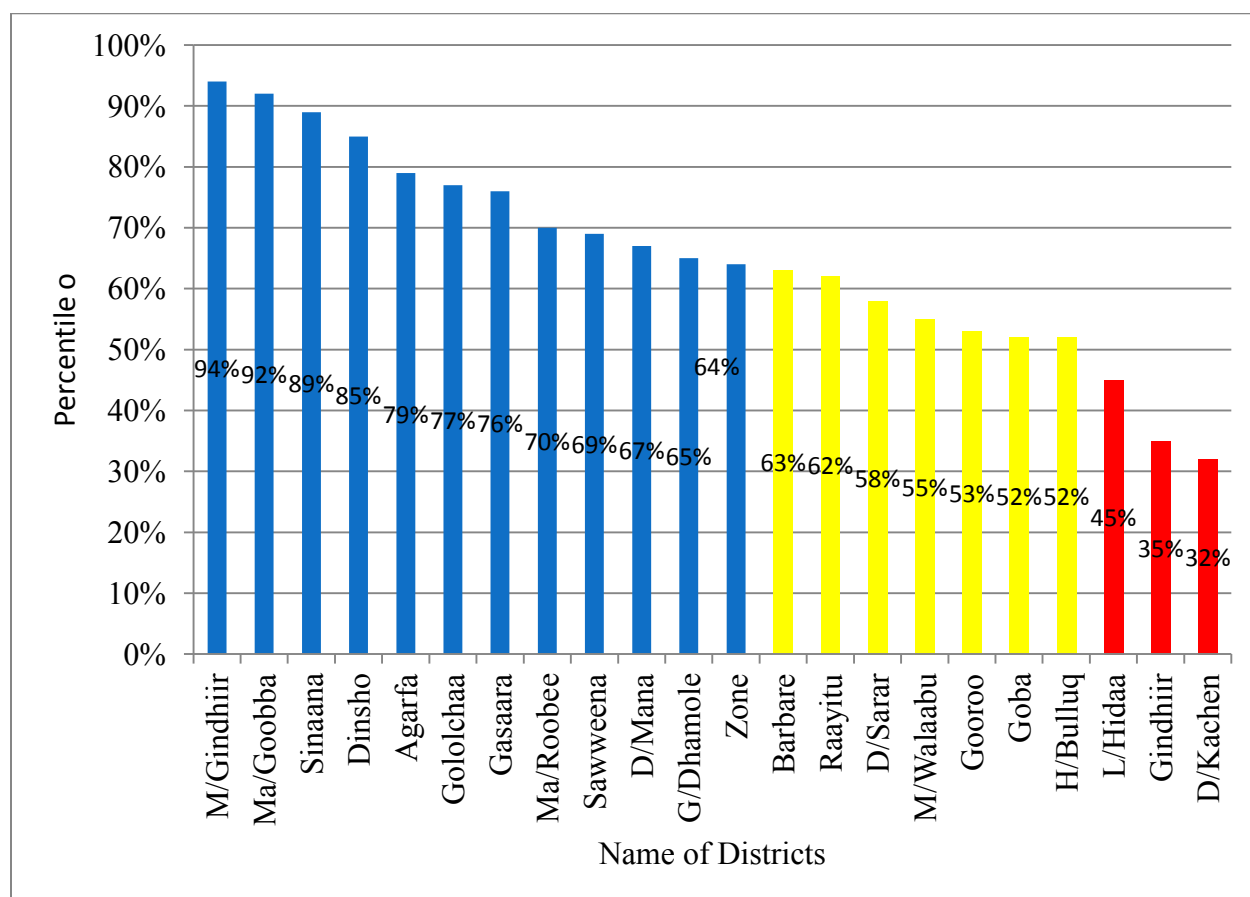


Figure 72: Standard Latrine Coverage of Bale zone Oromia Region Ethiopia 2016

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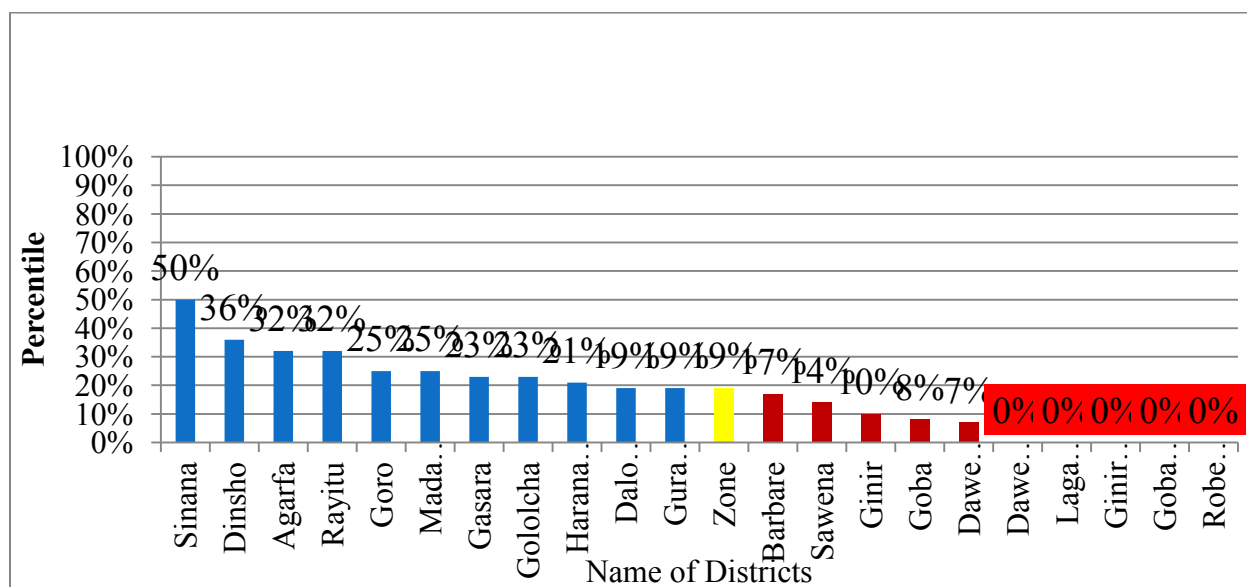


Figure 73: Coverage of ODF kebeles in Bale zone Oromia Region Ethiopia 2016

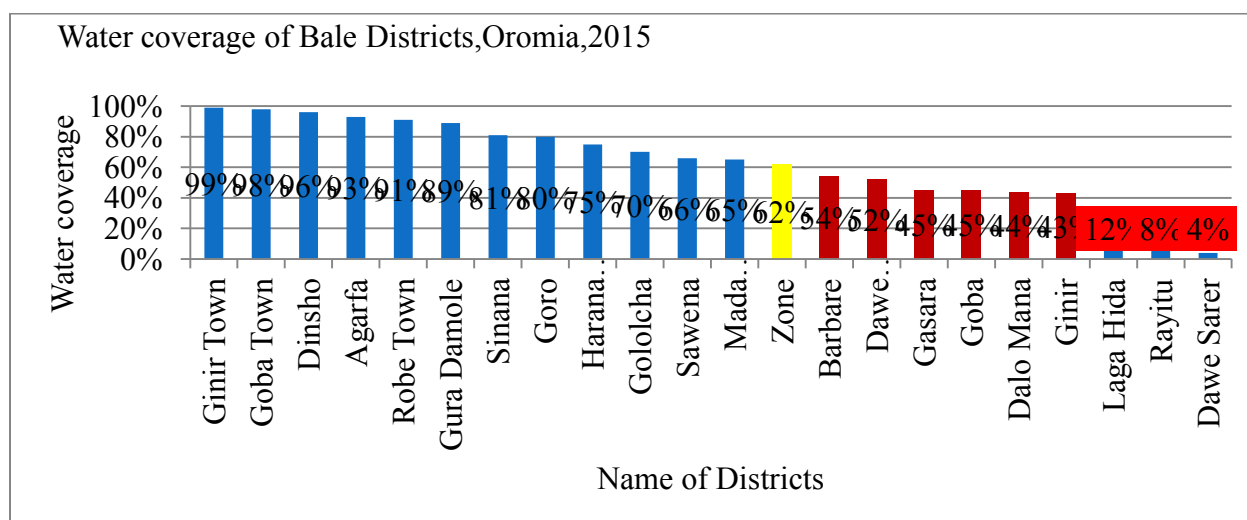


Figure 74: Water coverage of Bale districts Oromia region Ethiopia 216

Emergency Nutrition

Screening Result of September indicated that 6-59 month completed with 90% coverage, MAM 9044 SAM=1294 with edema 72, PLW coverage 93% MAM 12879 were identified.

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PHEM

Bale is one of the zones known by low report completeness and timeliness in Oromia Region, so we analyze 10 WHO weeks report completeness and timeliness of the district and given feedback for both district and zonal health office. The following figure shows it.

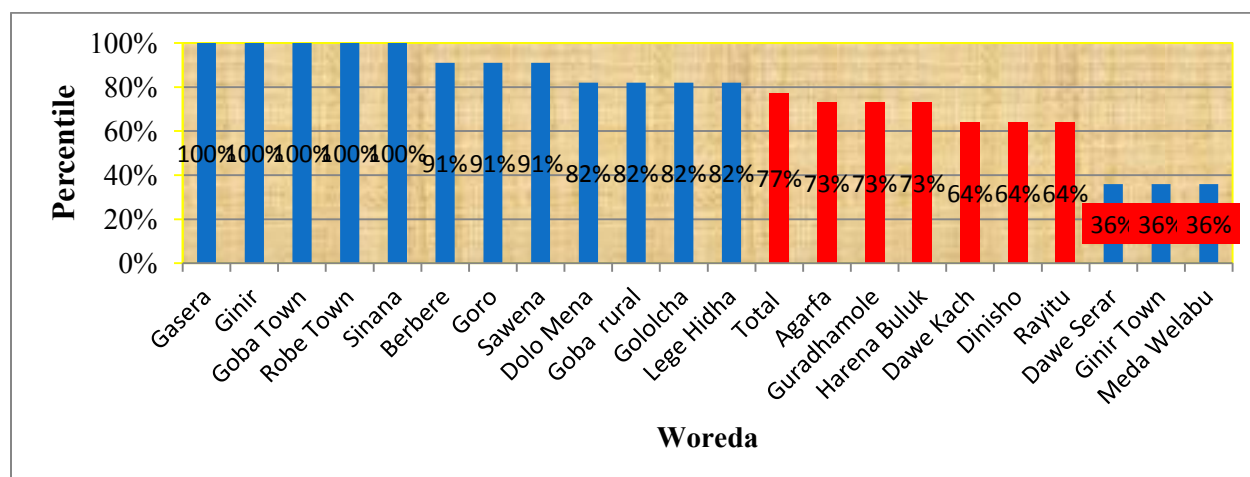


Figure 75: Report completeness of Bale zone districts Oromia region Ethiopia 2016

Malaria

Fifteen districts of Bale zone are malaria endemic. In these 15 districts 182 kebeles are malarious. Seventy one kebeles are targeted for IRS and 100074 Unit structure were planned for spray. All district started spraying except Rayitu woreda. The following figure shows this.

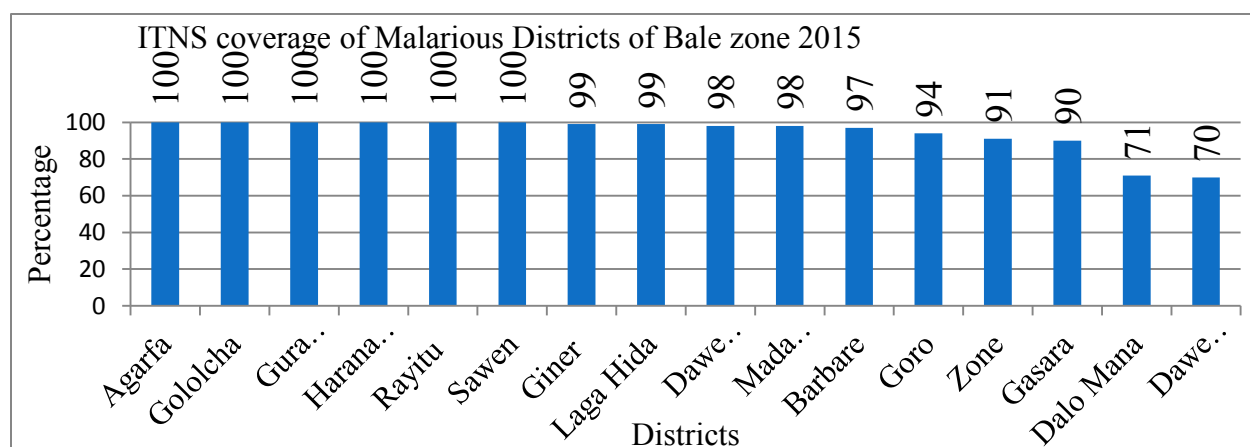


Figure 76: ITNS coverage of Malarious districts in Bale zone Oromia region Ethiopia 2016

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Measles

By fearing measles outbreak measles coverage of 2014 by district assessed and presented below.

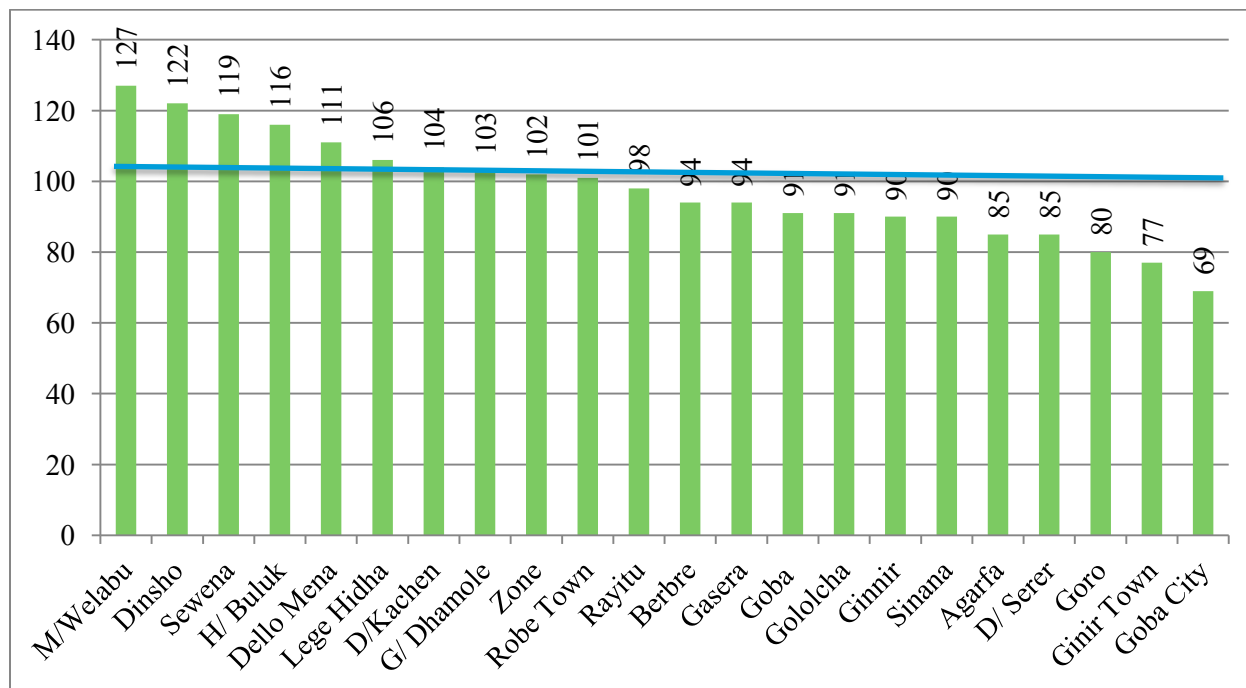


Figure 77: Measles vaccination coverage of Bale zone districts of 2014 Oromia region Ethiopia 2016

Scabies

Twenty scabies cases were detected in Mosque of Harawa five kebele of Ginir district. In the there were 150 Quran learners in the Mosque and they use pond water for personal hygiene. Six Scabies cases also found in IMNCI registration book of Waduma Health center of Mada Wolabu District. In addition, In Tadacha Bala Health center of Rayitu woreda also 4 scabies case seen

- Strengthen functionality of Taskforce, WASH and Mobilization committee at all level
- Maximize gap filling training
- Improve utilization of health data at all level.
- Improve data quality on immunization
- All health centers should provide sc services
- Increase ODF Kebele as much as possible
- Work strongly in collaboration against un-licensed private clinics(special attention to Ginir)

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- Strategy should be developed to retain the HEW on their job
- PHEM weekly Report Is mandatory to both woreda administration and H/Office
- Issue of Scabies need special attention
- Any outbreak disease is free of Charge

Measles Questionnaire

A NAME OF OUTBREAK _____ UNIQUE ID-----

Hello, my name is _____. I work for ORHB. We are doing an investigation of a measles outbreak. The purpose of these questions is to get information for public health action. Would you be willing to participate?

If YES, ask screening questions. If NO, thank the person for their time (FINISHED).

- 1.What is the name of the case or control? _____ (First/Last name)
- 2.What is your relation to (NAME)? ☐ Mother ☐ Father ☐ Other (specify)

SCREENING QUESTIONS:

3. Has (NAME) had any of the following symptoms over the past three months?

Rash: ☐ Yes ☐ No Fever: ☐ Yes ☐ No

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Runny nose: ☐ Yes ☐ No

Red eyes: ☐ Yes ☐ No

Cough: ☐ Yes ☐ No

Joint pain: ☐ Yes ☐ No

Conjunctivitis: ☐ Yes ☐ No

Large lymph nodes: ☐ Yes ☐ No

Pain behind your eyes: ☐ Yes ☐ No

If (name) has had fever and rash with cough, or conjunctivitis or coryza in the past three months, they can be a CASE

If (name) has not had these symptoms at the same time, they can be a CONTROL. Confirm that they have never had these symptoms that is saying of the potential control has previously had measles, they cannot be a control.

QUESTIONS AND FILTERS, CODING CATEGORIES

1. Respondent category ☐ Case ☐ Control
2. Data collector name-----
3. Date of data collection -----/-----/-----Month/Day/Year
4. Kebele-----
5. Got-----
6. Latitude-----
7. Longitude-----

CLINICAL PRESENTATION (for case ONLY)

8. What is the date (NAME) first saw a rash on his/her body? -----/-----/-----
9. Was (NAME) in their home village when became ill? ☐ Yes (skip to Q11) ☐ No (go to next question)
10. Where was (NAME) when the illness started. _____ Purpose of trip: _____
11. Did (NAME) visit a health facility for this illness? ☐ Yes (date went to facility ____/____/____)
☐ No (skip to Q14)
12. How long was (NAME) sick before visiting the health facility? _____ in days/hours
13. Was (NAME) admitted to a health facility? ☐ Yes --- date admitted: ____/____/____ (Month/Day/ Year) ☐ No
14. At the health facility, was (NAME) given treatment? ☐ Yes (go to Q15) ☐ No (skip to Q16)
15. Was the respondent given(READ ALL)
☐ ORS ☐ Antibiotics ☐ Vitamin A

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- ☐ Supplementary food ☐ Anti-pyretics
☐ TTC ointment ☐ Other _____

16. Outcome of the case ☐ alive ☐ death

17. Did (NAME) have any of the following complications when (NAME) was sick with measles or in the month after the rash? (READ ALL)

- | | | | | | |
|----------------|------------------------------|-----------------------------|-------------------|------------------------------|-----------------------------|
| Diarrhea: | ☐ yes | ☐ No | Pneumonia: | ☐ Yes | ☐ No |
| Blindness: | ☐ yes | ☐ No | Change in vision: | ☐ yes | ☐ No |
| Ear infection: | ☐ yes | ☐ No | other: | _____ | |
| Convulsions | ☐ yes | ☐ No | | | |

18. How old is (NAME)? _____ months ____ years

19. What sex is (NAME)? ☐ Male ☐ Female

20. Has (NAME) ever attended school? ☐ Yes ☐ No OR ☐ Not Applicable (mark N/A on Q24, Q25, then go to question 26)

21. What is the highest level of education (NAME) has completed? (Read answers):

- ☐ KG ☐ Primary ☐ Secondary ☐ Tertiary ☐ Not applicable

22. When the last time (NAME) went to school? ____ day ____ weeks ____ months ago or date: ____/____/____ (Month/ Day/ Year)

23. What is (NAME)'s occupation?

- ☐ Farmer ☐ Merchant ☐ Housewife ☐ Unemployed
☐ Government ☐ Pastoralist ☐ Not applicable ☐ other _____

24. What is (NAME)'s ethnicity? ☐ Oromo ☐ Tigre ☐ Amhara ☐ Gurage
☐ Other (specify) _____

25. What is (NAME)'s religion? ☐ Orthodox ☐ Protestant ☐ Muslim ☐ Catholic ☐ Other _____

26. What is the education level of the FATHER of (NAME)?

- ☐ Illiterate ☐ Primary ☐ Secondary ☐ Tertiary ☐ Don't know

27. What is the education level of the MOTHER of (NAME)? ☐ Illiterate ☐ Primary ☐ Secondary ☐ Tertiary ☐ Don't know

28. What is the main material of the roof? RECORD OBSERVATION

- ☐ No roof ☐ Thatch/leaf/mud

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☐ Rustic mat/plastic sheets

☐ Roofing shingles

☐ Wood planks

☐ Other (specify) _____

☐ Corrugated iron /metal

29. Does your household have (READ ALL)

Electricity? ☐ Yes ☐ No

Watch/clock? ☐ Yes ☐ No

Radio? ☐ Yes ☐ No

Television? ☐ Yes ☐ No

Mobile Telephone? ☐ Yes ☐ No

Table? ☐ Yes ☐ No

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KNOWLEDGE

30. There is a vaccine that can prevent measles. Did you know about this vaccine? ☐ Yes (go to question 31) ☐ No (go to question 32) ☐ Don't know (go to question 33)
31. What is the routine age for a child to be vaccinated with measles vaccine, or do you not know?
☐ 3 months ☐ 6 months ☐ 9 months ☐ Other _____ ☐ Don't know
32. Can I see (Name's) immunization card or vaccine certificate? ☐ Yes (go to question 37) ☐ No (go to question 36)
33. Why does (NAME) not have an immunization card or certificate? ☐ Never went to get vaccinated ☐ Got vaccinated but was never given the card ☐ Lost the card ☐ Other
34. Measles vaccinations are given in the arm, usually at nine months. Was (NAME) vaccinated against measles, or do you not know? *(if have an immunization card, refer to the card to find out if vaccinated)* ☐ Yes (go to question 36) ☐ No (go to question 39) ☐ Don't know (go to question 39)
35. What is the number of measles vaccine doses received? (refer to card if possible)
☐ NONE
☐ One Age of first dose _____ ☐ Card validated
☐ Two Age of second dose _____ ☐ Card validated
☐ More than two Age of third dose _____ ☐ Card validated
36. Where did (NAME) get these vaccines? Was it... (READ ANSWERS)
☐ Routine vaccination at health facility
☐ Not at a health facility (HEW visit or at a site)
☐ Another way? _____ ☐ Or did you forget or don't know GO TO QUESTION 40
37. The recommended age for vaccination is 9 months. What is the main reason (NAME) was not vaccinated against measles?
☐ Clinic was too far
☐ You were absent during vaccination campaign
☐ You didn't know it was time for vaccination
☐ You think the vaccine will hurt the child
☐ The child is not yet 9 months old
☐ Other, (specify) _____

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EXPOSURE

38. To your knowledge, did (NAME) have contact with a sick person with a fever and respiratory illness (measles)? (CASES: 1-3 weeks before onset of illness?) (CONTROLS: In the last 1-3 weeks?)
- ☐ Yes
- ☐ No -----→ (skip to Q44)
- ☐ Don't know -----→ (skip to Q44)
39. If yes, who did (NAME) have contact with? Name: _____
40. Where did (NAME) have contact with this person? District: _____ Kebele: _____
41. Has (NAME) travelled outside of your village (CASES: 2-3 weeks before onset of illness?) (CONTROLS: In the last 2-3 weeks?) ☐ Yes, (If yes), District _____ Kebele _____ (go to Q44) ☐ No (skip to Q45) ☐ Don't know
42. When (NAME) travelled outside of your village, did (NAME) have contact with anyone sick with measles symptoms? ☐ Yes ☐ No ☐ Not sure
43. Was there anyone else with measles symptoms in your household 1-3 weeks before (NAME) was ill? ☐ Yes: Total number of measles cases in the house _____ ☐ No
44. Have you attended any mass gatherings? (CASES: a week before rash onset) (CONTROLS: in the past 21 days?) (READ ANSWERS) ☐ Church ☐ Funeral ☐ Wedding ☐ Market
- Any other mass gathering? _____ (if yes, check the box)
45. How long does it take you to get to a health post?
- ☐ Less than 10 minutes ☐ 10-30 minutes ☐ 31 minutes – 1 hour ☐ More than 1 hour ☐ More than 2 hours ☐ don't know
46. How long does it take you to get to a health center?
- ☐ Less than 10 minutes ☐ 10-30 minutes ☐ 31 minutes – 1 hour ☐ More than 1 hour ☐ More than 2 hours ☐ don't know
47. How many people slept in your house with measles case last night? _____
48. Has (NAME) been to a health facility in the last 21 days? ☐ Yes ☐ No ☐ Not sure

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Annex 1: Questionnaire for evaluation of surveillance system

Annex 2: Regional/Zonal Level Questionnaire

Respondent _____

Interviewer: _____

Date _____

General

1. Is there a national manual for surveillance? Yes/ No
2. If yes, describe (last update, diseases included, case definitions, surveillance and control, Integrated or different for each disease): _____.
3. Do you have standard case definitions for the Country's priority diseases like AWD? AFP (polio), malaria, RF, typhoid fever, Epidemic fever and measles? Yes / No
4. If yes, Obs [1 to n priority diseases] is the standard case definition for each Priority disease _____
5. Is central level responsible for providing surveillance forms to the health facilities? Yes/ No
6. If yes, have you lacked appropriate surveillance forms at any time during the last 6 months? Yes / No
7. What are the reporting health facilities for the surveillance system?
 - a. Public health facilities b. NGO health facilities
 - c. Military health facilities d. Private health facilities
 - e. Others _____
8. Number of reports in the last 3 months compared to expected number
Weekly: ____/12 times the number of Woredas
Immediately: -----/times the number of Woredas
9. Number of weekly reports received on time: ____/12 times the number of Woredas
10. Was there any report of the immediately reportable diseases in the past 1 month? Yes/ No
11. If yes, with in what time is the report received after detection of the case/diseases? A. Less Than 1 hour b. 2-24 hour c. 1- 2 days d. 3- 7 days e. After 1 week
12. How do you report to the next high level? a. Mail b. Fax C. telephone d. Radio e. Electronic f. Other

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13. Does the zone level describe data by person (case based, outbreaks, and sentinel)? Yes/ No

If yes, (Obs) Observed description of data by age and sex

14. Describe data by place, time and person? Yes/No

15. Perform trend analysis? Yes/ No

If yes, Obs, line graph of cases by time and list disease(s) for which line graph is

16. Observed a. _____ b. _____ c. _____ d. _____ e. _____

17. Do the zone have an action threshold defined for Measles and malaria? Yes / No

18. Who is responsible for the analysis of the collected data? _____

19. How often do you analyze the collected data?

a. Daily b. Weekly c. Every 2 weeks d. Monthly e. Quarterly f. As needed

20. Do you have an appropriate denominators establish the threshold? Yes / No

21. **If yes, Obs** presence of demographic data (E.g. population by woreda and hard to reach Groups)

22. Is there any outbreak in the zone in the last year? Yes/No

If yes, number of outbreaks investigated: _____

23. List of diseases: _____.

24. Number of outbreaks investigated and in which risk factors were looked for: ____.

25. Number of outbreaks in which findings were used for action [Observe report] _____

26. Number of Woredas that looked for risk factors [observe in reports]

27. Number of Woredas that used the data for action [observe in final report] _____

Epidemic preparedness (relevant for epidemic prone diseases)

28. Dose the zone established epidemic management committee? Yes/No

29. Do you have plan for epidemic preparedness and response? Yes/No

If yes, Obs, a written plan of epidemic preparedness and response

30. Has the zone had emergency stocks of drugs, vaccines, and supplies at all times in past 1 Year? Yes/ No

31. Has the zone experienced shortage of drugs, vaccines or supplies during the most recent? Epidemic (or outbreak)? Yes/ No

32. Doses the standard case management protocol for malaria and measles exists in all health Facilities? Yes/No

33. Is there a budget line for epidemic response? Yes / No

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If yes, Obs. minutes (or report) of meetings of epidemic management committee

34. Does the region have a rapid response team for epidemic? Yes/No

Response to epidemics

35. Dose the epidemic responded within 48 hours of notification from zone level? Yes/No

If yes, Obs (from written reports with trend and intervention)

Feedback

36. Dose a report is regularly produced to disseminate surveillance data from the zone?

Yes/No

If, yes Obs: the presence of a report of surveillance data

37. How many feedback reports has the zone level produced in the last year? _____

Supervision

38. Did you conduct supervision last month? Yes/No

39. If yes, how many supervisory visits have you made in the last 6 months? _____

40. If no, what is reasons for not making all required supervisory visits.

(Text) _____

Training

41. Have you received any post-basic training in epidemic management? Yes/No

If yes, specify when, where, how long, by whom? _____

42. How many of your staffs trained in surveillance? _____

Resources

43. for data management

a) Computer & Printer Yes/No

b) Photocopier Yes/No

c) Data manager Yes/No

d) Statistical package Yes/No

44. Communications availability) Telephone service Yes/No

b) Fax Yes/No

c) Radio call Yes/No

d) Internet Yes/No

Surveillance

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45. Is there a budget line for surveillance in at zone? Yes/No

If yes, is it sufficient Yes/No

46. If No, what option did you use at zonal level? _____

How could surveillance be improved? _____

47. What opportunities are there for integration of surveillance activities and functions (Core activities, training, supervision, guidelines, resources etc.)?

a. _____

b. _____

c. _____

Attributes and level of

a) Usefulness:

48. Total population under surveillance in the zone _____

49. How many cases and deaths reported in the zone last year?

Malaria cases _____ Deaths _____

Measles cases _____ Deaths _____

50. Does the surveillance system help?

a) To detect outbreaks of these selected priority diseases early? Yes / No

b) To estimate the magnitude of morbidity, mortality and factors related to these Diseases? Yes/ No

c) Permit assessment of the effect of prevention and control programs? Yes/ No

b) Simplicity:

51. Do you feel that additional data collected on a case are time consuming? Yes/No

52. How long it takes to fill the format? a, <5 minute b-10-15minuts c- >15 minutes

c) Flexibility:

53. Do you think that the current reporting formats used for other newly occurring health Event (disease) without much difficulty? Yes / No

54. Do you think that any change in the existing procedure of case detection, reporting, and Formats will be difficult to implement? Yes/ No

If yes, how? _____

d) Data Quality:

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55. Are the data collection formats for these priority diseases clear and easy to fill for all the data?

Collectors/ reporting sites? Yes/ No

56. Are the reporting site / data collectors trained/ supervised regularly? Yes/No

If, **Obv:** Review the last months report of these diseases

57. Average number of **unknown or blank responses** to variables in each of the reported forms

58. Percent of reports which are complete (that is with no blank or unknown responses) from the
Total reports _____

e) Acceptability:

59. Do you think all the reporting agents accept and well engaged to the surveillance activities?
Yes/No

If yes, how many are active participants (of the expected to)? _____

60. If no, 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; i.e.
no dissemination of the analysis data back to reporting facilities

c) Reporting formats are difficult to understand

d) Report formats are time consuming

e) If Others: _____.

f) Representativeness:

61. What is the health service coverage of the woreda/ **zone**/ region? _____%

62. Do you think, the populations under surveillance have good health seeking behavior for these diseases? Yes/ No

63. Who do you think is well represented by the surveillance data? urban / rural

g) Timeliness:

64. What proportion of woredas reports in acceptable time? -----%

h) Stability

65. Was the new BPR restructuring affect the procedures and activities of the surveillance of?
These diseases? Yes/No

66. Was there lack of resources that interrupt the surveillance system? Yes/No

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Annex 3: Woreda (Intermediate Level) Surveillance system evaluation Questionnaire

Woreda _____

Respondent _____

Date _____

Interviewer _____

General Information

1. Is there a national PHEM /IDSR Guide line Or manual at this site? Yes/No

If yes, Obs national PHEM /IDSR Guide line/manual: _____

2. Does the woreda have the capacity to transport specimens to a higher level lab? Yes/No

If No, Reason _____

3. Does the woreda have guidelines Or SOP for specimen collection, handling and transportation to the next level? Yes / No

4. Have you lacked forms recommended for the country at any time during the last 6 months?

Yes/ No

5. Number of reports received in the last 3 months compared to expected number

Weekly: _____ /12 times the number of health facilities

Immediately: _____ / times the number of health facilities

6. Number of weekly reports submitted on time: ____/12 times the number of health facilities (On Monday)

7. Number of immediately reports submitted on time: _____/3 times the number of health facilities (within 30minutes of events)

8. How do you report Weekly or immediately to the next level?

a/ Mail b/Telephone c/ Fax d/Radio e/ Electronic f/ Other

9. How can reporting system are improved?

_____.

10. Did you analysis IDSR data? Yes/No

a) If yes, Is data describe by person for any case based, outbreaks or sentinel? Yes/No

If yes, Obs description of data by age and sex

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i) Is description of data by place (locality, village, work site etc)? Yes / No

If yes, Obs. description of data by Place

j) Is the description of data by time? Yes/ No

If yes, **Obs** observed description of data by time?

11. Is there a trend analysis for the following disease?

a) Malaria Yes/ No

b) Measles Yes/No

If yes, **Obs.** line graph of cases by time

12. Do you have an action threshold for any of the country priority diseases? Yes/ No

If yes, what is it? _____ cases _____ % increase _____ rate

(Obs for 2 priority diseases) _____

13. Did you have appropriate denominators? Yes/ No

If yes, Obs. demographic data at site (E.g. total population by village, <5 yrs, ---)

14. Who is responsible for IDSR data analysis? _____

15. How often do you analyze the IDSR data?

a. Daily b. Weekly c. Every 2 weeks

d. Monthly e. Quarterly f. As needed.....

Outbreak investigation

16. Is there any Outbreak or suspected in the woreda in the past year6 months? Yes/No

If yes, number investigated _____ (Observe reports and take copies if possible)

Epidemic preparedness

17. Dose the woreda epidemic preparedness plan? Yes/No

If, yes,(Obs) a written plan of epidemic preparedness and response.

18. Has the woreda had emergency stocks of drugs and supplies at all times in past 1 year?

Yes/No

If yes, Obs, Observed the stocks of drugs and supplies at time of assessment

19. Has the woreda experienced shortage of drugs, vaccines or supplies during the most recent epidemic (or outbreak)? Yes/ No

20. Is there a budget line or access of funds for epidemic response? Yes/ No

21. Does the woreda have a rapid response team for epidemics? Yes/No

If yes, Obs Observed minutes (or report) of meetings of epidemic management

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22. Did epidemic response team evaluated their preparedness and response activities during the past year? Yes/ No

If yes, (observe written report to confirm)

Responses

23. Has the woreda implemented prevention and control measures based on local data for at least one reportable disease or syndrome? Yes/No

24. Present of epidemic that responded by woredas within 48 hours of notification of most recently reported outbreak? _____

Feedback

25. How many feedback written reports has the woreda produced in the last year? _____

Obs observed the presence of a written report that is regularly produced to disseminate

Supervision

26. Did you supervise the health facilities in the last 6 month? Yes/No

If yes, how many times have you been supervised in the last 6 months? _____

(Obs supervision report)

27. If No, the most usual reasons for not making all required supervisory visits.

(Text)

Reason 1 _____

Reason 2 _____

Reason 3 _____

Training

28. Have you trained PHEM/IDSR disease surveillance? Yes/No

If yes, specify when, where, how long, by whom? _____.

29. What percent of your staffs in the woreda trained on PHEM/IDSR surveillance? _____%

Resources

30. Logistics Available

a) Bicycles Yes/No

b) Motor cycles Yes/No

c) Vehicles Yes/No

d) Stationery Yes/No

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e) Computer & Printer Yes/No

31. Communication available

a) Telephone service Yes/No

b) Fax Yes/No

c) Radio Yes/No

d) Computers that have modems Yes/No

32. Information education and communication materials

a) Posters Yes/No

b) Megaphone Yes/No

c) TV Screen Yes/No

d) Projector (Movie) Yes/No

39. Availability of hygiene and sanitation materials

a) Spray pump Yes/No

b) Disinfectant Yes/No

Surveillance

40. Is there a IDSR focal person in the woreda epidemic management committee? Yes/ No

41. Are you satisfied with the current surveillance system? Yes /No

If no, why? _____.

Attributes

a) Usefulness

42. Total population of the woreda under surveillance_____

42. Total population of the woreda under surveillance_____

43. How many cases and deaths reported in the woreda from the following disease past 6 months?

a) Malaria cases _____Deaths _____

b) Measles cases _____Deaths _____

44. Does the surveillance system help?

a) To detect outbreaks of these selected priority diseases early? Yes / No

b) To estimate the magnitude of morbidity, mortality and factors related to these diseases? Yes/ No

c) Permit assessment of the effect of prevention and control programs? Yes/ No

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b) **Simplicity:**

45. Do you feel that data collections on a case report form are time consuming? Yes/No

46. If yes, how long it takes to fill the format? a, <5 minute b- 10-15minuts c- >15minuts

c) **Flexibility:**

47. Do you think that the current reporting formats used for other newly occurring health event (disease) without much difficulty? Yes / No

48. Do you think that any change in the existing procedure of case detection, reporting, and formats will be difficult to implement? Yes/ No

If yes, how _____.

d) **Data Quality:**

49. Are the data collection formats for these priority diseases clear and easy to fill for all the Data collectors/ reporting sites? Yes/ No

50. Are the reporting site / data collectors trained/ supervised regularly? Yes/No

If, Obe: Review the last months report of these diseases

51. Average number of **unknown or blank responses** to variables in each of the reported forms

52. Percent of reports which are complete (that is with no blank or known responses) from the total reports _____

e) **Acceptability:**

53. Do you think all the reporting agents accept and well engaged to the surveillance activities? Yes/No

If yes, how many are active participants (of the expected to)? _____

53. If no, 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.

c) Reporting formats are difficult to understand

d) Report formats are time consuming

e) If Others: _____.

f) **Representativeness:**

54. What is the health service coverage of the woreda? _____%

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55. Do you think, the populations under surveillance have good health seeking behavior for these priority diseases? Yes/ No

56. Who do you think is well represented by the surveillance data? Urban / rural

g) Timeliness:

57. What proportion of health facilities reports in acceptable time? -----%

h) Stability:

58. Was there lack of resources that interrupt the surveillance system? Yes/No

If yes, how did you manage it? _____

59. What do you suggest to overcome such problems? _____.

Annex 4: Health facility Questionnaire (Hospital /Health center)

Identifiers

Woreda _____

Name of health facility _____

Type of health facility _____

Respondent _____

Date _____

Interviewer: _____

General Information

1. Is there PHEM/IDSR national Guide line or manual at this site? Yes / No

If yes, Obs; for the existence **PHEM/IDSR** national guide line or manual

2. Is there a clinical register in health facilities? Yes/ No

If yes, **Obs** the existence of a clinical register

3. Is there the health facilities correctly register cases during the previous 30 days?

Yes/No

If yes, **Obs;** the clinical register

Do you have a standard case definition for: (each priority disease)

a) Measles Yes/No

a) Measles Yes/No

b) Malaria Yes/No

If yes, Obs the standard case definition for: (each priority disease)

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4. Dose of health facilities use standardized case definitions for the country's priority diseases.

Yes/ No

If yes, Obs; the respondent correctly diagnosing one of the country's priority diseases using a standard case definition (Interview about of these)

5. Dose the health facilities have the capacity to collect the following specimens?

a) sputum Y N N/A

b) Stool Y N N/A c) Blood Y N N/A

d) CSF Y N N/A

6. If yes, Obs the presence of materials required to collect

a) Stool Yes No N/A

b) blood/serum Yes No N/A

c) CSF Yes No N/A

7. Do you have the capacity to handle sputum, stool, blood/serum and CSF until shipment at this facility? Yes No N/A

If yes, Obs the presence of status cold chain at health facility

8. Dose the health facility that has the capacity to ship specimens to a higher level lab?

Yes No N/A

If yes, Obs presence of transport media for stool at health facility.

9. Have you lacked appropriate surveillance forms at any time during the last 6 months?

Yes No N/A

If yes, what the reason? _____

10. Observed that the last monthly report agreed with the register for 4 diseases (1 for each Targeted group [eradication; elimination; epidemic prone; major public health importance]

a. Obs Measles Yes No N/A

b. Obs Malaria Yes No N/A

11. Number of reports in the last 3 months compared to expected number

Obs Weekly: _____ /12 times the number of health post sites

Obs immediately: _____ /--- times the number of health post sites

12. on time (use national deadlines)

Obs Number of weekly reports submitted on time:- _____ /12 times the number of sites

Obs Number of immediately reports submitted on time: ____ /-- times the number of sites

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13. How do you report?

a/Telephone b/ Fax c/ Mail d/ Radio e/ Electronic f/ Other

14. How can reporting be improved? Your suggestion

15. Describe data by person, place and time (outbreaks, sentinel) Yes No N/A

If yes, Obs data

16. Is there trend analysis Performed? Yes No N/A

If yes, Obs line graph of cases by time

17. Do you have an action threshold for any of the priority diseases? Yes No N/A

If yes, what is it (Ask for 2 priority diseases)?

Malaria cases _____ % increase

Measles cases _____ % increase

18. Who is responsible for data analysis? _____

19. How often do you analyze the collected data?

a) Daily b) Weekly c) Every 2 weeks d) Monthly e) Quarterly

f) As needed.....

20. Presence of demographic data at site (E.g. population <5 yr., population by village, total Population) Yes / No

Epidemic preparedness

21. Is there standard case management protocol for epidemic prone diseases at health facilities?

Yes No N/A

If yes, Obs the existence of a written case management protocol for 1 epidemic prone disease

Epidemic response

Has the health facility implemented prevention and control measures based on local data?for at least one epidemic prone disease? Yes No N/A

Feedback

23. Have you received feedback report in the last year from higher level? Yes/No

If yes, how many feedback reports has the health facility received in the last year? ____

Obs; at least 1 report received

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24. Have you conduct meeting with community in the last 6 month? Yes No N/A

If yes, how often? a) Weekly b) every two weeks c) monthly d) quarterly e) as needed

Supervision

25. Did you supervise health posts in the last 6months? Yes No N/A

26. If yes, how many times have you been supervised in the last 6 months? _____

Obs; supervision report or any evidence of supervision in last 6 months

27. Did you get any supportive supervision from higher level in the last 6 months? Yes No
N/A

If yes, Obs; supervision report or any evidence for appropriate review of surveillance

Training

28. Have you trained in disease surveillance and epidemic management? Yes No N/A

If yes, specify when, where, how long, by whom? _____

_____.

29. Number of Staffs trained in disease surveillance and epidemic management _____.

Resources

30. Logistics

a) Electricity Yes/No

b) Bicycles Yes/No

c) Motor cycles Yes/No

d) Vehicles Yes/No

31. For data management

a) Stationery Yes/No

b) Calculator Yes/No

c) Computer Yes/No

d) Software Yes/No

e) Printer Yes/No

32. Communications available

a) Telephone service Yes/No

b) Fax Yes/No

c) Radio call Yes/No

d) Computers Yes/No

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33. Information education and communication materials

a) Posters Yes/No

b) Megaphone Yes/No

TV Yes/No

d) Other: Yes/No

34. Hygiene and sanitation materials

a) Spray pump Yes/No

b) Disinfectant Yes/No

35. List Personal Protection materials (PPE) available in health facility

_____.

Attributes

a) Usefulness

49. Total population of the woreda under surveillance _____

50. How many cases and deaths reported in the woreda from the following disease past 6 month?

a) Malaria cases _____ Deaths _____

b) Measles cases _____ Deaths _____

51. Does the surveillance system help?

d) To detect outbreaks of these selected priority diseases early? Yes / No

e) To estimate the magnitude of morbidity, mortality and factors related to these diseases? Yes/
No

f) Permit assessment of the effect of prevention and control programs? Yes/ No

b) Simplicity

52. Do you feel that data collections on a case report form are time consuming? Yes/No

53. If yes, how long it takes to fill the format? a, <5 minute b- 10-15minuts c- >15 minutes

c) Flexibility

54. Do you think that the current reporting formats used for other newly occurring health event (disease) without much difficulty? Yes / No

55. Do you think that any change in the existing procedure of case detection, reporting, and formats will be difficult to implement? Yes/ No

If yes , how _____.

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d) Data Quality

49. Are the data collection formats for these priority diseases clear and easy to fill for all the data collectors/ reporting sites? Yes/ No

51. Are the reporting site / data collectors trained/ supervised regularly? Yes/No

If, **Obe:** Review the last months report of these diseases

51. Average number of **unknown or blank responses** to variables in each of the reported forms

54. Percent of reports which are complete (that is with no blank or unknown responses) from the total reports _____

e) Acceptability

53. Do you think all the reporting agents accept and well engaged to the surveillance activities? Yes/No

If yes, how many are active participants (of the expected to)? _____

55. If no, what is the reason for their poor participation in the surveillance activity?

f) Lack of understanding of the relevance of the data to be collected

g) No feedback / or recognition given by the higher bodies.

h) Reporting formats are difficult to understand

i) Report formats are time consuming

j) If Others: _____.

f) Representativeness

54. What is the health service coverage of the woreda? _____%

55. Do you think, the populations under surveillance have good health seeking behavior for these priority diseases? Yes/ No

56. Who do you think is well represented by the surveillance data? Urban / rural

g) Timeliness

58. What proportion of health facilities reports in acceptable time? -----%

h) Stability

58. Was there lack of resources that interrupt the surveillance system? Yes/No

If yes, how did you manage it? _____

59. What do you suggest to overcome such problems? _____.

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Health post level Surveillance system Evaluation questionnaire

Identifiers

Woreda _____

Name of health Post _____

Respondent _____

Date _____

Interviewer _____

General Information

1. Is there PHEM/IDSR national Guide line or manual at this site? Yes No

If yes, Obs PHEM/IDSR national guide line or manual:

2. Is the health post has a clinical register? Yes No N/A

3. Are cases correctly registered in the health post? Yes No N/A

If No, state the reason; _____

If yes, Obs; the correct filling of the clinical register during the previous 30 days

4. Do you have a standard case definition for: (each priority disease)

a) Measles, Yes No N/A

b) Malaria? Yes No N/A

If yes, Obs; the standard case definition for: (each priority disease)

5. Do you use standardized case definitions for the priority diseases? Yes/No

If yes, Select one of the priority diseases in the facility's clinical register and ask how they diagnosed it — interviewer should have the standard case definition from MOH)

6. Have you lacked appropriate surveillance forms at any time during the last 6 months?

Yes/ No

7. Dose the health post reported accurately cases from the registry into the summary report to go to higher level? Yes/No

If yes, the last monthly report agreed with the register for 4 diseases (1 for each targeted group [eradication; elimination; epidemic prone; major public health importance])

a) **Obs** Measles Y N N/A

b) **Obs** Malaria Y N N/A

8. Number of reports in the last 3 months compared to expected number

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Obs Weekly: ____/12 times the number of sites

Obs immediately: ____/-- times the number of sites

9. On time (use national deadlines)

Obs; Number of weekly reports submitted on time:- _/12 times health post.

Obs ; Number of immediately reports submitted on time: ____/-- times from health post .

10. How do you report?

a) Mail b) Fax c) Telephone d) Radio e) Electronic f) Other

11. How can reporting be improved?

Suggest

12. Describe data by person, place & time (outbreaks, sentinel) Yes/ No Not applicable

Epidemic response

13. Has the health post implemented prevention and control measures based on local data for at least one epidemic prone disease? Yes No N/A

Feedback

14. Have you received feedback in the last month? Yes No N/A

15. How many feedback reports has the health post received in the last year? ____

If yes Obs; Observed at least 1 report at the health post from a higher level during the past year on the data they have provided

16. Have you conduct meeting with community members in the month? Yes No N/A

17. If yes, how many meetings has this health post conducted with the community members in the past six months? _____

Obs Observed the minutes or report of at least 1 meeting between the health post and the community members within the six months

18. If No, list the reason _____
_____.

Supervision

19. Have you supervised by higher level in the last 6 months?

20. If yes, how many times have you been supervised in the last 6 months? _____

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Obs; supervision report or any evidence of supervision in last 6 months

Training

21. Have you trained in disease surveillance and epidemic management? Yes No N/A

22. Number of staffs trained _____

If yes, specify when, where, how long, by whom? _____

_____.

Resources

23. Logistics

a) Electricity yes No N/A

b) Bicycles yes No N/A

c) Motor cycles yes No N/A

24. Data management

a) Stationery yes No N/A

b) Calculator yes No N/A

c) Computer Software &Printer Yes No N/A

25. Communications

a) Telephone service yes No N/A

b) Fax yes No N/A

c) Radio call yes No N/A

d) Computers that have modems Yes No N/A

26. Information education and communication materials

a) Posters yes No N/A

b) Megaphone yes No N/A

c) Flipcharts Image box yes No N/A

d) Other: yes No N/A

27. Hygiene and sanitation materials

a) Spray pump yes No N/A

b) Disinfectant Yes No N/A

28. List of Personal Protection Equipment (PPE)

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Satisfaction with surveillance system

29. Are you satisfied with the surveillance system? Yes No N/A

If no, how can the surveillance systems will be improved? Suggest _____

_____.

30. What opportunities are there for integration of surveillance activities and functions (core activities, training, supervision, guidelines, resources etc)

Attributes

a) Usefulness

31. Total population of the woreda under surveillance _____

32. How many cases and deaths reported in the woreda from the following disease past month?

a) Malaria cases _____ Deaths _____

b) Measles cases _____ Deaths _____

33. Does the surveillance system help?

a) To detect outbreaks of these selected priority diseases early? Yes No N/A

b) To estimate the magnitude of morbidity , mortality and factors related to these diseases? Yes
No N/A

c) Permit assessment of the effect of prevention and control programs?

Yes No N/A

b) Simplicity

34. Do you feel that data collections on a case report form are time consuming? Yes No

N/A

35. If yes, how long it takes to fill the format? a, <5 minute b- 10-15minuts c- >15

Minutes

c) Flexibility

36. Do you think that the current reporting formats used for other newly occurring health event (disease) without much difficulty? Yes No N/A

37. Do you think that any change in the existing procedure of case detection, reporting, and formats will be difficult to implement? Yes No N/A

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If yes , how _____.

d) Data Quality

38. Are the data collection formats for these priority diseases clear and easy to fill for all the data collectors/ reporting sites? Yes No N/A

39. Are the reporting site / data collectors trained/ supervised regularly? Yes No
N/A

If, **Obe**: Review the last months report of these diseases

40. Average number of **unknown or blank responses** to variables in each of the reported forms

41. Percent of reports which are complete (that is with no blank or unknown responses) from the total reports _____

e) Acceptability

42. Do you think all the reporting agents accept and well engaged to the surveillance activities?
Yes No N/A

If yes, how many are active participants (of the expected to)? _____

43. If no, 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.

c) Reporting formats are difficult to understand

d) Report formats are time consuming

e) If Others: _____.

f) Representativeness

44. What is the health service coverage of the woreda? _____%.

45. Do you think, the populations under surveillance have good health seeking behavior for these priority diseases? Yes No N/A

46. Who do you think is well represented by the surveillance data? Urban / rural

g) Timeliness

47. What proportion of health facilities reports in acceptable time-----?

h) Stability

48. Was there lack of resources that interrupt the surveillance system? Yes No N/A

If yes, how did you manage it? _____

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49. What do you suggest to overcome such problems?

_____.

Annex 5: Data collection tools for health profile of Dugda Dawa Woreda Borana Zone Oromia Region

1. Historical Aspects of the area (if available)

The name how and why _____

How the woreda was formed _____

Any other historical aspect _____

2. Geography and Climate

Area of the woreda _____

Distance from Addis Ababa _____

Altitude _____

Latitude _____

Average Annual rain fall _____

Average Annual temp _____

Land bodies _____

Water bodies _____

3. Demographic information

Total Population size _____

male _____

female _____

urban _____

rural _____

Sex ratio _____

Age structure: -percentage of children < 1yrs _____. <5yrs ____ < 15 yrs.

Percentage of old people >65 years _____

Women child bearing age _____

Percentage of pregnant women _____

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Dependency ratio _____

Population size by religion

Orthodox _____

Catholic _____

Protestant _____

Muslim _____

Others _____

Estimated Population size by kebele

S/numbers	Name of kebele	population size		
		Male	Female	Total
1				
2				
3				
4				
5				
6				
7				
8				
9				
10				
11				
12				
13				
14				
15				
16				
17				
18				

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19				
20				
21				
22				
23				
24				
25				
26				
Total				

Administrative setup

Total no. of kebeles: rural _____ Urban _____

Woreda Boundaries _____

5. Health status

Number of health facilities

Type of Health facility	Number	Ratio
1.Hospital		
2.Health center		
3.private clinic		
4.Pharmacy		
5.Drug store/Rural drug vender		
6.diagnostic Laboratories		
7.Neucles health center		

Man power of Dugda Dawa district health office and health facility in 2015

Type	Number	Ratio
Physicians		
Health officers		
Laboratory technician/technologist		
Pharmacy		

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technician/Pharmacist		
Nurses		
Midwife		
X-Ray technician		
ENHS		
HEWs		
TBA		

Top causes of morbidity and mortality

Top ten leading causes of OPD visit (morbidity) Dugda Daw district, in 2015

Serial no	Adult	Number (%)	Pediatrics	Number (%)
1				
2				
3				
4				
5				
6				
7				
8				
9				
10				

Top ten causes of admissions

S/No	Adult	Pediatrics

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Top ten causes of deaths (mortality)

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

Vital statistics

CBR_____

CDR_____

NMR_____

PNMR_____

IMR_____

MMR_____

GR_____

Marital status: single____ Married ____ Divorced ____

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MCH and EPI coverage of the district in 2015

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

Environmental sanitation and availability of safe drinking Water in 2015

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

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Endemic Diseases

Malaria prevention and control program of Dugda Dawa District in 2015

Description	Number of population (%)
Number of Malarious areas	
ITN coverage	
Coverage of Insecticide chemical spray	
Total no. of cases/yr.	
Case fatality rate	
Cases treated clinically	
Cases Treated based on lab finding	

Supplies: RDT _____

Coartem _____

Prevalence of TB/Leprosy

Description	
Prevalence of TB	
Pulmonary TB	Smear positive
	Smear negative
Extra PTB	
TB detection rate	
TB Rx completion rate	
TB cure rate	
TB Rx success rate	
TB defaulter rate	
Death on TB Rx	
Total TB patients screened for HIV	
HIV prevalence rate among TB cases	

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Prevalence of Leprosy	
-----------------------	--

HIV/AIDS

Activities	Male	Female	total	Remar
Total people screened for HIV				
VCT				
PICT				
PMTCT				
HIV Prevalence				
Total PLWHIV				
On ART				
Pre ART				
Condom Distribution				
Health education coverage				

6. Socio economic conditions

☐ Education and school Health

Type of School	Number School	Number of teachers	Male Students	Female students	Total students
Primary					
Secondary					
Tertiary					
Total					

School health activities:

Schools with water supply _____

Schools with functional latrines _____

Schools with HIV/other Health clubs _____

Literacy ratio _____

Employment

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Number of people employed _____

Number of people un employed _____

Ratio of Employed to un employed _____

Income

Main source of income: Agriculture _____ Civil servant _____ others (specify)

Yearly income per house hold _____

Average income per capita _____

Communication and Utilities

How many of the health facilities have access to transportation _____ (%)

Telecommunication _____ (%)

Electric power _____ (%)

Health sector expenditure and financing

Source	
1.total woreda budget	
2.allocated to health sector	
3.total per capital health expenditure	

9. Disaster situation in the woreda

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

_____ No _____

Any recent disease outbreak/other public health emergency?

Yes (specify) _____

No _____

If yes cases _____ and deaths _____

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10, Nutrition intervention in Dugda Dawa district in 2015

Type of food intervention program	
OTP sites	
TFU program	
TSF program	
CBN program	
EOS program	
PNSP	

11. What do you think the major Health problem/s of the woreda?

11.1 What do you think solutions of the addressed problems?

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

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

14. What are the main zoonotic diseases in the district?

a. _____

b. _____

c. _____

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Annex 6:Belg humanitarian needs assessment tools for health sectors at Woreda level in Oromia Region region, June 2015

Rapid belg assessment-Health Sector: Woreda level Questionnaire

Serial No.

Interviewer name _____ Institution: _____

Interview Date: (dd) ____ (mm) ____/2014 ____

Region: _____

Zone: _____ Woreda _____

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

SECTION I: SOCIO- DEMOGRAPHIC PROFILE

1.1. M _____ F: _____ Under5 _____ Total: _____

Woreda

total

populatio

n:

1.2. Pastorals _____ Refugees _____ IDPs _____ Migrant

Special Workers_

Populatio

n (if

any):

SECTION II: HEALTH PROFILE

2.1. Morbidity and Mortality (List top 5 causes of Morbidity and Mortality) in the year 2006

EC

a. Morbidity

b. Mortality

1.

1.

2.

2.

3.

3.

4.

4.

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5.

5

2.2. List number of cases/deaths from January-October 2012							
AWD		Malaria		Measles		Meningitis	
Cases	Deaths	Cases	Deaths	Cases	Deaths	Cases	Deaths
January							
February							
March							
April							
May							
2.3. 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)							
2.4. 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 ☐			
Amoxicillin sups (measles)		Yes ☐		No ☐			
Tetracycline ointment (measles)		Yes ☐		No ☐			
Vit A (measles)		Yes ☐		No ☐			
Coartem for Malaria		Yes ☐		No ☐			

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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			
2.5. Coordination			
Is there a multi sectoral 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	No
Malaria	Malaria endemic area		
Presence of malaria breeding site			
Interrupted or potentially interrupting rivers			
Unprotected irrigation in the area			
LLINs coverage <80%			
Depleted 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)			
Any other observations you made or any risks of epidemics?			

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Annex-7.1. 7: Rapid Belg assessment-tools for Health Sector at Region/Zonal level

Interviewer name _____ Institution: _____	Institution: _____
Interview _____ Date: _____ (dd) _____/(mm) _____/2015 _____	Region: _____ Zone _____

Main contact at this location:	Name: _____	Position: _____	Tel: _____
1. COORDINATION			
A. Is there a functional multispectral coordination forum for the health sector? Yes ☐ No ☐			
B. Are all relevant government, NGOs and UN agencies represented? Yes ☐ No ☐			
C. Frequency of regular meeting? (Weekly, Every 2 weeks, monthly.....)			
2. Is there any ongoing outbreak? Yes ☐ No ☐			
If yes, specify the type of disease _____			
Number of cases _____ Deaths _____ (specify the time period)			
3. Mention anticipated epidemics _____,			

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If yes please indicate Zone/Woreda at risk and risk population per anticipated risk:			
4. Public Health emergency Management			
A. Is there a Public Health Emergency Preparedness and response plan? Yes ☐ No ☐			
If yes, is the plan funded? Yes ☐ No ☐			
B. Is there a trained staff on PHEM Yes ☐ No ☐			
If yes specify number of trained personnel _____			
Drugs and medical supplies	Total requirement	Available	Gap
i. Meningitis vaccine			
ii. Drugs:		Coartem	
Oily CAF			
Doxycycline			
Ringer lactate			
ORS			
Amoxil			
suspension			
suspension			
Tetracycline			
Ointment			
Vit A.			

iii. Lab RDT (Malaria)

supplies

Pastorex (Meningitis)

CTC Kit (AWD)

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Health

Summary: Requirements/ 2015 Region/Zone	Type of Health emergency	Total estimated Beneficiaries	Required finance

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Annex 7: Questionnaire for assessments of Cold Chain Management in West Arsi zone Oromia Region

Name of health facility _____ Date of assessment _____

Refrigerator/cold chain check list

Item/Indicator	Yes	No
Refrigerators/freezers correctly situated		
Room cool and properly ventilated		
Working thermometer in each refrigerator/freezer		
Refrigerator temperature in correct range		
Freezer (if used) temperature in correct range		
Temperature record sheet(s) correct and up to date		
All vaccines in stock and suitable quantities		
All vaccines correctly stored		
BCG/measles diluents stored beside its vaccine		
Vaccine stock record books correct and up to date		
Vaccine stock record book includes diluents stock		
OPV Vial Monitors all unchanged		
Cold Chain Monitor Cards (if used) all white		
Cold Chain Monitor Cards (if used) correctly filled in		
Sufficient frozen icepacks in freezer		

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(Household refrigerator) Water containers in bottom		
(if observed) Cold box/vaccine carrier correctly loaded with vaccine and icepacks		
(if observed) Vaccines correctly handled during immunization session		
Sufficient stock of syringes and needles		

National immunization days and mass campaigns

1. Did you conduct national immunization days and mass campaign? 1. Yes___ 2. No___
2. If yes, did you use Extra Cold Chain Monitor Cards? 1. Yes___ 2. No___ (If yes observe)
3. Were vaccinators trained? 1. Yes___ 2. No___
4. Check for Records of quantity of vaccine received, distributed, used and any remaining afterwards_____
5. Should be kept separately from vaccine records for the RI program? 1. Yes___ 2. No___
6. Interviewed health personnel Sex 1. Male___ 2. Female ___ Profession_____
7. Are you assigned permanently or 2. Substitute to cover their duties when there were absent
8. Did you trained on cold chain management in the past one year? 1. Yes___ 2. No___
9. Where did you collect your vaccine?_____
10. How often do you take delivery of your vaccine vials? Monthly _____every 2 months___
every 3 months___ as needed_____
11. How do you collect the vaccine? 1. Cold box___ 2. Vaccine carrier___ 3. Foam pad___
12. How do you manage vaccine during national holidays and weekend? _____

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Item/Indicator	Yes	No
Cold chain tools in vaccination rooms		
No expired diluents		
No expired vaccine		
No food		
No light exposure		
Hand wash		
Carrier arrangement		
Suitable ice bag		
Good freezing indicator		
Good VVM		
Good card monitor		
Record expiry date		
Record arrival date		
Record vaccine name and number		
Good arrange aeration		

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No vaccine in the bottom		
No vaccine in the door or back		
Proper site of vaccine		
Fire extinguishers with valid expiry dates		
Refrigerator maintenance and temperature monitoring		
Storing and handling vaccines		
Stored vaccines in a single refrigerator/freezer unit		
Thermometers in all facilities		
keep up-to-date temperature cards		

Item/Indicator	Yes	No
Refrigerator for vaccines should be placed in a cool room, away from direct heat or sunlight, at least 20 cm from the wall with at least 40 cm of clear space above it		
Indices concerning refrigerator maintenance		
Keeping the refrigerator for vaccine free from dust, and what to do in the event of a break down.		
The refrigerator temperature settings were found to be within the normal range (2-8° C).		
Thermometers, temperature charts, freezing indicators were kept,		
There was proper maintenance of the correct temperature in cold boxes and vaccine carriers.		
Recorded the temperature twice a day.		
Signed their documents		
State the correct temperature range (2°-8°C) for the storage of vaccines.		

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Recorded room temperature or humidity.		
Cold chain tools in government and private clinics		
Cold box		
Vaccine carrier		
Ice bag		
Water bottles		
VVM		
Temperature monitor card		
Freezing indicator		
Vaccine monitoring, handling and observed storage conditions		
Appropriate handling and usage of the vaccine during the vaccine sessions.		
Availability of guideline		
Adherence to the guidelines on quality is important and guarantees the potency of the vaccines		
Vaccines are to be arranged by expiry dates with dilutes close to the proper vaccine vials.		
Adhered to the MoH official guidelines for cold chain maintenance		
Storage of the vaccines on the proper shelves of the refrigerator was appropriate		
A close inspection of the arrangement of vaccine packages according to expiry dates so that those close to expiry would be easily accessible for use		
vaccines were stored in the door compartments of the refrigerator and bottom		
Spaces between products stored in the refrigerator to allow		

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circulation of air		
--------------------	--	--

Waste disposable		
Strict protocol for the management of waste in the vaccination rooms to decrease the possibility of infections		
Waste separated into infectious and non infectious receptacles		
Mismanagement of healthcare waste puts healthcare workers, patients and the community at risk.		
Immunization waste includes syringes and needles, empty vaccine vials and ampoules, syringe wrappers, cotton swabs, syringe caps, and packaging used safe disposable boxes		
Hand washing after each child vaccinated		

Observational Cold Chain Checklist

I. Here are the 10 most important things you can do to safe guard your vaccine supply. Yes/No

1. We have detailed written standard operating procedures for general and emergency vaccine management.
2. We have a designated (and back - up) person in charge of the handling and storage of our vaccines.
3. Our refrigerator for vaccines is either household - style or commercial - style, NOT dormitory - style. The freezer compartment has a separate exterior door. ____
4. We store vaccines in the middle of the refrigerator or freezer, and NOT in the door. We do NOT store any food or drink in the refrigerator or freezer.
5. We stock, rotate, and use our supply so that vaccine with the shortest expiration date is placed in front and used first.
6. We post a sign on the refrigerator door showing which vaccines should be stored in the refrigerator and which should be stored in the freezer.

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7. We post a temperature log on the refrigerator door on which we record the refrigerator and freezer temperatures twice a day and we know whom to call if the temperatures go out of range.

8. We keep a thermometer in the refrigerator and the temperature is maintained at 36 to 46°F (2 to 8°C).

9. We keep a thermometer in the freezer and the temperature is maintained at - 4 to 14°F (20 to - 10°C).

10. In the event of a refrigerator failure, we take the following steps:

We place the vaccines in a location with adequate refrigeration, note the refrigerator and freezer temperature, mark exposed vaccines and separate them from undamaged vaccines, and contact USAMMA DOC to determine how to handle the affected vaccines.

Annex 8: Budget Proposal for Assessments of Cold Chain Management in West Arsi zone
Oromia Ethiopia 2016

Item/Description	Number	No of days	Allowance per day	Total cost in Birr	Remark
Investigator	1	30	400	12,000	
Data collector	8	15	290	34800	
Supervisors	2	15	290	8700	
Training	10	1	290	2900	
Vehicle	2	15	2000	60000	
Total	0	0	0	118400	
Contingency	0	0	0	11840	10%
Grand Total	0	0	0	130240	

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Annex 9: Work Plan for Assessments of Cold Chain Management in West Arsi zone Oromia Region Ethiopia 2016.

Time lines									
S/No	Major Activity	September				October			
		Wk 1	Wk 2	Wk 3	Wk 4	Wk 1	Wk 2	Wk 3	Wk 4
1	Develop proposal								
2	Literature Review								
3	Data collection								
4	Data entry								
5	Data analysis								
6	Report Writing								
7	Dissemination of findings								