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 Getenesh Taye

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

August/2017

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Mentor - Abigiya Wondimagegnehu
Mentor - Muluken Gizaw
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Acknowledgment

First of all, I would like to thank the Almighty God for what he has done for me, Second I would like to appreciate my mentors Abigiya Wondimagegnehu, Muluken Gizaw and my Advisor Abyot Bekele for their continuous support, guidance and inputs in my outputs.

Next, I would like to thank Addis Ababa University School of Public Health and Ethiopia Field Epidemiology Training Program academic coordinator Dr. Adamu Addissie for his help and cooperation and also Abdulnasir Abagero

Also, I would like to thank Southern Nations Nationalities and Peoples Region and Oromia Regional Health Bureau, Zonal Health Department and community members for their cooperation during outbreak investigation and also I would like to thank all Ethiopian Public Health Institute PHEM staffs.

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List of Abbreviations

AAU - Addis Ababa University

ACD – Acute Childhood Diarrhea

AFP – Acute Flaccid Paralysis

AIDS – Acquired Immune Deficiency Syndrome

ANC – Antenatal Care

AR - Attack Rate

ART – Antiretroviral Therapy

AWD - Acute Watery Diarrhea

BPR – Business Process Reengineer

CBN – Community Based Nutrition

CDC – Center for Disease Control

CDR – Crude Death Rate

CFR – Case Fatality Rate

CHD – Community Health Day

Cm – Centimeter

CMR –Crude Mortality Rate

CMR – Child Mortality Rate

CTC - Cholera Treatment Center

DHS – Demographic Health Survey

EC – Ethiopian Calendar

EFETP –Ethiopian Field Epidemiology Training Program

ENHS – Environmental Health Science

EPHA – Ethiopian Public Health Association

EPHI – Ethiopian Public Health Institute

EPI – Expanded Program of Immunization

EPRP – Epidemic Preparedness and Response Plan

FMOH – Federal Ministry of Health

GR – Growth Rate

HC – Health Center

HE – Health Education

HEP –Health Extension Program

HEW –Health Extension Worker

HMIS –Health Management Information System

HP – Health Post

IDSR – Integrated Disease Surveillance and Response

IMR - Infant Mortality Rate

IN. P - Inpatient

ITNs- Insecticide Treated Bed Nets

LLINs – Long Lasting Impregnated Nets

MMR – Maternal Mortality Rate

MOH – Ministry of Health

NMR – Neonatal Mortality Rate

OPD – Outpatient Department

OR – Odds Ratio

ORHB – Oromia Regional Health Bureau

ORS – Oral Rehydration Salt

PCD – Persistent Childhood Diarrhea

PHEM – Public Health Emergency Management

PITC – Provider Initiated Testing and Counseling

RDT – Rapid Diagnostic Test

RHB – Regional Health Bureau

SARS – Sever Acute Respiratory Syndrome

SNNPR – Southern Nations Nationalities and Peoples Region

SOP – Standard Operating Procedures

SPH –School of Public Health

UNICEF – United Nations Children's Fund

VCT – Voluntary Counseling and Testing

VHF – Viral Hemorrhagic Fever

VPD – Vaccine Preventable Disease

WASH – Water Sanitation and Hygiene

WHO –World Health Organization

WK – Week

ZHD – Zonal Health Department

Summary

The Ethiopian Field Epidemiology Training program(EFETP) is a two year post graduate training program. The training is provided in collaboration with Addis Ababa University, School of Public Health, Ministry of Health. The program designed to work 75% of the time in service and 25% theory, it is learning by doing. For the partial fulfillment of master's in public health field epidemiology, this summary compiled two-year residency outputs include the following surveillance data analysis, health profile, surveillance system evaluation, outbreak investigation, manuscript Belg season assessment and project proposal.

The document is organized in eight chapters:

Chapter one about outbreak investigation. During the residency period two outbreak investigations have been conducted: one was AWD outbreak investigation which was conducted in Burayu town Oromia region, we conducted a case control study. The second outbreak investigation was Rota virus outbreak investigation in Dano woreda Ambo town west Shewa Zone Oromia Region was conducted.

Chapter two deals about surveillance data analysis which was conducted nationally on malaria disease. The analysis was made from the year 2011-2015 it addresses the burden of malaria in the country by person, place and time, disease trends and seasonality was discussed on the chapter.

Chapter three is about surveillance system evaluation of measles and malaria conducted in Adama town, Oromia region. In this chapter purpose and objective of surveillance system, progress towards the objective and also attributes of the surveillance system was discussed.

Chapter four is about health profile of Kolfe Keranio sub city, Addis Ababa town. In this chapter health and health related data of the sub city presented. Health profile is a system of collecting and summarizing health and other health related events, demographic, socio-economic, political and cultural aspect of a particular district. Health and health related data was collected in Kolfe Keranio sub city Addis Ababa from february24 – march 9/ 2016. Acute upper respiratory infection, Diarrhea (non-bloody), infection of the skin and subcutaneous tissue and pneumonia were the leading causes of morbidity in under five children, Acute upper respiratory infection, urinary tract infection, dyspepsia and acute febrile illness were leading causes of morbidity in adult in the sub city.

Chapter five is Scientific manuscript for peer reviewed journal on AWD in Burayu town Oromia region and Rotavirus outbreak investigation in west Shewa zone Dano woreda, Ambo town Oromia region.

Chapter six presents Belg season health and nutrition need assessment which was conducted in SNNPR, Kembata tembaro zone, Kedida gamela and tembaro woreda. 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. It was done together with partners working on health and nutrition.

Chapter seven presents project proposal on Knowledge, Attitude and Practice of bed net use to prevent malaria. The proposal intended to do descriptive cross-sectional study in Kedida gamela woreda, SNNP region Ethiopia. Finally, public health emergency weekly bulletin: Prepared on week fifteen bulletins.

Chapter - I
Outbreak Investigations

Chapter 1 - Outbreak / Epidemic Investigations

1.1. Acute Watery Diarrhea Outbreak Investigation in Burayu Town Oromia Region from June 6 – June 21/ 2016

Abstract

***Introduction*:** Acute watery diarrhea(AWD) is a diarrheal disease caused by infection of the intestine with the bacterium vibrio cholera commonly either type O1 or O139. Both children and adults can be infected. About 20% of those who are infected develop acute watery diarrhea 10-20% of these individuals develop severe watery diarrhea with vomiting. If these patients are not promptly and adequately treated the loss of large amount of fluid and electrolytes can lead to sever dehydration and death within hours. The case fatality rate in untreated cases may reach 30-50%. We received reports of AWD outbreak in Burayu. Burayu town is one of the Oromia town with a total population of 131,721. when we see by sex female 67,178 and male 64,543. The town is divided in to six kebeles and has two health centers.

***Methods**:* A suspected case was defined as any person aged 5 years or more who developed acute watery diarrhea, with or without vomiting. We perform a descriptive study followed by unmatched case control 33 cases and 33 control by using structured questionnaires to collect data starting from 6/7/2016 – 21/7/2016 G.C in Burayu town.

Result: A total of 54 Acute Watery Diarrhea (AWD) cases and two deaths were reported from June 14 to July 20 /2016 from the six kebeles. And two deaths of AWD cases with 3.7% case fatality rate may be due to patient came to health center after severely dehydrated, 34 males (62.96%) and 20 females (37%) were reported. More affected kebeles are Melka Gefersa (30%), Gefersa Nono (20.4%), Leku Keta (19%), Gefersa Guje (13%), Gefersa Burayu (9.25%) and Burayu Keta (9.25%) cases and the two deaths were from Melka Gefersa.

Conclusion: A total of 54 AWD cases reported from Burayu town. All six kebeles; Melka Gefersa (30%), Leku Keta (19%), Gefersa Nono (20.4%), Gefersa Guje (13%), Burayu Keta (9.25%), Gefersa Burayu (9.25%)and also two deaths reported from Melka Gefersa kebele with case fatality rate12.5. When we see cases by sex males (63%) are more affected than females. The significant factor of the outbreak drinking untreated water was a risk for the disease and hand washing with soap and water before meal and hand washing with water and soap after going to the toilet protective of the disease. and lack of hygiene and sanitation. We recommend continuous health education to give awareness about the disease condition and transmission, hygiene and sanitation, availability of safe water supply system and water treatment.

Key words – AWD, Outbreak in Burayu town, June/ 2016

Introduction

Cholera is a diarrheal disease caused by infection of the intestine with the bacterium vibrio cholera, commonly either type O1 or O139. Both children and adults can be infected. About 20% of those who are infected develop acute, watery diarrhea 10-20% of these individuals develop severe watery diarrhea with vomiting. If these patients are not promptly and adequately treated, the loss of such large amounts of fluid and electrolytes can lead to severe dehydration and death within hours. **(1)**

The case fatality rate in untreated cases may reach 30-50%. When consumed, most bacteria do not survive the acidic conditions of the human stomach. The few surviving bacteria conserve their energy and stored nutrients during the passage through the stomach by shutting down much protein production. Once it reaches the intestine it produces The cholera toxin (CTX or CT) is an oligomeric complex made up of six protein subunits: a single copy of the A subunit (part A), and five copies of the B subunit (part B), connected by a disulfide bond. The five B subunits form a five-membered ring that binds to GM1 gangliosides on the surface of the intestinal epithelium cells. The A1 portion of the A subunit is an enzyme that ADP-ribosylates G proteins, while the A2 chain fits into the central pore of the B subunit ring. Upon binding, the complex is taken into the cell via receptor-mediated endocytosis. Once inside the cell, the disulfide bond is reduced, and the A1 subunit is freed to bind with a human partner protein called ADP-ribosylation factor 6 (Arf6). Binding exposes its active site, allowing it to permanently ribosylate the Gs alpha subunit of the heterotrimeric G protein. This results in constitutive cAMP production, which in turn leads to secretion of H2O, Na+, K+, Cl−, and HCO3 into the lumen of the small intestine and rapid dehydration. **(1,2)**

Cholera is usually transmitted through fecal Contaminated water or food and remains an ever-present risk in many countries. New outbreaks can occur sporadically in any part of the world where water supply, sanitation, food Safety, and hygiene are inadequate. The greatest risk occurs in over-populated communities and Refugee settings characterized by poor sanitation, unsafe drinking water, and increased person to-person transmission. Because the incubation period is very short (2 hours to 5days), the number of cases can rise extremely quickly**.** Treatment is straightforward (basically rehydration) and if applied appropriately should keep case-fatality rate below 1%. **(1.2)**

Acute Watery Diarrhea in Ethiopia

Acute watery diarrhea outbreak has started in Ethiopia in November 2015. The AWD outbreak is still ongoing in ten regions: Addis Ababa, Oromia, SNNP, Afar, Harari, Amhara, Tigray, Dire Dawa, Benishangul-Gumuz and Ethio-Somali, during week 40, 53 woredas and 10 sub cities reported suspected AWD cases in nine regions. In week 40, a total of 456 suspected and conformed AWD case were reported during the week. Since the beginning of the outbreak in November 2015, a total of 20,367 cases with 74 deaths (CFR: 0.4%) were reported.

Oromia: On week 40 a total of 57 cases with no death from 18 woredas were reported. So far, the region reported a total of 4011 cases with 45 deaths, Case Fatality Rate (CFR=1.127%). Data source Ethiopian Public Health Institute (EPHI) week 40, bulletin.

Objectives

1) General objective

- To investigate and control Acute watery diarrhea outbreak in Burayu town Finfinnee zuriya Oromia Region from 6/7/2016 to 21/7/2016 G.C

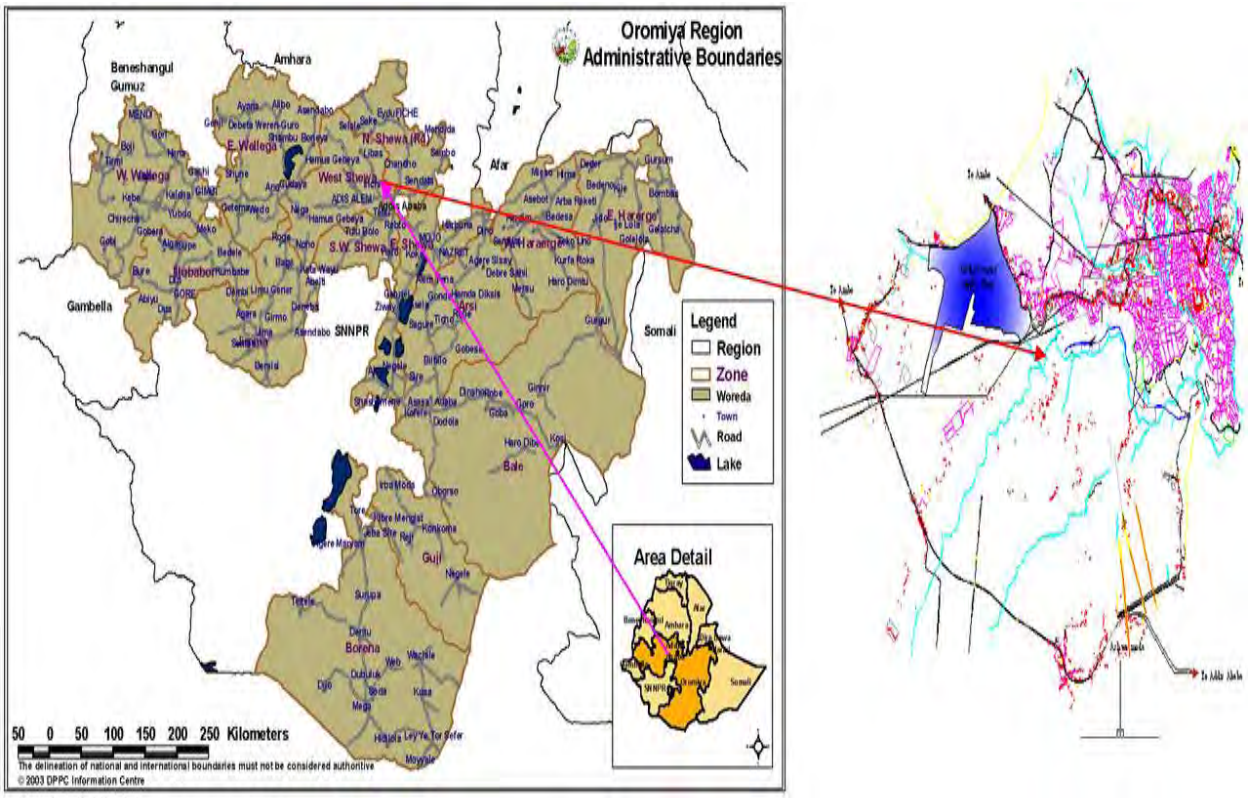
2) Specific objectives

- To describe the outbreak in terms of place, person and time
- To identify risk factors of transmission
- To control the outbreak and prevent occurrence of additional cases.

Methods

Study area: Burayu Town

Burayu town was established 1998 E.C it is a high land area located at an attitude of 2580 m above sea level with an area of 66.5km2. Burayu town is one of the Oromia town located at 10km in the west part of Addis Ababa. According to data obtained from ZHB (Zonal Health Bureau) the total population of Burayu town is 131,721 and when we see by sex Female 67,178 (51%) and male 64,543(49%) (Source; Zonal health office). The town has divided in to six kebeles, Burayu has two health centers, no hospital and low tap water coverages, some villages used unprotected spring water for their consumption. generally poor sanitation and hygiene practices contributes a lot for the illness. There are two Cholera treatment center in the town giving the service for Cholera cases; Burayu CTC (Cholera Treatment Center) and Guje CTC also the town is adjacent to Addis Ababa city and transportation is easily available most patients are treated in Addis Ababa CTC Birchico condominium health center and also the first case was reported there on June 14/2016.



Map 1 Map of Oromia Region showing Burayu Town

Study period: The study was conducted from *6/7/2016 – 21/7/2016 G.C.*

Study design: We conducted descriptive followed by unmatched case-control study with one to one ratio.

Sampling technique and Sample size- We took all 33 cases which were present at the time of our arrival by using the line list and we interviewed them from house to house and 33 controls were selected randomly from the neighbors.

Case definition

Suspected *Case* – A case of cholera should be suspected when: In an area where the disease is not known to be present, a patient aged 5 years or more develops severe dehydration or dies from acute watery diarrhea. In an area where there is a cholera epidemic, a patient aged 5 years or more develops acute watery diarrhea with or without vomiting.

Confirmed case- a case of cholera is confirmed when vibrio cholera O1 or O139 is isolated from The patient stool

Control - Any person in the village without sign and symptom of Cholera at the study time.

Ethical consideration - Letter was obtained from Ethiopian public health institute (EPHI) written for woreda health offices in order to obtain approval on data collection. At the time of the study Informed verbal consent was taken from all respondents before interview. confidentiality was ensured.

Data collection- Data was collected by using structured questioner.

Data analysis and quality assurance- The collected data was entered into Epi-info (version 7) software and checked for completeness and consistency. The entered data was analyzed by Epi-Info (version 7) software. Descriptive statistics were used to determine the frequency of different variables. Bivariate and logistic regression analysis was applied for analysis. Results were displayed using tables and graphs and it was interpreted using Odds ratio, P value<0.05 and 95% confidence interval.

Environmental investigations - We observed the general condition of the cases and controls. Health education was given about hygiene, sanitation and water treatment.

Result

Descriptive analysis: A total of 54 Cholera (AR=0.04%) cases and two deaths (CFR 3.7%), 34 males (62.96%) and 20 females (37.03%) were reported from June 14 to July 20 2016 G.C in Burayu town from the six kebeles.

More affected kebeles are Melka Gefersa (16), Gefersa Nono (11), Leku Keta (10), Gefersa Guje (7), Gefersa Burayu (5) and Burayu Keta (5) cases comparatively and the two deaths are reported from Melka Gefersa. In the town there is a shortage of water: the tapwater not coming regularly peoples went far to get drinking water some of them use spring water.

Table 1. Population of Burayu town by kebele, Oromia region 2016

Kebele	Population	No of cases	case reported AR(%)	Death	Case fatality rate(%)
Burayu keta	21,460	05	0.023	0	0
Gafarsa Burayu	41,000	05	0.012	0	0
Gafarsa Guje	9,039	07	0.077	0	0
Gafarsa Nono	14,125	11	0.077	0	0
Laku Keta	21,097	10	0.047	0	0
Malka Gafarsa	25,000	16	0.064	02	12.5
Total	131,721	54	0.04	02	3.703

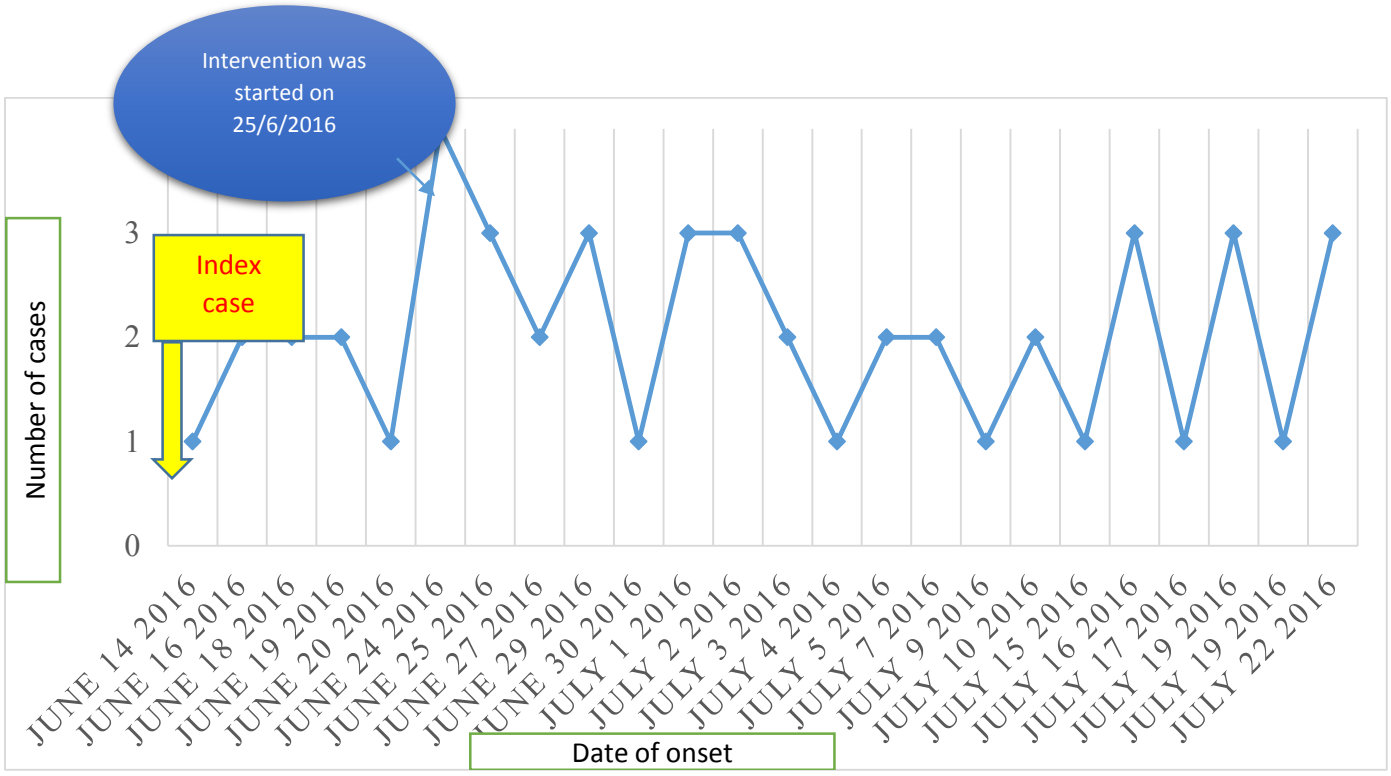


Figure 1 Acute watery diarrhea cases by date of onset, Burayu town, Oromia region, 2016

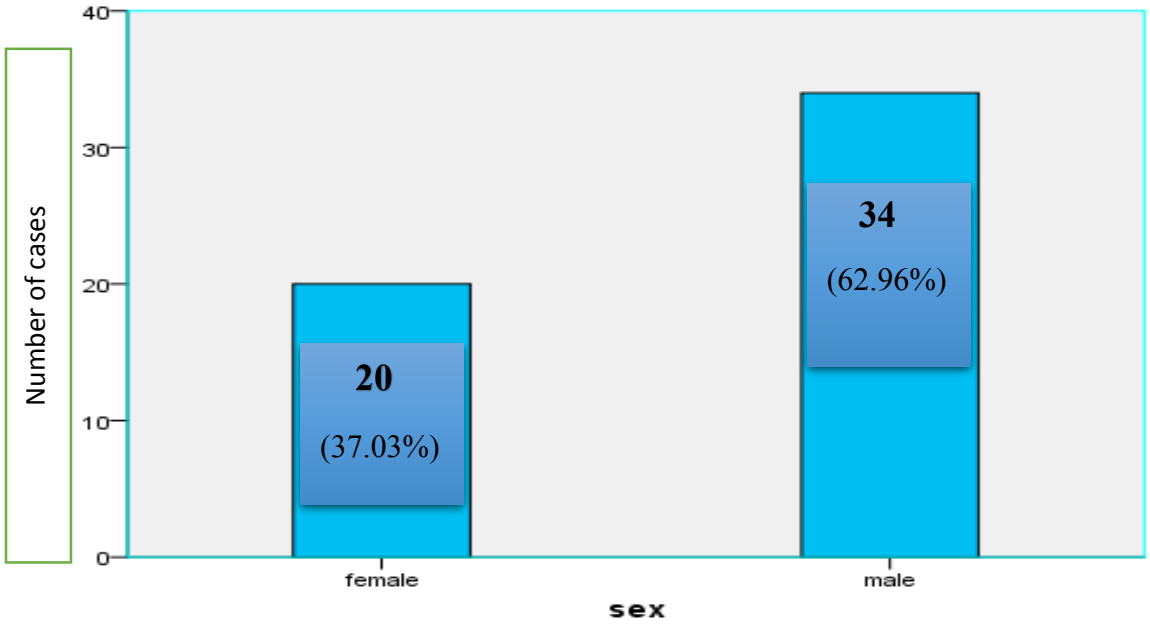


Figure2. Acute watery diarrhea cases by sex, Burayu town, Oromia Region,2016

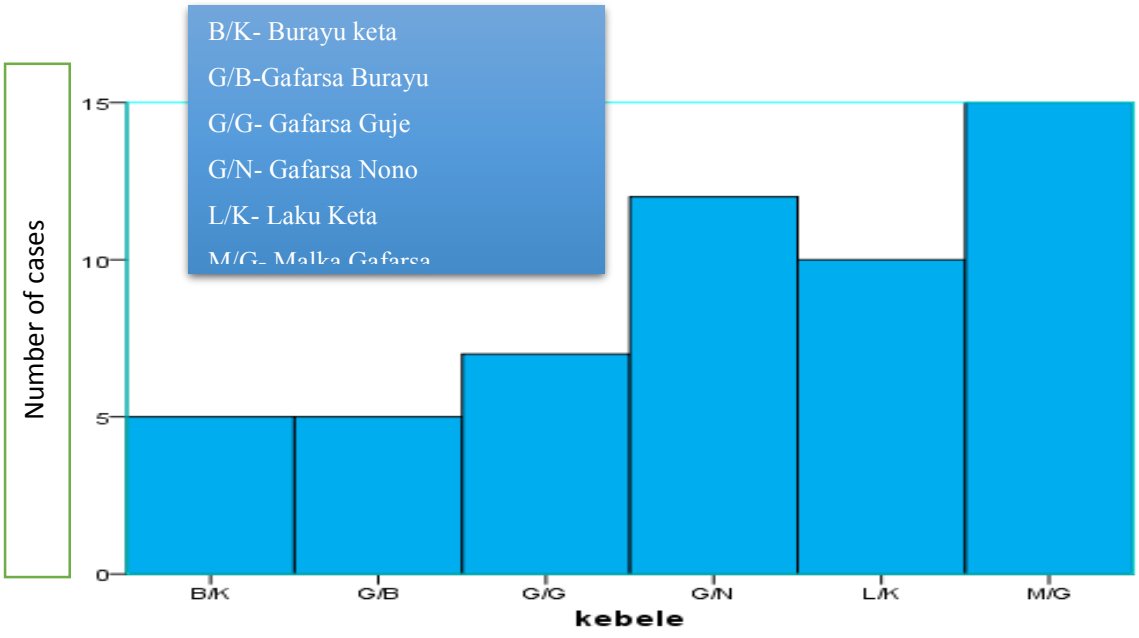


Figure 3, Number of Acute watery diarrhea cases in each kebele, Burayu town, Oromia Region,2016

Table 2. Demographic characteristics of cholera cases and controls in Burayu town, Oromia Region,2016

		Case = 33		Controls = 33	
		Number	Percent(%)	Number	Percent(%)
Age	<5	0	0.0	0	0.0
	5-14	1	3	0	0.0
	15-44	26	79	30	91
	>45	6	18	3	9
Sex	Female	12	36	16	48
	Male	21	64	17	52
Occupation	Private	21	64	19	58
	Governmental	0	0	1	3
	Housewife	4	12	12	36
	House Maid	1	3	0	0
	Driver	1	3	0	0
	Daily laborer	3	9	0	0
	Student	2	6	1	3
	Retired	1	3	0	0

Table 3 –Bivariate analysis for different exposures, Burayu town, Oromia Region,2016

Exposure		Case(%)	Control(%)	OR(95%CI)	P value	Adjusted OR (95%CI)
1) Eating food outside their home in the last 5 days	Yes No	18(54.5%) 15(45.4%)	15(45.4%) 18(54.5%)	1.44(0.54-3.79)	0.622	--
2) Eating Raw meat	Yes No	18(54.5%) 15(45.45%)	12(36.36%) 21(63.64%)	2.10(0.78-5.63)	0.216	4.1683 (1.162-14.94)
3) Eating Raw Fish	Yes No	1(3.03%) 32(96.97%)	0(0.00%) 33(100%)	-	1.000	--
4) Eating salad	Yes No	24(72.73%) 9(27.27%)	17(51.52%) 16(48.48%)	2.50(0.89-7.00)	0.127	4.464 (1.22-16.29)
5) Drinking Shameta	Yes No	5(15.15%) 28(84.85%)	1(3.03%) 32(96.97%)	5.71(0.629-51.89)	0.198	5.5581 (0.48-63.97)
6) Source of water	Tap	31(93.9%)	26(78.79%)	4.17(0.79-21.85)	0.15	--
	Spring	2(6.06%)	7(21.21%)	0.23(0.045-1.254)	0.151	--
7) Drinking untreated water	Yes No	28 5	19 14	***4.12(1.27-13.37)***	**0.029**	**5.1579 (0.147-18.08)**
8) Attending funeral in the last 5 days	Yes No	2 31	3 30	0.31(0.030-3.170)	0.6055	--
9) Washing hand with soap and water before meal	Yes No	15(45.45%) 18(54.55%)	26(78.79%) 7(21.21%)	***0.22(0.076-0.660)***	***0.011***	***0.35(0.106-1.15)***
10) washing hand with soap and water after going to the toilet	Yes No	15(45.45%) 18(54.55%)	26(81.25%) 7(18.75%)	***0.22(0.076-0.660)***	***0.011***	***0.35(0.106-1.15)***

When we see from the table drinking untreated water is a risk factor for the disease and hand washing with soap and water and also hand washing with soap and water after toilet were a protective value of the disease.

Table 4 multivariate analysis, *Burayu town, Oromia Region,2016*

S.N	Exposure	Adjusted OR(95%CI)	p-value
1	Eating Raw Meat	4.1683(1.162-14.94)	0.0284
2	Eating Salad	4.4641(1.222-16.29)	0.0235
3	Drinking Shameta	5.5581(0.482-63.97)	0.1688
4	Drinking untreated water	5.1579(0.147-18.08)	0.0104
5	Washing hand before meal	0.350(0.106-1.15)	0.0848
6	Washing hand after toilet	0.350(0.106-1.15)	0.0848

On multivariate analysis Eating Raw meat, eating salad and drinking untreated water were found a risk factor.

Intervention

Response to this outbreak there was a multisector committee from WHO, Wash committee and the woreda and zonal administrations and health offices. There was daily meeting. Cases were managed appropriately

Surveillance - Active case search, Contact tracing and line listing of cases and daily reporting of Cases was done with proper format.

Coordination - At the beginning the work load was on health personals only, we discussed with Responsible persons, Kentiba to strengthen the team, they start to coordinate and Active case search, daily situation monitoring, assessing risk factors and case Management were strengthened.

Discussion

Our investigation confirmed that Acute watery diarrhea outbreak has occurred in Burayu town, Oromia region. The clinical manifestations of Cholera include profuse diarrhea and vomiting of clear fluid, these symptoms usually start suddenly, half a day to five days after ingestion of the bacteria. A total of 54 suspected and laboratory confirmed by RDT, Cholera cases were recorded. The outbreak has affected all Six kebeles, especially Melka Gefersa (30%), Leku Keta (19%),

Gefersa Nono (20.4%), Gefersa Guje (13%), Gafarsa Burayu (9.25%) and Burayu Keta (9.25%). The disease affects both sexes and all age groups >5yrs (AR=0.04%) and two deaths (CFR=3.7%), when we see cases by sex 34 males (62.96%) and 20 females (37.03%) were reported males are more affected than females because of their working condition always going out of their home and eating food out of home and when we see by age group 15-44 years were more affected by the disease than others age group(79%) .During our investigation time those age groups were working and eating food outside their home this may increase incidence of the disease among this age group.

Also a study done in Liben woreda, Guji Zone in May 2016 revealed that from a total of 57 cases, the more affected age group was 15-44 and the identified risk factor was because this age group is more engaged in movement from place to place for different social reasons.

Conclusion

- From this study done in Burayu town, Oromia region, we can conclude that a total of six kebeles have been affected by the outbreak, 54 cases and Two deaths were reported. The highest number reported cases were from Melka Gefersa Kebele. Among this Males are more affected than females, and age group of 15-44 years are mostly affected and The Response to this outbreak was a multisector committee from WHO, Wash committee, the woreda and zonal administrations and health offices. Surveillance was done through Active case search, Contact tracing and line listing of cases and daily reporting of Cases was done with proper format.
- The associated factors for the outbreak were mainly:
    1. Shortage of safe water supply (drinking untreated water)
    2. Eating Raw meat and Vegetable salad
    3. Sanitation and hygiene problem.
    4. Lack of awareness about the illness.

Recommendation

- We recommend continuous health education about sanitation and hygiene; cooking food before eating and avoiding raw foods, hand washing and proper garbage disposal and safe water supply system and water treatment methods.
- Surveillance system should also be strengthened.

Reference

1. Yemane Berhane, D. H. M., Helmut Kloos (2006). Epidemology and ecology of health and disease in Ethiopia
2. C.D.C (1995). Detection and control of an epidemic of cholera; technical guidelines. Atlanta, GA, Center for Disease Control and prevention, 1995.
3. Health, F. M. o. (2005/2006). "Federal Ministry of Health, Ethiopia; Health and Health Indicators 2005/2006."
4. Health, F. M. o. (2006/2007). "Federal Ministry of Health, Ethiopia; Health and Health indicators 2006/2007."
5. Health, F. M. o. (2007/2008). "Federal Ministry of Health, Ethiopia; Health and Health indicators 2007/2008."
6. Institute, P. H. (2007). "Public Health Institute process implementation manual."
7. Institute, P. H. (2008). "Public Health Emergency Management core process, Addis Ababa."
8. W.H.O (2011). "Guidelines for cholera outbreak management ".

2nd outbreak

1.2. Rota virus outbreak investigation in Dano Woreda, Ambo, West shoa Zone, Oromia region 2017

Abstract

Introduction - Rota virus diarrheal disease is the most common causes of severe diarrhea among infants and young Children. There are five species, Rota virus A causes more than 90% infections in human. The virus is transmitted by the fecal- oral route. Treatment of infection is mostly maintenance of hydration. The primary public health intervention is vaccination. In 2009 the world health organization (WHO)recommended that rotavirus vaccine be included in all national immunization programs. Two vaccines are taken orally and contain attenuated live virus. In Ethiopia rotavirus vaccination were introduced in 2013. The national immunization schedule is at 6 and 10 weeks for Rota 1 and 2 respectively. We received report about Rota virus outbreak from Dano woreda Ambo town January2017. The woreda has a total population of 124,713 of which 62,350 males and623,369 females. 23 kebeles,4 health center and 3 HP.

Methods - We defined a conformed rotavirus case as an illness characterized by child with vomiting and diarrhea and positive stool examination for rotavirus. 10 stool samples taken for laboratory conformation, Descriptive followed by 1; 2 case control study conducted. Data collection a structured questionnaire was used and analyzed by epi-info and excel.

Result – A total number of 549 suspected Rota virus cases and from which 10 confirmed cases with no death reported from Ambo town, Dano woreda; 21 kebeles, index case seen January 10/2017 from Awedigulfa kebele. When we see cases by sex male 310 and 239 female cases were seen. Statistically associated was being unvaccinated with OR-7.78(3.6-17.1) P value 0.001376., also there were no vaccination card to know about child's vaccination status. There is also big problem of safe water supply in the woreda .

Conclusion – There was an outbreak of Rota virus in Ambo town, Dano woreda. Being unvaccinated was found to be the most significant risk factor for the disease OR=**7.78(3.6-17.1), P value= 0.001376)**. We recommend awareness creation about the advantage of vaccination**,** exclusive breast feeding, Hygiene and sanitation and safe water supply have to be improved.

***Key words**: Rota virus outbreak, Dano woreda, Ambo, January/2017.

Introduction

Rotavirus is the most common cause of severe diarrhea among infants and young children. It is a genus of double stranded RNA virus in the family reoviridae. Nearly every child in the world has been infected with rotavirus at least once by the age of five, Immunity develops with each infection, so subsequent infections are less severe, adults are rarely affected. There are five species of virus referred to as A, B, C, D and E. Rotavirus A is the most common species, causes more than 90 % infections in humans. (1,2 ,9)

The virus is transmitted by the fecal-oral route. It infects and damages the cells that line the small intestine and causes gastroenteritis (which is often called, stomach flu, despite having no relation to influenza). Although rotavirus was discovered in 1973 and accounts for up to 50 % of hospitalizations for severe diarrhea in infants and children. Its importance is still not widely known within the public health community, particularly in developing countries. In addition to its impact on human health, rotavirus also infects animals and is a pathogen of livestock. Rotavirus is usually an easily managed disease of child hood, but worldwide more than 450,000 children under five years of age still die from Rota virus infection each year, most of whom live in developing countries and almost two million more become severely ill. In the united states, before initiation of the rotavirus vaccination Programme. Rota virus caused about 2.7 million cases of severe gastroenteritis in children almost 60,000 hospitalizations, and around 37 deaths each year. Public health campaigns to combat Rota virus focus on providing oral rehydration therapy for infected children and vaccination to prevent the disease. The incidence and severity of rotavirus infections has declined significantly in countries that have added rotavirus vaccine to their routine childhood immunization policies. (1,2)

Sign and symptoms - Rota virus gastroenteritis is a mild to severe disease characterized by vomiting, watery diarrhea and low grade fever. once a child is infected by the virus there is an incubation period of about two days before symptoms appear. Symptoms often start with vomiting followed by four to eight days of profuse diarrhea. Dehydration is more common in rotavirus infection than in most of those caused by bacterial pathogens, and is the most common cause of death related to rotavirus infection. *Transmission* - Rotavirus transmitted by the fecal – oral route via contact with contaminated hands, surfaces and objects and possibly by the respiratory route.

The faces of an infected person can contain more than 10 trillion infectious particles per gram fewer than 100 of these are required to transmit infection to another person. Diagnosis and detection of infection with rotavirus normally follows diagnosis of gastroenteritis as the cause of severe diarrhea, specific diagnosis of infection with rotavirus A is made by finding the virus in the child stool by enzyme immunoassay. There are several licensed test kits on the market which are sensitive, specific and detect all serotypes of rotavirus A. Other methods such as electron microscopy and PCR are used in research laboratories. Reverse transcription polymerase chain reaction (RT-PCR) can detect and identify all species and serotypes of human rotavirus. (1,2)

Treatment - Treatment of acute rotavirus infection is nonspecific and involves management of symptoms and most importantly maintenance of hydration. Untreated children can die from the resulting severe dehydration.

Rotavirus surveillance in Ethiopia

Ethiopia FMOH with support of WHO established Rota surveillance in 2007 with the purpose to estimate from hospital – based surveillance, the burden of rotavirus gastroenteritis in children less than five years of age, determine the predominant circulating rotavirus strains, assess the importance of introducing new and prospective rotavirus vaccine based on the predominant circulating rotavirus strains and generate base line data for policy making.

The ministry of health continued to work in collaboration with EPHI and WHO to monitor the epidemiological impact after rotavirus vaccine introduction. Surveillance activities initiated in 2007 at Black Lion Hospital was further expanded to other two sites in Yekatit 12 and Betezata Hospitals in 2008 and 2011 respectively.

The primary public health intervention is vaccination. In 2009, the world health organization (WHO) recommended that rotavirus vaccine be included in all national immunization programs. Two vaccines against Rotavirus A infection are approved for global use and safe and effective in children, Rotarix and RotaTeq. Both are taken orally and contain attenuated live virus. In Ethiopia rotavirus vaccinations were introduced in 2013. The national immunization schedule is at 6 and 10 weeks for Rota 1 and 2 respectively. Ethiopia has achieved 88% coverage of Rota 2 vaccine dose by 2014/15 and planned to increase coverage to 97% by 2020. (1,2)

Objectives

General objective

- To investigate the Rotavirus outbreak in Dano woreda, Ambo town from January 27 up to February 10/2017

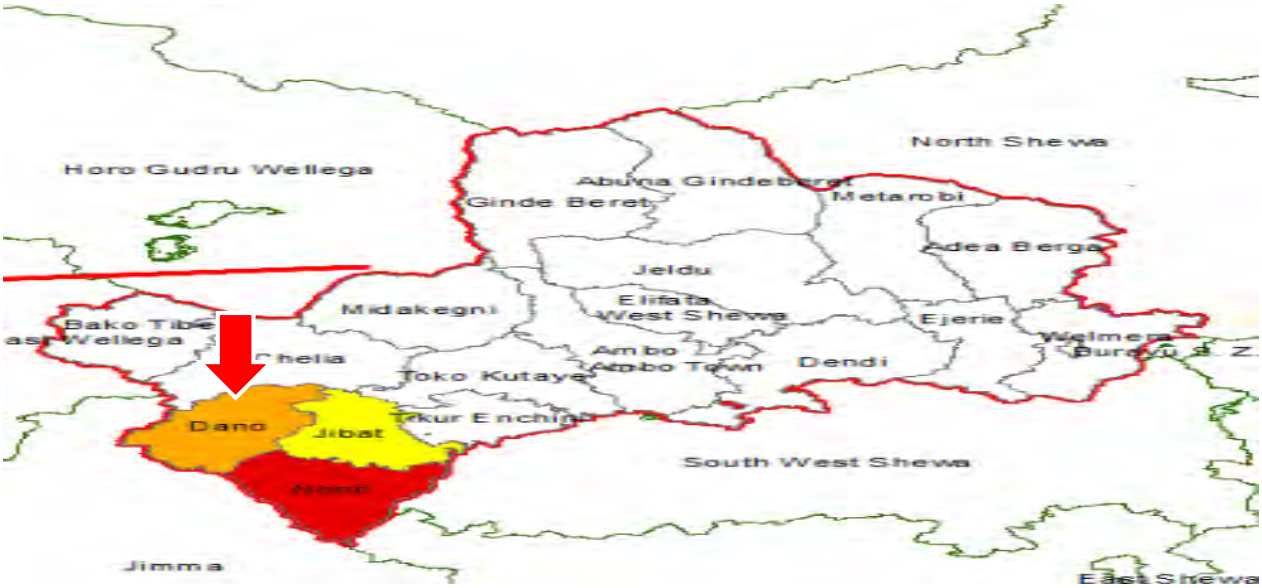
Specific objectives

- To describe the magnitude of the outbreak
- To identify possible risk factors for Rotavirus
- To take prevention and control measures

Methods

- Study area and study period

We received information about reported cases of Rotavirus from west Shewa Ambo town Dano woreda in January26/ 2017. Dano woreda is one of the west shoa zone woredas which is located 125 km from zonal Ambo and 250 km from Addis Ababa to the west. Its bounder from the east Jibat woreda, west Jima zone, north Challa and Ilugelan and from the south Nono woredas are located. Dano woreda has a total population of 124,713 from which male 62,350, female 62,369 and 8628 urban populations. The woreda has 23 kebeles and 4 health centers and 3 health posts, Infants/ < 1 yrs. **4240,** < 5 yrs. **20,453** and < **15yrs 57,791**. The study was conducted from January 27 up to February 10/2017.



Map 2 - Map of Dano woreda, Ambo town

- ***Study design***

We conducted a descriptive cross sectional study followed by unmatched case control study to investigate the outbreak in the woreda. we used 50 cases with 100 controls selected from the same woreda.

Suspected case definition - Any child under five years of age with sudden onset of watery yellowish color diarrhea with vomiting.

Conformed case definition - A suspected case with laboratory conformation of rotavirus in the stool examination

Controls - A child without the sign and symptom of Rotavirus infection in the same area

- ***Data collection method and sampling procedure*** – *sampling procedure for cases we use all cases admitted in 2 health center (*most *cases were admitted) during our arrival time and for our controls we selected 100 under 5 children from the same community or the neighborhood. [1:2 case control (50 cases and 100 controls)].*

A structured questionnaire was used to interview the patients and controls parents or caregivers by house to house visiting with the help of health extension worker using line list which is obtained from the PHEM office.

- ***Data analysis and clearance***

The collected data entered in to EPI –INFO software and checked for completeness and consistency and analyzed by using EPI –INFO and EXCEL.

- ***Ethical issues***

Support letter was obtained from EPHI; the letter was written for woreda health office in order to obtain approval on data collection. Informed verbal consent was obtained from all study participants before conducting interview by explaining the purpose of the study, privacy and confidentiality was ensured.

Result

When we arrived at Dano woreda on January 29/2017 there were 375 total number of suspected rotavirus cases and with no death reported from 21 kebeles starting from January 10 /2017 then the Number of cases increased to 549. The attack rate was 2.68% with no case fatality rate. The outbreak was first reported from neighbor woreda Nono before Dano woreda.

Among these suspected cases 10 stool samples were taken to identify the etiologic agent and all samples were positive for rotavirus. The first case was reported on 10/1/2017 from Awedigulfa kebele index case was identified from the line list. When we see cases by sex 310 (56.5%) Males, 239(43.5%) Females, and cases seen in each health centers Seyo HC 35%, Kara Genet HC 18.4%, Beke sirba HC 14.2%, Ajila Dalle HC14%, D/Shanan 12%, D/Hujiba 6% and Qagaro Jibat HP 1.3% cases were seen.

Table 5- Number of cases in each health center in Dano woreda, Ambo Town, Oromia region,2017

Name of Health Center	Number of cases seen	Percent from the total case
Seyo HC	190	34.6%
Kara Genet HC	101	18.4 %
Bake sirba HC	78	14.2%
Ajila Dalle HC	76	13.8 %
D/Shanan HP	65	11.8 %
D/Hujiba HP	32	5.8%
Qagaro Jibat HP	7	1.3%
Total	549	100%

Cases seen in each health center When we observe cases mostly seen at Seyo health center 190(34.6%)cases, Kara genet HC 101(18.4%) cases, Bake sirba HC 78(14.2%) cases, Ajila dale HC 76(13.8%) cases, D/Shanan HP 65(11.8%) cases, D/Hujiba HP 32(5.8%) and Qagaro Jibat HP 7(1.3%) Cases Seen.

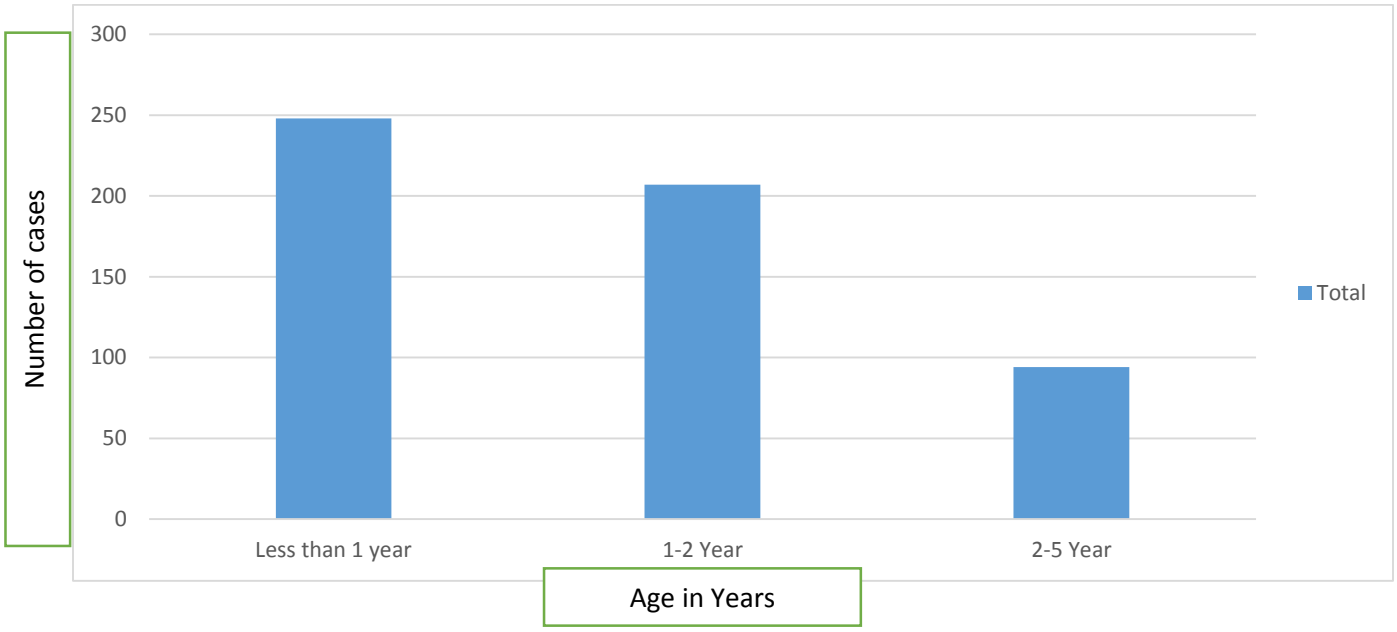


Figure 4- Number of Rota cases by age in Dano woreda, Ambo Town, Oromia region 2017

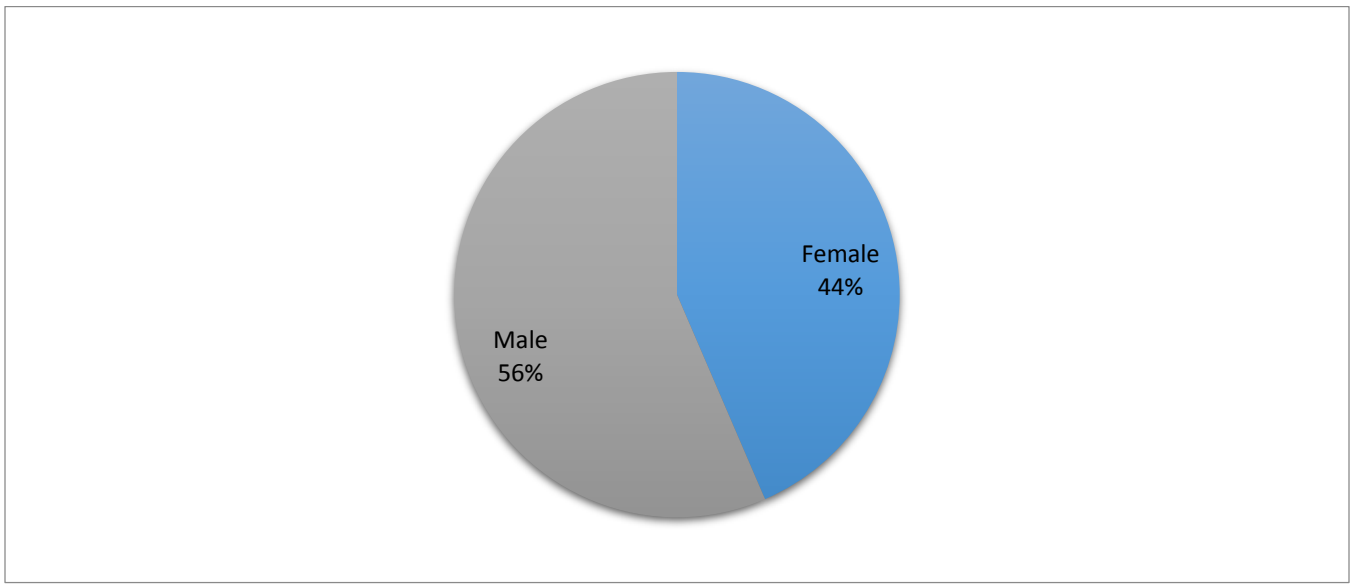


Figure 5. Number of cases by sex Dano woreda, Ambo Town, Oromia region,2017

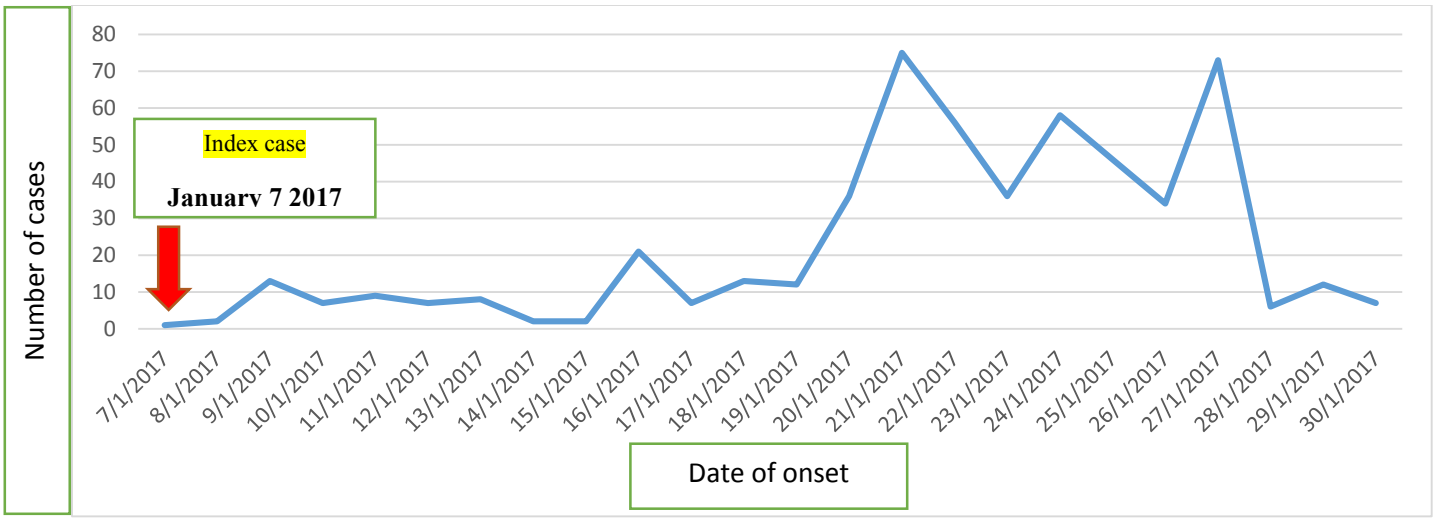


Figure 6. Number of cases by date of onset Dano woreda, Ambo Town, Oromia region,2017

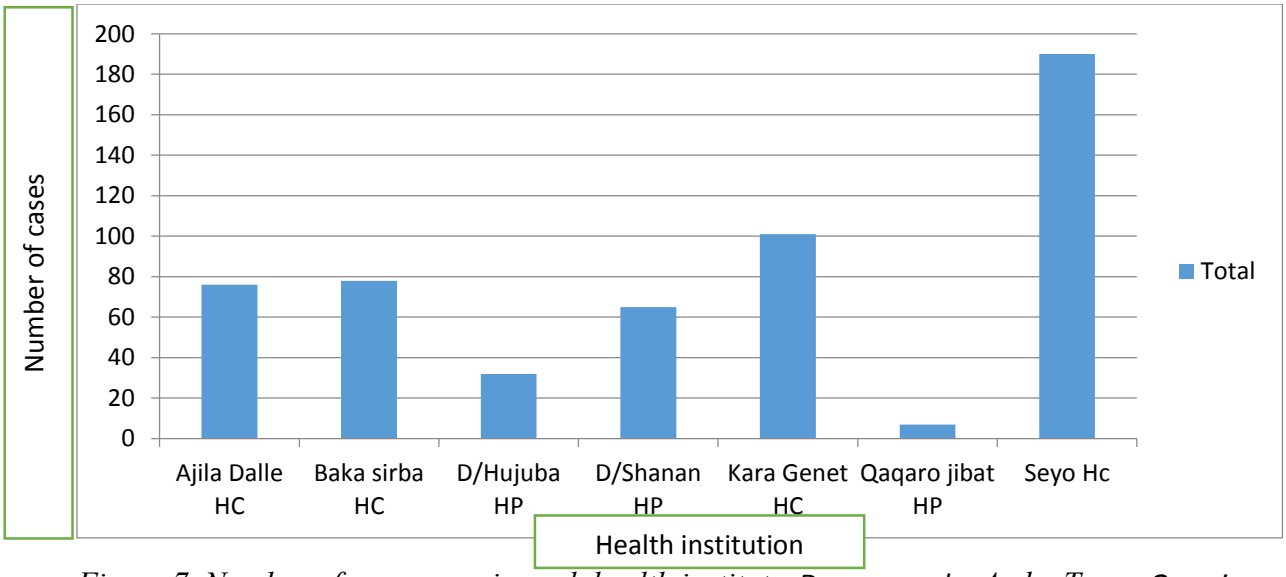


Figure 7. Number of cases seen in each health institute, Dano woreda, Ambo Town, Oromia region,2017

Table 6. Information of cases and control in Dano woreda, Ambo Town, Oromia region,2017

		Cases	Percent	Controls	Percent
Age group	< 6 month	0	0	1	1%
	6 - 12 month	33	66%	20	20%
	>12 month	17	34%	79	79%
Sex	Female	29	58 %	44	44.4 %
	Male	21	42 %	55	55.6 %
No formal education	Yes	33	66 %	36	36%
	No	17	34 %	64	64%

Table 7. Bivariate analysis for Exposures in Dano woreda Ambo Town, Oromia Region 2017.

Exposure		Case(%)	Control(%)	OR(%)	P-Value
Being Unvaccinated	Yes No	30(60%) 20(40%)	16(16.16%) 84(83.8%)	**7.78(3.6-17.1)**	**0.001376**
Having contact with sick	Yes No	5(10%) 45(90%)	8(8%) 92(92%)	1.27(0.3-4.1)	0.9182
Knowledge about Rota vaccine	Yes No	12(24%) 38(76%)	21(21%) 79(79%)	1.13(0.5-2.6)	0.8344
Presence of latrine and use	Yes No	47(94%) 3(6%)	96(96%) 4(4%)	0.65(0.14-3.03)	0.89

Discussion

Our investigation revealed that Rotavirus cases has occurred in Dano woreda, Ambo town. Rotavirus gastroenteritis is a mild to severe disease characterized by vomiting, watery diarrhea and low grade fever. Among the total 549 Seyo health center had 190 (34.6%) cases, Kara Genet Health center 101 (18.4%) cases, Ajila Dalle Health center 76 (13.8%) cases, Baka sirba health center 78 (14.2%) cases, D/Shanan health post 65 (11.8%) cases, D/Hujiba health post 32 (5.8%) cases, Qagaro Jibat Health post 7 (1.27%) cases. So Seyo Health center has seen the most number of cases. When we see cases by sex male 310 (56.5%) and females 239 (43.5%) totally seen and from the 23 kebeles 21 (91.3%) kebeles affected by the outbreak in Dano woreda. The outbreak affects under five age groups and when we see the most recorded age for the cases was 6 – 12months (66%) of age. On bivariate Analysis the risk factor statistically associated was Being unvaccinated with **[OR=7.78(3.6-17.1) P value=0.001376**] and also one of the main problem was no clear vaccination history about child have got full dose of rotavirus vaccine or not and also mothers not knowing about the disease vaccine prevention. There is also big problem of safe water supply in the woreda and peoples use spring, river water some villages have Hand dug water.

- **Limitation**

During house to house study time for data collection, vaccination card was not available in all the households, for this reason the vaccination status was taken by simply asking the family. This may cause bias on vaccination status.

Conclusion

- From this study done in Dano woreda Ambo Town, Oromia region we can conclude that a total of 21 Kebeles have been affected by the outbreak and 549 cases with no death were reported. The outbreak has affected mostly under five children specially 6-12 months of age,
- The risk factors associated with the outbreak were mainly: Being unvaccinated,

Lack of awareness about the disease prevention method and Shortage on Safe water supply.

Recommendation

- Routine vaccination for Rotavirus should be strengthened.
- Awareness creation about the advantage of vaccination, exclusive breast feeding
- Hygiene and sanitation and safe water supply have to be improved.

Reference

1. CDC (2012). "CDC Rota virus infection clinical information."

2. CDC (2012). "Epidemiology and prevention of vaccine preventable Disease ".

3. HD, P. (2013). "Treatment and prevention of Rotavirus Infection in children, current Infectious Disease Reports."

4. Matson Do, O., Ryan ML, Jiang x (2000). "Rotavirus, enteric adenovirus, Calicivirus, astrovirus and other viruses causing gastroenteritis, Washington, D.C. ASM press."

5. Parashar UD, G. C., Bresee JS (2006). "Rotavirus and severe childhood diarrhea, Emerging Infectious Diseases."

6. Wafa E, H., Fadhil O, Abdel Wahid A (2013). "Prevalence of rotavirus and adenovirus associated with diarrhea among displaced communities in Khartoum, Sudan, BMC Infectious Diseases."

7. WHO (2011). "Global Burden of Rotavirus Diarrhea ".

8. Yasutaka H, A. K. (2000). "Rotavirus serotypes; classification and Importance in Epidemiology, Immunity and vaccine Development, J Health popul Nutr."

9. Yemane Berhane, D. H. M., Helmut Kloos (2006). Epidemology and ecology of health and disease in Ethiopia

Chapter II
Surveillance data analysis report

Chapter 2: Surveillance data analysis report

Epidemiology of Malaria in Ethiopia a descriptive data analysis 2011- 2015 G.C.

Abstract

Introduction

Malaria is a leading public health problem in Ethiopia. An estimated 40 million people (two third) of the Population are at risk. Malaria transmission is generally seasonal and unstable, patterns and Intensity of transmission vary throughout the country due to differences in altitude, rain fall and population movement. There are four species of the parasite affecting human being -plasmodium falciparum, plasmodium Vivax, plasmodium Malare and plasmodium ovale.

Methodology – Descriptive *Study* in Ethiopia all region starting from 2011 -2015 G.C

The data source was from EPHI. data analysis done by using Excel, pivot the data.

Result

We identified 13,893,897 malaria conformed and suspected cases out of each 128,614 deaths were reported from the nine regions and two federal cities between 2011-2015.The annual incidence of malaria was3295.46/100,000 population and there were 128,614 deaths (CFR of 0.92%). The highest incidence was from B/Gumuz (20804.7) The most common regions were malaria report was high are SNNPR, Amhara, Oromia and the lowest prevalence were seen in Diredawa and Addis Ababa. Also the most epidemic months are from September to December, January to April and May to August.

Conclusion

Total Malaria cases and total number of deaths since 2011 till 2015 has increased exponentially and Other important finding was that the distribution of the disease burden in different regions of Ethiopia is unequal, meaning SNNPR takes33 %, Amhara 27 %, Oromia 18 % and also it was found that September to December most of the cases occurred.

Key words – Surveillance, Data analysis, Malaria, Ethiopia, 2011-2015.

Introduction

Malaria is a leading public health problem in Ethiopia. An estimated 55.7 million People (68%) Of the population are at risk for malaria and around 80 % of the 736 districts (woreda) in Ethiopia are considered "Malarious". (8)

Malaria transmission is generally seasonal and unstable, though patterns and Intensity of transmission vary throughout the country due to differences in altitude, rainfall and population movement. Malaria transmission varies widely with Ethiopia's diverse topography and associated rainfall patterns. About 75% of the land mass is potentially Malarious and about two thirds of the population (over 40 million people) is at risk of infection. (1,2,3,8)

Transmission is largely seasonal and unstable with marked monthly fluctuation in the number of cases. The major malaria transmission season peaks between September and December following the main rains of June through September. A second but less pronounced peak occurs during the second transmission season in April and may following the short rains. (8)

Following the nationwide 1958 malaria epidemic, and in the context of successful eradication in other countries and available donor support, the Ethiopian Malaria eradication service was established in 1959 under the ministry of Public Health.

* Protective immunity in Ethiopian populations is relatively low due to unstable transmission and unlike large parts of sub-Saharan Africa; all age groups are at risk of infection and disease (1,2,3,8)
Malaria is febrile illness characterized by Fever*, Splenomegaly*, Varying degrees of anemia.

Species of the parasite infecting man

- Plasmodium Falciparum - common 60-70%
- Plasmodium Vivax - common 30-40%
- Plasmodium Malare
- Plasmodium Ovale

Vectors of malaria

- Females of certain species of Anopheles 30/60 Spps. Are of major epidemiologic importance. *Reservoirs* :Human - no animal reservoir

* Key components of Malaria control program are implemented by different units in the federal ministry.

Efforts to control malaria in Ethiopia

Efforts to control malaria since the mid twentieth century, it remains one of the most important suggest that malaria existed for centuries in the country, and the widespread occurrence of the disease in fertile lowland areas has been a major obstacle to agricultural causes of morbidity and mortality in Ethiopia. The high concentration of human settlements in the highlands persisting avoidance of the lowlands for health reasons by the Ethiopian highland population development.

Ethiopia's complex topography and seasonal rainfall support largely seasonal short- term transmission, and malaria is generally unstable since the population remains non-immune. Unlike many other sub-Saharan African countries, asymptomatic parasitemia is not a common phenomenon in the country. As a result, recurrent outbreaks and epidemics are associated with cyclical climatic variations that lead to increased vector survival. (8)

Following the nationwide 1958 malaria epidemic, and in the context of successful eradication in other countries and available donor support, the Ethiopian Malaria Eradication Service was established in 1959 under the Ministry of Public Health. Well-organized and widespread vector control operations supported by case treatment and insecticide spraying of homesteads led to a reduction in malaria incidence and prevalence during the early years of operation. However, subsequent international concern about increasing DDT resistance and high Programme costs in Malarious countries led WHO to adopt a control strategy, and in 1971 the Ethiopian Malaria Eradication Service was converted into a control Programme. Until 1992 the National Programme for the Control of Malaria and Other Vector Borne Diseases operated vertically through regional, zone, and sector offices of the Ministry of Health. In 1993, following the adoption of a policy of decentralization by the Transitional Government of Ethiopia, control activities were integrated in to the general health services under the regional health bureau. Further decentralization of control activities to the zone level took place from 1994 to 1996 and in some regions to the woreda level in 2002. (8)

Objective

General Objective

- To Describe Malaria cases in different Regions of Ethiopia in the time between 2011-2015.

Specific Objective

- To Identify where malaria epidemic is common
- To Identify the most common epidemic months and weeks
- To Describe number of malaria cases outpatient and in-patient
- To describe morbidity and mortality from malaria

Map 3 - Map of Ethiopia

The data was collected from the nine regions and two federal states of Ethiopia (Addis Ababa, Afar, Amhara, Benishengul, Dire dawa, Gambella, Harari, Oromia, SNNPR, Somalia, and Tigray.

Methodology

Description of the study area

The study was undertaken in Ethiopia, in all 14 regional states and their corresponding woreda approximately 940 starting from 2011 till 2015. And the data was collected on a weekly basis, because malaria is one of the weekly reportable disease of priority disease under surveillance so we will have 4 or 5 data collected in each month.

Study design - we are using secondary data review. We use data from EPHI.

The data collected was using quantitative method, majorly on the number of malarial inpatient cases, outpatient cases and number of deaths caused by malaria.

Data processing and analysis - So we will analyze the data using Microsoft Excel and using it we will pivot the data based on the number of cases in each region and as stated in our objective we will try to analyze the data and try to full fill the different objectives.

Standard Case definition of Malaria - Any person with fever, headache, rigor, chills, sweats, myalgia, nausea and vomiting or a person diagnosed clinically as malaria.

Results

From 2011-2015 a total of 13,893,897 malaria confirmed and clinical cases with 128614 deaths were reported throughout the country with a CFR of 0.92%. The national annual incidence rate was 3295.46/100,000 population and the highest incidence rate was reported from B/Gumuz,20804.7 followed by Gambella, 17008.6 per 100,000 populations. Most common regions where malaria prevalence was high were 1st SNNPR, 2nd AMAHARA, and 3rd OROMIA. And the lowest prevalence was seen in Dire-Dawa and Addis Ababa.

Among them 128662 out-patient cases and 128617 inpatient cases were recorded.

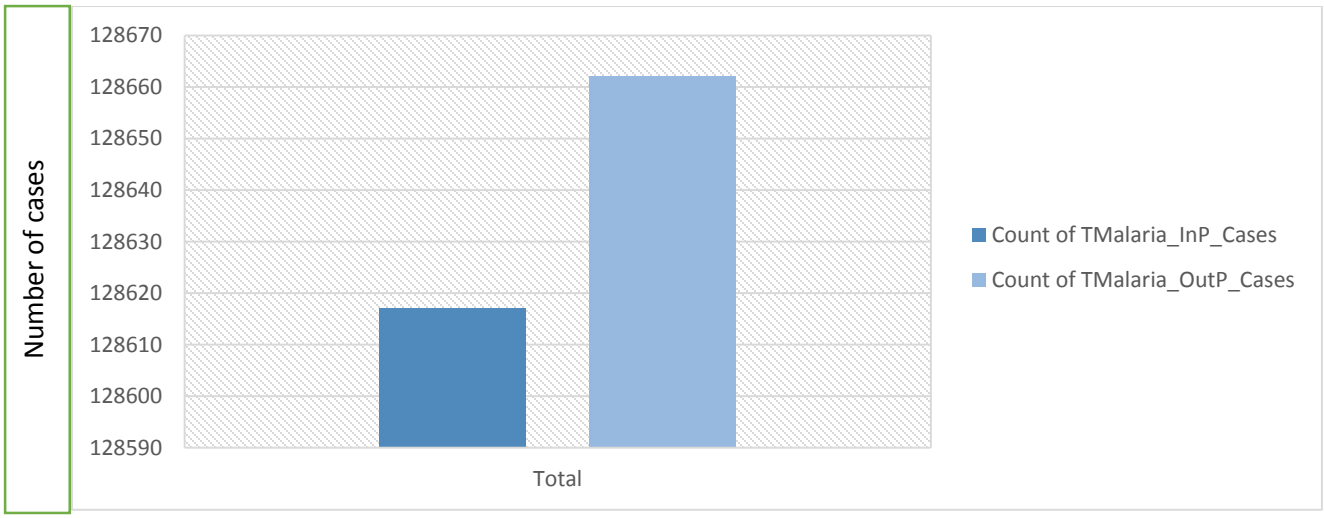


Figure 8. Number of total malaria inpatient and outpatient cases 2011-2015, Ethiopia

Most cases reported months are from September to December and the list common months are from January to April and May- August.

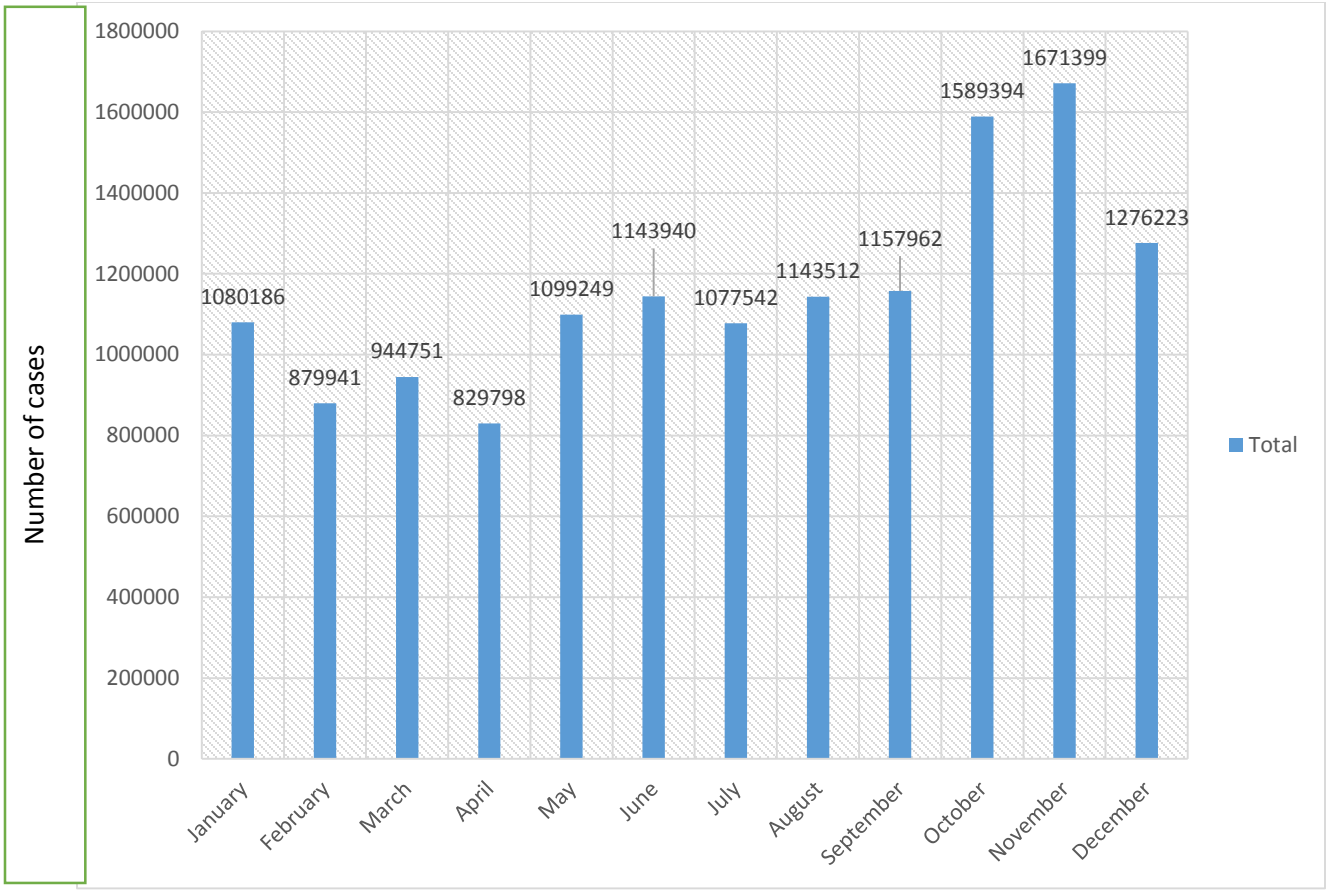


Figure 9. Total number of malaria cases in each month, 2011-2015, Ethiopia

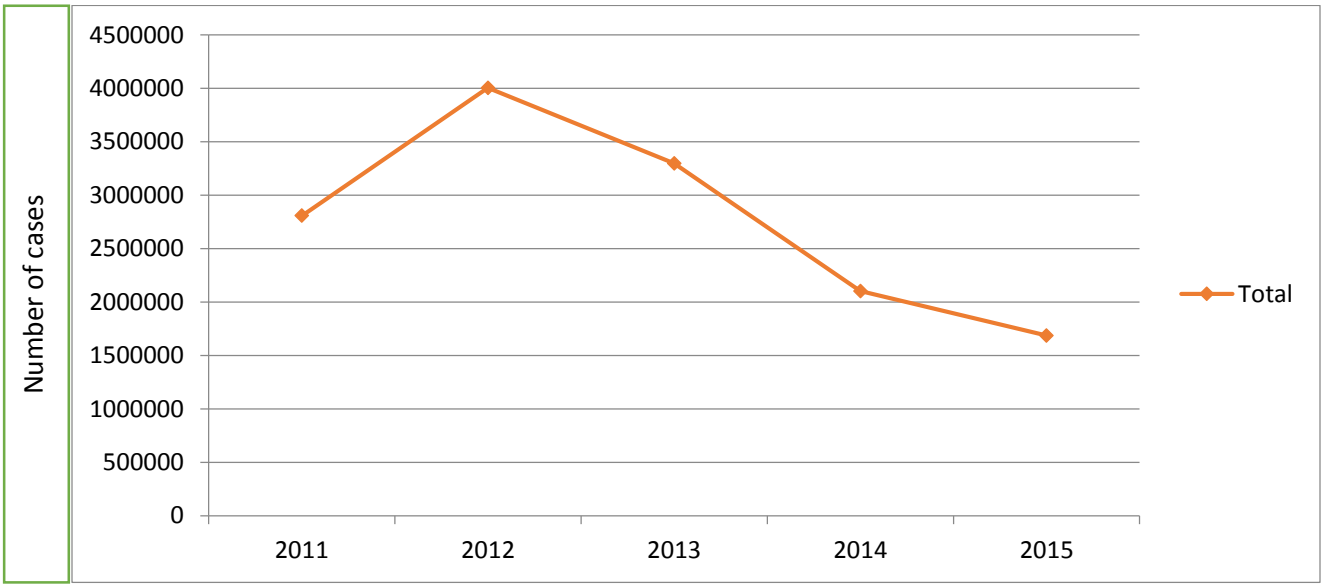


Figure 10. Total number of malaria cases in each year, 2011-2015, Ethiopia

So as we can see from the graph the highest recorded year was on 2012(4,003,237) cases but since then the number of cases decreasing.

Table 8. Total number of malaria cases and total number of deaths in each year, 2011-2015, Ethiopia

Year	Total Number confirmed cases	Total Malarial inpatient death
2011	2,807,805	6180
2012	4,003,237	8227
2013	3,296,389	27119
2014	2,101,451	43034
2015	1,685,015	44054

Table 9. Cases and deaths of malaria by Region, Ethiopia 2011-2015

	Region	**Case**	**Death**	CFR(%)
1	Oromia	2,467,224	43,876	1.78%
2	SNNPR	4,556,165	23,467	0.5%
3	Amhara	3,714,531	23,973	0.6%
4	Addis Ababa	17,292	3412	19.7%
5	Tigray	1,331,291	10,465	0.78%
6	Harari	25,384	1909	7.5%
7	B-Gumuz	1,021,517	4028	0.39%
8	Somali	165,794	9155	5.5%
9	Gambella	328,264	1820	0.55%
10	Dire Dawa	5362	1701	31.7%
11	Afar	261,073	4808	1.8%
12	National	13,893,897	128,614	0.92%

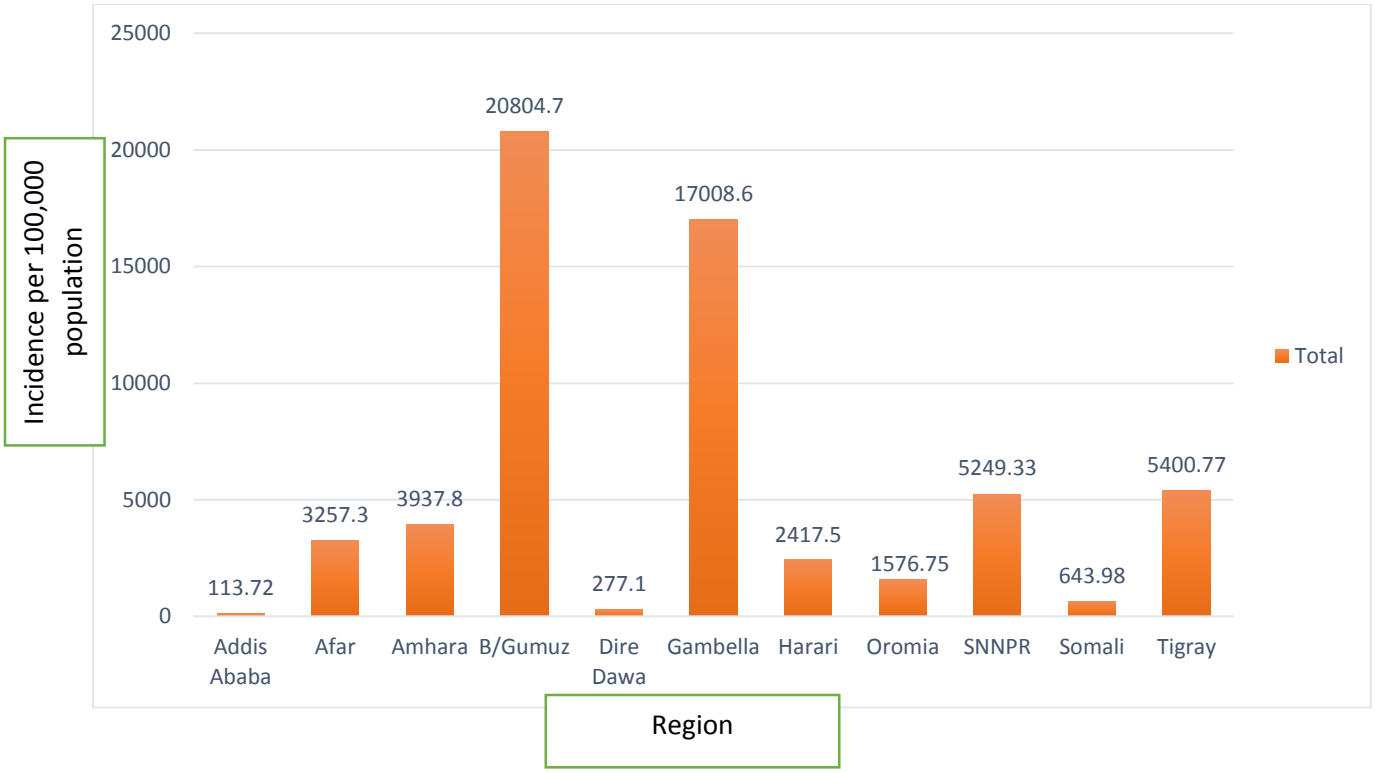


Figure 11 Trends of malaria incidence Rate by Region-Ethiopia,2011-2015

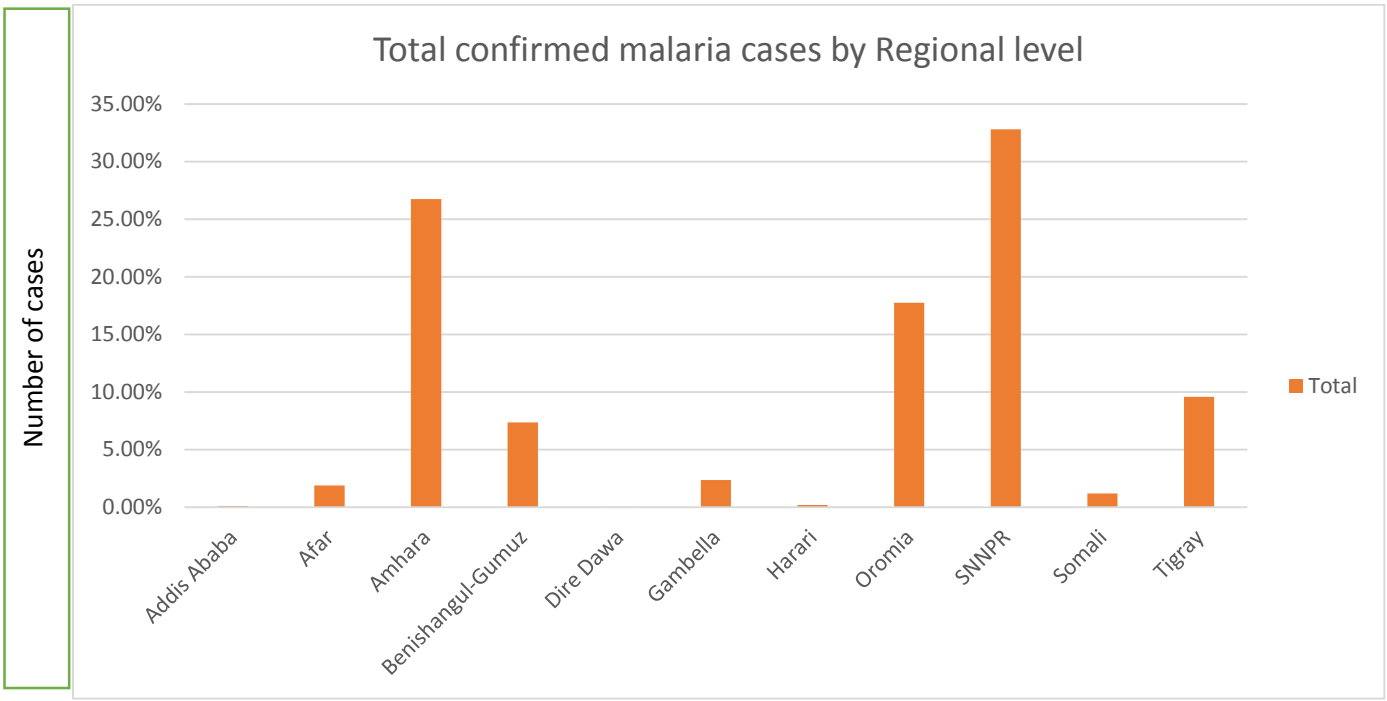


Figure 12. Total confirmed malaria cases by Regional level

Discussion

We found that the number of total confirmed malaria case from 2011-2015 was 13,893,897 and 128,614 total No of deaths, in 2011 there was 2,807,805 malaria cases and 6180 deaths this data shows malaria cases increased in 2012 with the data of 4,003,237 and 8227 deaths, since 2012 gradually shows decreasing in other case the no of in-patient death caused by Malaria has approximately doubled compared to the 2013 inpatient death data, hence we could consider a lot of factors for the increment in the no of inpatient deaths like the 2015 surveillance have increased its data by incorporating new clinics and hospitals from the different regions, also epidemiologically speaking since the first 2011 data collection methods or in other words the sensitivity of the surveillance has increased.

The highest incidence of malaria from 2011-2015 in Ethiopia were reported from B/Gumuz followed by Gambella region, but these regions contributed a small number of cases. As we see from the data analysis made that the most affected area is the SNNPR taking (33%) of the total conformed cases from the entire country, second is Amhara (27%), the third is Oromia(18%).so we can conclude that this could be done to the difference in topography of this regions, and the list Malarious regions are Dire dawa, A/A& Harari respectively Dire dawa being the least this area have contribute to < 1% no of cases each for the total no of conformed cases in Ethiopia.

When we see the specific months which malaria no of case is high September to December take the lions share and this could be due to the preceding rainy season creating the conducive

environment for malaria breeding site and when we compare the no of inpatient & outpatient cases we can conclude that the of outpatient cases is greater than the no of inpatient case, so we can deduce that most patients with diagnosis of malaria are treated without being Admitted to the health facility. The highest incidence of malaria from 2011-2015 in Ethiopia were reported from SNNP Region followed by Amhara and Oromia regions.

As per the WHO guideline epidemic threshold of the disease in a population of more than 30,000 is an incident of 15 per 100,000 inhabitants per week. however, when the epidemic risk is high, the recommended epidemic threshold is 10 cases per 100,000 inhabitants per week. On the other hand, populations less than 30,000 an epidemic threshold is 5 cases in a week or doubling of the number of cases over a three-week period. When an epidemic is conformed in a neighboring area the alert threshold also serves as the epidemic threshold.

Most of the time epidemic of malaria being from September – December and the least common months are February – April.

Conclusion

High number of cases reported during October to January. SNNPR (33%), Oromia (18%) and Amhara (27%)regions reported high number of malaria cases. The annual incidence of malaria was 3295.46/100,000. We can conclude that since 2011 the attention given nationally to malaria control program has increased, we can say this b/c the total no of case or transmission is decreasing, this could be due to the different measures taken to halt the malaria transmission by using bed nets & creating awareness in national level.

Recommendation

we recommend that some work has to be done in some regions like SNNPR because they contribute the most no of malaria case in Ethiopia.

Also better job has to be done to control malaria transmission during October to January (High burden period).

References

1. FMOH (2014/15). "Health sector development program IV ".

2. health, F. m. o. (2007). "Ethiopia malaria indicator survey on 2007 EHNRI Addis Ababa."

3. health, F. m. o. (2011). "Ethiopia National malaria indicator survey 2011, Addis Ababa."

4. health, F. m. o. (2012). "Ethiopia National malaria indicator survey ".

5. health, F. m. o. (2012). "Federal ministry of health malaria guide line."

6. W.H.O (2011). "Epidemiological approach in malaria control."

7. W.H.O (2012). "World malaria report fact sheet ".

8. Yemane Berhane, D. H. M., Helmut Kloos (2006). Epidemology and ecology of health and disease in Ethiopia

Chapter III
Evaluation of Surveillance system

Chapter 3-Evaluation of Surveillance system

Evaluation of malaria and measles surveillance system in Adama town, Oromia Region,2016

Abstract

Introduction

Surveillance system evaluation is essential for early detection of outbreaks, epidemics and pandemics in order to initiate timely response and also it is essential to monitor or evaluate progress of ongoing interventions targeted for disease reduction. It includes reporting and feedback mechanism. Malaria and Measles are among the public health priorities of the country. There for evaluating the surveillance system functions supportive activities and system attributes of malaria and measles in Adama tow Oromia region.

Methods

Study design - Cross sectional study design, Information were collected by using structured questionnaire and interviewing responsible persons in the selected health facilities in Adama town Oromia region from November 2 – November 23 2016 GC.

Result

The understanding of measles and malaria case definitions by all visited health staffs were found good which helps for early detection and identification of cases for timely response and prevent further dissemination. There was a surveillance focal person in all visited sites. There were 4735 total malaria cases reported among these 2641 without laboratory investigation, 818 with falciparum and 1276 with species other than falciparum and also 34 measles cases were reported in 2008 EC.in the town.

Conclusion

The surveillance system of malaria and measles is useful to detect out breaks and to estimate the magnitude of the disease in the town. The system is simple and flexible. We conclude training man power for sustainability of the system should be improved.

Key word – Surveillance, System evaluation, Adama/ 2016

Introduction

Public health surveillance is an ongoing systematic collection, analysis, interpretation and dissemination of data regarding health related events for use in public health action to reduce Morbidity and mortality, also to improve health. Disease surveillance is essential for early detection of outbreaks, epidemics and pandemics in order to initiate timely response and also it is essential to evaluate or monitor progress of ongoing interventions targeted for disease reduction.

It is carried out through a system which has legal support and extending from central health authorities down to the peripheral health facilities and community level through sets of communication channels. It includes upward and downward reporting and feedback mechanism.

An effective communicable disease surveillance system is one of the basic strategies of the national disease Prevention, control and evidence based decision making practice. In most developing countries surveillance systems are often weak even though the burden of communicable disease remains major public health concern. Surveillance system evaluation answers what are the success and gaps of the surveillance system. (1,2,10)

Ethiopia had introduced IDSR (Integrated Disease Surveillance and Response) in 1996 and updated It to public health emergency management (PHEM) on 2009. Malaria and measles are among the public Health priorities of the country. Evaluation of the surveillance system performance plays a big role in identifying the gaps and to take measures accordingly. The objective of this study is to evaluate the surveillance system performance of supportive activities and system attributes of malaria and measles in Adama town Oromia region.

Rationale of the study

Public health surveillance system should be evaluated periodically to assess the quality, efficiency and identifying gaps of the existing system accordingly to improve the surveillance System.

Background

Malaria is not just a disease commonly associated with poverty: some evidence suggests that it is also a cause of poverty and a major hindrance to economic development. Although tropical regions are most affected, malaria's furthest influence reaches into some temperate zones that have extreme seasonal changes. The disease has been associated with major negative economic effects on regions where it is widespread. During the late 19th and early 20th centuries, it was a major factor in the slow economic development of the American southern states. (8,10)

A comparison of average per capita GDP in 1995, adjusted for parity of purchasing power, between countries with malaria and countries without malaria gives a fivefold difference ($1,526 USD versus $8,268 USD). In the period 1965 to 1990, countries where malaria was common had an average per capita GDP that increased only 0.4% per year, compared to 2.4% per year in other countries. Poverty can increase the risk of malaria, since those in poverty do not have the financial capacities to prevent or treat the disease. In its entirety, the economic impact of malaria has been estimated to cost Africa $12 billion USD every year. The economic impact includes costs of health care, working days lost due to sickness, days lost in education, decreased productivity due to brain damage from cerebral malaria, and loss of investment and tourism. The disease has a heavy burden in some countries, where it may be responsible for 30–50% of hospital admissions, up to 50% of outpatient visits, and up to 40% of public health spending**.** (8,10)

Malaria is a leading public health problem in Ethiopia. An estimated 55.7 million people (68%) of the population are at risk for malaria and around 80% of the 736 districts(woreda) in Ethiopia are “Malarious”. Malaria is the leading cause of hospital admission for children in Ethiopia. The risk of malaria varies greatly in communities and families. Malaria transmission is generally seasonal and unstable, though patterns and intensity of transmission vary throughout the country due to differences in altitude, rainfall and population movement. Protective immunity in Ethiopian populations is relatively low due to unstable transmission and unlike large parts of sub-

Saharan Africa all age groups are at risk of infection and disease. Malaria transmission varies widely with Ethiopia diverse topography and associated rain fall patterns. About 75% of the land mass is potentially Malarious and about two thirds of the population (over 40 million people) are at risk of infection. transmission is largely seasonal and unstable with marked monthly fluctuation in the number of cases. The major malaria transmission seasons peaks between September and December following the main rains of June through September. A second but less pronounced peak occurs during the second transmission season in April and May. Vector of malaria -Female anopheles' mosquito. Reservoirs are Humans.

Plasmodium falciparum, plasmodium Malare, plasmodium Vivax and Plasmodium ovale are the 4 species of the parasite infecting man. Plasmodium falciparum accounts for 60-70% of infections, while p. Vivax accounts for the remaining 30-40%. (10)

Malaria is a febrile illness characterized by - Fever, Splenomegaly and Varying degrees of anemia.

Measles is an acute highly contagious vaccine preventable disease caused by morbillivirus. It is among the top causes of death in children less than 5 years of age in many African countries. It is transmitted through droplet or direct contact with infected person's respiratory secretions which is a most contagious with one case can infect twenty other individuals. It is characterized by symptoms like Fever, Cough, runny nose, conjunctivitis and a generalized maculopapular rash. The rash occurs fourteen days after exposure to the virus (with in a range of seven to eighteen days) and lasts for five to six days and then fades on average. The only reservoir is human being. It can be transmitted by an infected person from four days prior to the onset of the rash to four days after the rash erupts. people exposed to measles who have not been vaccinated almost 90% Develop measles. (10)

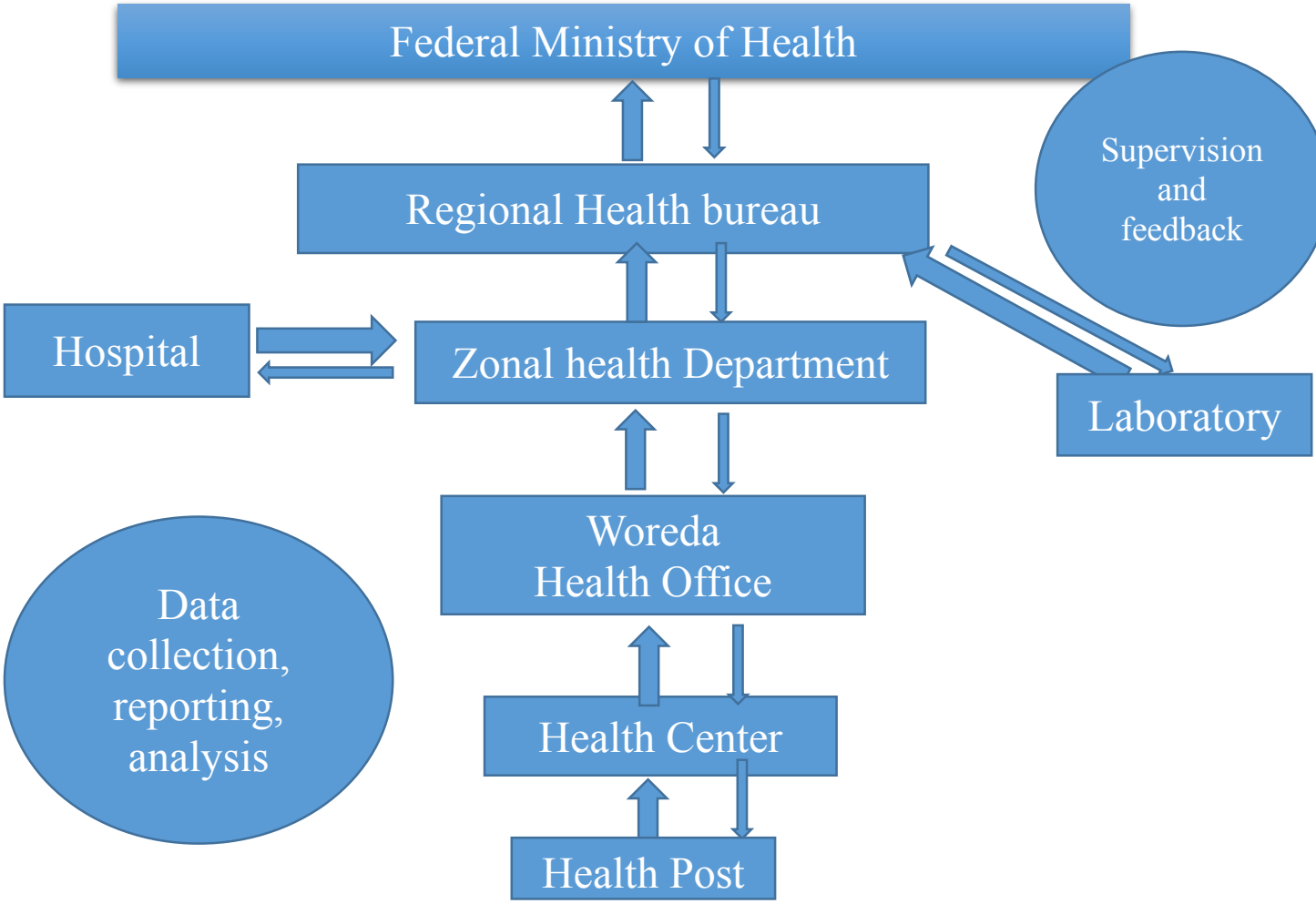


Figure 13. Routine data and information flows for public health surveillance activities. Ministry of Health, Ethiopia.

Objective

General objective

- To describe the surveillance system of malaria and measles in Adama Town Oromia region November 2 – November 23 2016 GC.

Specific objectives

- To describe the surveillance system of malaria and measles
- To strengthen monitoring and evaluation
- To describe the simplicity, flexibility, acceptability, timeliness and stability of malaria and measles surveillance system evaluation.

Data collection method

The data was collected by using surveillance system evaluation questionnaire and interviewing PHEM officers and other responsible personals in the selected study areas.

Study area and study population ⇨ Adama town having a total population of 341,979, one general hospital and seven governmental health centers from these we select; seven study unit's zonal health office, one Referral hospital ,4 health centers and 1 missionary health center from November 2 – November 23 2016 GC.

Study design ⇨ A cross sectional study design

Sample size and sampling technique ⇨ By discussing with PHEM focal person of the town health office and selecting from highly populated 4 health centers,1 missionary health center and Adama general hospital.

Data analysis ⇨ Data were entered and analyzed by using Microsoft Excel.

Data collection tool ⇨ The data was collected by using the updated surveillance system evaluation questionnaire and interviewing PHEM officers and other responsible personals in the selected study areas.

Operational definitions

Simplicity: Simplicity of a public health surveillance system refers to its structure and ease of operation as a surveillance system.

Sensitivity: Sensitivity is the capacity of the system to detect the highest proportion of true cases

Acceptability: The willingness of individuals and institutions to participate in the surveillance system.

Representativeness: Is the ability of the system to describe health events accurately in terms of time, place and person.

Data quality: Is the completeness and validity of the data recorded in the public health surveillance system.

Stability: Refers to the reliability, the ability to collect, manage and provide data properly without failure and availability to be operational when it is needed of the public health surveillance system.

Usefulness: Relevance of the system

Timeliness: The ability of the system to trigger appropriate action in time

Positive predictive value: Is the proportion of reported cases that actually have the health related event under surveillance.

Flexibility: Is the ability of the system to adapt changing needs such as the addition of a new disease, the collection of additional data and change in case definition.

Completeness: Proportion of all expected data reports that are submitted to public health surveillance.

Purpose of the surveillance system

In Ethiopia there are 22 nationally notifiable diseases: 13 immediately reportable and the rest (9) are weekly reportable disease. Measles is one of the immediately reportable whereas malaria is one of the weekly reportable disease.

Map 4 - Map of Adama town

Case definitions - There are two types of case definitions, standard case definition and Community case definition.

Malaria Standard case definition - Any person with fever or fever with headache, Rigor, back pain, chills, sweats, myalgia, nausea and vomiting or a person diagnosed clinically as malaria.

Measles standard case definition - Any person with fever and maculopapular generalized rash plus one of the following cough, coryza (runny nose) or conjunctivitis (red eye).

Community case definition - community case definitions are a simplifies 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 priority diseases under surveillance.

Community case definition for malaria - Any person with fever or fever with headache, back pain, chills, sweats, muscle pain, nausea and vomiting.

Community case definition for measles - Any person with fever and rash starts from face all over the body.

Result

Availability of surveillance manual

In all six health facilities there were national manuals for surveillance but in 1 health center (biftu health center) there was no surveillance manual.

Case detection and registration

Clinical registers were available in all of visited health facilities. All health centers and the hospital except one (Boku health center) have cold chain capacity guideline to collect and ship samples. CSF examination was done only in Hospital level.

Epidemic preparedness and response

All have rapid response and epidemic preparedness activity. there is no budget for epidemic response. There are stocks of medicines and reagents available. Adama health center they have problem of measles vaccine syringe and needle not compatible.

Reporting

Reports were sent by hard copies delivered by person and telephone from health center to zonal health office. Adama town health office accept reports from 1 hospital and 7 health centers of governmental and one hospital ,19 clinics of privet and NGO health facilities. There was no shortage of reporting formats in the past 6 month in all study sites. There was no immediately reportable disease received in the past one month.

Supportive functions

Feedback and supervision **-** There was verbal feedback at all level and also supportive supervision were made.

Material resources available for surveillance

Resource for data management, communication and other logistics were available at all level with no shortage. There was no vehicle except Adama hospital and no radio call in any of the visited health facilities.

Data Analysis.

Surveillance data collection through immediately and weekly reporting is one of the steps and also the collected data should be analyzed, interpreted and used for decision making starting from local to the central level in order for the values of the data to be realized. Ongoing analysis of surveillance data is important for detecting outbreaks and unexpected increases or decreases in disease occurrence. At zonal level the data was analyzed by person, place and time. There were no data observed data analyzed by age, by place and time. Also no line graph of cases by time in any of health centers. The responsible person for the data analysis was PHEM focal person. All reporting sites including zonal health department have epidemic threshold based on national MoH estimate for the malaria and measles diseases.

Training

All visited health facilities and offices were trained on EPI and at least one trained person available in PHEM system. They need additional trained person in PHEM to strength the surveillance system.

Attribute of the surveillance system

Usefulness

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

Simplicity

All visited health facilities and health office agreed that the case definitions of Malaria and Measles for identification of suspected cases are easy to understand and possible to be applied by all level health professionals. There was no lack of reporting format at all health facilities. Laboratory conformation for malaria takes 15 minutes. RHB is responsible to receive report of the surveillance data.

Flexibility

A flexible public health surveillance system can adapt to changing information needs or operating conditions with little additional time, personnel, or allocated funds. In the absence of

practical experience, the design and workings of a system can be examined. Simpler systems might be more flexible. The reporting format is more flexible to report other newly occurring health event without difficulty.

Acceptability

Health workers are satisfied with their work related to surveillance. No refunding for personal mobile phone and transport expenses, All the reporting agents accept and are well engaged to the surveillance activities almost 90%.

Timeliness

Reports came from the health center to the Adama health office on Monday and Tuesday midday. Timeliness was 80-95%.

Stability

After the introduction of the BPR the system is well established and structured but lack of budget lines and lack of trained personal affects the stability of the system.

Positive predict value

$$\text{PVP malaria} = \frac{\text{Total confirmed case by laboratory}}{\text{Total suspected case diagnoses by laboratory for conformation}}$$

$$= \frac{2094}{4735}$$

$$= 0.44 = 44\%$$

Sensitivity

Sensitivity of a surveillance system can be considered the level of case detection and the ability of the system to detect outbreaks including the ability to monitor changes in the number of cases over time.

Discussion

The understanding of measles and malaria case definition by all health staffs were found Complete. Which helps for early detection and identification of cases for timely response and prevent further dissemination. There was a surveillance focal person in all visited sites but the focal person had work overload and lack of capacity to do data analysis regularly also the visited health centers did not analyzed data by time, place and person. This may be they don't have continues training how to analyze and interpreted their surveillance data.

Malaria is one of the major public health concern in the region. In 2008 EC, there were 4735 total malaria cases reported among these 2641 without laboratory investigation ,818 with falciparum and 1276 with species other than falciparum were reported. Also measles is one of the public health concern. The routine and supplementary immunization activities were under taken. At this moment the Adama town health office has completed preparation to give supplementary measles vaccine in 2008 EC. There were 34 cases reported in the town.

Conclusion

The surveillance system of measles and malaria is useful to detect outbreaks and to estimate the magnitude of morbidity and mortality of the disease in the town. The system is simple and flexible. I suggest the government for training man power for sustainability of the surveillance system reporting rate, feedback system, data analysis and quality should be improved.

Recommendation

1. Training should be given to the surveillance focal person and the remaining health professionals.
2. Regional health research laboratory should perform quality assurance programs and training to the laboratory professionals.
3. Networking system should be established to facilitate the surveillance system.
4. Regional health bureau should put in place feedback and supervision to surveillance system at least twice in a year.

Reference

1. DPPC (2006). "Ethiopia, Real Time Evaluation of the 2006."

2. EHNRI (2012). "EHNRI public health emergency management guideline ".

3. Ethiopia, F. m. o. h. (2009). "Ethiopia National Notifiable diseases and conditions Reporting Rule and General Control measures for the control of public health threats, PHEM."

4. health, F. m. o. (2002). "Ministry of health Malaria Control profile Addis Ababa ".

5. IFRC (2012). "The Johns Hopkins and PUBLIC HEALTH GUIDE FOR EMERGENCIE."

6. organization, W. h. (2013). "Technical Guidelines for Integrated disease surveillance and response in the African region."

7. Prevention, C. f. D. C. a. (2012). "Updated Guidelines for evaluating Public Health Surveillance systems."

8. W.H.O (2012). "African Regional Guidelines for measles surveillance."

9. WHO, F. M. o. H. a. (2007). "Ethiopia National Guideline on Measles surveillance and outbreak investigation."

10. Yemane Berhane, D. H. M., Helmut Kloos (2006). Epidemology and ecology of health and disease in Ethiopia

Chapter IV
Health profile description

Chapter 4 – Health profile description

Health profile of Kolfe Keranio sub city, Addis Ababa, 2016

Abstract

Introduction - Health profile description is a system of collecting, organizing and summarizing health and other health related events. This includes, demographic, socio–economic, vital statistics, political, cultural and other health aspects of a particular geographic areas of interest. The purpose of this project is to assess and describe Kolfe Keranio sub city health profile which will help in identifying the woreda health and health related events to use it for program planning and intervention.

Methods

A structured questionnaire was used to collect health and health related data from different offices of Kolfe Keranio sub city (Health, water, finance transport, school and electric power offices) by interview and record review from Yekatit 16 -30/2008.

Result - Kolfe Keranio sub city is one of the sub city in Addis Ababa and it has 15 administrative woredas; Its surface area is 61.25km2, The sub city total population 511,642.

In the sub city there are 364 schools, 13 government K.G, 173 private K.G, 26 government primary schools, 101 private primary schools, 35 government secondary schools, 27 private secondary schools, 16 governments preparatory and 13 private preparatory schools and a total of 136,657 enrolments of which 63,411 are males and 71,246 females. There are 11 governmental health centers and 1 federal hospital, 3 private hospitals and 122 private clinics in the sub city.

Conclusion - When we see the school participation of females is excellent, there are governmental and private health institutes giving services to the community. Among the leading causes of above 5 years is acute upper respiratory (25%) and the second most common urinary tract infection (13.7%) and the third is dyspepsia (10.5%). In relation with HIV /AIDS in 2007 E.C. 25,163 people were screened in both VCT and PICT.

Key words - Health profile, Kolfe Keranio sub city, A.A 2016.

Introduction

Health profile description is a system of collecting, organizing and summarizing health and other health related events. This includes; demographic, socio-economic, vital statistics, political, cultural and other health Aspects of a particular geographic areas of interest. It helps in prioritizing health and other health related condition occurred with in the communities. (1,2,3)

The summarized data prioritized health events are important for public health officials as well as Decision makers they use it for planning, implementation and evaluation of public health programs.

The purpose of this project is to assess and describe K/K sub city Addis Ababa city health profile which will help in identifying the woreda health and health related events to use it for program planning and intervention.

Health profile provides summary health information to support local authority member's officers and community partners to lead for health improvement. Health profile is a program to improve availability and accessibility for health and health related information. (1,2,3)

Informing the public, policy-makers and politicians about health and its determinants in their city is the key to ensuring that all relevant groups in the city truly understand the ideas, problems and issues with which they are dealing. The city health profile is an ideal way of bringing together a wide range of health information to acquaint with current health challenges. It may be useful to consider public health reports as "a visible manifestation of the public health function." The role of city health profiles in influencing health policy includes:

1. Interesting, informing and educating the public, health professionals, politicians and policy-makers and stimulating them to action;
2. acting as a source of epidemiological information about the locality;
3. being a critical component of health planning – indicating health priorities, the preferred resource allocation and the direction of service development; and
4. Providing a focus for inter-sectorial action.

This health profile describes the health and health related information of K/K sub city, A/A, it encompasses complication and interpretation of Demographic, Education and water, Transport and also health status information of the sub city on the perspective of health. It gives health and health related information to stakeholders and different sectors involved in the health system.

Rationale of the study

Health description is important for prioritizing health and health related problems of the community at any level. In related to this Kolfe Keranio sub city is one of the biggest sub city's in Addis Ababa and since Addis Ababa solid waste disposal site (koshe) is located near to it there are a lot of health issues related to it, having evidence based information on health and health related conditions is crucial in priority setting and decision making on the sub city's health affairs. So, this health profile can be used as a critical source of evidence based information for taking an action of improving the health status of the people living in that area.

Objectives

General objective

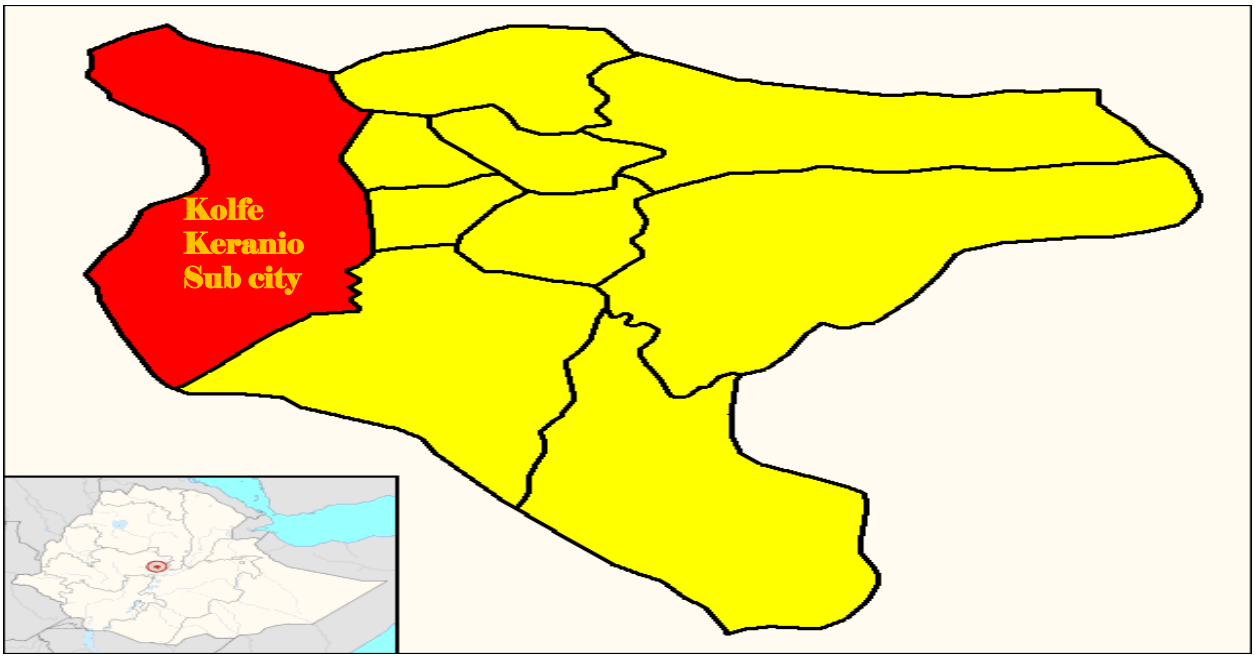
- To describe health profile of K/K in the year 2015/2016 which gives information about Health care delivery in the sub city which is helpful for priority setting and decision making.

Specific objective

- To describe health and health related problems of the sub city
- To describe existing health information
- To describe factors that affect health in the sub city
- To describe suggested areas for action to improve health

Study Area

Kolfe Keranio sub city is one of the 10 sub cities under Addis Ababa city administration and there are 15 woreda in this sub city. It is bounded in the east by, Nifas Silk, Lideta, Addis ketema and Gulele.



Map 5 - Map of Kolfe Keranio sub city, Addis Ababa

Methods

Data will be collected from different offices of Kolfe Keranio sub city health bureau and other Offices like school, etc... I will take an official latter from EPHI to the health bureaus for requesting the health profile data of the sub city. The data will be collected by structured questioner and I will analyze it by using Microsoft excel. The study period will be from February 24 –March 9, 2016.

Result

Government and administration

Addis Ababa city is sub divided into 10 sub city administrations. Kolfe Keranio is one of the sub cities and it has 15 administrative woredas, it is the biggest in population size compared to the other sub cities in Addis Ababa. Its surface Area is 61.25Km2, geographically, the Kolfe area covers locations stretching from the Dutch Embassy to the General Wingate High School area. The General Wingate area in the north, the Mesalemiya area in the east and the Torr-Hayloch area in the south border Kolfe.

To add some historical background of Kolfe, there are different accounts of the origin of the naming of the area. Word of mouth suggests that the area got its name during the period of Menelik. There are many speculations as to who coined the name Kolfe. Some argue that the defence

minister of Menelik, Fetawrari Habtegiorgis, was the founder of the area and others argue that it was Menelik himself. The name Kolfe was believed to be derived from the Oromiffa word *Kolfa,* which literally means 'laughing'. In conclusion Kolfe is one of the oldest areas which date back to the beginning of the 20th century.

Demography

The total population of the sub city is approximately 511,642 peoples and because of no further researches has been done, like the age group classifications, I could not add data's like the age pyramid.

Infrastructures of the sub city

Education

In the sub city there are a total of 364 schools out of which are 13 government K.G, 173 Private K.G, 26 Government Primary schools, 101 private primary schools, 35 Government secondary schools, 27 private secondary schools, 16 Government preparatory and 13 private preparatory schools and a total of 136,657 total enrollments of which 65,411 are male and 71,246 females from this we can conclude that the participation of female is overwhelmingly excellent.

When we see the school health activities there are about 247 schools with water supply and about 346 with functional latrine both for male and female.

Table 10. Total number of Schools in Kolfe Keranio sub city and their enrollments

Row Labels	Sum of Number
K.G	186
Preparatory	16
Primary Schools	127
Secondary	35
Grand Total	364

Row Labels	Sum of Number
Female	71246
Male	65411
Grand Total	136657

Transportation

The means of transport is similar like the rest of sub cities in Addis Ababa and its mainly through roads which connect Kolfe Keranio with other neighboring sub cities and the type of transportations are Mid bus, city bus and Taxi. The main rods are also used by long distance traveling buses which have destinations to Jimma and Ambo.

Water supply

The main sources of water supply for Kolfe Keranio sub city is mainly Gefersa and other different sources like small water holes due to the huge size of sub city it is difficult to supply all areas with running water, know there are about 29,408 houses getting safe water.

Budget

The recurrent Health budget for Kolfe Keranio sub city for 2007 E.C was 70,336,834 Ethiopian Birr, due to increase in population size and also increase even in the economic status of the country; the budget allocation is increasing from year to year. In 2008 E.C the health budget has reached 100,377,860 Ethiopian birr.

Health

The information on health care delivery system has essential value in estimating the health condition of a given health sector in decision and policy making as well as evaluation of the health care delivery. In K/K sub city there are 11 governmental health centers and 1 federal hospital which is Alert hospital. There are also 3 private hospitals and 122 private clinics. There are a total of 1404 health workers in the sub city which is 2 MD,97 BSC Nurse, 224 clinical nurse, 14 pharmacists,58 druggists, 19 Lab technologist, 51 Lab technicians, 7 midwifery having degree and 93 midwiferies with diploma, 174 Tena extensions and 547 administrative workers.

Table 11. total number of health staffs *Table 12. Total number of health institutes in Kolfe Keranio sub city*

Row Labels	Sum of Number
Administrative workers	547
Druggist	58
G.P	2
H.O	118
Lab technician	51
Lab technologist	19
Midwifery degree	7
Midwifery diploma	93
Nurse (diploma)	224
Nurse (degree)	97
Pharmacist	14
Tena extensions	174
Total	1404
Grand Total	**2808**

Facility type	Sum of Number
Government hospital	1
Health center	11
Private drug stores	42
Private hospital	3
Private clinic	122
Grand Total	179

Table 13. Immunization coverage

Vaccine	Number of vaccinated individuals
1) BCG	**16,649**
2) OPV	**60,401**
3) Penta	**Penta 1) 49,617 Penta 2) 36710 Penta 3) 49617**
4) Measles	**16,488**
5) PCV	**10-1 36978 10-3 49970**

The vaccine coverage is relatively satisfactory with BCG vaccine 16649 and OPV 60401 and Penta 1-49617 and Measles 16488 and PCV 36978.

HIV/AIDS

In 2007 E.C a total of 25,163 people were screened and 711 were found to be positive in both VCT and PITC combined from the 25,163 people tested for HIV 3849 were tested in VCT and 21314 were via PITC.

Table 14. Total number of people screened for HIV throughout the year 2015/2016

Row Labels	Sum of Number of case
Total people screened for HIV (last one year)	25163
VCT	3849
PITC	21314
PMTCT	17084
On ART	5271
On pre-ART	560

TB/Leprosy

A total of 720 individuals were found TB positive and a Total of 1197 TB patients were screened for HIV.

Table 15. TB positive patients screened for HIV throughout the year 2015/2016

cases Type	Total number cases
Death on TB Rx	6
Extra PTB	605
PTB negative	411
PTB Positive	309
TB cure rate	266
TB defaulter	12
TB detection rate	309
TB Rx completion rate	17
TB Rx success rate	43
Total leprosy cases	9
Total leprosy cases on Rx	7
Total number of cases	720
Total TB patients screened for HIV	1197

Table 16. Top ten causes of morbidity above 5 yrs. of age in Kolfe Keranio sub city

Disease	Number
Acute upper respiratory infections	41278(25.05%)
Urinary tract infection	21697(13.17%)
Dyspepsia	17391(10.55%)
Acute febrile illness	17269(10.48%)
Disease of them musculoskeletal system and connective tissue	16056(9.74%)
Infections of the skin and subcutaneous tissue	11752(7.13%)
Diarrhea (non-bloody)	11364(6.90%)
Other or unspecified infectious and parasitic diseases	9679(5.87%)
Trauma (injury, fracture etc.)	9541(5.79%)
Other or unspecified disease of the eye	8754(5.31%)

Table 17. Top ten causes of morbidity less than 5 yrs. of age in Kolfe Keranio sub city

Type of diseases	Number
Acute upper respiratory infection	30586(43.38%)
Diarrhea(non-bloody)	14903 (21.14%)
Infection of the skin and subcutaneous tissue	6321 (8.9%)
Pneumonia	6176 (8.76%)
Other or unspecified disease of the eye	3773(5.35%)
Other or unspecified disease of the skin and subcutaneous tissue	2125(3.01%)
Helminthiasis	1886(2.67%)
Otitis	1713(2.43%)
other or unspecified infectious and parasitic disease	1588(2.25%)
Other or unspecified disease of the digestive system	1439(2.04%)

Environmental sanitation

When we see environmental sanitation, Kolfe Keranio has the biggest population from all the Addis Ababa sub cities, more people means more waste production and as we know the Koshe land fill is the city's solid waste disposal site and its found close to Kolfe sub city and it has been used since 1964 G.C almost 50 Years ago, but know it's being changed to a different location and also the first waste to energy project is being built in the Koshe, but in the previous year's Koshe had a profound effect on the surrounding villages and neighborhoods , as we have seen in the top ten causes of Morbidity, Acute upper respiratory infections takes the biggest share and most of it can be attributed to Koshe.

Discussion

Kolfe Keranio is one of the sub cities and it has 15 administrative woredas, it is the biggest in population size compared to the other sub cities in Addis Ababa. Its surface Area is 61.25Km2.

In the sub city there are a total of 364 schools out of which are 13 government K.G, 173 Private K.G, 26 Government Primary schools, 101 private primary schools, 35 Government secondary schools, 27 private secondary schools, 16 Government preparatory and 13 private preparatory schools and a total of 136,657 total enrollments of which 65,411(47.86%) are male and 71,246(52.13%) females from this we can conclude that the participation of female is overwhelmingly excellent.

The means of transport is similar like the rest of sub cities in Addis Ababa and its mainly through roads which connect Kolfe Keranio with other neighboring sub cities and the type of transportations are Mid bus, city bus and Taxi. The main rods are also used by long distance traveling buses which have destinations to Jimma and Ambo.

The main sources of water supply for Kolfe Keranio sub city is mainly Gefersa and other different sources like small water holes due to the huge size of sub city it is difficult to supply all areas with running water, know there are about 29,408 houses getting safe water.

In K/K sub city there are 11 governmental health centers and 1 federal hospital which is Alert hospital. There are also 3 private hospitals and 122 private clinics. There are a total of 1404 health workers in the sub city which is 2 MD, BSC Nurse, 224 clinical nurse, 14 pharmacists,58 druggists, 19 Lab technologist, 51 Lab technicians, 7 midwifery having degree and 93 midwiferies with diploma, 174 Tena extensions and 547 administrative workers.

Among the leading causes of O.P.D visits above 5 years' acute upper respiratory infections takes the highest percentages around 25.05% and the second most common cause is urinary tract infection (13.17%) and the third is Dyspepsia (10.55%).

In relation with HIV/AIDS in 2007 E.C a total of 25,163 people were screened and 711 were found to be positive in both VCT and PITC combined from the 25,163 people tested for HIV 3849 were tested in VCT and 21314 were via PITC.

Recommendation

During investigation time the data which was necessary to understand the health profile of the sub city, I came around some major draw backs on the sub city administration office both the administrator and health office, the main problem is lack of simple but important data's are lacking for example data's like population pyramid, mortality rate, birth rate, nutrition supplements and many more. The sub city also needs to computerize their system and at least compile the major data's.

Reference

1. health, F. m. o. (2007/2008). "Health and health related indicators."

2. health, F. m. o. (2011). "Community health Assessment and planning."

3. health, F. m. o. (2012). "Health and Health related indicators."

4. survey, E. d. (2007). "Population and housing census of Ethiopia, Addis Ababa."

5. Yemane Berhane, D. H. M., Helmut Kloos (2006). Epidemology and ecology of health and disease in Ethiopia

Chapter V

Scientific manuscripts for peer reviewed journals

Chapter 5 – Scientific manuscripts for peer reviewed journals

5.1. Acute watery diarrhea Outbreak investigation in Burayu town Oromia region from June 6 – June 21/2016

Abstract

***Introduction*:** Acute watery diarrhea is a diarrheal disease caused by infection of the intestine with the bacterium vibrio cholera commonly either type O1 or O139. Both children and adults can be infected. About 20% of those who are infected develop acute watery diarrhea 10-20% of these individuals develop severe watery diarrhea with vomiting. If these patients are not promptly and adequately treated the loss of large amount of fluid and electrolytes can lead to sever dehydration and death within hours. The case fatality rate in untreated cases may reach 30-50%. We received reports of Acute watery diarrhea outbreak in Burayu. Burayu town is one of the Oromia towns surrounding Addis Ababa city with a total population of 131,721. when we see by sex female 67,178 and male 64,543. The town is divided in to six kebeles and has two health centers.

***Methods**: A suspected case was defined as any person aged 5 years or more who developed acute watery diarrhea, with or without vomiting. We perform a descriptive study followed by unmatched case control 33 cases and 33 control by using structured questionnaires to collect data starting from 6/7/2016 – 21/7/2016 G.C in Burayu town.*

Result: A total of 54 Cholera cases and two deaths were reported from June 14 to July 20 /2016 from the six kebeles. And two deaths of Cholera cases with 3.7% case fatality rate, 34 males (62.96%) and 20 females (37.03%) were reported. More affected kebeles are Melka Gefersa (16), Gefersa Nono (11) andLekuKeta (10), Gefersa Guje (7), Gefersa Burayu (5), Burayu Keta (5) and the two deaths were from Melka Gefersa. Drinking untreated water *is a risk for the disease.*

Conclusion: A total of 54 Cholera cases reported from Burayu town. All six kebeles; Melka Gefersa (30%), Gefersa Nono (20.4%), Leku Keta (19%), Gefersa Guje (13%), Gefersa Burayu (9.25%)and Burayu Keta (9.25%) also two deaths reported from Melka Gefersa kebele. When we see cases by sex males are more affected than females. The significant factor of the outbreak; drinking untreated water, latrine usage and lack of hygiene and sanitation. **We recommend** continuous health education to give awareness about the disease condition and transmission, hygiene and sanitation, availability of safe water supply system and water treatment.

Key words – Acute watery diarrhea outbreak, Burayu tow June/ 2016

Introduction

AWD is a diarrheal disease caused by infection of the intestine with the bacterium vibrio cholera, commonly either type O1 or O139. Both children and adults can be infected. About 20% of those who are infected develop acute, watery diarrhea 10-20% of these individuals develop severe watery diarrhea with vomiting. If these patients are not promptly and adequately treated, the loss of such large amounts of fluid and electrolytes can lead to severe dehydration and death within hours. **(1,9)**

The case fatality rate in untreated cases may reach 30-50%. When consumed, most bacteria do not survive the acidic conditions of the human stomach. The few surviving bacteria conserve their energy and stored nutrients during the passage through the stomach by shutting down much protein production. Once it reaches the intestine it produces The cholera toxin (CTX or CT) is an oligomeric complex made up of six protein subunits: a single copy of the A subunit (part A), and five copies of the B subunit (part B), connected by a disulfide bond. The five B subunits form a five-membered ring that binds to GM1 gangliosides on the surface of the intestinal epithelium cells. The A1 portion of the A subunit is an enzyme that ADP-ribosylates G proteins, while the A2 chain fits into the central pore of the B subunit ring. Upon binding, the complex is taken into the cell via receptor-mediated endocytosis. Once inside the cell, the disulfide bond is reduced, and the A1 subunit is freed to bind with a human partner protein called ADP-ribosylation factor 6 (Arf6). Binding exposes its active site, allowing it to permanently ribosylate the Gs alpha subunit of the heterotrimeric G protein. This results in constitutive cAMP production, which in turn leads to secretion of H_2O, Na^+, K^+, Cl^-, and HCO_3 into the lumen of the small intestine and rapid dehydration. **(1,2)**

AWD is usually transmitted through fecal Contaminated water or food and remains an ever-present risk in many countries. New outbreaks can occur sporadically in any part of the world where water supply, sanitation, food Safety, and hygiene are inadequate. The greatest risk occurs in over-populated communities and Refugee settings characterized by poor sanitation, unsafe drinking water, and increased person to-person transmission. Because the incubation period is very short (2 hours to 5days), the number of cases can rise extremely quickly**.** (1,9)

Treatment is straightforward (basically rehydration) and if applied appropriately should keep case-fatality rate below 1%. **(2)**

Objectives

General objective

- To investigate Acute watery diarrhea outbreak in Burayu town Oromia region from 6/7/2016 to 21/7/2016 G.C

Specific objectives

- To describe the outbreak in terms of place, person and time.
- To identify risk factors of transmission.
- To control the outbreak and prevent occurrence of additional cases.

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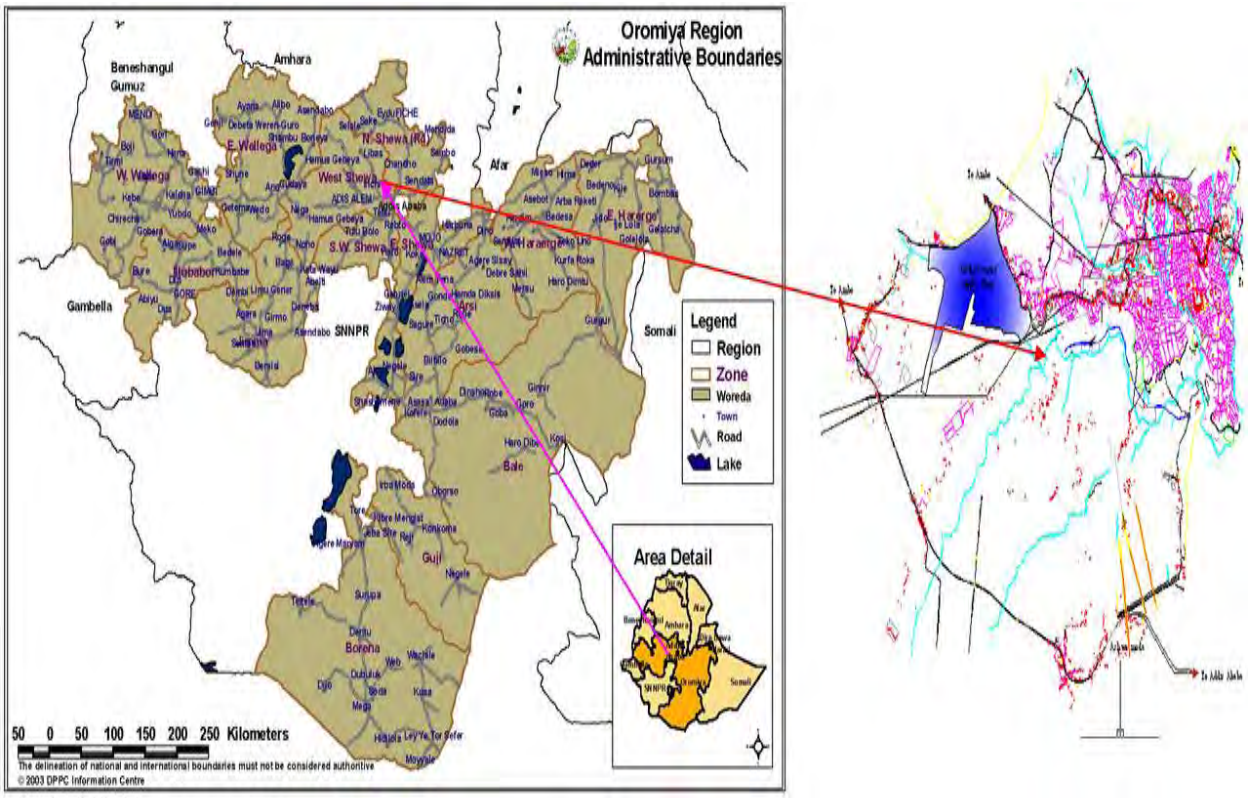
Methods

Study area: Burayu Town

Burayu town was established 1998 E.c it is a high land area located at an attitude of 2580 m above sea level with an area of 66.5km2. Burayu town is one of the Oromia towns surrounding Addis Ababa city located at 10km in the west part of Addis Ababa. According to data obtained from ZHB the total population of Burayu town is 131,721 and when we see by sex Female 67,178 (51%) and male 64,543(49%). Source; Zonal health office. The town has divided in to six kebeles, Burayu has two health centers, no hospital and low tap water coverages, some villages used unprotected spring water for their consumption. generally poor sanitation and hygiene practices contributes a lot for the illness. There are two cholera treatment center in the town giving the service for Cholera cases; Burayu CTC and Guje CTC also the town is adjacent to Addis Ababa city most patients are treated in Addis Ababa CTC Birchico condominium health center and also the first AWD case was reported there on June 14/2016.



Map 1) Map of Oromia Region showing *Burayu town*

Study period: The study was conducted from *6/7/2016 – 21/7/2016 G.C.*

Study design: We conducted unmatched case-control study with 1:1 (33 cases and 33 controls).

Sample size and sampling procedure – cases were selected all 33 cases which were present at the time of our arrival by using line list, Controls were selected randomly from the neighbors. house to house interviewing with a questioner.

Case definition - ***Case*** - a patient aged 5 years or more develops acute watery diarrhea with or without vomiting, a case of cholera is confirmed when vibrio cholera O1 or O139 is isolated from any patient with diarrhea.

Control - Any person in the village without sign and symptom of AWD at the study time.

Ethical consideration - Letter was obtained from Ethiopian public health institute (EPHI) written for woreda health offices in order to obtain approval on data collection. At the time of the study Informed verbal consent was taken from all respondents before interview. confidentiality was ensured.

Data quality assurance - The collected data was checked daily during the investigation period by using Epi info and EXCEL.

Environmental investigations - We observed the general condition of the cases and controls. Health education was given about hygiene, sanitation and water treatment.

Result- A Total of 54 Choler (AR=0.04%) cases and two deaths (CFR 3.7%), 34 males (62.96%) and 20 females (37.03%) were reported from June 14 to July 20 2016 G.C in Burayu town from the six kebeles.

More affected kebeles are Melka Gefersa(16), Gefersa Nono(11) , Leku Keta (10),Gefersa Guje(7),Gefersa Burayu(5)and Burayu keta (5) and the two deaths are from Melka Gefersa.

Table 1. Population of Burayu town by kebele, Oromia region 2016.

Kebele	Population	No of cases	case reported AR (%)	Death	Case fatality rate(%)
Burayu keta	21,460	05	0.023	0	0
Gafarsa Burayu	41,000	05	0.012	0	0
Gafarsa Guje	9,039	07	0.077	0	0
Gafarsa Nono	14,125	11	0.077	0	0
Laku Keta	21,097	10	0.047	0	0
Malka Gafarsa	25,000	16	0.064	02	12.5
Total	131,721	54	0.04	02	3.703

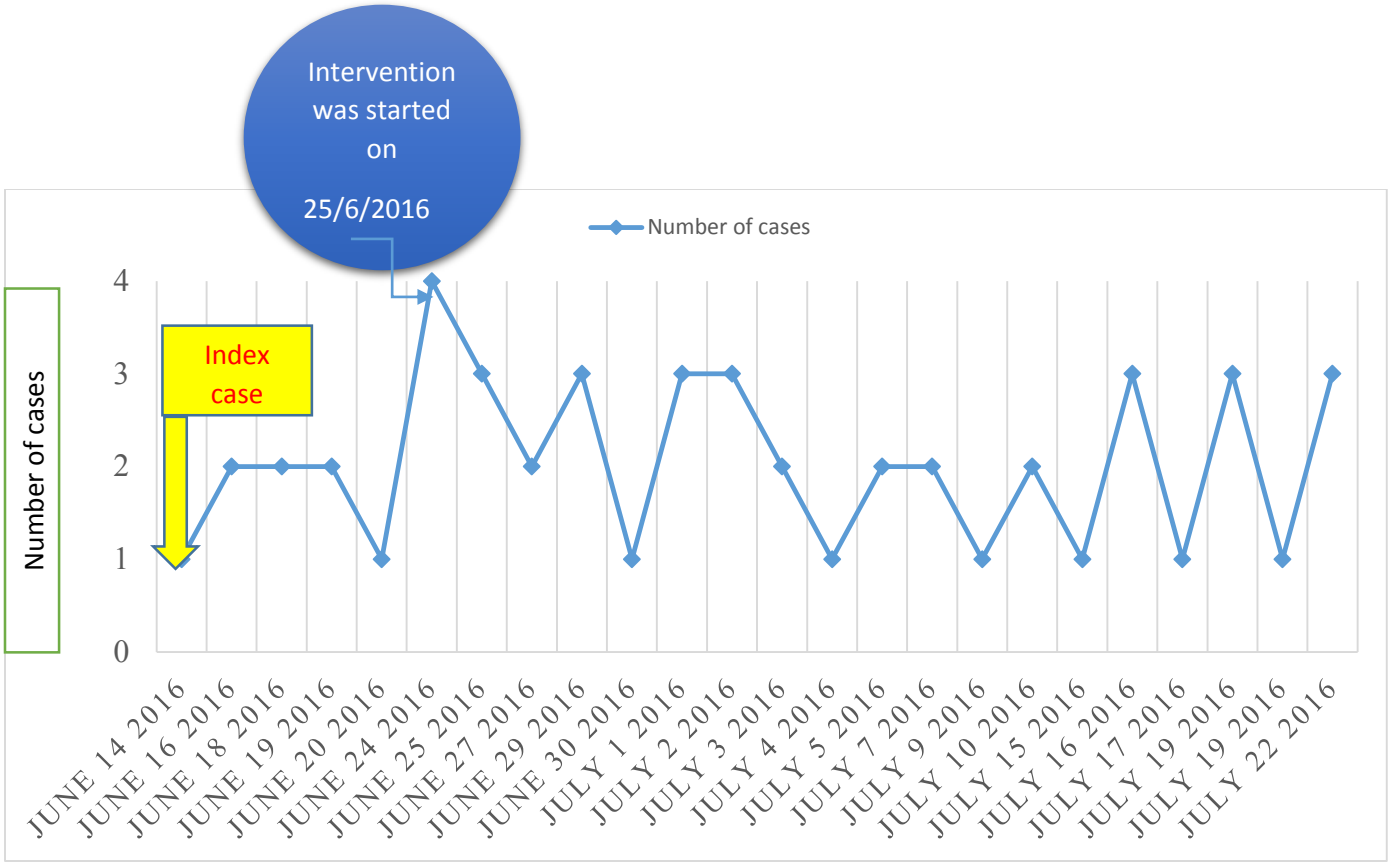


Figure 1 Acute watery diarrhea cases by date of onset, Burayu town, Oromia region,2016

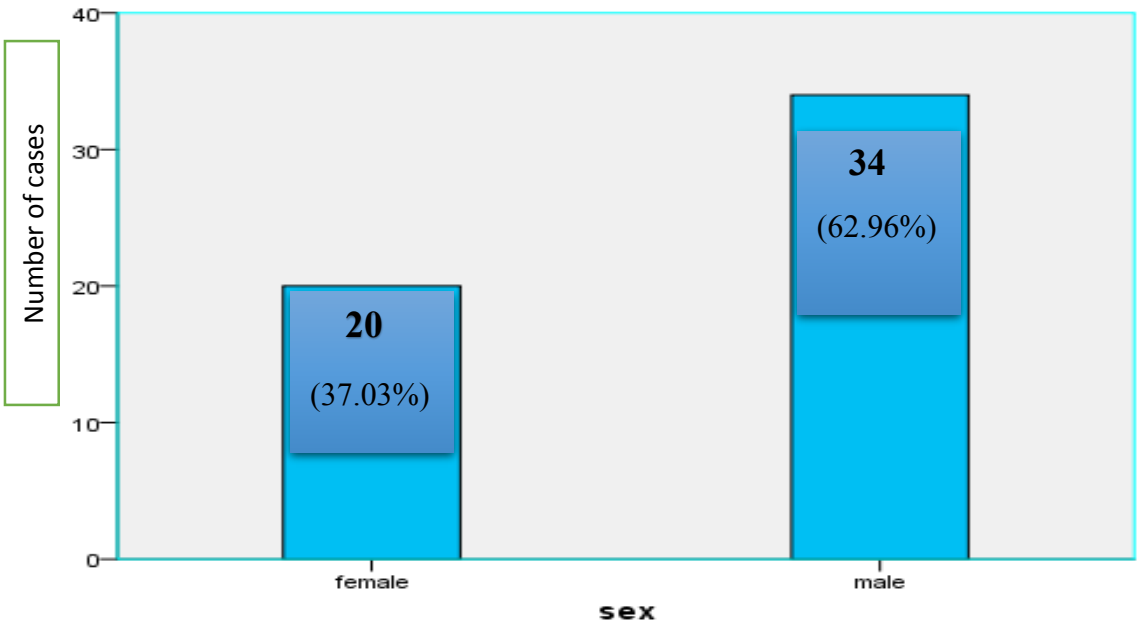


Figure 2 Acute watery diarrhea cases by sex, Burayu town, Oromia Region,2016

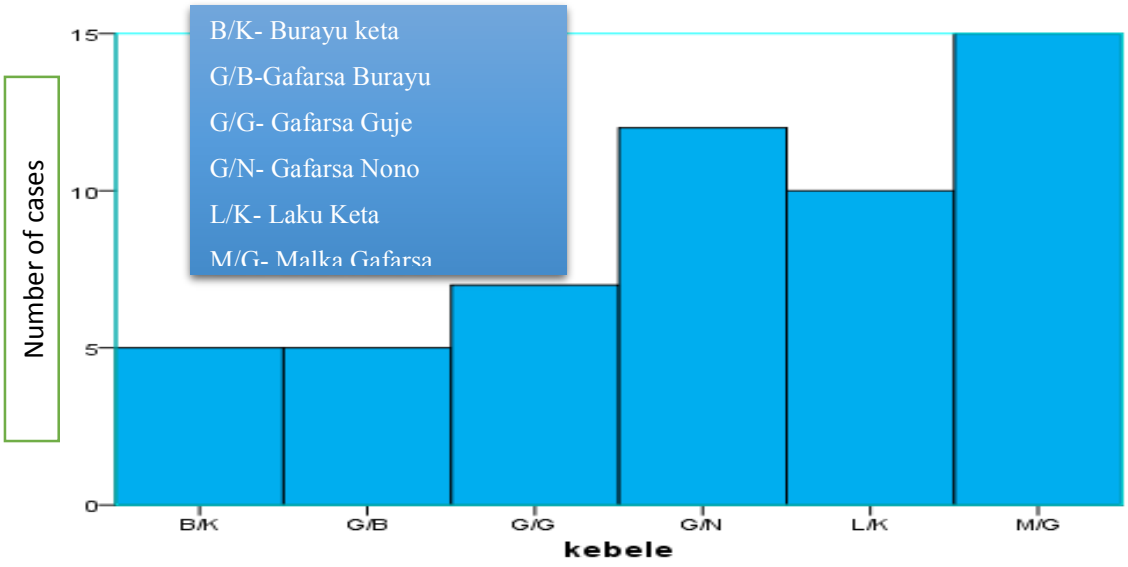


Figure 3. Number of Acute watery diarrhea cases in each kebele, Burayu town, Oromia Region, 2016

Table 2. Demographic characteristics of AWD cases and controls in Burayu town, Oromia Region,2016

		Case = 33		Controls = 33	
		Number	Percent(%)	Number	Percent(%)
Age	<5	0	0.0	0	0.0
	5-14	1	3	0	0.0
	15-44	26	79	30	91
	>45	6	18	3	9
Sex	Female	12	36	16	48
	Male	21	64	17	52
Occupation	Private	21	64	19	58
	Governmental	0	0	1	3
	Housewife	4	12	12	36
	House Maid	1	3	0	0
	Driver	1	3	0	0
	Daily laborer	3	9	0	0
	Student	2	6	1	3
	Retired	1	3	0	0

Table 3 bivariate analysis for different exposures, Burayu town, Oromia Region,2016

Exposure		Case(%)	Control(%)	OR(95%CI)	P value
1) Eating food outside their home in the last 5 days	Yes No	18(54.5%) 15(45.4%)	15(45.4%) 18(54.5%)	1.44(0.54-3.79)	0.622
2) Eating Raw meat	Yes No	18(54.5%) 15(45.45%)	12(36.36%) 21(63.64%)	2.10(0.78-5.63)	0.216
3) Eating Raw Fish	Yes No	1(3.03%) 32(96.97%)	0(0.00%) 33(100%)	-	1.000
4) Eating salad	Yes No	24(72.73%) 9(27.27%)	17(51.52%) 16(48.48%)	2.50(0.89-7.00)	0.127
5) Drinking Shameta	Yes No	5(15.15%) 28(84.85%)	1(3.03%) 32(96.97%)	5.71(0.629-51.89)	0.198
6) Source of water	Tap	31(93.9%)	26(78.79%)	4.17(0.79-21.85)	0.15
	Spring	2(6.06%)	7(21.21%)	0.23(0.045-1.254)	0.151
7) Drinking untreated water	Yes No	28 5	19 14	***4.12(1.27-13.37)***	**0.029**
8) Attending funeral in the last 5 days	Yes No	2 31	3 30	0.31(0.030-3.170)	0.6055
9) Washing hand with soap and water before meal	Yes No	15(45.45%) 18(54.55%)	26(78.79%) 7(21.21%)	**0.22(0.076-0.660)**	**0.011**
10) washing hand with soap and water after going to the toilet	Yes No	15(45.45%) 18(54.55%)	26(81.25%) 7(18.75%)	**0.22(0.076-0.660)**	**0.011**

Table 4. multivariate analysis, Burayu town, Oromia Region,2016

S.N	Exposure	Adjusted OR(95%CI)	p-value
1	Eating Raw Meat	4.1683(1.162-14.94)	0.0284
2	Eating Salad	4.4641(1.222-16.29)	0.0235
3	Drinking Shameta	5.5581(0.482-63.97)	0.1688
4	Drinking untreated water	5.1579(0.147-18.08)	0.0104
5	Washing hand before meal	0.350(0.106-1.15)	0.0848
6	Washing hand after toilet	0.350(0.106-1.15)	0.0848

Intervention

In response to this outbreak there was a multisector committee formed from WHO wash committee and the woreda and zonal administration and health offices there was daily meeting. - Cases were managed appropriately

Surveillance - Active case search, Contact tracing and line listing of cases and daily reporting of Cases was done with proper format.

Coordination - At the beginning the work load was on health personals only, we discussed with Responsible persons, Kentiba to strengthen the team, they start to coordinate and Active case search, daily situation monitoring, assessing risk factors and case Management were strengthened.

Discussion

Our investigation revealed that AWD outbreak has occurred in Burayu town, Oromia region. The clinical manifestations of AWD include profuse diarrhea and vomiting of clear fluid, these symptoms usually start suddenly, half a day to five days after ingestion of the bacteria. A total of 54 suspected and confirmed AWD cases were recorded. The outbreak has affected all Six kebeles, especially Melka Gefersa (16 cases), Leku Keta (10 cases), Gefersa Nono (11 cases), Gefersa Guje (7 cases), Gafarsa Burayu (5 cases) and Burayu Keta (5 cases). The disease affects both sexes and all age groups >5yrs (AR=0.04%) and two deaths (CFR=3.7%), when we see cases by sex 34 males (62.96%) and 20 females (37.03%) were reported males are more affected than females because of their working condition always going out of their home and eating food out of home and when we see by age group 15-44 years were more affected by the disease than others age group

.during our investigation time those age groups working outside their home this may increase incidence of the disease among this age group.

On bivariate analysis the factors associated with the illness were Drinking untreated water *OR=4.12(1.27-13.37) P value=0.029*, Hand washing with soap and water before meal *OR=0.22(0.076-0.660) P value=0.011*, Hand washing with soap and water after toilet *OR=0.22(0.076-0.066) P value=0.011*, so from this Bivariate analysis we can understand that drinking untreated water is a risk for the disease while hand washing with soap and water before meal and after going to the toilet is protective of the disease. However, on multivariate analysis the factor which remained statistically significant was drinking untreated water with OR=5.157 and P value=0.0104.

Conclusion

From this study we can conclude that males are more affected than females, age group of 15-44 years are mostly affected and the associated factor for the outbreak were mainly: shortage of safe water supply (drinking untreated water)

- sanitation and hygiene problem.
- Lack of awareness about the illness.

Recommendation

We recommend continuous health education about sanitation and hygiene: hand washing and proper garbage disposal and safe water supply system and water treatment methods.

Reference

1. C.D.C (1995). Detection and control of an epidemic of cholera; technical guidelines. Atlanta, GA, Center for Disease Control and prevention, 1995.
2. Health, F. M. o. (2005/2006). "Federal Ministry of Health, Ethiopia; Health and Health Indicators 2005/2006."
3. Health, F. M. o. (2006/2007). "Federal Ministry of Health, Ethiopia; Health and Health indicators 2006/2007."
4. Health, F. M. o. (2007/2008). "Federal Ministry of Health, Ethiopia; Health and Health indicators 2007/2008."
5. Institute, P. H. (2007). "Public Health Institute process implementation manual."
6. Institute, P. H. (2008). "Public Health Emergency Management core process, Addis Ababa."
7. W.H.O (2011). "Guidelines for cholera outbreak management ".
8. Yemane Berhane, D. H. M., Helmut Kloos (2006). Epidemology and ecology of health and disease in Ethiopia

5.2. Investigation of Rota virus outbreak in Dano woreda, Ambo town, Oromia Region 2017

Abstract

Introduction - Rota virus disease is the most common causes of severe diarrhea among infants and young children. There are five species, Rota virus A causes more than 90% infections in human. The virus is transmitted by the fecal- oral route. Treatment of infection is mostly maintenance of hydration. The primary public health intervention is vaccination. In 2009 the world health organization (WHO)recommended that rotavirus vaccine be included in all national immunization programs. Two vaccines are taken orally and contain attenuated live virus. In Ethiopia rotavirus vaccination were introduced in 2013. The national immunization schedule is at 6 and 10 weeks for Rota 1 and 2 respectively. We received report about Rota virus outbreak from Dano woreda Ambo town January2017. The woreda has a total population of 124,713 of which 62,350 males and 623,369 females. 23 kebeles,4 health center and 3 HP.

Methods - We defined a conformed rotavirus case as an illness characterized by child with vomiting and diarrhea and positive stool examination for rotavirus. 10 stool samples taken for laboratory conformation, descriptive followed by 1;2 unmatched case control study conducted. Data collection and Analysis – a structured questionnaire was used analyzed by epi-info and excel.

Result - 549 total number of suspected and 10 confirmed cases and no death reported from Ambo town, Dano woreda; 21 kebeles. Index case seen on January 10 /2017 from Awedigulfa kebele. When we see cases by sex male 310 and female 239 cases were seen. . Generally, there were no vaccination card to know about child's vaccination status.

Concussion – There was an outbreak of Rota virus in Ambo town Dano woreda. Being unvaccinated was found to be the most significant risk factor for the diseaseOR-7.78(3.6-17.1) p value-0.001376. We recommend awareness creation about the advantage of vaccination, exclusive breast feeding, safe water supply, hygiene and sanitation have to be improved.

***Key words** -Rota virus outbreak, Dano woreda, Ambo.

Introduction

Rotavirus is the most common cause of severe diarrhea among infants and young children. It is a genus of double stranded RNA virus in the family reoviridae. Nearly every child in the world has been infected with rotavirus at least once by the age of five, Immunity develops with each infection, so subsequent infections are less severe, adults are rarely affected. There are five species of virus referred to as A, B, C, D and E. Rotavirus A is the most common species, causes more than 90 % infections in humans.

The virus is transmitted by the fecal-oral route. It infects and damages the cells that line the small intestine and causes gastroenteritis (which is often called, stomach flu, despite having no relation to influenza). Although rotavirus was discovered in 1973 and accounts for up to 50 % of hospitalizations for severe diarrhea in infants and children. Its importance is still not widely known within the public health community, particularly in developing countries. In addition to its impact on human health, rotavirus also infects animals and is a pathogen of livestock. Rotavirus is usually an easily managed disease of child hood, but worldwide more than 450,000 children under five years of age still die from Rota virus infection each year, most of whom live in developing countries and almost two million more become severely ill. In the united states, before initiation of the rotavirus vaccination Programme. Rota virus caused about 2.7 million cases of severe gastroenteritis in children almost 60,000 hospitalizations, and around 37 deaths each year. Public health campaigns to combat Rota virus focus on providing oral rehydration therapy for infected children and vaccination to prevent the disease. The incidence and severity of rotavirus infections has declined significantly in countries that have added rotavirus vaccine to their routine childhood immunization policies.

Sign and symptoms - Rota virus gastroenteritis is a mild to severe disease characterized by vomiting, watery diarrhea and low grade fever. once a child is infected by the virus there is an incubation period of about two days before symptoms appear. Symptoms often start with vomiting followed by four to eight days of profuse diarrhea. Dehydration is more common in rotavirus infection than in most of those caused by bacterial pathogens , and is the most common cause of death related to rotavirus infection.

Transmission - Rotavirus transmitted by the fecal-oral route via contact with contaminated hands, surfaces and objects and possibly by the respiratory route. The faces of an infected person can contain more than 10 trillion infectious particles per gram fewer than 100 of these are required to transmit infection to another person. Diagnosis and detection of infection with rotavirus normally follows diagnosis of gastroenteritis as the cause of severe diarrhea, specific diagnosis of infection with rotavirus A is made by finding the virus in the child stool by enzyme immunoassay. There are several licensed test kits on the market which are sensitive, specific and detect all serotypes of rotavirus A. Other methods such as electron microscopy and PCR are used in research laboratories. Reverse transcription polymerase chain reaction (RT-PCR) can detect and identify all species and serotypes of human rotavirus.

Treatment - Treatment of acute rotavirus infection is nonspecific and involves management of symptoms and most importantly maintenance of hydration. If a treated child can die from the resulting severe dehydration.

Rotavirus surveillance in Ethiopia

FMOH with support of WHO established Rota surveillance in 2007 with the purpose to estimate from hospital – based surveillance, the burden of rotavirus gastroenteritis in children less than five years of age, determine the predominant circulating rotavirus strains, assess the importance of introducing new and prospective rotavirus vaccine based on the predominant circulating rotavirus strains and generate base line data for policy making.

The ministry of health continued to work in collaboration with EPHI and WHO to monitor the epidemiological impact after rotavirus vaccine introduction. Surveillance activities initiated in 2007 at Black Lion Hospital was further expanded to other two sites in Yekatit 12 and Betezata Hospitals in 2008 and 2011 respectively.

The primary public health intervention is vaccination. In 2009, the world health organization (WHO) recommended that rotavirus vaccine be included in all national immunization programs. Two vaccines against Rotavirus A infection are approved for global use and safe and effective in children, Rotarix and RotaTeq. Both are taken orally and contain attenuated live virus. In Ethiopia rotavirus vaccinations were introduced in 2013.

The national immunization schedule is at 6 and 10 weeks for Rota 1 and 2 respectively. Ethiopia has achieved 88% coverage of Rota 2 vaccine dose by 2014/15 and planned to increase coverage to 97% by 2020.

Background

We received information about reported cases of Rotavirus from west Shewa Ambo town Dano woreda in January26/ 2017. Dano woreda is one of the west shoa zone woredas which is located 125 km from Ambo and 250 km from Addis Ababa to the west. Its bounder from the east Jibat woreda, west Jima zone, north Challa and Ilugelan and from the south Nono woredas are located. Dano woreda has a total population of 124,713 from which male 62,350, female 62,369 and 8628 urban populations. The woreda has 23 kebeles and 4 health centers and 3 health posts, Infants/ < 1 yr **4240** < 5 yrs. **20,453** and < **15yrs 57,791**.

Methods

Study area and Study Period

Dano woreda is one of the woredas found in west Shewa Ambo zone. It has a total population of 124,713 of which 62,350 are males and 62,369 females. The woreda has 23 kebeles and 4 health centers and 3 health posts. The study was conducted from January 27 up toFebruary10/2017.

Map 2 - Map of Oromia Region showing Dano woreda, Ambo town

Study design

We conducted a descriptive cross sectional study followed by unmatched case control study to investigate the outbreak in the woreda. we used 50 cases with 100 controls selected from the same woreda.

Rotavirus case definition - Any child under five years of age with sudden onset watery yellowish color diarrhea with vomiting.

Conformed case definition - A suspected case with laboratory conformation of rotavirus in the stool examination

Controls - A child without the history of Rotavirus infection with the same area.

Data collection method

A structured questionnaire was used to interview the patients and controls parents or caregivers by house to house

visiting with the help of health extension worker.

Data analysis and clearance

The collected data entered in to EPI –INFO software and checked for completeness and consistency and analyzed by using EPI –INFO and EXCEL.

Ethical issues

Support letter was obtained from EPHI; the letter was written for woreda health office in order to obtain approval on data collection. Informed verbal consent was obtained from all study participants before conducting interview by explaining the purpose of the study, privacy and confidentiality was ensured.

Result

When we arrived at Dano woreda there were 549 total number of suspected rotavirus cases and with no death reported from 21 kebeles starting from January10/2017. The attack rate was 2.68% with no case fatality rate. Among these suspected cases 10 stool samples were taken to identify the etiologic agent and all samples were positive for rotavirus. The first case was reported on 10/1/2017 from Awedigulfa kebele identified on line list. When we see cases by sex 310 (56.5%) Males, 239(43.5%) Females, and cases seen in each health centers Seyo HC 190, Bekeserba HC 101, Ajila Dalle HC 76, Beke sirba HC 78, D/hujiba HP 32, D/Shanan 65 and Qagaro Jibat HP 7 cases were seen.

Table 1 Number of cases in each health center in Dano woreda

Name of Health Center	Number of cases seen	Percent
Seyo HC	190	34.6%
Kara Genet HC	101	18.4 %
Bake sirba HC	78	14.2%
Ajila Dalle HC	76	13.8 %
D/Shanan HP	65	11.8 %
D/Hujiba HP	32	5.8%
Qagaro Jibat HP	7	1.27%

Cases seen in each health center When we observe cases mostly seen at Seyo health center 190cases, Kara genet HC 101 cases, Bake sirba HC 78 cases, Ajila Dalle HC 76 cases, D/Shanan HP 65 case, D/Hujiba HP 32 and Qagaro HP 7 Cases Seen.

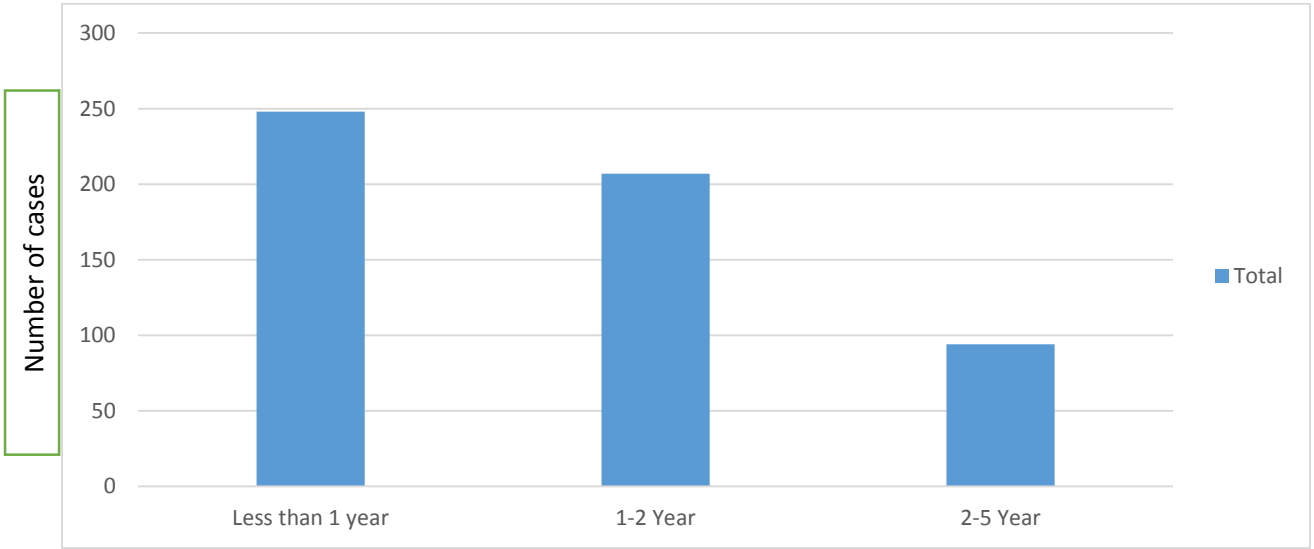


Figure 4. Number of Rota cases by age in Dano woreda, Ambo town, Oromia Region,2017

When we see total cases by age all cases are under five years of age.

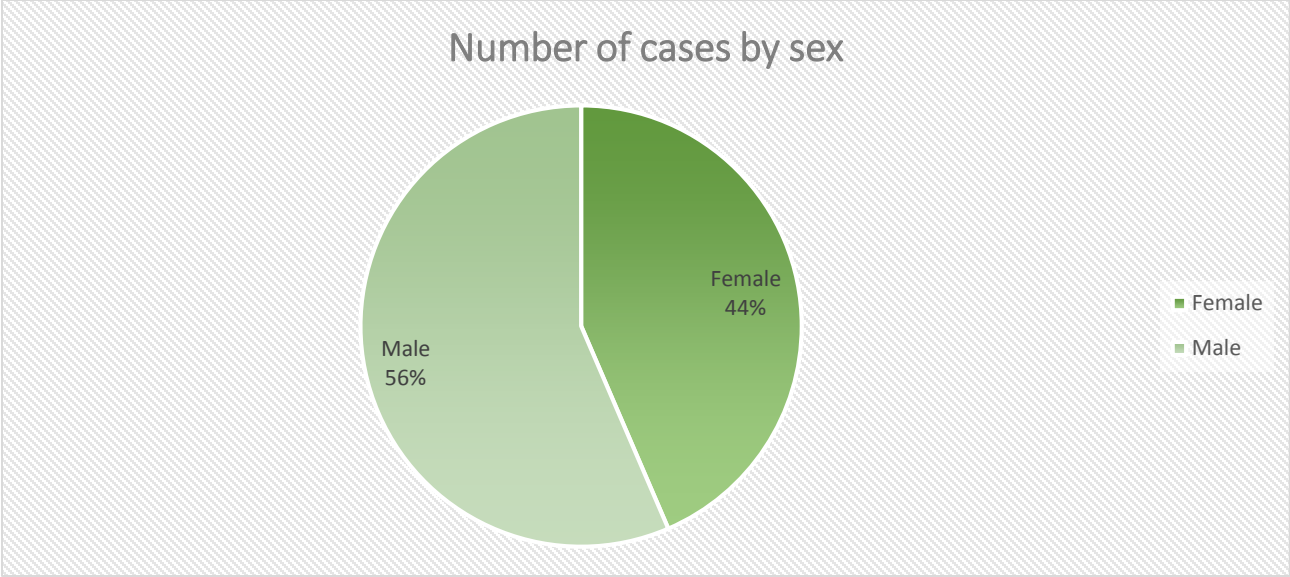


Figure 5. Number of cases by sex Dano woreda, Ambo town, Oromia Region,2017

When we see total cases by sex 239 female and 310 male cases seen.

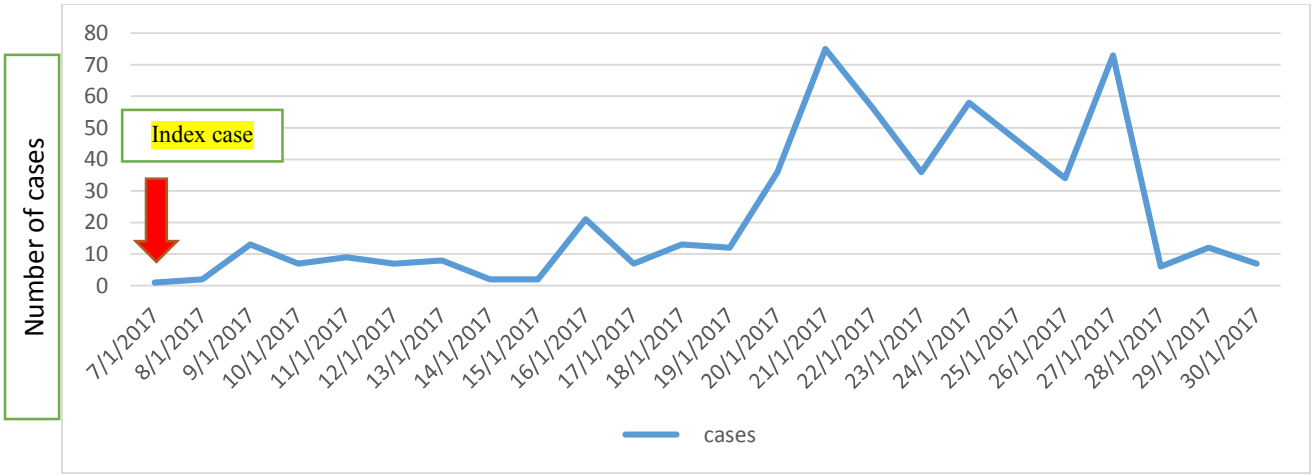


Figure 6. Number of cases by date of onset Dano woreda, Ambo town, Oromia Region,2017

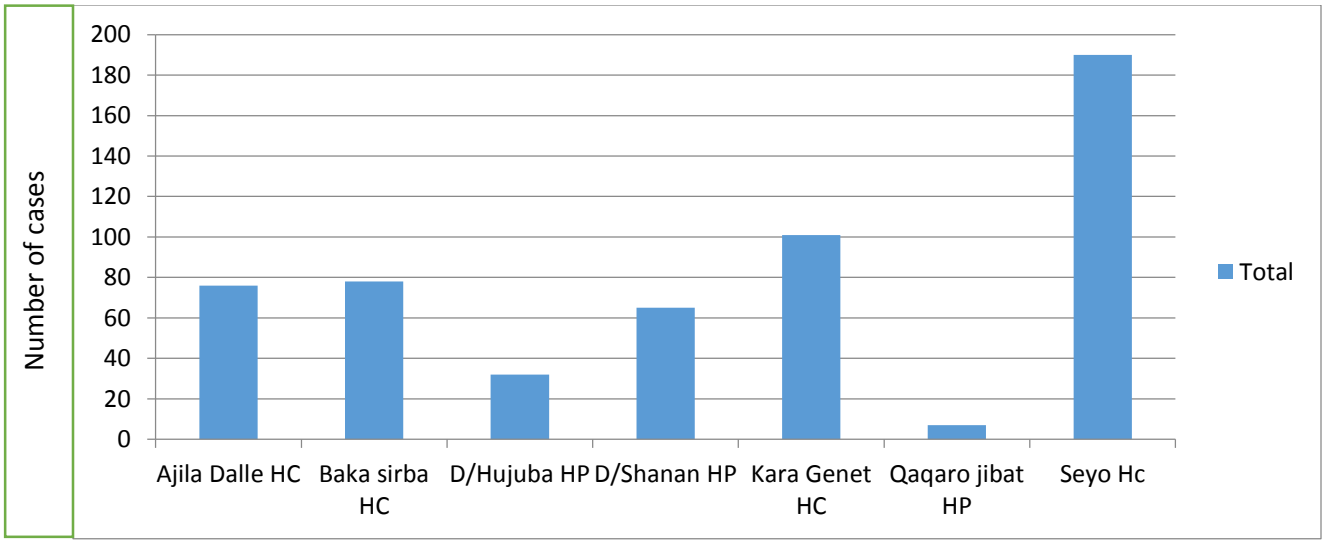


Figure 7. Number of cases seen in each health institute Dano woreda, Ambo town, Oromia Region,2017

Table 6. Information of cases and control in Dano woreda, Oromia region 2017

		Cases	Percent	Controls	Percent
Age group	< 6 month	0	0	1	1%
	6 - 12 month	33	66%	20	20%
	>12 month	17	34%	79	79%
Sex	Female	29	58 %	44	44.4 %
	Male	21	42 %	55	55.6 %
No formal education	Yes	33	66 %	36	36%
	No	17	34 %	64	64%

Table 7. Bivariate analysis for Exposures in Dano woreda 2017

Exposure		Case(%)	Control(%)	OR (95%)	P Value
Being un vaccinated	Yes	30(60%)	16(16.1%)	7.78(3.6-17.1)	0.001376
	No	20(40%)	84(83.8%)		
Having contact with sick	Yes	5(10%)	8(8%)	1.2778	0.9182
	No	45(90%)	92(92%)		
Knowledge about Rota vaccine	Yes	12(24%)	21(21%)	1.139	0.8344
	No	38(76%)	79(79%)		
Presence of latrine and use	Yes	47(94%)	96(96%)	0.6667	0.89
	No	3(6%)	4(4%)		

Discussion

Our investigation conformed that rotavirus cases has occurred in Dano woreda, ambo town. rotavirus gastroenteritis is a mild to severe disease characterized by vomiting, watery diarrhea and low grade fever. Among the total 549 cases Seyo health center had 190(34.6%), Kara genet HC101(18.4%), Baka sirba HC78(14.2%), Ajila Dalle health center 76(13.8%), D/Shanan health post 65(11.8%), D/hujiba health post32(5.8%)and Qagaro Jibat health post7(1.27%)cases. So Seyo health center has seen the most number of cases. When we see cases by sex male310(56.5%)andfemales239(43.5%)totally seen and from 23 kebele 21(91.3%)affected by the outbreak in the woreda. The outbreak affects under five age groups and when we see the most recorded age for the case was 6-12 months (66%)of age. On bivariate analysis the risk factor statistically associated was being unvaccinatedwithOR-7.78(3.6-17.1) p value-0. 001376.From the total of 549 cases majority were not vaccinated against rotavirus and vaccination history was not known because there is no vaccination card available at all. Therefore, one of the main problem was no clear vaccination history about child have got full dose of rotavirus vaccine or not and also mothers not knowing

about the disease vaccine prevention. There is also big problem of safe water supply in the woreda and peoples use spring, river water some villages have Hand dug water. Awareness creation about vaccination advantage by giving strong health education to all mothers will be strengthen. To minimize further complications case management should be conducted regularly and active case searching and treating cases done.

Limitation

During house to house study time for data collection, vaccination card was not available in all the households, for this reason the vaccination status was taken by simply asking the family. This may cause bias on vaccination status.

Conclusion

The outbreak was affected mostly under five children's specially 6-12 months of age and being unvaccinated was a risk factor for the disease, also about vaccination card and safe water supply have to be improved.

Recommendation

- Routine vaccination for Rotavirus should be strengthened. Vaccination card is very important the woreda health office and health centers have to take strong action.
- Eligible children for vaccination estimated appropriately
- Awareness creation about the advantage of vaccination, exclusive breast feeding, Hygiene and sanitation and safe water supply have to be improved.

References

1. CDC (2012). "CDC Rota virus infection clinical information."

2. CDC (2012). "Epidemiology and prevention of vaccine preventable Disease ".

3. HD, P. (2013). "Treatment and prevention of Rotavirus Infection in children, current Infectious Disease Reports."

4. Matson Do, O., Ryan ML, Jiang x (2000). "Rotavirus, enteric adenovirus, Calicivirus, astrovirus and other viruses causing gastroenteritis, Washington, D.C. ASM press."

5. Parashar UD, G. C., Bresee JS (2006). "Rotavirus and severe childhood diarrhea, Emerging Infectious Diseases."

6. Wafa E, H., Fadhil O, Abdel Wahid A (2013). "Prevalence of rotavirus and adenovirus associated with diarrhea among displaced communities in Khartoum, Sudan, BMC Infectious Diseases."

7. WHO (2011). "Global Burden of Rotavirus Diarrhea ".

8. Yasutaka H, A. K. (2000). "Rotavirus serotypes; classification and Importance in Epidemiology, Immunity and vaccine Development, J Health popul Nutr."

9. Yemane Berhane, D. H. M., Helmut Kloos (2006). Epidemology and ecology of health and disease in Ethiopia

Chapter VI

Narrative summary
of disaster situation

Chapter 6 – Narrative summary of disaster situation visited

Belg Season Rapid Emergency Needs Assessment, SNNPR, Ethiopia, 2016

Summary

Ethiopia has been producing emergency health and nutrition preparedness to address health and nutrition emergencies caused by drought, epidemics, earthquake, flood etc. This year Ethiopia responds for drought affected population with MAM and SAM management, outbreaks like Malaria, Measles and Flood response. In 2016, Belg assessment was conducted to identify areas where emergency assistance by health, nutrition might be needed due to acute problems and come up with effective estimates of the size of the population needing emergency assistance.

Districts were selected by regional health bureaus and zonal health departments. Assessment was conducted in Welayita, Gamugofa, Dawro, Hadiya, Kembata tembaro, Sidama, Gedio, Segen, Southomo, silte, Gurage and Halaba zones from these zones two – three woredas (district) were selected and visited during assessment. There were five groups for assessment assigned.

Kembata Tembaro zone is one of the 13 zones in SNNPR divided in to 8 woredas (one town administration) with a total population of 857,375 (437,261 females). The zone has 4 hospitals (1general hospital) ,34 health centers, 136 health posts and 364 health workers serving the population in Kembata Tembaro zone. Moreover, the zone has a total of 254 primary schools, (1-4 & 1-8) serving a total of 301,766 students (145,660 girls). According to respective zonal sector department records, the zone has 59.3% of water supply, 100% of primary education, 98% of health service and 100% of latrine coverage as of June 2016. When it comes to health emergencies a number of health epidemics have been reported over the past years and months. Among others, malaria, meningitis and measles are considered as major human epidemics occurred in the past 3 years in the zone. Malnutrition was also the most pressing challenge/problem in the zone in previous years. During this assessment period it was not possible to reach in all woredas of the zone and hence seasonal emergency need assessment was carried out only in hot spot priority one woredas namely Tembaro and Kedida gamela woredas where nutrition, health and wash emergencies are apparent in the previous years and months. Multispectral epidemic prevention and control committees at zonal and district level existed. They are functional There is a public health emergency preparedness and response plan and there is no ongoing outbreak in woredas which I perform my assessment Kembata tembaro and Kedida gamela woredas.

Introduction

Ethiopia has been conducting health and nutrition emergency needs assessment twice a year Meher and Belg assessment. On the assessment government and nongovernmental organizations(ministry of agriculture, Disaster Risk Management and Food Security Sector ,Ministry of Health ,Ministry of water and energy, Ministry of education, WHO, UNICEF, OCHA, MSF, Plan international have been participating in the assessment and respond following Meher and Belg rain fall malaria outbreak is expected in many parts because of suitable condition for mosquito breeding , meningitis suspected in dry seasons, measles , acute malnutrition and shortage of drinking water is common risk. Therefore, these assessments provide the necessary resource for at risk population which is very important.

To prevent or minimize loss of health budget, school dropouts due to health problems of disasters and epidemics. Therefore 2016 Belg assessment conducted to identify places where emergency assistance might be needed to come up with reasonable estimates of size of the population needing assistance.

Map 6 –Map of SNNPR

Objectives

- To describe major public health concern potential outbreaks and at risk population.
- To identify areas where emergency assistance in health and nutrition might be needed.
- To describe existing resources and the capacity to cope with circumstances.
- To describe the capacity of the existing health services to address the health and nutrition emergencies likely to occur.

Methodology

A Cross sectional study design was used to assess and identify human health and nutrition emergency needs, the Assessment was performed in SNNPR- Kembata tembaro zone, it was conducted starting from June 5 for fifteen days.

Study area

Assessment was performed in SNNPR-Kembata tembaro Zone. In Kembata tembaro zone specifically where the woredas which were experiencing higher malnutrition, measles, malaria, and meningitis prevalence or at risk of above mentioned outbreaks and might need emergency interventions for the upcoming six months' period were identified to be Tembaro and Kedida gamela woredas in the zone.

In Tembaro woreda there are 131,414 total populations, male 65443(49.8%), female 65968(50%) under 5 age 2050, number of pregnant women 4547, and there are 04 health centers, number of health centers with water access is 02 and there are 24 health posts in the woreda 57 health workers in the woreda all have been trained in SAM management.

In Kedida gamela woreda there are 110,975 total populations, 55377(49.9%)male, 55598(50%) female, 17323 under five and 25857 women of reproductive age (15-49years) and number of pregnant women is 3840 also there are 4 health centers and 19 health posts ,40 health workers in the woreda all are trained in SAM management.

Selection of Assessment area

Areas were identified by regional health bureaus and zonal health departments addressed by assessment were taken in to consideration both natural disasters and diseases trends such as drought, shortage of rain, floods, landslides etc. and might need emergency interventions for the upcoming six months' period were identified to be Tembaro and K/Gamela woredas in the zone.

Selection of Assessment team

The assessment team was composed of experts from UNICEF, MOWE, RHB, SCI, EPHI, FAO, WVE, OCHA, MOWIE, REW, MOLF, NDRMC etc. Half day training was given for all assessment teams at federal DRMFSS before deploying to regions. One and half day training was given for all assessment teams at regional level. The team was classified in to food and nonfood groups in the five team groups.

Selection of Assessment Tools

Questioners were used for data collection. Two different questioners were used to collect health and nutrition related Data at zonal and district levels. The questioner addresses socio – demographic profile, health profile, status of epidemic prevention and control multi sectorial coordination Committee at all levels and go through asking ongoing epidemic situation and check availability of emergency drug at zonal and district levels.

Source of Data

Both primary and secondary data were collected from health departments and district health offices. Head of zonal health departments and district health offices, pharmacist, public health emergency management officers, maternal and child health officers were interviewed. Zonal and woreda level briefing and debriefing were held prior to and after data collection together with the food assessment team. In addition, concerned zonal officials and respective woreda sector offices were interviewed during data collection.

Results

1) Zonal level

Coordination - Multi-sectorial epidemic prevention and control committee at the zone assessed during the Belg assessment were present.

Public health emergency management (PHEM) - At the zonal levels there is public health emergency preparedness and response plan. The zonal health departments allocated annual budget from regional health bureau.

Ongoing Outbreak - There is no ongoing epidemic in all district of Kembata Tembaro zones.

Requirements/Needs - Federal ministry of health has rolled out malaria reduction program with the overall result that malaria morbidity and mortality has significantly reduced. However, factors that enhance transmission still exist and expected increase the risk of malaria outbreaks, presence of stagnant water, interrupted rivers are suitable condition for mosquito breeding.

There are a number of risk factors to anticipate occurrence of large scale AWD out breaks, some of them include flood, low coverage of safe drinking water, poor hygiene and sanitary practices expected to aggravate the spread of the disease.

Stock - The visited zone has sufficient drugs and medical supplies to treat diseases of major public importance such as malaria, measles, meningitis and AWD. There are risk factors to anticipate occurrence of Malaria outbreak due to presence of malaria breeding site and shortage of chemicals for FRS, shortage of budget for conducting spraying chemicals and lack of transportation in K/Tembaro – Tembaro woreda.

2) Woreda level

During Belg health and nutrition emergency needs assessment two woredas were visited from Kembata Tembaro zone - Tembaro and Kedida Gamela woreda.

Tembaro woreda has total population of 131,414 of which 65443 (49.8%) are male, 65968 (50%) are female and 2050 are under 5 children. In the woreda there is no special population such as pastoralist, refuge, internal displacement population and migrant workers.

Kedida Gamela woreda has a total population of 110,975 of which 55377 (49.9% male) ,55598 (50% are female) and 17323 (15.6%) are children under 5. In the woreda there is no special population such as pastoralist, refuges, internal displacement population and migrant workers.

Table 18. Top five causes of morbidity in the year 2007E.C.

Morbidity below 5			Morbidity above 5		
	Tembaro	K/Gamela	TEMBARO		K/Gamela
1	Pneumonia	All respiratory disease	1	Typhoid fever	AFI
2	AFI	Pneumonia	2	Malaria	Typhoid fever
3	Diarrhea non-bloody	Malaria all type	3	AFI	Malaria all type
4	Malaria	AFI	4	Pneumonia	All respiratory disease
5	AURI	Diarrhea non-bloody	5	Helminthiasis	Helminthiasis

Diseases trend - In the last six months there are no cases and deaths of AWD and meningitis in the two visited woreda. There were malaria cases in the two woredas and shows increment cases in Tembaro woreda (5657 cases) and also there is one death reported in this woreda from Feb- April and there are no measles cases reported in both woredas in the year 2008EC.

There was preventive treatment given like Vit A supplementation given to children 6- 59 months and Deworming given to children 2- 5 years of age with in the last six months.

Preparedness at woreda level – are there emergency drugs and supplies enough for 1 month? Or are they easily accessible on need?

Table 19. Table of preparedness at woreda level

	Tembaro		K/Gamela	
	Yes	No	Yes	No
Ringer Lactate(to treat AWD cases)		✓	✓	
ORS(to treat AWD cases)	✓		✓	
Doxycycline(to treat AWD)	✓			
Consumables, syringes, Gloves for AWD management	✓		✓	
Amoxil susp(measles)	✓		✓	
Tetracycline ointment (measles)	✓		✓	
Coartem for Malaria	✓		✓	
Lab supply; RDT for malaria		✓		✓
Lab supply RDT(pastorex)for meningitis LP set		✓		✓
Number of CTC kit available;(for AWD)		✓		✓

Coordination – Multi-Sectorial epidemic control and prevention coordination committees were available at district level. Both visited woredas have this committee. The committee have been leading by respective district administrator and having head of district health office as secretary.

Risk factors

Malaria- The two visited woredas, Tembaro and Kedida Gamela are malaria endemic area. In these woredas there are malaria risk factors which could contribute for the occurrence of malaria cases – malaria breeding sites such as stagnant water, interrupted or potentially interrupting rivers during the dry season, unprotected irrigation are the main contributing risk factors in the above two districts. ITN (IRS 2008)79% LLINS coverage < 80% =63% in Tembaro woreda and in Kedida Gamela LLINS coverage -100%, IRS 2008 60%.

Meningitis - In all the two woredas there is no meningitis epidemics in the last 3 years in Kedida Gamela woreda vaccination been conducted in the past 3 years in October 2014.

AWD - There was no AWD epidemic reported in both woredas.

Measles - In both woredas there is no ongoing measles outbreak. The vaccination coverage of 2008 less than one year is 92.6% in Kedida Gamela woreda, 94 % in Tembaro woreda. SIA been conducted in April

2008 EC in both woredas for the age group of 6 months up to 15 years 50,719 children in Kedida Gamela and 60,712 in Tembaro woreda vaccination given.

Number of cases and deaths in two woredas from October 2015-march 2016 Malaria out-break due to presence of malaria breeding site and shortage of chemicals for FRS, shortage of budget for conducting spraying chemicals and lack of transportation in K/Tembaro, Tembaro woreda.

3) Woreda level

During Belg health and nutrition emergency needs assessment of two woredas was visited from Kembata Tembaro zone. Tembaro woreda has total population of 131,414 of which 65443 (49.8%) are male, 65968 (50%) female and 2050 are under 5 children. In the woreda there is no special population such as pastoralist, refuges, internal displacement population and migrant workers.

Table 20. Number of cases/deaths from tekemt2007 –megabit 2008 in Tembaro woreda

Month	AWD				Malaria				Measles				Meningitis			
	Cases		Death		Cases		Death		Cases		Death		Cases		Death	
	07	08	07	08	07	08	07	08	07	08	07	08	07	08	07	08
Oct	0	0	0	0	316	50	0	0	0	0	0	0	0	0	0	0
Nov	0	0	0	0	270	95	0	0	0	0	0	0	0	0	0	0
Dec	0	0	0	0	321	204	0	0	45	0	0	0	0	0	0	0
Jan	0	0	0	0	185	347	0	0	0	0	0	0	0	0	0	0
Feb	0	0	0	0	185	839	0	01	0	0	0	0	0	0	0	0
Mar	0	0	0	0	166	3114	0	0	0	0	0	0	0	0	0	0

Table 21. Number of cases/deaths from tekemt2007-megabit 2008 in Kedida gamela woreda

Month	AWD				Malaria				Measles				Meningitis			
	Cases		Death		Cases		Death		Cases		Death		Cases		Death	
	07	08	07	08	07	08	07	08	07	08	07	08	07	08	07	08
Oct	0	0	0	0	1301	390	0	0	0	0	0	0	0	0	0	0
Nov	0	0	0	0	1310	301	0	0	0	0	0	0	0	0	0	0
Dec	0	0	0	0	673	289	0	0	0	0	0	0	0	0	0	0
Jan	0	0	0	0	408	252	0	0	0	0	0	0	0	0	0	0
Feb	0	0	0	0	382	181	0	0	0	0	0	0	0	0	0	0
Mar	0	0	0	0	463	227	0	0	0	0	0	0	0	0	0	0

Table 22. Facilities with SAM management in Tembaro woreda

Month	Total number of Health centers/Hospitals	Total number of Health Posts	Number of SC	% of health centers/hospitals with SC		Number of OTC	% of health posts with OTP	Total number of OTP/SC reported	% of OTP/SC who have reported
Oct	4	19	4	100		22	95.6%	23	100
Nov	4	19	4	100		22	95.6%	23	100
Dec	4	19	4	100		22	95.6%	23	100
Jan	4	19	4	100		22	95.6%	23	100
Feb	4	19	4	100		22	95.6%	23	100
Mar	4	19	4	100		22	95.6%	23	100

Table 23. facilities with SAM management in Kedida gamela woreda

Month	Total number of Health centers/Hospitals	Total number of Health Posts	Number of SC	% of health centers/hospitals with SC	Number of OTC	% of health posts with OTP	Total number of OTP/SC reported	% of OTP/SC who have reported
Oct	4	24	4	100	28	100	28	100
Nov	4	24	4	100	28	100	28	100
Dec	4	24	4	100	28	100	28	100
Jan	4	24	4	100	28	100	28	100
Feb	4	24	4	100	28	100	28	100
Mar	4	24	4	100	28	100	28	100

Table 24. Admission and performance of therapeutic feeding program in Tembaro woreda

Month	Total SAM cases		% of SAM children cured	% of SAM children defaulted	% of SAM children died	% of SAM children non-respondents	% of SAM children other
	2007E.c	2008E.c					
Oct	5	6	53%	0	0	0	0
Nov	12	12	29%	0	0	0	0
Dec	9	6	54%	0	0	0	0
Jan	5	11	26%	0	0	0	0
Feb	6	9	36%	0	0	0	0
Mar	13	11	30%	0	0	0	(1)3.7%
Apr	21	9	29%	0	0	0	0
May	20	15	32%	0	0	0	0

Table 25. Admission and performance of therapeutic feeding program in Kedida gamela woreda.

Month	Total SAM cases		% of SAM children cured	% of SAM children defaulted	% of SAM children died	% of SAM children non-respondents	% of SAM children other
	2007E.c	2008E.c					
Oct	80	136		0	0	0	0
Nov	79	110		0	0	0	0
Dec	82	84		0	0	0	0
Jan	84	72		0	0	0	0
Feb	88	72		0	0	0	0
Mar	86	76		0	0	0	0

Table 26. MAM admission in Tembaro woreda

Month	Priority 1 woreda		Total MAM cases		Total number of Food distribution point in the woreda
	2007 E.c	2008 E.c	2007 E.c	2008 E.c	
Oct	Yes	Yes		3572	5
Nov	Yes	Yes		2716	5
Dec	Yes	Yes		3659	5
Jan	Yes	Yes		2657	5
Feb	Yes	Yes		4375	5
Mar	Yes	Yes		2592	5

Table 27. MAM admission in Kedida gamela woreda

Month	Priority 1 woreda		Total MAM cases		Total number of Food distribution point in the woreda
	2007 E.c	2008 E.c	2007 E.c	2008 E.c	
Oct	Yes	Yes		493	18
Nov	Yes	Yes		347	18
Dec	Yes	Yes		735	18
Jan	Yes	Yes		1211	18
Feb	Yes	Yes		1249	18
Mar	Yes	Yes		1228	18

Table 28. Screening performance for children in Kedida gamela woreda

Month	Target children 6-59 months	NO of screened children	Screening coverage (%)	No of children with no edema and MUAC<11cm			No of children with no edema and MUAC 11 to 11.9	% proxy GAM for children	% Proxy SAM for children
				SAM					
				MUAC<11	Edema	Total	MAM		
Oct	15469	15349	99.2%	12	0	12	248	1.7	0.08
Nov	15469	15329	99.1%	15	0	15	167	1.2	0.09
Dec	15469	15365	99.3%	16	0	16	299	2.1	0.10
Jan	15469	15401	99.5%	11	0	11	504	3.3	0.07
Feb	15469	15312	98.9%	15	0	15	517	3.5	0.09
Mar	15469	15357	99.3%	19	0	19	390	2.7	0.12
Apr	15469	15305	98.9%	19	1	20	411	2.7	0.13

Table 29. Screening performance for children in Tembaro woreda

Month	Target children 6-59 months	NO of screened children	Screening coverage	No of children with no edema and MUAC<11cm			No of children with no edema and MUAC 11 to 11.9	% proxy GAM for children	% Proxy SAM for children
				SAM					
				MUAC<11	Edema	Total	MAM		
Oct	18608	18037	96.9%	86	54	140	1523	9.2	0.77
Nov	18608	17181	92.3%	28	25	53	1370	8.3	0.3
Dec	18608	17532	94.2%	54	20	74	1520	9.1	0.4
Jan	18608	18527	99.5%	27	8	35	1276	7.1	0.18
Feb	18608	18523	99.5%	8	4	12	2932	15.9	0.06
Mar	18608	18621	100%	9	0	9	1324	7.2	0.048

Table 30. Screening performance for pregnant and lactating women Kedida gamela woreda

Month	Target PLW	NO of Screened PLW	Screening coverage (%)	No of PLW MUAC below 23.0 cm	% proxy GAM for PLW
Oct	4328	3891	89.9%	245	6.3%
Nov	4328	3848	88.9%	180	4.7%
Dec	4328	4183	96.6%	436	10.4%
Jan	4328	4259	98.4%	707	16.6%
Feb	4328	4151	95.9%	732	17.6%
Mar	4328	4195	96.9%	838	19.9%
Apr	4328	4394	96.9%	817	19.5%

Table 31. Screening performance for pregnant and lactating women in Tembaro Woreda

Month	Target PLW	NO of Screened PLW	Screening coverage (%)	No of PLW MUAC below 23.0 cm	% proxy GAM for PLW
Oct	5135	5138	100%	2049	39.8
Nov	5135	4880	95%	1346	27.6
Dec	5135	5046	98%	2139	42.3
Jan	5135	5089	99%	1381	27
Feb	5135	5189	101%	1443	27.8
Mar	5135	5204	101%	1268	24.2

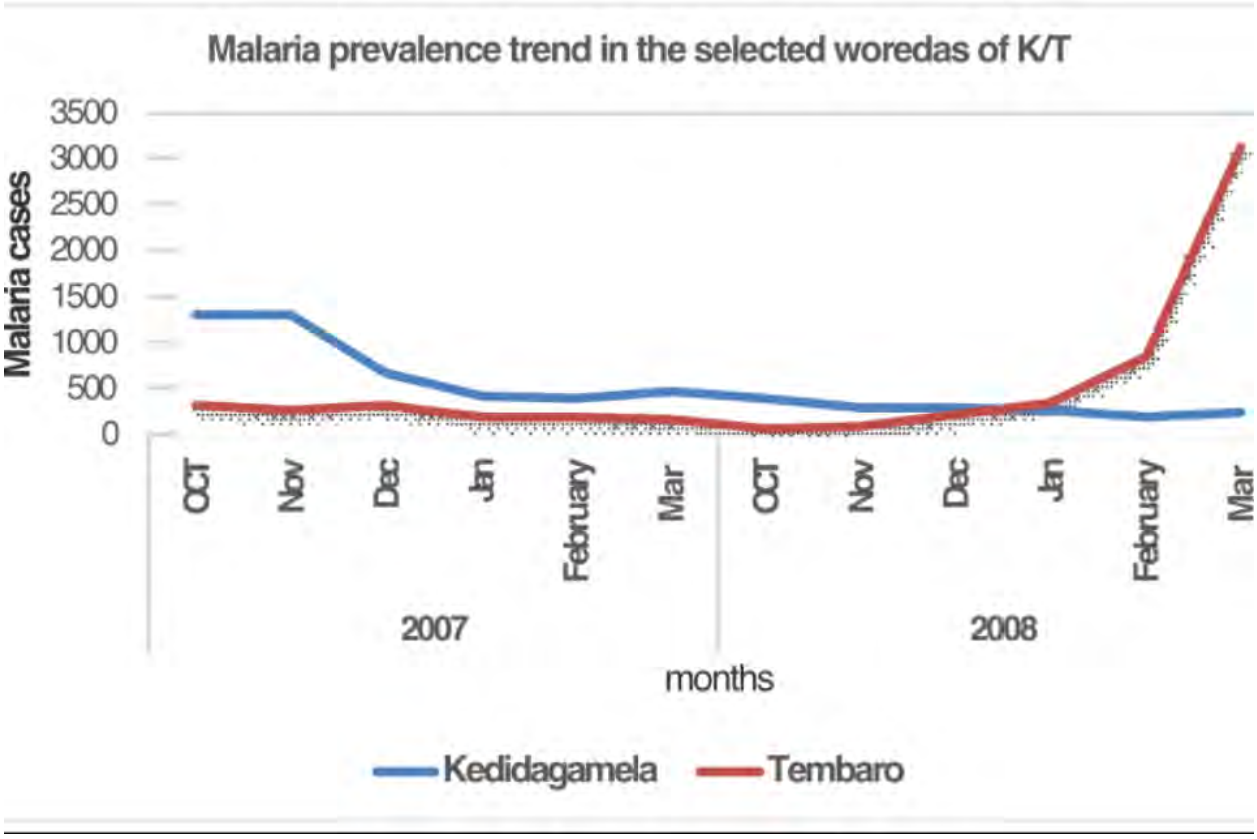


Figure 14. of malaria prevalence trend in Tembaro and Kedida gamela woreda

Flood – There was a flood disaster in the last 3 months in the woreda, in 2 kebeles but there was no human death due to the flooding neither there was displaced people due to the flooding most of water supply system are not functional

Conclusion

There was a functional multisectoral coordination forum in assessed zone and woredas. They have regular meeting, both woredas have their own Public Health Emergency Preparedness and response plan and budget allocated. Additionally both assessed woredas have adequate emergency drugs and supplies for one month and adequate therapeutic supplies RUTF ,F100 and F75 available in both woredas but there is a shortage of water treatment chemicals in woredas.

Recommendation

Significant number of water supply system are not functional and hence people are vulnerable to WASH related emergencies. Distribution of water treatment chemicals in both woredas should be given attention.

Chapter VII

Protocol / Proposal for Epidemiologic research project

Chapter 7 –Protocol / Proposal for Epidemiologic research project

Assessment of Knowledge, Attitude and Practice (KAP) of bed net use to prevent malaria Among Kedida gamela woreda, SNNPR, Ethiopia 2017.

Summary

Introduction - In Ethiopia malaria is a leading public health problem, an estimated 68% of the population are at risk for malaria. Malaria transmission is generally seasonal and unstable.

According to 2015 public health emergency management surveillance data report a total of 1,685,015 malaria cases were reported nationally, 33% of conformed cases reported from SNNPR.

Kedida gamela woreda from SNNPR were reported 4071 total malaria cases in 2015.

The use of insecticide treated net is one of the main malaria control strategies laid out in Ethiopia to reach the national targets to achieve malaria elimination with in specific geographical areas with historically low malaria transmission and achieve near zero malaria death in the remaining Malarious areas of the country.

Objective

General objective

- The overall objective of this study is to Assess knowledge, Attitude and practice of ITNs utilization to prevent malaria in Kedida gamela woreda, SNNPR Ethiopia.

Specific objectives

- To Assess knowledge and Attitude of respondents about Malaria and ITN utilization
- To Assess the proportion of households with Bed net (Ownership)
- To identify factors affecting ITNs utilization

Method - The study area will be Kedida gamela woreda located in SNNPR, Ethiopia, using a cross-sectional study design to conduct a research starting from June up to September.

Work plan - Data collection will be started from June -- September 2017. The study will be completed in September 2017.

Budget - The required cost for the study is estimated 62,916 Ethiopian Birr.

Introduction

Malaria is a mosquito-borne infectious disease of humans and other animals caused by parasitic protozoans (a type of unicellular microorganism) of the genus *Plasmodium*. Commonly, the disease is transmitted via a bite from an infected female *Anopheles* mosquito, which introduces the organisms from its saliva into a person's circulatory system. In the blood, the organism travel to the liver to mature and reproduce. Malaria causes symptoms that typically include fever and headache, which in severe cases can progress to coma or death. The disease is widespread in tropical and subtropical regions in a broad band around the equator, including much of Sub-Saharan Africa, Asia, and the America. (1,2,3)

In Ethiopia Malaria is a leading public health problem. An estimated 55.7million people (68%)of the population are at risk for malaria and around 80% of the 736 districts (woreda) in Ethiopia are considered "Malarious". (1)

Malaria transmission is generally seasonal and unstable, though patterns and intensity of transmission vary throughout the country due to differences in altitude, rainfall and population movement.

All age groups are at risk of infection and disease. 4 species of the parasite infecting human; Plasmodium falciparum 60-70%, plasmodium Vivax 30-40%, plasmodium Malariae and plasmodium ovale. In the year2011-2015EC. There were 13,954,147 malaria cases reported totally in Ethiopia from which 130410 outpatients and 130364 cases reported. (1) In order to reduce malaria transmission, malaria prevention and control strategies include early diagnosis and prompt treatment, vector control in selected areas through the use of ITNs and IRS. (3,5)

Statement of the problem

According to 2015 public health emergency management surveillance data report a total of 1,685,015 malaria cases were reported nationally. The highest malaria cases were reported from SNNPR taking 33% of the confirmed cases, from SNNPR one of malaria endemic zone is Kembata tembaro Kedida gamela woreda reported 4071 total malaria cases in 2015. (13)

In Ethiopia free bed net distribution started in 2005 and by 2010 the ministry of health seat a goal to reach 100% ITN coverage. However, malaria indicator survey (MIS) reported, National percentage of households with at least one mosquito bed net in malaria endemic areas is lower by 13.7% in 2011(55%)comparing with 2007(68.9%). The 2011 MIS report indicated that, SNNPR performing low (57.2%) with at least one mosquito net next to Oromia region and only 53.3% of women have knowledge on mosquito nets as prevention for malaria. In related study done in Tigray region indicated that only one third (33.1%) of the participant mentioned they used ITN properly to prevent malaria (.6,8,9) this indicated that appropriate use of bed net by the public to prevent malaria still have limitation. Therefor this study will conduct to assess knowledge, attitude and practice of bed net utilization in order to prevent malaria among Kedida gamela woreda, Kembata tembaro zone.

The use of Insecticide Treated Nets (ITNs) is one of the main malaria control strategies laid out in Ethiopia to reach the national targets to achieve malaria elimination within specific geographical areas with historically low malaria transmission and achieve near zero malaria death in the remaining Malarious areas of the country.

Increase in ITN access (i.e. household ownership) does not necessarily translate to equal increase in utilization. Because, the success of ITN utilization depends on several factors: such as, willingness of people to use nets, inconvenience to hang the nets, educational background, place of residence, age and gender differences, and color of nets. This indicated that appropriate use of bed net by the community to prevent malaria still have limitation. Therefore, this study will be con ducted to assess knowledge, attitude and practice of bed net use to prevent malaria among Kedida gamela woreda.

Literature review

Malaria in Ethiopia

Malaria in Ethiopia is one of the most important public health problems, with more than three quarters of the landmass of the country and an estimated 68% of the total population is considered at risk of malaria infections. (1,2)

Two of the plasmodium species are of epidemiological importance in Ethiopia. P. *falciparum* accounts for 60% and P. *Vivax* for the remainder. Forty-Two Anopheles species have been recorded, with distribution varying by altitudinal zone and microhabitats. The four malaria vectors (Anopheles. *arabiensis*, An. *Pharoencis, An. funestus and An. nili)* are widely distributed. However, Anopheles arabiensis is the most important vector and responsible for most epidemics in the country.

A study done in Raya Alamata District, Tigray, Ethiopia showed that of 667 households in Malarious villages in Raya Alamata district with LLINs in their home were selected for the study,
Among all households 445(68.6%) of them were utilizing the LLINs and the rest 204(31.4%) of them were not using the net. The net was given based on the size of the family and some of the household had more than one net. Accordingly, among all the households 314(41.2%) of them had more than one LLINs. In terms of number from the total available 1015 LLINs, 678(66.8%) were used. In this study the utilization of LLINs is 68.6% and significant number, 31.4% of households do not use their net. These findings justify that there is a considerable discrepancy between the distribution and utilization of the net. In addition, the finding indicates that even though the household own the net they do not utilize for the intended purpose and this may affect the program for intervention.

Another study done in west Gojjam zone, Ethiopia showed that a total of 79(20.8%) households had no mosquito net, 173(45.5%) had one net, 101(26.6%) had 2 nets while 27(7.1%) had three. Not all mosquito nets were used over the sleeping areas. One hundred forty-one (46.8%) were hanged, 93(30.9) were stored after use, 53(17.6%) were used for other purposes and 14(4.5%) were in package. Relatively the distribution of LLINs in this study is lesser than that of the previous study but the absence of appropriate utilization is still the major drawback in both areas.

Objectives

General objective

- The overall objective of this study is to Assess knowledge, Attitude and practice of ITNs utilization to prevent malaria in Tembaro woreda, SNNPR Ethiopia.

Specific objectives

- To Assess knowledge and Attitude of respondents about Malaria and ITN utilization
- To Assess the proportion of households with Bed net (Ownership)
- To identify factors affecting ITNs utilization

Research methodology

Study area

The study area will be Kedida gamela woreda located in SNNPR Ethiopia. Kedida gamela woreda has 110,975 total populations, with 55,377 males and 55,598 females, 17,323 under 5, 25,857 women of reproductive age (15 – 49 yrs.) and 3840 pregnant women and also there are 4 health centers and 19 health posts present in the woreda.

Study design

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

Data collection method and sampling procedure

A structured questionnaire will be used to collect the data. The data will be collected by 12 data collectors and supervise by 3 supervisors. From the woreda 3 kebeles were selected based on highest malaria case reported of 2015 and by using random sampling households.

Data analysis and clearance

Data will be entered, cleaned and analyzed by using Epi info 7 and Microsoft Excel.

Sample size and Sampling procedures

The study sample size will be calculated using a formula on single population proportion. It is calculated considering the study done in Raya Alamata District. Assuming that utilization of bed net to prevent malaria in the area was, P = 0.69, confidence interval 95% and 5% error of estimate.

To determine the sample size, we use the following formula

The following formula was used to calculate the sample size:

***N= (Zα/2)2 P(1-P) / D2**

Where **N** = sample size

P =68.6 % (Proportion of ITN users)

Z α/2=1.96 (Z=score corresponds to 95% confidence interval), **D**= 0.05 (Margin of error)

The sample size was calculated as 332 households which are registered as having ITN, then as a final sample size 365 was calculated by adding 10% Non-respondents because it helped to address our objectives of household net ownership coverage in addition to utilization among the population.

Ethical Issues

The study will be conducted after getting Ethical clearance from ethical committee of the public health facility and also permission obtained from regional health bureau and zonal health office. Before interview oral consent with each respondent is mandatory.

Data quality

The questionnaire will be prepared first in English and then will be translated in to local language then back to English to get reliable information. Pretest of the questionnaire and training of data collectors and supervisors will be conducted. Data collectors and supervisors will review every questionnaire for completeness and consistency, then checked by the principal investigator every day in the field work. Data cleaning will be conducted next to data entry.

Operational Definitions

Malaria - A febrile illness caused by plasmodium parasite

Knowledge – what the individual knows about malaria prevention

Attitude - assessment of respond in favor or disfavor to malaria prevention

Practice – how respondents are actually practicing

Inclusion criteria

House hold head/ leader or adult member of the house hold, volunteer to participate in the study.

Exclusion criteria

Children, relatives who come during the study period.

Variables

Dependent variables

- Practice on ITN utilization to prevent malaria

Independent variables

- Knowledge and attitude of the community
- Socio-economic characteristics eg. Age, educational level, income
- Living room (housing condition)
- Availability of ITN in the house hold

Consent Form

Objective - To assess Knowledge, Attitude and Practice of bed net use to prevent malaria infection among Kembata tembaro zone in Kedida gamela woreda SNNPR Ethiopia.

This study questioner will take about 20 minutes of your time, During the study time we will clearly explain you the objective, Advantage and risk of the study. We will ask you about the knowledge, attitude and practice of bed net use among your family, all information discussed during the study will be kept private.

Benefits - This study will help to enhance knowledge, attitude and practice of bed net to prevent malaria transmission.

- There is no risk to you answering the questions
- We will keep information about you private, we will not write your name.
- There is no payment to you.

Agreement

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

- Date of interview_____
- Participant signature_____
- Supervisor name_____
- Signature_____
- Date _____

Table 32. Project Implementation Period

Activities	Time in Month			
	June	July	August	September
Training of data collectors	*			
Pretesting questioners	*			
Data collection		*		
Data analysis			*	
Report writing			*	
Progress report submission			*	
Final report submission				*

Table 33. Budget breakdown of KAP assessment of bed net use to prevent malaria in Kedida gamela woreda SNNPR 2017.

Items	unit	Quantity	Unit price		Total price Birr
Notebooks	pcs	20	12		240
Pen	pack	1	500		500
Photocopy paper	pack	4	300		1200
Pencil	pcs	4	4		16
Eraser	pcs	4	5		20
Sharper	pcs	4	10		40
Flip chart	Pcs	2	50		100
Marker	Pcs	4	50		200
Perdium				Duration	
Principal investigator		1	300	15	4500
Supervisors		3	200	15	9000
Data collectors		12	150	15	27,000
Training					
Project coordinator		1	300	300x 3	900
Field super visor		3	200	3x 200x 3	1,800
Data collector		12	150	12x150x 3	5,400
Driver	Perdium	1	300	300x 15	4,500
Vehicle rent		1	500	500 x 15	7,500

Grand total-62,916 Birr.

Reference

1. Dawit siraw, D. D. (2013). "Assessment of ownership and factors affecting utilization of insecticide treated bed nets in Dembecha woreda, west Gojjam zone, Ethiopia."

2. Girmay Desta Araya, H. L. R., Azeb Gebresilassie Tesema (2011). "Utilization of long lasting insecticidal nets among household in Malarious areas of Raya Alamata district, Tigray, Ethiopia."

3. health, F. m. o. (2007). "Ethiopia malaria indicator survey on 2007 EHNRI Addis Ababa."

4. health, F. m. o. (2011). "Ethiopia National malaria indicator survey 2011."

5. health, F. m. o. (2012). "Federal ministry of health malaria guideline ".

6. health, F. m. o. (2015). "Public health emergency management surveillance data."

7. health, F. m. o. (2007). "Ethiopia malaria indicator survey on 2007 EHNRI Addis Ababa."

8. health, M. o. (2011). "Health and health related indicators 2011."

9. organization, W. h. (2011). "Epidemiological approach in malaria control."

10. Yemane Berhane, D. H. M., Helmut Kloos (2006). Epidemology and ecology of health and disease in Ethiopia

11. Zewdneh Tomas, T. D. a. D. K. (2007). "Knowledge, Attitude and Practice (KAP) about Insecticide Treated Nets(ITN) usage against Malaria in Kolla Tembien district, Tigray."

Chapter VIII

Other Additional output report

Chapter 8 – Other Additional output report

Public health emergency management weekly bulletin

Introduction

This Epidemiological Weekly Bulletin serves to provide key information on public health emergency management activities, and summarizes surveillance data and performance on epidemic prone diseases and other public health emergencies. The bulletin mainly includes surveillance data of week 15 of 2017 and daily phone communication, line list reports+ of outbreaks for week 16 of 2017. It highlights the surveillance completeness and timeliness across the regions, trends of diseases under surveillance, cluster of cases and events, ongoing outbreaks and responses undertaken at all levels in Ethiopia. The numbers of disease specific cases indicated in this issue of bulletin are subject to change due to on-going receiving late surveillance data and retrospective verification and investigation of data from outbreak areas.

National Surveillance Data Summary

Table 34: Comparison of surveillance data by corresponding week, week 14 and 15, 2017

Indicators	2017		
	Week 14	Week 15	% Change
Percent of Health Facility reported	90.89%	90.18%	-0.8
Percent of Health Facility reported timely	90.89%	90.18%	-0.8
Total Malaria Confirmed and Clinical	15,550	14759	-5.4
Typhoid fever	24,831	21566	-15.1
Dysentery	6,654	6377	-4.3
Epidemic Typhus	8,426	7093	-18.8
Measles	130	65	-100.0
Severe Acute Malnutrition	4286	3792	-13.0
Rabies exposure	63	45	-40.0
Meningitis	39	31	-25.8
Relapsing fever	46	56	17.9
AFP	15	8	-87.5
Anthrax	11	11	0.0
Neonatal Tetanus	2	4	50.0
Avian Human Influenza	0	0	0.0
AWD	143	72	-98.6
Polio	0	0	0.0
Drancunculiasis/Guinea worm	0	0	0.0
Pandemic Influenza	0	0	0.0
SARS	0	0	0.0
Small pox	0	0	0.0
Yellow Fever	0	0	0.0
Viral hemorrhagic fever	0	0	0.0
Maternal Death	31	15	-106.7

III. Public Health Surveillance Reporting Completeness and Timeliness Rates

Public Health Surveillance Reporting Completeness Rate

The national surveillance completeness rate was 90.2% in the week which is above the minimum requirement (80%). Afar, Dire Dawa, Gambella and Somali Regions had achieved below the minimum requirement during the week (Fig 1).

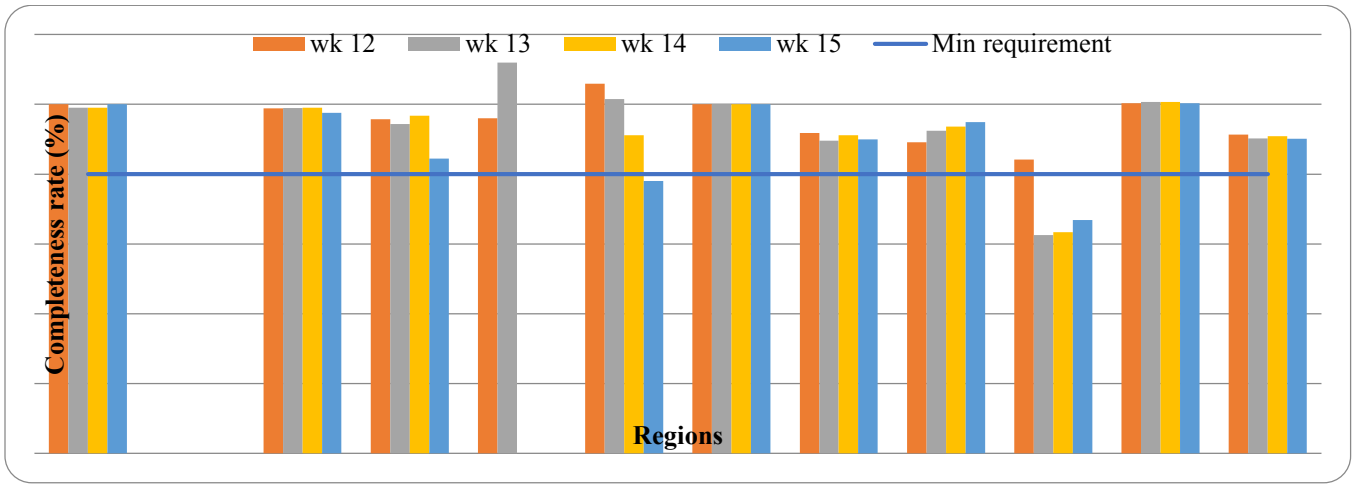


Figure 15: Surveillance data completeness rate by regions, week 12-15, 2017, Ethiopia.

Public Health Surveillance Reporting Timeliness Rate

During week 15, the national surveillance timeliness rate was 90.2% which is below the minimum requirement. Afar, Dire Dawa, Gambella and Somali Regions had achieved below the minimum requirement (Fig 2).

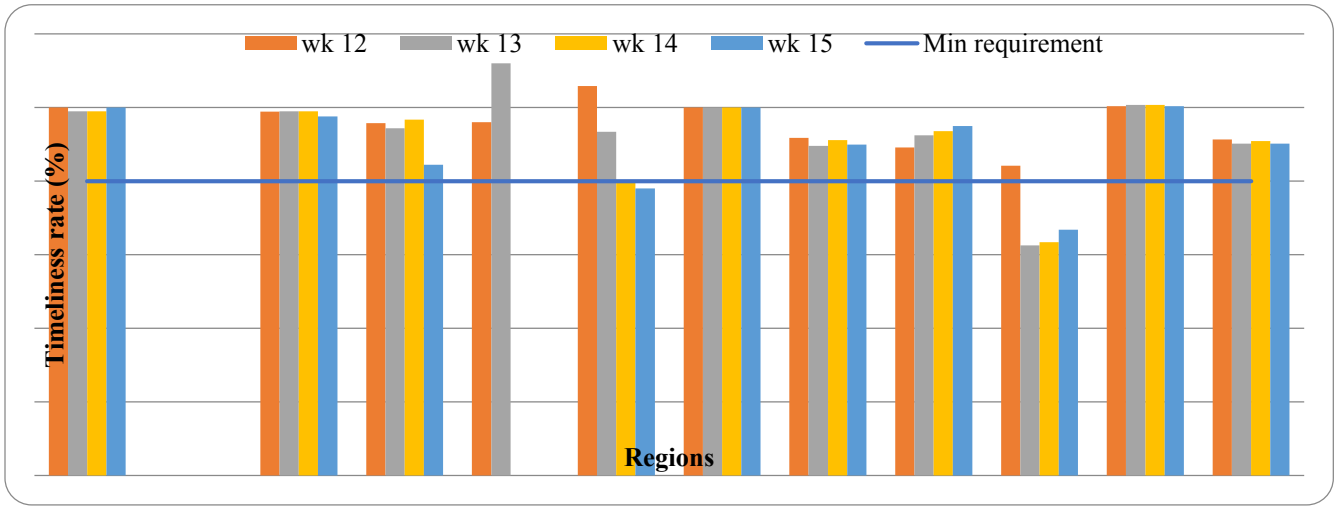


Figure 16: Surveillance data timeliness rate by regions, week 12-15, 2017, Ethiopia.

1. Malaria

During the week a total of 100604 health facilities visitors were suspected and examined for malaria of which 14.7% (14759) cases were treated as malaria which is 5.4% (791 cases) lower than the last week. There was no death reported during the week. Plasmodium falciparum contributes the highest portion, 59.8% (8820 cases) of the cases.

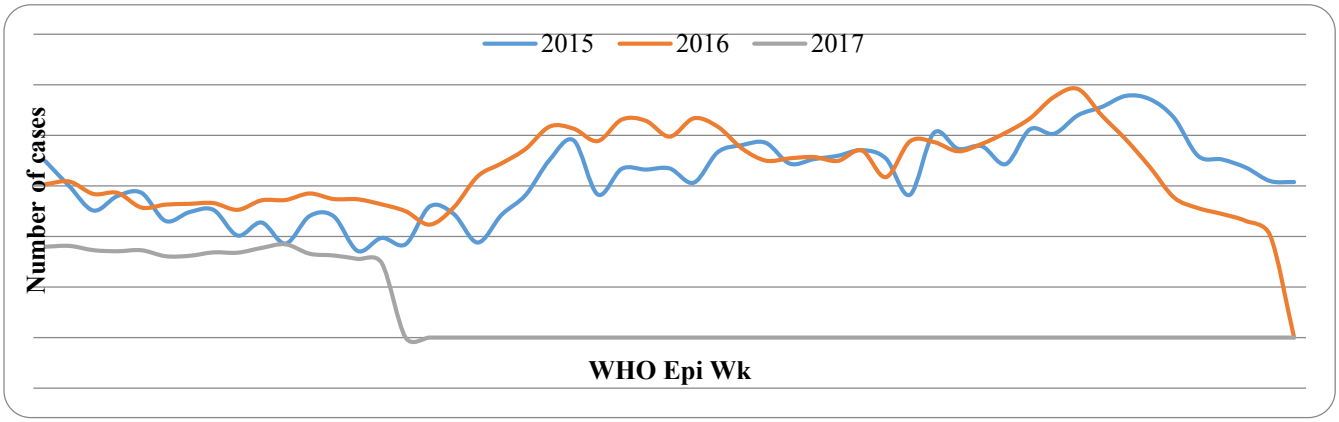
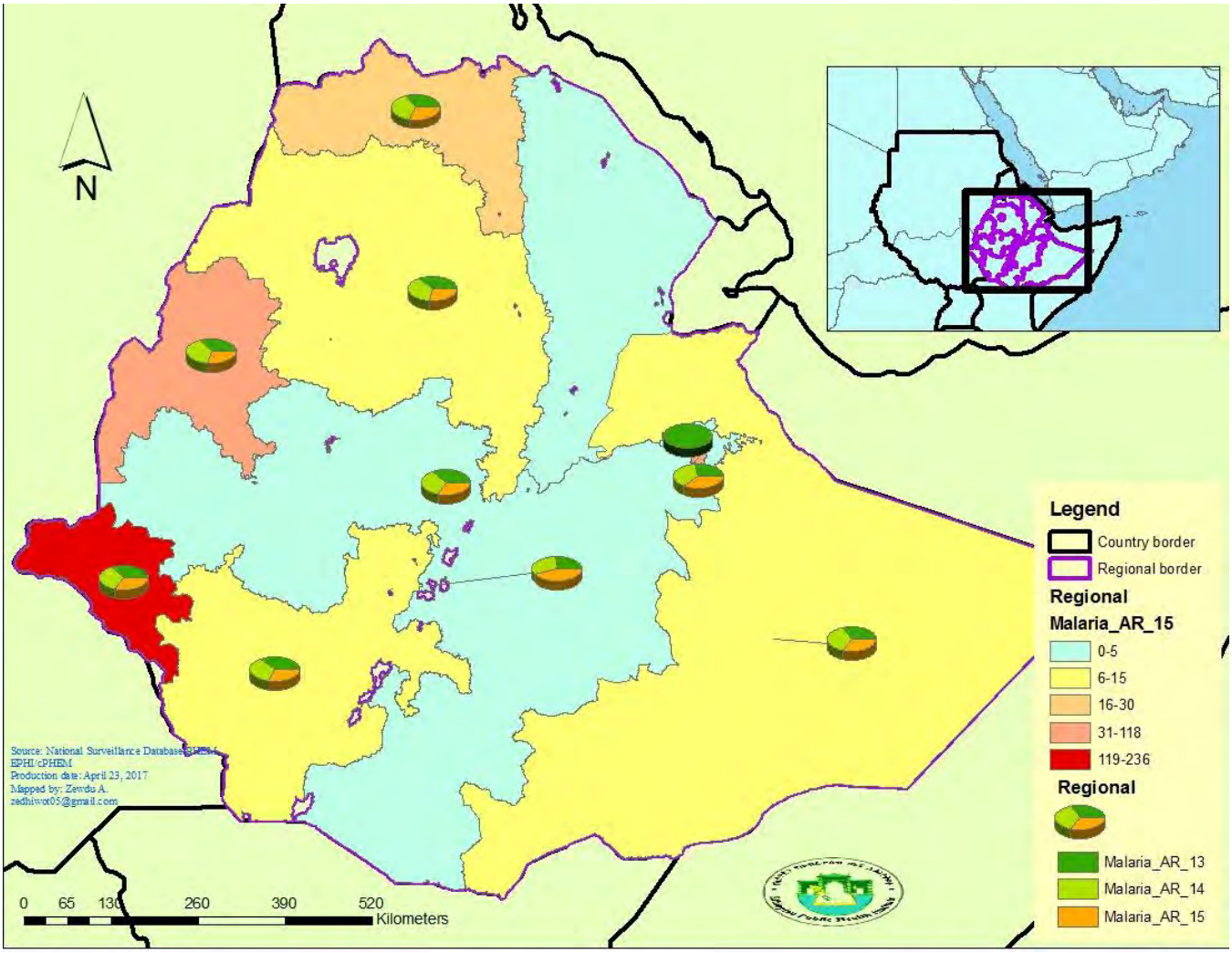


Figure 17: National malaria (clinical and laboratory confirmed) trend by week from 2015-2017, Ethiopia.

The malaria attack rate per 100,000 populations is highest in Gambella (245.1) followed by Benishengul Gumuz Region (146.3) during the week. The top ten leading malaria case report during the week was from Oromia followed by SNNP Region.

Table 35: Top ten total malaria (confirmed and clinical) reporting sites, week 15, 2017, Ethiopia.

Woreda	Zone	Region	Cases	Percent of contribution
Shashamane Town	Shashamane Town	Oromia	944	6.4
Arba Minch Town	Gamo Gofa	SNNPR	472	3.2
Gambella Town	Agnuwak	Gambella	261	1.8
Kemba	Gamo Gofa	SNNPR	243	1.6
Metema	North Gondar	Amhara	198	1.3
Assosa Town	Assosa	Benishangul-Gumuz	191	1.3
Kucha	Gamo Gofa	SNNPR	182	1.2
Konta Special Town	Konta Town	SNNPR	181	1.2
Dima	Agnuwak	Gambella	177	1.2
Etang	Etang Spe.	Gambella	164	1.1
Grand Total			**3013**	**20.4**



Map 7: Malaria attack rate per 100,000 populations by regions, week 15, 2017, Ethiopia.

A total of 1665 cases (11.3%) of malaria were treated clinically nationwide while 53.2% and 38.5% were treated clinically in Somali and Oromia Regions respectively. The slide positivity nationwide during the week was 14.5% while 72.7% in Somali Region followed by Gambella Region, 45.3%.

2. Meningitis

During week 15 of 2017 a total of 25 suspected meningococcal meningitis cases were reported from, SNNP (14), Oromia (5), Amhara (2), Gambella (1), Benishangul Gumuz (1) and Somali Region (1) without death. The suspected cases had decreased by 25.8% as compared to the last week.

There was no woreda in which the alert threshold was passed during the week (Map 2).

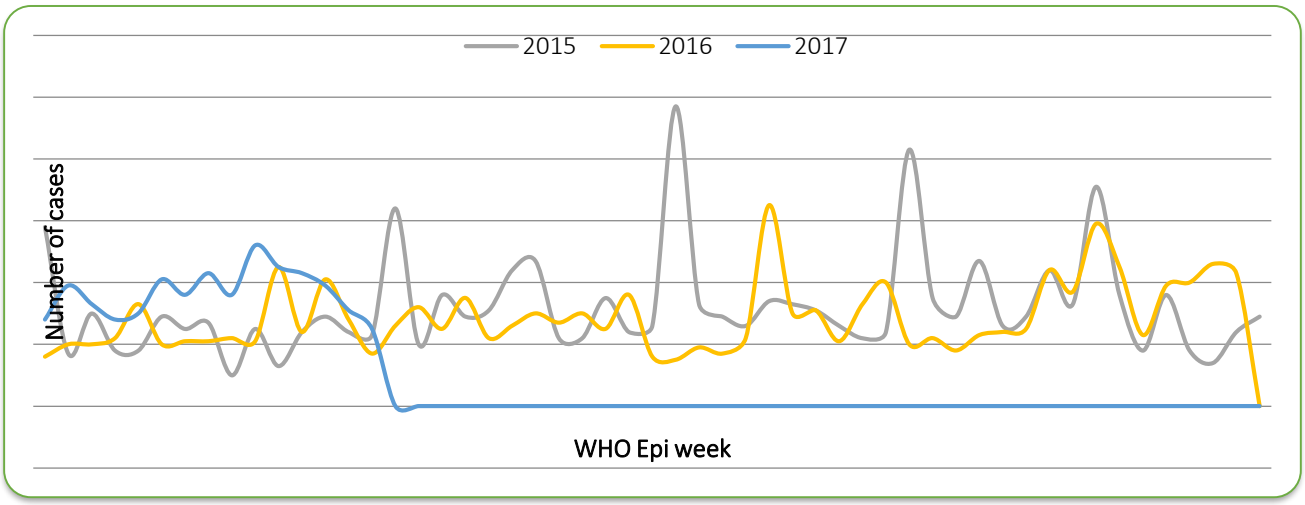
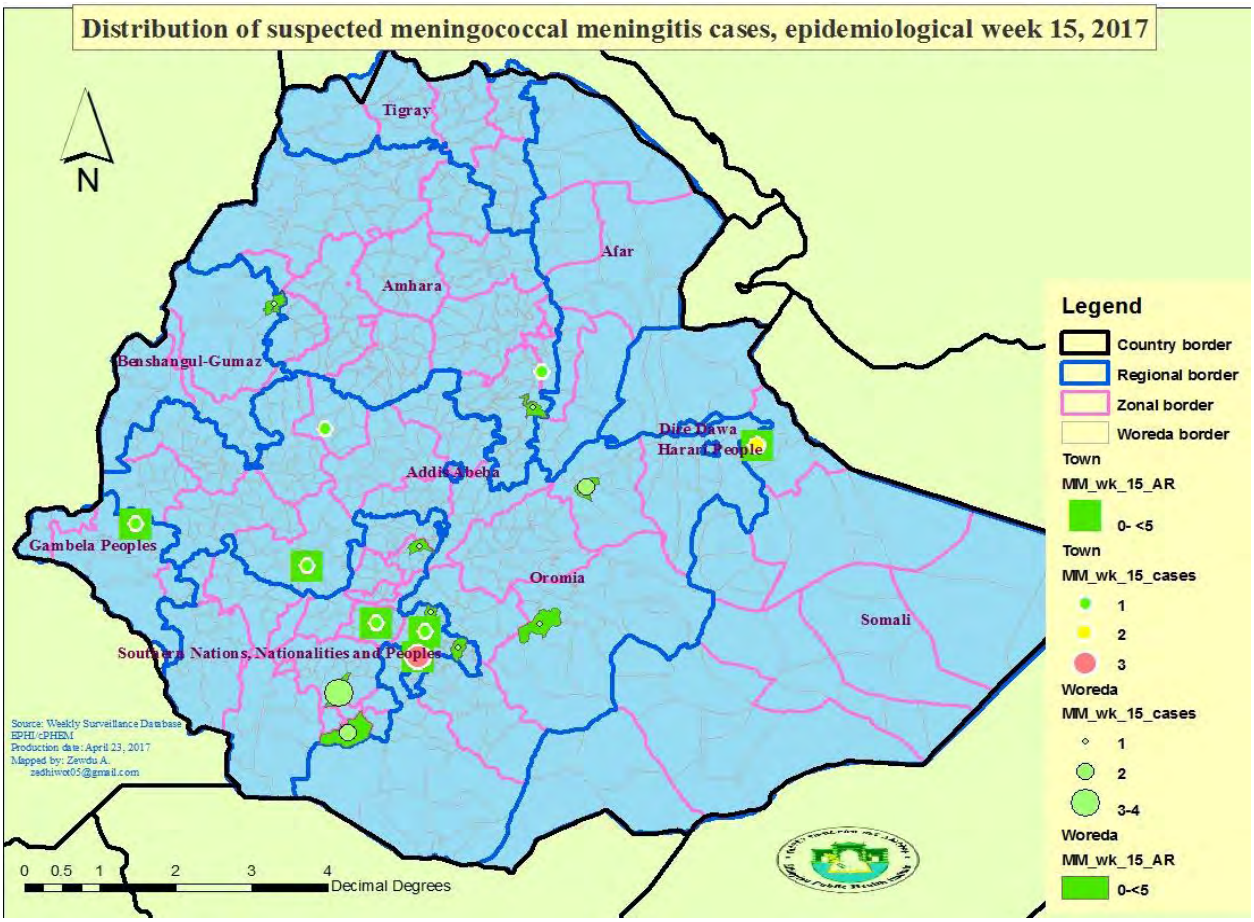


Figure 18: Trend of suspected meningococcal meningitis cases over week, 2015-2017, Ethiopia.



Map 8: Suspected meningococcal meningitis cases distribution and attack rate per 100,000 populations by woreda, week 15, 2017, Ethiopia.

3. Dysentery

During week 15, a total of 6377 dysentery cases were reported showing 4.3% (277 cases) decrement as compared to week 14 of 2017.

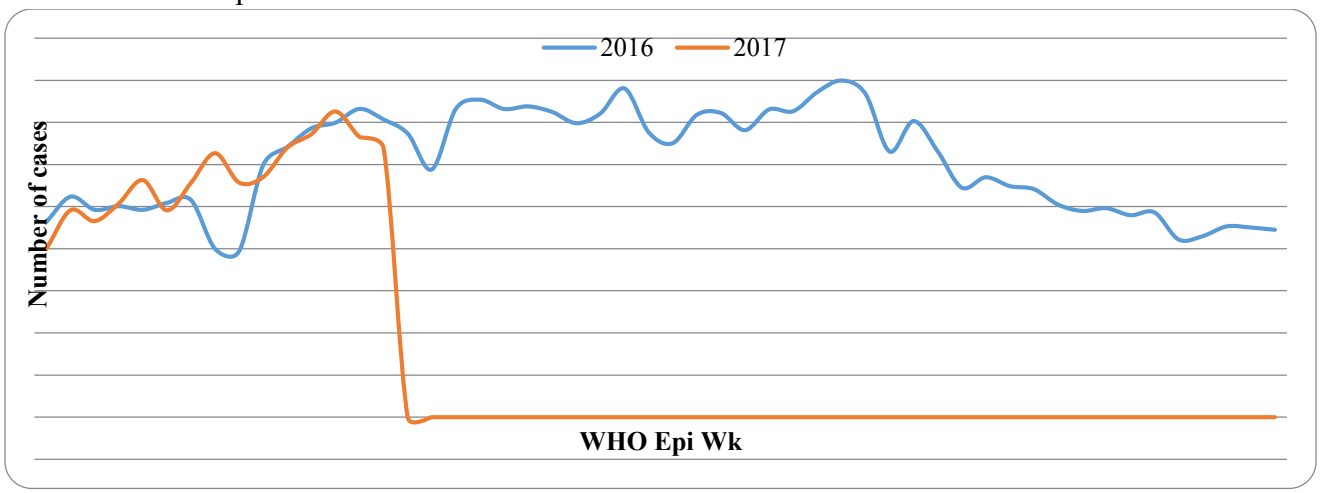


Figure 19: Dysentery cases trend by week, 2016-2017, Ethiopia.

The national attack rate per 100,000 population during the week is 6.62 and Harari, the second highest in the last week, was with highest attack rate (26.3/100000) followed by Gambella (AR=15.8/100000) and Benishangul Gumuz Region (AR=15.3/100000)

4. Tyhoid Fever

During week 15, a total of 21566 cases of typhoid fever were reported which is 15.1% (3265) lower than the last week of the same year.

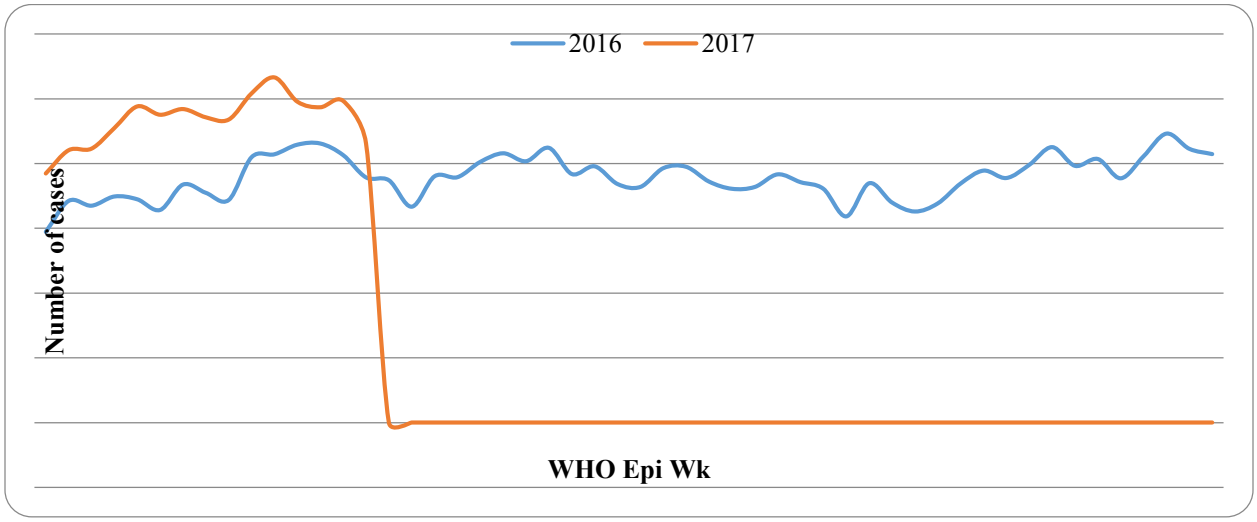


Figure 20: Tyhoid fever cases trend by week, 2016-2017, Ethiopia.

Addis Ababa City Government is highly affected (AR= 89.75/100000) followed by Benishangul Gumuz Region (AR= 89.5/100000) during the week while nationwide 22.37 per 100,000 population were affected by typhoid fever.

5. Relapsing Fever

A total of 56 cases of relapasing fever were reported during week 15, which is 17.9% (10 cases) higher than the week 14 of 2017 cases. Nationally, about 1 persons per million population were affected while 10 and 1 persons per million were affected in Addis Ababa City Government and Tigray Region respectively during the week.

6. Epidemic Typhus

A total of 7093 cases of epidemic typhus were reported during week 15, which is 18.8% (1333 cases) lower than the week 14 of 2017 cases.

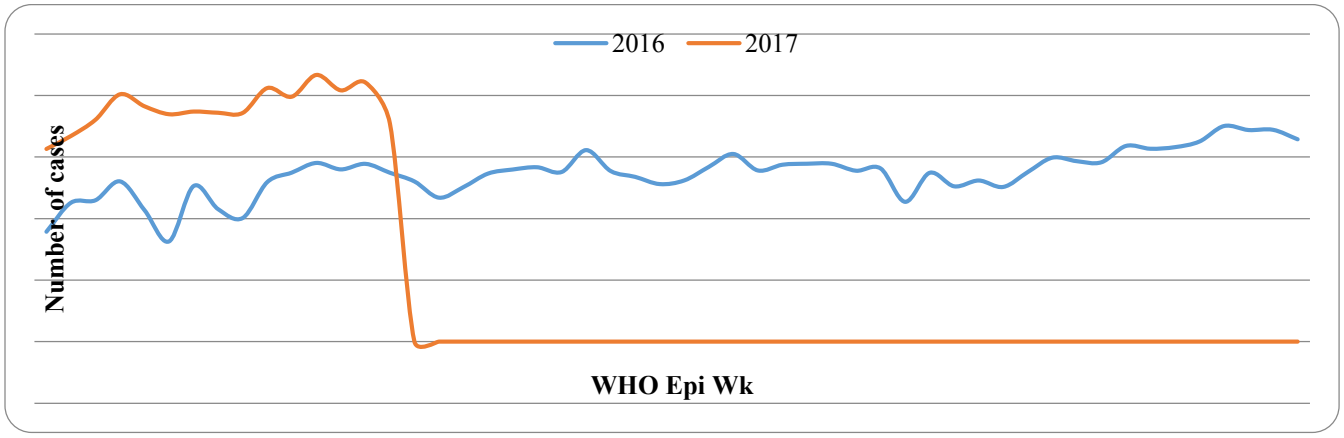


Figure 21: Epidemic typhus cases trend by week, 2016-2017, Ethiopia.

Nationwide about 74 persons per million populations were affected by epidemic typhus while in Addis Ababa and Benishangul Gumuz Region about 66 and 11 persons per 100000 population were affected respectively during the week.

7. Severe Acute Malnutrition

During week 15 of 2017, a total of 3792 cases were reported which showed 13% (494 cases) decrement as compared to last week. There were a total of three deaths, from Amhara, Oromia and SNNP regions making the case fatality ratio of 0.08% nationally.

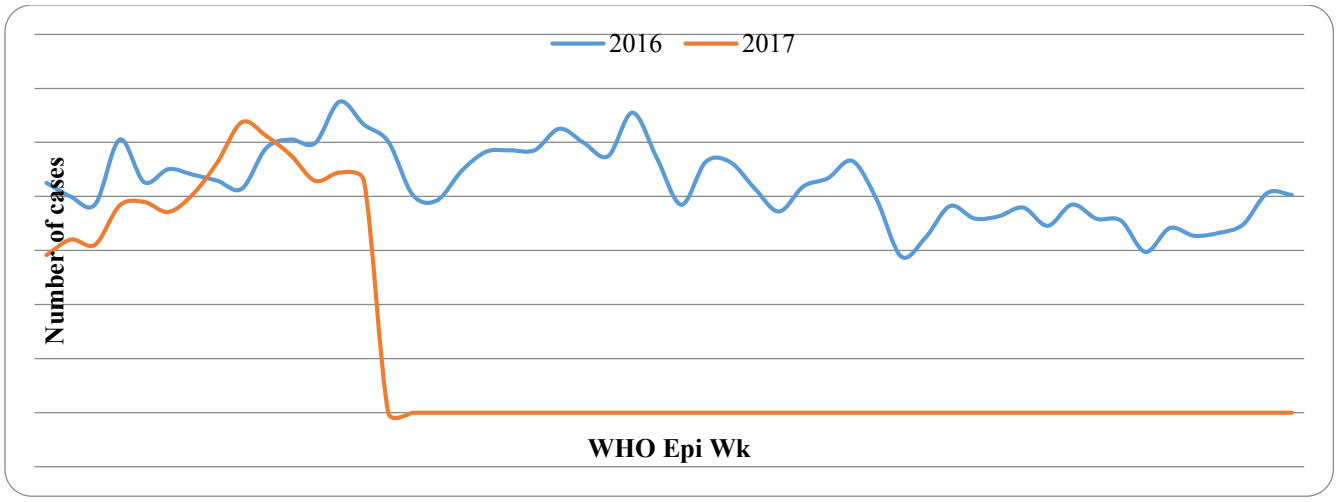


Figure 22: Epidemic typhus cases trend by week, 2016-2017, Ethiopia.

The top ten leading woredas were from Somali, Oromia and SNNP Regions.

Table 36: Top ten severe acute malnutrition cases reporting sites, week 15, 2017, Ethiopia.

Woreda	Zone	Region	Cases	Percent of contribution
Hargele	Afder	Somali	250	6.6
Girawa	East Hararge	Oromia	87	2.3
Bedeno			83	2.2
Dolo Bay	Afder	Somali	79	2.1
Siraro	West Arsi	Oromia	73	1.9
Fedis	East Hararge		65	1.7
Boreda	Gamo Gofa	SNNPR	60	1.6
Shashemene Rural	West Arsi	Oromia	53	1.4
Shala			51	1.3
East Ime	Shabelle	Somali	50	1.3
Grand Total			**851**	**22.4**

8. Acute Flaccid Paralysis

During the week a total of 8 suspected AFP cases were reported showing 87.5% (7 cases) decrement as compared to last week from four regions (table 4).

Table 37: Distribution of suspected AFP cases by woreda, week 15 of 2017, Ethiopia.

Region	Zone	Woreda/Town	AFP suspected cases
Amhara	North Shewa	Asagert	1
	South Gonder	Dera	1
		Libokemkem	2
	South Wollo	Kombolcha Town	1
		Tehuledere	1
Oromia	Arsi	Sire	1
	East Wellega	Gida Ayana	1
Grand Total			**8**

9. Anthrax

A total of 11 suspected anthrax cases were reported from four woredas of Amhara and Tigray Regions (table 5). Eight of the cases were reported from Amhara Region while the rest of the cases were reported from Amhara Region.

Table 38: Distribution of anthrax suspected cases by woreda, week 15 of 2017, Ethiopia.

Region	Zone	Woreda/Town	Anthrax suspected cases
Amhara	South Gonder	Tach Gayint	1
	Wag Himra	Sehale Seyemt	5
		Zikwala	2
Tigray	Central Tigray	Tanqua Abergele	3
Grand Total			**11**

10. Measles

During week 15, a total of 65 suspected measles cases were reported. Thirty-four reporting sites reported one or more while seven reporting sites reported three or more suspected measles cases and as compared to last week there is 100% (65 cases) decrement. There was one death reported from Somali Region, Fik Hospital resulting in nationwide case fatality rate of 1.5%.

Table 39: Reporting sites that have reported at least three suspected measles cases, week 15 of 2017, Ethiopia.

Region	Zone	Woreda/Town	Measles suspected cases
Amhara	East Gojjam	Baso Liben	3
	North Shewa	Debrebrehan Hospital	8
		Merhabete	3
	South Wollo	Sayinit	7
Oromia	East Hararge	Bedeno	4
	Jimma Spe Town	Jimma Spe Town	3
Somali	Faafan	Harshin	5
Grand Total			**33**

11. Neonatal Tetanus

Four suspected cases of NNT were reported from Jimma Special Town of Oromia Region and Loka Abaya woreda of SNNP Region. Additionally, two deaths were reported from Jimma Special Town of Oromia Region.

12. Rabies Exposure

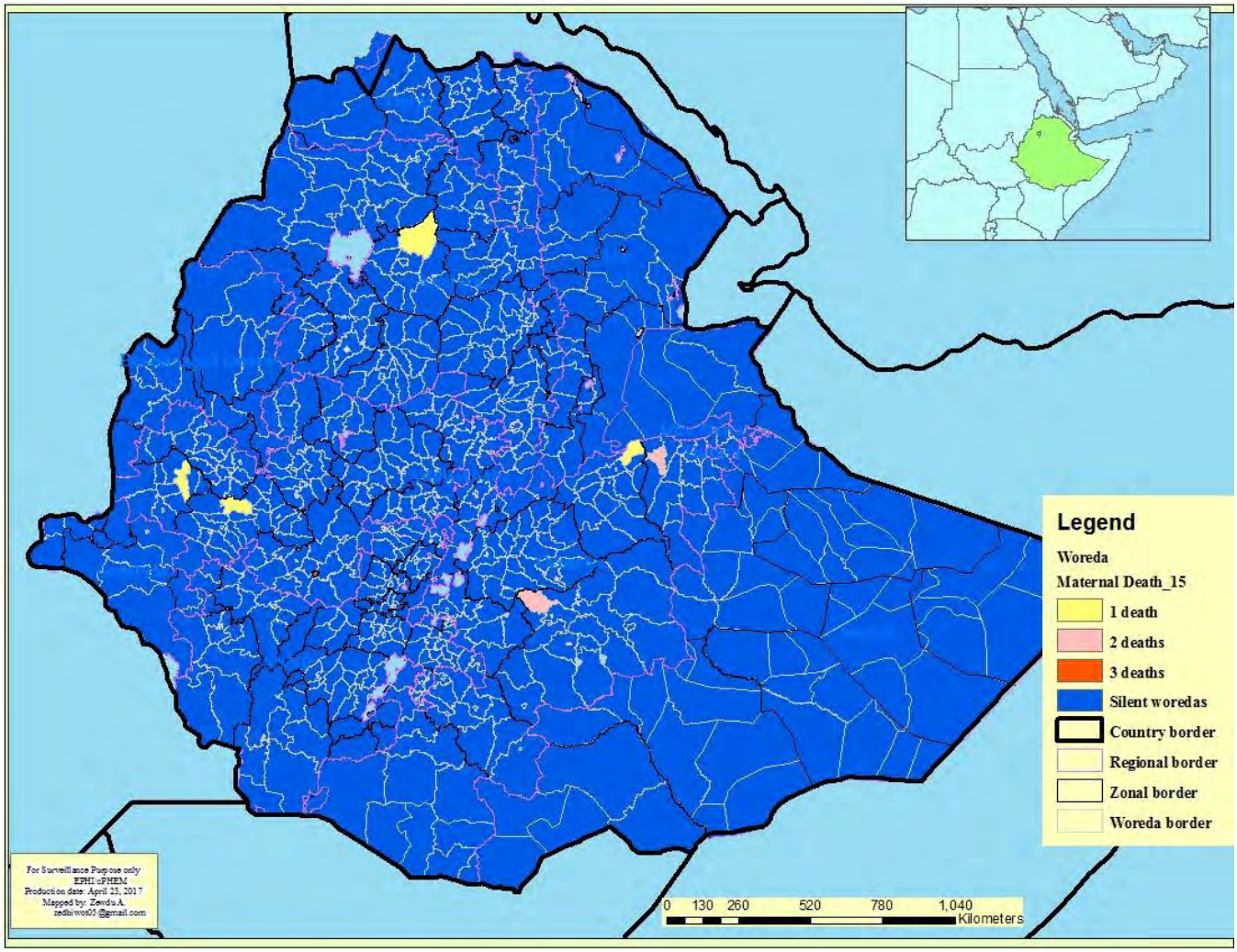
A total of 45 exposure cases with one death were reported from 11 reporting sites of six regions. There was 40% (18 cases) decrement as compared to last week.

Table 40: Reporting sites that have reported rabies exposure cases, week 15 of 2017, Ethiopia.

Region	Zone	Reporting sites	Exposure cases
Tigray	Central Tigray	Aksum Town	5
Amhara	West Gojjam	Bure Zuria	1
SNNPR	Gedio	Dila Town	7
Amhara	Gonder Town	Gonder Town	8
Benishangul-Gumuz	Maokomo Special	Maokomo	2
Amhara	Wag Himra	Sehale Seyemt	1
Oromia	Shashamane Town	Shashamane Town	2
Amhara	East Gojjam	Shebel Berenta	1
Tigray	Mekele Especial Zone	South & North Mekele	8
Amhara	Wag Himra	Tefera Hailu Hospital	7
Addis Ababa	Arada	Yekatit 12 Hospital	3
Grand Total			**45**

13. Maternal Death

During the week a total of 15 maternal deaths were reported from 11 reporting sites of Oromia Region (11 deaths), Amhara Region (2 deaths) and SNNP Region (2 deaths).



Map 9: Maternal death distribution by woreda, week 15 of 2017, Ethiopia.

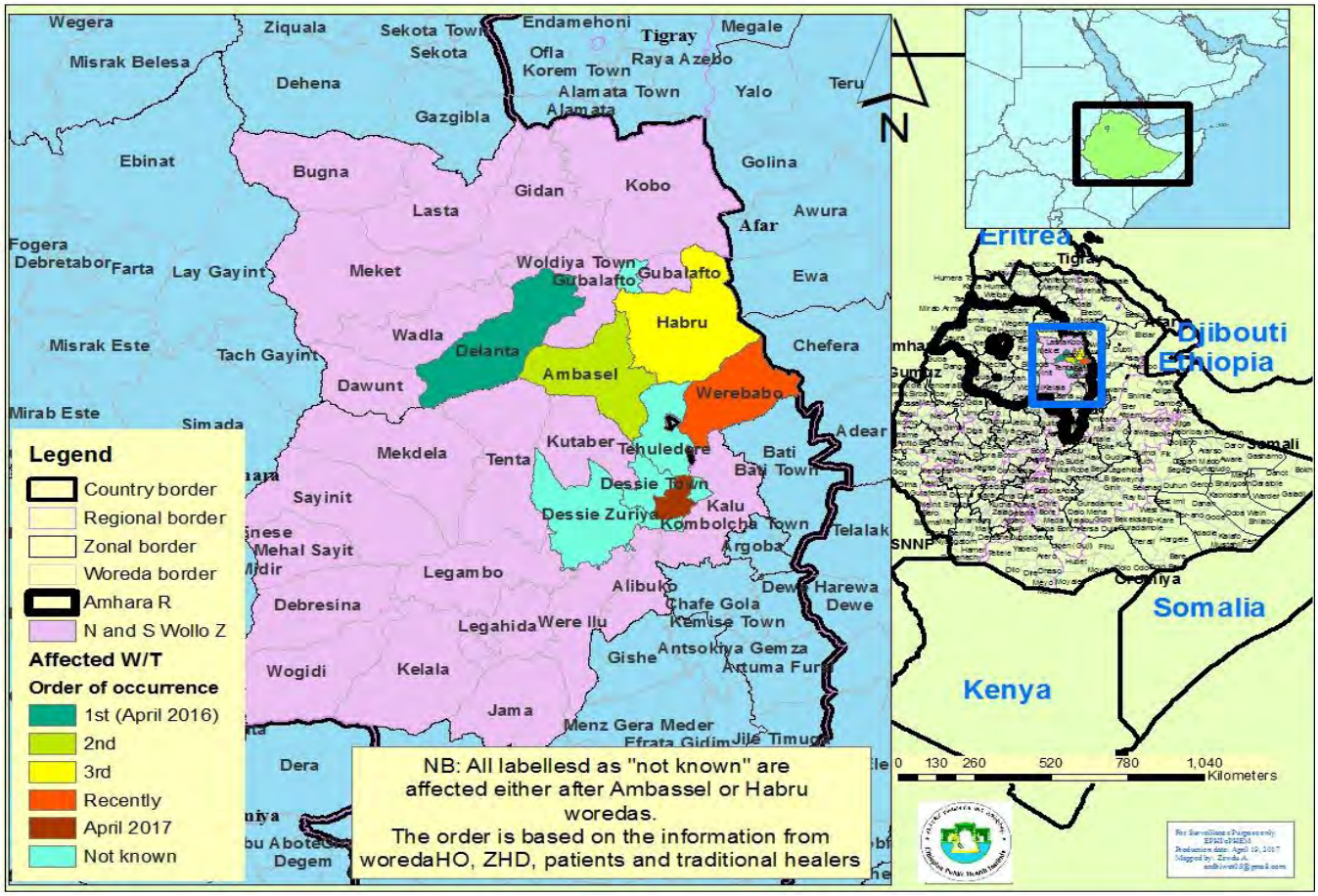
V. Diseases/Conditions Outbreaks

1. Acute Watery Diarrhea Outbreak

Acute watery diarrhea outbreak is ongoing in (to be updated) woredas nationally. Currently the outbreak is ongoing in 43 woredas of Somali Region, 24 woredas of Amhara Region, 18 woredas of Afar Region and 9 woredas of Oromia Region.

2. Unknown insect infestation in Wollo Zones, Amhara Region

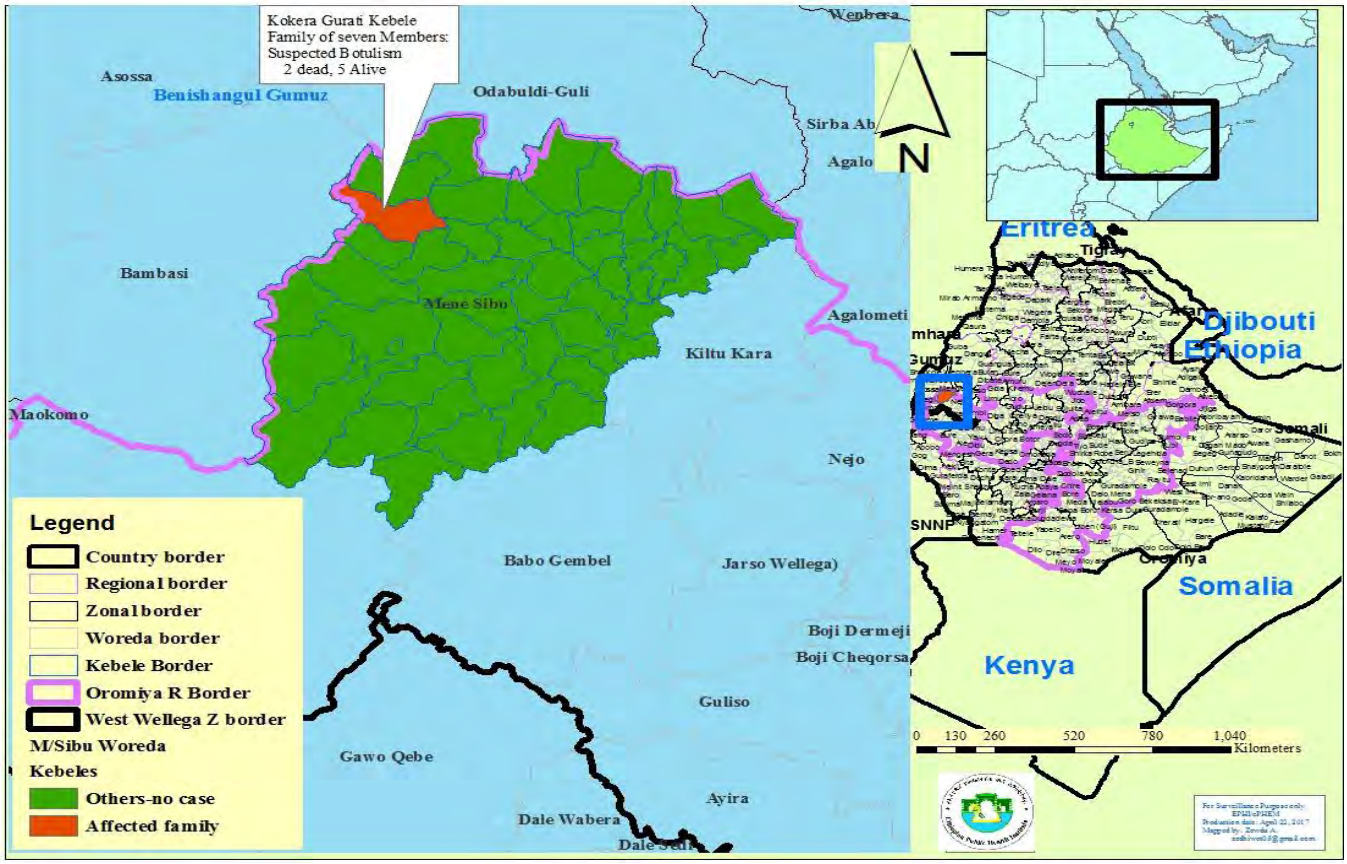
Unknown insect infestation identified as Pachnoda Interrupta by Entomologists is affecting Kombolcha Town in addition to the previously affected areas, Delanta, Ambassel, Habru, Tehuledere, Warababo, Woldia Town, Dessie Town and Dessie Zuria.



Map 10: Administrative map showing unknown insect outbreak affected areas, Amhara Regional State, Ethiopia, April 2017.

2. Suspected Botulism in West Wollega Zone, Oromia Region

A family of seven members was suspected to be affected by botulism during Easter of which two dead and three are on treatment at SPHMMC from Kokera Gurati Kebele of West Wellega Zone.



Map 11: Administrative map showing suspected botulism affected kebele, Oromia Regional State, Ethiopia, April 2017.

VI. Response to Diseases/Conditions Outbreaks

1. Response to acute watery diarrhea outbreak

Team composing of epidemiologists both from national and regional health bureaus, partners including WHO, UNICEF, MSF and Save the Children are enhancing the response to the AWD outbreak. Case management, surveillance, WASH and social mobilization are maintained and strengthened.

2. Response to unknown insect outbreak

Based on the preliminary report of national investigation team multidisciplinary team was established, checklists to further study the situation and protocols to collect samples were prepared for further study.

3. Response to suspected botulism

Epidemiological investigation by all level PHEM is underway in addition to care provision to the suspected cases at SPHMMC. The critical suspected cases were given antitoxin and serum and stool samples were collected for testing in addition to food left over and environmental samples.

Annex

Annex 1

SURVEY QUESTIONNAIRE

This survey is conducted by the Ethiopian Public Health institute in collaboration with WHO as part of the ongoing response to the Acute Watery Diarrhea (AWD) outbreak in Addis Ababa. All personal information collected through this survey will be handled confidentially and your name is not required. The survey is being conducted to improve prevention measures against AWD and stop further spread. You may wish to withdraw at any stage of the interview.

Part A - General information

1.serial NO/code

2.case ☐ control ☐

3.Age (in year)

4.Sex - Male Female

5.Main current occupation

6.Residential Address

7.Sub city

8.Telephone Number

Clinical information (for cases)

1. Date of onset (dd/mm/yyyy)
2. Presenting symptoms

   Watery diarrhea ☐ Vomiting ☐ Dehydration ☐ Others ☐ (specify)
3. Hospitalized? Yes ☐ No ☐
4. Date of hospitalization (dd/mm/yyyy)

Part B – Water Exposures

1.What is your regular source of water for domestic use in the last 5 days?

Household Tap water ☐ communal tap water ☐ River ☐ Well ☐

Borehole ☐ Spring ☐ Street vended water ☐

Tanker water ☐ Bottled water ☐ Others(specify) ☐

2. what was your regular source of drinking water within the last five days?

House hold Tap water ☐ Communal tap water ☐ River Well ☐ ☐

Borehole ☐ spring ☐ street water ☐ Tanker water(Roto) ☐

Bottled water ☐ others(specify) ☐

3.Did you treat the water before drinking? yes ☐ No ☐

4. If yes, how did you treat it? Filter ☐ Boiling ☐ Aqua tab ☐

Water guard ☐ Bishangare ☐ pure ☐ other (specify) ☐

5.Did you drink water from a holy water site in the last five days? Yes ☐ No ☐

6.If yes, what is the source of the holy water? spring ☐ piped water ☐ well ☐

Others (specify) ☐

Food and Beverages

6.Did you eat any of the following food items in the last 5 days?

Vegetable salad ☐ Fruits ☐ Any type of raw meat ☐

partially Roasted meat ☐ Fish ☐ Unboiled fresh milk ☐

others (specify) ☐

7.Wher did you get (or by) food for your household?

Local market ☐ private garden/farm ☐ Street shops ☐ supermarkets ☐ Others (specify) ☐

8.Did you eat food outside your home in the last 5 days? Yes ☐ No ☐

9.If yes, where? Sold by street vendors ☐ Hotel ☐ Restaurant ☐

At a gathering ☐ school/work cafeteria ☐ others (specify) ☐

10.Did you eat any cold left over food in the last 5 days? Yes ☐ No ☐

11.If yes, where is the source of the food? Home ☐ Hotel ☐ Others(specify) ☐

12.Did you drink any of the following locally- made beverages in the last 5 days? shameta ☐ Beso ☐ other ☐

Hygiene and sanitation

13. Do you regularly wash your hands with soap before eating? Yes ☐ No ☐

14. Do you have a latrine? Yes ☐ No ☐

15. IF yes, is the latrine communal or private? Communal ☐ Private ☐

16. If No to Q 15, where do you discharge human waste (faces)?

Open defecation ☐ in the river ☐ bury in the soil ☐ others(specify) ☐

17. Do you regularly wash your hands with soap after defecation? Yes ☐ No ☐

18. Where do you dispose of your refuse? Open dumping ☐ Open pit ☐ in the river ☐ Bury ☐ Burn ☐ others (specify) ☐

19.In the last one week, did anyone in your household have diarrhea or vomiting? Yes ☐ No ☐

20.Did you visit anyone having diarrhea or vomiting? Yes ☐ No ☐

21.Did you attend a funeral within the last 5 days? Yes ☐ No ☐

22. Did you travel to a place affected with diarrhea and vomiting illness? Yes ☐ No ☐

23.If yes where? (Name of kebele/ketema, woredas)

Annex 2

Questionnaire for Data collection of Rota virus outbreak, West Shewa Oromia January 2017

1.Demography

1.1 Status 1. case 2. Control

1.2 Serial number ----------

1.3 Place of interview 1. Health Center/Hospital 2. Home

1.4 Date of interview ----------

1.5 Address Region Woreda Kebele House NO

1.6 Age of the Case/Control 1. --------- Month 2. -------year

1.7 Sex of the Case /Control 1. Male 2. Female

1.8 How are you related to the child 1. Mother 2. Father 3. Other relative

1.9 Ethnicity 1. Oromo 2. Welayita 3. Amhara 4. Tigre 5. Other

1.10 Religion 1. Orthodox 2. Protestant 3. Muslim 4. Other

1.11 Occupation 1. Farmer 2. Merchant 3. Student 4. House wife

5. Government employee 6. Private employee 7. Other

1.12 Marital status/parents 1. Single 2. Married 3. Widowed 4. Divorced

1.13 Level of education of mother 1. Illiterate 2. Read and writing 3. Elementary

4. Secondary 5. Tertiary

1.14 Educational status of father 1. Illiterate 2. Read and write 3. Elementary

4. Secondary 5. Tertiary

1.15 How many rooms in the house ----------

1.16 How many people sleep in the house ----------

1.17 In the past month has the child attend a daycare 1. yes 2. No

2. Knowledge about Rota virus

2.1 Do you know about advantage of Rota vaccine 1. Yes 2. No

2.2 What is the routine age for child to be vaccinated 1. 3month 2. 6 weeks 3. Don't know

2.3 Has she/he ever been vaccinated? 1. Yes 2. No

2.4 What is the number of Rota vaccine received 1. one 2. Two 3. Don't know

2.5 If child was not vaccinated, what is the reason for not vaccinating?

1.Vaccination center or clinic too far

2. No vaccine at the site

3. other

2.6 How long does it take you to go to the Health facility from your home?

1. < 10 min 2. 10- 30 min 3. > 30mi

2.7 Since birth has the child been admitted to Hospital for the same illness? 1. Yes 2. No

3. History of exposure

3.1 Did she/he have contact with sick 1. Yes 2. No

3.2 Where did she / he have contact with sick? 1. Home 2. Neighbors 3. others

3.3 Was she / he breast feed at all? 1. Yes 2. No

3.4 For how long did the child receive breast milk? 1. ---------- 2. Don't know

4. Clinical pictures

4.1 Did the child have vomiting 1. Yes 2. No

4.2 During this illness, what was the maximum number of vomiting in24 hrs. ----------

4.3 Did the child have diarrhea? 1. Yes 2. No

4.4 What was the maximum number of diarrhea in 24 hrs. ----------

4.5 How many days before admission did diarrhea Begin? ----------

4.6 What was the child dehydration status 1. Sever 2. Mild 3. Normal

4.7 On admission what was the child's thirst status 1. Drank normally 2. Thirst, drank eagerly 3. Drank poorly 4. Don't know

4.8 What type of medication the child received? 1. ORS 2. Iv medication 3. Tablet

5. Wash

5.1 Do you Have latrine? 1. Yes 2. No

5.2 Where do you discard your child's feces? 1. Toilet 2. Open field

5.3 What is the water source for your house Hold drinking purpose? 1. Pipe water 2. Spring 3. River 4. Hand dug well 5. Deep well 6. Bottled water

5.4 When do you wash your hand 1. After toilet 2. Before eating food 3. Before preparing food 4. Before feeding child 5. Other

Annex 3

REGIONAL /ZONAL LEVEL QUESTIONNAIRE
Identifiers:
Interviewer Respondent
Date Surveillance System
Interviewer name of health facility
General
I. Availability of a National Surveillance Manual

1.Is there a national manual for surveillance?

Yes / No / Not applicable / Unknown
2.**If yes**, describe (last update, diseases included, case definitions, surveillance and control, integrated or different for each disease):

_____
_____
_____

II. Case Detection and Registration

3.Do you have standard case definitions for the Countries priority diseases like malaria and measles?

Yes / No / Unknown / Not applicable
4.**Obs [1 to n priority diseases] Observed** the standard case definition for (each priority disease) Yes No Unknown Not applicable

III. Data reporting.

Presence of recommended reporting forms in the country at all times over the past 6 months
5.Is the central level responsible for providing surveillance forms to the health facilities? Yes, No Unknown Not applicable

6.**If yes**, have you lacked appropriate surveillance forms at any time during the last 6 months? Yes, No Unknown Not applicable

7.What are the reporting entities for the surveillance system?
a. Public health facilities d. Private health facilities

b. NGO health facilities e. Others_____

c. Military health facilities

8.**Percent of district reports (either directly or through an intermediate level) received each reporting period at the central level during the past 3 months:**

Number of reports in the last 3 months compared to expected number

Weekly: /12 times the number of districts
Immediately: /------times the number of districts
9.**On time (use national deadlines)**

Number of weekly reports received on time: /12 times the number of districts
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 d. 3-7 days

b.2-24-hour e. After 1 week

c.1-2 days
12.**Percent of districts that have means for reporting to next level by e-mail, telephone, fax or radio**

_____
13.**Capacity to report to next level by e-mail, telephone, fax or radio:**

How do you report?
a. Mail d. Radio
b. Fax e. Electronic c. Telephone f. Others

IV. Data analysis

Does the regional level:
14.**Describe data by person** (case based, outbreaks, and sentinel)?

(Obs) Observed description of data by age and sex:
Yes, No Unknown Not applicable
15.**Describe data by place?**

(Obs) Observed description of data by district (tables, maps)
Yes, No Unknown Not applicable
16.**Describe data by time?**

(Obs) Observed description of data by time:
Yes, No Unknown Not applicable
17.**Perform trend analysis?**

Obs Observed line graph of cases by time
Yes, No Unknown Not applicable
18.List disease(s) for which line graph is observed
_____
_____

19.**Have an action threshold defined for each priority disease?**

Do you have an action threshold defined for malaria, Measles, and typhoid fever? Yes, No Unknown Not applicable

20.Who is responsible for the analysis of the collected data? _____

21.How often do you analyze the collected data?

a. Daily d. Monthly c. Every 2 weeks f. As needed

b. Weekly e. Quarterly

22.**Have appropriate denominators?**

Obs Observed presence of demographic data (E.g. population by district and hard to reach groups) Yes, No Unknown Not Applicable

V. Outbreak Investigation

Percent of suspected outbreaks that were investigated in the past 6 months

23.Number of outbreaks suspected in the past year: _____

24.List the diseases: _____

25.Of those, number investigated: _____

(Observe reports and take copies if possible)

Of the investigated outbreaks in the past 1 year, percent in which risk factors were looked for:

26.Number of outbreaks in which risk factors were looked for: _____

Of the investigated outbreaks in the past 1 year, percent in which findings were used for action

27.Number of outbreaks in which findings were used for action: _____

[Observe report]

28.**Of districts that investigated an outbreak, percent that looked for risk factors**

Number of districts that looked for risk factors [observe in reports] _____

29.**Of districts that investigated an outbreak, percent that used the data for action (action include containing outbreak, improving surveillance, community actions)**

Number of districts that used the data for action [observe in final report] _____

VI. Epidemic preparedness (relevant for epidemic prone diseases)

30.**Existence of a Regional/Zonal plan for epidemic preparedness and response**

Obs Observed a written plan of epidemic preparedness and response Yes No Unknown Not applicable

31.**Existence of emergency stocks of drugs, vaccines, and supplies at all times in past 1 year:**

Has the region had emergency stocks of drugs, vaccines, and supplies at all times in past 1 year?
Yes, No Unknown Not applicable

32.**Experience of a shortage of drugs, vaccines or supplies during the most recent epidemic (or outbreak)**

Has the country experienced shortage of drugs, vaccines or supplies during the most recent epidemic (or outbreak)?
Yes, No Unknown Not applicable

33.**Existence of a standard case management protocol for AWD, Malaria, AFP (polio), measles**

Obs Observed the existence of a written case management protocol for at least 1 priority disease

34.**If yes**, list: _____

35.**Presence of a budget line for epidemic response**

Is there a budget line for epidemic response?
Yes, No Unknown Not applicable

36.**I. Existence of a regional epidemic management committee**

Observed minutes (or report) of meetings of epidemic management committee
Yes, No Unknown Not applicable

37.**Existence of a regional rapid response team for epidemics**

Does the country have a rapid response team for epidemic?
Yes, No Unknown Not applicable

VII. Response to epidemics

38.**Ability of the regional level to respond within 48 hours of notification of most recently reported outbreak:**

Obs Observed that the central level responded within 48 hours of notification of most recently reported outbreak (from written reports with trend and intervention)
Yes, No Unknown Not applicable

39.**Ability of the regional epidemic management committee to evaluate its preparedness and response activities:**

(Obs) Has epidemic management committee evaluated its preparedness and response activities during the past year (Observe written report to confirm)?
Yes, No Unknown Not applicable

VIII. Feedback

Existence of a report or bulletin that is regularly produced to disseminate surveillance data:
40.How many feedback bulletin or reports has the regional level produced in the last year? _____

41.**Obs:** Observed the presence of a report or bulletin that is regularly produced to disseminate surveillance data

Yes, No Unknown Not applicable

IX. Supervision

Percent of supervisors that made the required number of supervisory visits in the past 6 months
42.How many supervisory visits have you made in the last 6 months? _____

Obtained required number of visits from regional level _____
43.The most usual reasons for not making all required supervisory visits. (Text) _____
_____
_____

X. Training

Percent of health personnel trained in disease surveillance
44.What percent of your subordinate personnel have been trained in surveillance? _____

45.Have you been trained in disease surveillance?

Yes, No Unknown Not applicable
46.**If yes,** specify when, where, how long, by whom? _____
_____

Percent of health personnel that have received post-basic training in epidemic management
47.Have you received any post-basic training in epidemic management?

Yes, No Unknown Not applicable

48.**If yes,** specify when, where, how long, by whom? _____
_____

49.**Obtain and analyze the content of the surveillance and epidemic management training**

Strengths_____
Weaknesses _____
Opportunities _____

Threats _____

XI. Resources

Percent of sites that have:

50.**Data management**

a. Computer e. Statistical package

b. Printer f. Data manager

c. Photocopier

51.**Communications**

a. Telephone service d. Satellite phone

b. Fax e. Computers that have modems

c. Radio call

52.**Budget line** _____

53.**Logistics** _____

XII. Surveillance

Have a functional computerized surveillance network

54.Do you have a computerized surveillance network at this level?

Yes, No Unknown Not applicable

Budget for surveillance

55.Is there a budget line for surveillance in the Regional Health Bureau budget?

Yes, No Unknown Not applicable

56.**If yes**, what is the proportion: %

Opportunities for strengthening surveillance

57.Howcouldsurveillancebe

_____

_____

XIII. Surveillance Co-ordination

Existence of focal unit for surveillance at RHB level

58.**Obs** Is there a focal unit for surveillance at the MOH central level? [Observe organogram me of MoH to confirm]

Yes, No Unknown Not applicable

Opportunities for integration

59.What opportunities are there for integration of surveillance activities and functions (core activities, training, supervision, guidelines, resources etc.)?

Questionnaire for Attributes and level of Usefulness:

1.Total population under surveillance_____

2.What is the incidence / Prevalence of -------in your area/region in 2008EFY

□Measles _____ cases _____Deaths

□Malaria _____ cases _____Deaths

I. Level of Usefulness of the Surveillance System for these selected priority diseases

Does the surveillance system help?

1.To detect outbreaks of these selected priority diseases early? Yes/ No

2.To estimate the magnitude of morbidity and mortality related to this disease, including identification of factors associated with these diseases? Yes/ No

3.Permit assessment of the effect of prevention and control programs? Yes/ No

Observe (confirmation):

□interventions and diseases trends analyzed ---Available //Not available

II. Describe Each System Attributes:

i. Simplicity:

1.Is the case definition of AWD, malaria, AFP (polio), and measles easy for case detection by all level health professionals? Yes/ No

2.What are the organizations which need to receive reports of the surveillance data

3.Do you feel that additional data collected on a case are time consuming? Yes/No

4.How long it takes to fill the format? a, <5-minute b-10-15minuts c->15 minutes

5.How long does it take to have laboratory confirmation of

A. Measles

B. Malaria

C. Typhoid fever

ii. Flexibility:

1.Can the current reporting formats be used for other newly occurring health event (disease) without much difficulty? Yes/ No

2.Do you think that any change in the existing procedure of case detection, reporting, and formats will be difficult to implement? Yes /No

Comment:

iii. Data Quality: (Completeness of the reporting forms/and validity of the recorded data)

1.Are the data collection formats for these priority diseases clear and easy to fill for all the data collector's/ reporting sites? Yes/ No

2.Are the reporting site / data collectors trained/ supervised regularly? Yes/No

3.**Observe:** Review the last month's report of these diseases

A. Average number of **unknown or blank responses** to variables in each of the reported forms

B. Percent of reports which are complete (that is with no blank or unknown responses) from the total reports

iv. Acceptability:

1.Do you think all the reporting agents accept and well engaged to the surveillance activities? Yes/No

2.If yes, how many are active participants (of the expected to)? _____

3.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.Other_____

v. Representativeness:

1.What is the health service coverage of the district/ zone/ region? _____%

2.Do you think the populations under surveillance have good health seeking behavior for these diseases? Yes / No

3.Who do you think is well represented by the surveillance data? the urban/ the rural

vi. Timeliness:

1.---------- 2. ----------

vii. Stability:

1.Was the new BPR restructuring affect the procedures and activities of the surveillance of these diseases? Yes/ No

2.Was there lack of resources that interrupt the surveillance system? Yes/No

Annex-3

SURVEILLANCE SYSTEM EVALUTION HEALTH FACILITY QUESTIONNAIRE
Identifiers
Assessment team Type of health facility
Date District
Interviewer Region/province
Respondent Country
Name of health facility Surveillance system
1.**Percent of health facilities with national surveillance manual**

Is there a national manual for surveillance at this site?
Obs Observe national surveillance manual:
Yes, No Unknown Not applicable
I. Case detection and registration _____

2.**Percent of health facilities that have a clinical register**

Obs Observed the existence of a clinical register
Yes, No Unknown Not applicable
3.Percent of health facilities that correctly register cases

Obs Observed the correct filling of the clinical register during the previous 30 days
Yes, No Unknown Not applicable
4.Percent of health facilities that have standardized case definitions for the country's priority diseases

Do you have a standard case definition for: (each priority disease), malaria, TF, measles?
Yes, No Unknown Not applicable
5.**Obs** Observed the standard case definition for: (each priority disease)

Yes, No Unknown Not applicable

6.Percent of health facilities that use standardized case definitions for the country's priority diseases

Obs Observed the respondent correctly diagnosing one of the country 's priority diseases using a standard case definition
Yes, No Unknown Not applicable
(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)
II. Case confirmation_____

7.Percent of health facilities that have the capacity to collect specimens (sputum stool, blood/serum and CSF)

Are you able to collect sputum Y N U N/A

Stool Y N U N/A
Blood Y N U N/A
CSF at this facility? Y N U N/A
8.**Obs** Observed the presence of materials required to collect

Stool Y N U N/A
Blood/serum Y N U N/A
CSF Y N U N/A
9.Percent of health facilities that have the capacity to handle specimens until shipment

Do you have the capacity to handle sputum, stool, blood/serum and CSF until shipment at this facility?
Yes, No Unknown Not applicable
10.**Obs** Observed presence of functional cold chain at health facility

Yes, No Unknown Not applicable
11.Percent of health facilities that have the capacity to ship specimens to a higher level lab

12.**Obs** Observed presence of transport media for stool at health facility

Yes, No Unknown Not applicable
13.**Obs** Observed presence of packing materials for shipment of specimens at health facility

Yes, No Unknown Not applicable
III. Data reporting _____

14.Percent of sites that have appropriate surveillance forms for that site at all times over the past 6 months

Have you lacked appropriate surveillance forms at any time during the last 6 months?
Yes, No Unknown Not applicable
15.Percent of sites that reported accurately cases from the registry into the summary report to go to higher level

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 Y N U N/A

b. **Obs** Malaria Y N U N/A

c. Obs Typhoid Fever Y N U N/A
16.Percent of sites that reported each reporting period to the next higher level during the past 3 months

Number of reports in the last 3 months compared to expected number
Obs Weekly: /12 times the number of sites
Obs immediately: /--times the number of sites
17.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
18.Percent of HF that have means for reporting to next level by e-mail, telephone, fax or radio

How do you report?
a. Mail d. Radio

b. Fax e. Electronic

c. Telephone f. other specify

19.Strengthening reporting

How can reporting be improved?
_____
_____
_____

IV. Data analysis_____

20.Percent of site that Describe data by person (outbreaks, sentinel)

Obs Observed description of data by age and sex
Yes, No Unknown Not applicable
21.**Describe data by place:**

Obs Observed description of data by place (locality, village, work site etc)
Yes, No Unknown Not applicable
22.**Describe data by time**

Obs Observed description of data by time
Yes, No Unknown Not applicable
23.Perform trend analysis

Obs Observed line graph of cases by time
Yes, No Unknown Not applicable
24.**Have an action threshold for each priority disease**

Do you have an action threshold for any of the Country priority diseases?
Yes, No Unknown Not applicable
25.**If yes,** what is it (Ask for 2 priority diseases)? _____cases ____ % increase _____rate

26.Who is responsible for data analysis? _____

27.How often do you analyze the collected data?
a. Daily d. monthly

b. Weekly e. quarterly

c. Every 2 weeks f. as needed

28.Have appropriate denominators

Obs Observed presence of demographic data at site (E.g. population <5 yr., population by village, total population)
Yes, No Unknown Not applicable

V. Epidemic preparedness_____

29.Percent of health facilities that have a standard case management protocol for epidemic prone diseases

Obs Observed the existence of a written case management protocol for 1 epidemic prone disease
Yes, No Unknown Not applicable

VI. Epidemic response_____

30.Percent of sites that implemented prevention and control measures based on local data for at least one epidemic prone disease

Has the health facility implemented prevention and control measures based on local data for at least one epidemic prone disease?
Yes, No Unknown Not applicable

31.Percent of sites that achieved acceptable case fatality rates (e.g. 10% for Meningococcal CSM 1% for Cholera) during the most recent outbreak

Obs Observed that the health facility achieved an acceptable case fatality rate for most recent outbreak
Yes, No Unknown Not applicable

VII. Feedback

32.Percent of sites that have received a report or bulletin from a higher level during the past year on the data they have provided

How many feedback bulletin or reports has the health facility received in the last year? ___
Observed at least 1 report or bulletin at the health facility from a higher level during the past year on the data they have provided
Yes, No Unknown Not applicable

33.Percent of health facilities that conducted at least semi-annual meetings with community members to discuss results of surveillance or investigation data

How many meetings has this health facility conducted with the community members in the past six months? _____
Observed the minutes or report of at least 1 meeting between the health facility team and the community members within the six months
Yes, No Unknown Not applicable

VIII. Supervision:

34.Percent of individuals supervised in the past 6 months

How many times have you been supervised in the last 6 months? _____
Observed supervision report or any evidence of supervision in last 6 months
Yes, No Unknown Not applicable

35.Of those supervised in the previous 6 months, percent of individuals for which the supervisor from the next higher level reviewed surveillance practices appropriate to their level

Observed supervision report or any evidence for appropriate review of surveillance practices
Yes, No Unknown Not applicable

IX. Training

36.Percent of health personnel trained in disease surveillance and epidemic management

Have you been trained in disease surveillance and epidemic management?
Yes, No Unknown Not applicable
37.**If yes,** specify when, where, how long, by whom? _____
_____

Resources

38.Percent of sites that have Logistics
a. Electricity c. Motor cycles

b. Bicycles d. Vehicles

39.Data management
a. Stationery d. Software

b. Calculator e. Printer

c. Computer f. Statistical package

40.Communications
a. Telephone service c. Radio call

b. Fax d. Computers that have modems
41.**Information education and communication materials**
a. Posters e. Generator

b. Megaphone f. Screen

c. Flipcharts or Image box g. Projector (Movie)

d. VCR and TV set h. Others

42.Hygiene and sanitation materials
a. Spray pump b. Disinfectant

43.Protection materials (list) _____
_____
_____

XI. Satisfaction with surveillance system

44.Satisfaction with the surveillance system

Are you satisfied with the surveillance system?
Yes, No Unknown Not applicable
45.If no, how can the surveillance system be improved? _____
_____

46.Opportunities for integration

What opportunities are there for integration of surveillance activities and functions (core activities, training, supervision, guidelines, resources etc.)
_____
_____
_____

Annex 4 - ***Health profile questionnaire***

Health profile assessment questionnaire

1. Historical aspects of the Sub city

- Name_____
- How and when the sub city was formed_____
- Any other historical aspect about the sub city_____

2. Geography and Climate

Sub city map_____

- Location(distance) _____Direction _____
- Surface Area _____

Sub city boundaries

North _____South_____

East_____West_____

3. Political and Administrative Organization

- Total no. of kebeles: _____
- rural_____
- Urban_____

4. Population and Population structures

Demographic data

1. Total Population_____Male_____Female_____ sex ratio_____
2. Urban Total _____ Male_____Female_____
3. Rural Total _____ Male_____ Female_____
4. Population under 1yrs_____
5. Population under five yrs._____
6. Population < 15 years_____
7. Population >64 years_____
8. Women 15_49 years of age_____
9. Total population by kebele (each kebele pop) _____

Population pyramid

Population data by age and sex								
Male	<1	1-5	6-14	15-24	25-34	35-49	50-64	>65
Female	<1	1-5	6-14	15-24	25-34	35-49	50-64	>65

5. Economy (mainstay of the economy, average income levels etc.)

Main income sources

- Agriculture
  - Cultivated area_____
  - Grazing area_____
  - Cropping seasons_____
  - Land density_____

- Livestock
- Truism
- Trade
- Other business

House hold income source

1. Agriculture_____ (#)
2. Government Employer_____ (#)
3. Private Employer_____ (#)
4. Daily Laborer_____ (#)
5. Different business_____ (#)

6. Education and school Health

Number of educational institution

1. K.G._____
2. Primarily School_____
3. Secondary_____
4. Preparatory_____
5. College/ University_____
6. TVET_____
7. Total School Age Children (target) _____
8. Total Enrolment _____Male_____Female_____
9. School dropout in 6 months or year 2007_____
10. If there is school dropout, why _____

Educational status of the community

1. Total Educated people_____
    - Male _____
    - Female _____
2. School health activities:
    - Number of schools with water supply_____

- Toilets:
    - Schools with functional latrines (male & female) _____
    - Schools with HIV/other Health clubs_____

7. Facilities

Transport

1. Accessibility (main roads) _____
2. Type of road _____
3. How many kebeles have access to transportation _____

Water

1. Total safe water coverage _____ (___%)
2. Safe water supply coverage by kebele _____
3. Main source of water supply _____
4. Kebeles getting safe water____ (__ %)
5. Population getting safe water_____ (__ %)
6. Daily water consumption per day per person_____

8. Disaster situation in the woreda

1. Was there any disaster (natural or manmade) in the woreda in the last one year? _____
2. Any recent disease outbreak/other public health emergency_____
3. If yes cases_____ and deaths_____

9. Vital Statics and Health Indicators

1. Infant Mortality Rate (IMR) _____ (total <1 yr deaths this 2007yr_____)
2. Child Mortality Rate_____ (this year's total <15 yr deaths_____)
3. Crude Birth Rate_____
4. Crude Death Rate_____ (total deaths 2007yr____)
5. Maternal Mortality Rate_____ (2007 total maternal deaths_____)
6. Contraceptive prevalence rate_____
7. Contraceptive acceptance rate _____

8. ANC rate (how many of the total expected pregnancies attended 1st ANC) _____
9. ANC rate (how many of the total expected pregnancies attended 4th ANC) _____
10. Percentage of deliveries attended by skilled birth attendants_____
11. Percentage of deliveries attended by HEWs_____
12. Percentage of deliveries attended by TBA _____
13. Average family size_____

10. Immunization Coverage (for children and Women)

1. BCG _____ (__ %).
2. OPV0____ (____ %), OPV1_____ (___ %), OPV3_____ (___ %)
3. Penta1_____ (___ %), penta2 _____ (___ %) penta3_____ (___ %)
4. Measles_____ (___ %).
5. PCV-10-1_____(__%), PCV-10-3_____(___%)

11. Health Service

Type and Number of Health Institution

Type		umber	Total No. of beds
Gov. Hospital			
Gov. Health center	Type A		
Private H.Fs (clinics/diag. lab/drug stores)	Clinics (all type)		
	Diag. Lab.		
	Drug store		
Gov. Health posts			
NGOs	H.Ps		
	H.Cs		
	Hospitals		
	Clinics		

Health institution to pop ratio:

- Hospital: Pop----------.
- HC: Pop----------
- HP: Pop----------
- Health service coverage----------

Type and Number of health professionals

Type	No.	Remark
Specialist		
G.P		
HO		
Nurses (Deg. and Dip.)		
Mid wife (Deg. and Dip.)		
Lab. (Deg. and Dip.)		
Pharmacy (Deg. and Dip.)		
Env. Health (Deg. and Dip.)		
HIT		
Health education		
HEWs		
Others		

- ❖ Health professional to population ratio
  - Doctor: pop. Ratio_____
  - Nurse: pop. Ratio____
  - Mid. Wife: pop. Ratio ____
  - HEW: pop. ratio_____

12. Top causes of morbidity and mortality

Top ten leading causes of OPD visit (morbidity)

Adult		Pediatrics/ < 5 years
1		
2		
3		
4		
5		
6		
7		
8		
9		

10		

Top ten causes of admissions

	Adult	Pediatrics/ <5 year
1		
2		
3		
4		
5		
6		
7		
8		
9		
10		

- **Top ten causes of deaths (mortality).**

	Adult	Pediatrics/ <5 year
1		
2		
3		
4		
5		
6		
7		
8		
9		
10		

13. Health budget allocation

Government

2. Total budget allocated for the woreda _____
3. Total budget allocated for health _____ (____%)

Funds from NGO

1. Total _____ (purpose/programs) _____

14. Community Health Services

Status of services provided by community health workers namely:

1. No. of TBAs/TTBA_____ and their responsibility _____
2. No. of CHWs/CHPs_____ and their responsibility _____
3. Responsibility of HEWs_____
4. Others_____

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

1. MCH (Delivery, ANC, PNC) _____
2. FP(Methods) _____
3. EPI (outreach service, cold chain, vaccine): _____

- Environmental Health & sanitation.
  1. Latrine coverage_____ & utilization rate_____
  2. Solid waste management_____
  3. Liquid waste management _____
  4. others_____

16. Endemic diseases

Malaria:

1. Total Malarious kebeles_____& Pop at risk_____
2. ITNs coverage (including current dist.) _____
3. Is there IRS this year (No of kebeles) _____
4. Total cases/yr._____ deaths/yr._____, <5yr cases_____ deaths_____
5. Malaria supplies (Coartem, RDT, etc.) shortage _____
6. Other issues_____

TB/Leprosy:

1. Total TB cases_____
2. PTB negative_____
3. PTB positive_____
4. Extra PTB _____
5. TB detection rate _____
6. TB Rx completion rate _____
7. TB cure rate _____
8. TB Rx success rate _____
9. TB defaulter_____
10. Death on TB Rx_____
11. Total TB patients screened for HIV_____
12. Total Leprosy cases_____on Rx_____

HIV/AIDS

1. Total people screened for HIV (last one year) _____
2. VCT_____ PITC_____PMTCT_____
3. HIV prevalence_____
4. HIV Incidence (new cases/yr) _____
5. Total PLWHA_____
6. On ART_____on Pre-ART_____
7. Other HIV prevention activities_____

Nutrition

1. Total OTP sites_____, total admissions to OTP/yr_____
2. Total SC sites, _____, Newly opened/yr_____, total admissions to SC/yr_____
3. Is there TSF (targeted supplementary feeding) program in the woreda_____
4. CBN program_____ PSNP_____ other_____

17. Essential drugs (shortage)

_____

_____

Annex 5 - ***Belg season rapid emergency needs assessment questionnaire***

Rapid Belg assessment - Health Sector. Region /Zone

Interviewer name_____		Institution:_____	
Interview Date: (dd) ____ /(mm)_____/2016		Region:_____Zone:_____	
Main contact at this location:	Name:_____	Position:_____	Tel:_____

1. COORDINATION

A.	Is there a functional multi-sectoral coordination forum for the health sector?	Yes□	No□
B.	Are all relevant government, NGOs and UN agencies represented?	Yes□	No□
C.	Frequency of regular meeting? (Weekly, Every 2 weeks, monthly.....)_____		

2. Outbreak?

Was there any outbreak in the last 3 months? If yes, specify the type of disease	Yes□	No□

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

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

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

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

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

Is there any ongoing outbreak of any disease? YES_____ NO_____

If yes, specify the type of disease

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

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

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

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

3. Mention anticipated epidemics_____,_____,_____

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

4. Public Health emergency Management

A.	Is there a Public Health and Nutrition Emergency Preparedness and Response plan?	Yes□	No□
	If yes, is the plan budgeted/ funded?	Yes□	No□
B.	Is there a trained staff on PHEM basic level (Regional/Zonal/Woreda/HFs)	Yes□	No□

If yes specify number of trained personnel per level:

Region: Female _____Male_____**Zone:** Female_____Male_____**Woreda:** Female____Male_____

C.	Is there a Regional/zonal trained Rapid Response team (RRT)?			Yes□	No□
D.	Is there a trained staff on Emergency nutrition management at all level? yes --- No ---- If yes specify the no. : Total___ Male : ____Female :-___				
E.	Drugs and medical supplies		Total requirement	Available	Gap
	i. Meningitis vaccine				
	ii. Drugs:	Coartem			
		Artesunate (rectal)			
		Artesunate (Inj)			
		Artemether IM			
		Quinine (PO)			
		Quinine (IV)			
		Chloroquine			
		Ceftriaxione			
		Oily CAF			
		Doxycycline			
		Ringer lactate			
		ORS			
		Vit A.			
	iii. Nutrition: Therapeutic supplies and antibiotics	F100			
		F75			
		RUTF			
		Resomal			
		Routine antibiotics at SC/OTP (the list can be annexed)			
	iv.Lab supplies	RDT (Malaria)			
		Pastorex (Meningitis)			
		LP set			
		TI bottle			
	CTC Kit (AWD)				
	Medical Supplies	Gloves,			
		Syringe			
		PPE			
	Drugs and supplies for Emergency RH	Individual Clean Delivery Kits			

SAM Management

4.1 Facilities with SAM management in the Region /Zone

Month	Total Number of Health centers/ hospitals	Total Number of Health posts	Number of SC.	% of health centers/ hospitals with a SC.	Number of OTP.	% of health posts with an OTP	Total Number of OTP/SC reported	% of OTP/SC who have reported
Oct								
Nov								
Dec								
Jan								
Feb								
Mar								

4.2 Admission and performance of the therapeutic feeding programme for SAM management

Month	Total SAM Cases		% of SAM children cured	% of SAM children defaulted	% of SAM children died	% of SAM children non-respondent	% of SAM children other
	2007 E.C.	2008 E.C.					
Oct							
Nov							
Dec							
Jan							
Feb							
March							

4.3. Availability of therapeutic supplies

	Yes	No	If Yes, How much is available
Is there sufficient supplies for 3 months of :			
RUTF			
F100			
F75			
2nd line drugs			

MAM Management

4.6. TSFP programme in the Region /Zone

	Yes	No	If Yes, How ma is available
Is this a priority 1 woreda?			
Was there a TSFP distribution last month?			
Is there sufficient TSFP supplies for the next 1 month (RUSF, CSB+/oil or CSB++)?			
Is there woreda level storage of TSFP supplies for at least 2 months of supplies?			
Are children discharged from OTP referred to TSFP			
Is this a pilot (2nd generation) TSFP woreda?			
Has the Woreda been supported by an NGO in the last 3 months?			

4.7 MAM admission

Month	Priority 1 woreda Y/N		Total MAM Cases		Total Number of Food Distribution point in the woreda
	2007 E.C.	2008 E.C.	2007 E.C.	2008 E.C.	
Oct					
Nov					
Dec					
Jan					
Feb					
March					

Screening

4.8. When was the last screening conducted in the Region /Zone? _____

4.9. What screening modality is used in the Region /Zone? EOS _____, CHD _____, Routine_____.

4.10. Screening performance for children in the Region /Zone

Month	Target Children 6-59 months	# of screened children	Screening Coverage (%)	# of Children with no odema and MUAC <11 cm			# of children with no oedema and MUAC 11 to 11.9CM	% Proxy GAM for children	% Proxy SAM for children
				#SAM			#MAM		
				MUAC <11 cm	odema	Total			
Oct									
Nov									
Dec									
Jan									
Feb									
March									

4.11. Screening performance for Pregnant and lactating Women (PLW) in the Region /Zone

Month	Target PLW	# of screened PLW	Screening Coverage (%)	# of PLW MUAC below 23.0 cm*	% Proxy GAM for PLW
Oct					
Nov					
Dec					
Jan					
Feb					
March					

* Below 21.0 cm in Tigray

4.12 Any other observations you made or any risks of emergency nutrition?

_____

_____

_____

4.13 What were the major challenges in your emergency nutrition response experience?

_____

_____

_____

_____

_____

Flood

- Was there flood disaster in the last 6 months in the Region /Zone? Yes□ No□
- If yes, How many weredas affected _____, Total affected population _____
- Affected pregnant and lactating _____, under five children_____
- Human Death due to flooding_____ yes or no
- If yes how many in number_____
- Are there displaced people due to flooding? Yes or No
- If Yes , how many_____
- was there outbreak in the flood affected area Yes□ No□

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

Any comment

_____

_____

_____

_____

_____

_____

_____

_____

_____

_____

_____

_____

Annex 6 - ***Protocol /Proposal for epidemic research project questionnaire***

Questionnaire

Knowledge, Attitude and Practice of Bed net use to prevent malaria

1) Demographic

1.1) Region

1.2) Zone

1.3) Woreda

1.4) Kebele _____ House no_____

1.5) Age

1.6) Sex

1) Male 2) Female

1.7) Marital status

1) Married 2) Single 3) Divorce 4) Others

1.8) Educational status

1) Illiterate 2) Read & write 3) Primary 4) Sec.

1.9) Occupation 1) Farmer 2) Housewife 3) Government 4) Privet worker

1.10) Religion 1) Orthodox 2) Protestant 3) Muslim

1.11) Ethnicity 1) Amhara 2) Wolayita 3) Gurage 4) Others

1.12) How many people live in the house? _____

1.13) Is there pregnant women in the family 1.yes 2. No

1.14) Are there children less than 5 years of age 1.yes 2. No

1.15) If yes for the previous question, how many children less than five in your family_____

2) Knowledge

2.1) Do you know about malaria 1. Yes 2. No

2.2) What are the common symptoms of malaria 1. Fever 2. Headache 3. Chills 4. All

2.3) How can people get malaria 1. Mosquito bite 2. Stagnant water 3.not using tent 4. by food 5. others

2. 4) How can we prevent the disease 1) Using bed net 2) Avoiding stagnant water 3) Using medication 4) Others(specify)

2.5) Who is mostly at risk of malaria 1) Old age 2) Under five 3) Pregnant 4) other specify

2.6) Have you heard education about malaria 1) Yes 2) No

2.7) If yes where did you get the education 1) TV 2) Radio 3) Health worker 4) Other

2.8) when should you use bed net 1) Seasonally 2) Every night 3)When there is mosquito in the house 4) Other

2.9) How far health facility from your home 1) 5-10 min 2) >30 min 3) 1 –2hrs

3) Attitude

3.1) Do you know malaria is most serious health problem 1) Yes 2) No

3.2) Do you know the advantage of bed net 1) Yes 2) No

3.3) If yes what are the advantages of bed net 1) To prevent mosquito biting 2) Prevent malaria 3) To prevent cold 4) To cover head 5) To protect from dirt 6) Using as a bed sheet

4) Practice

4.1) Does the house hold have bed net 1) Yes 2) No

4.2) If yes how many bed net do you have _____

4.3) Did you slept inside bed net during last night 1) Yes 2) No

4.4) If no to question 4.3 what was the reason? 1) It takes time 2) Carelessness 3) Dislike bed net

4) It cannot prevent from mosquito bite

5) Lack of knowledge 6) Don't have bed net

7) Feeling breathless while sleeping under net

8) Burning of the ITN chemical

9) It is too hot sleeping under bed net

Declaration

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

Name: Getenesh Taye Tekele

Signature: _____

Place: _____

Date of Submission: _____

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

Name of advisor: _____

Signature: _____

Date: _____