Addis Ababa University

ADDIS ABABA UNIVERSITY, COLLEGE OF HEALTH SCIENCE, SCHOOL OF PUBLIC HEALTH

Ethiopian Field Epidemiology Training Program (EFETP)

Compiled Body of Works in Field Epidemiology

By

Daniel Tamirat Dinku

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

Mentors

1. Pro. Fikre Enquselassie

2. Mr. Wondimu Ayele

26, June, 2017
Addis Ababa

ADDIS ABABA UNIVERSITY SCHOOL OF GRADUATE STUDIES

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School of Public Health, College of Health Sciences
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Approval by Examining Board

_____ _____
Chairman, School Graduate Committee

_____ _____
Advisor

_____ _____
Examiner

_____ _____

Examiner

ACKNOWLEDGMENTS

There are many contributors those were directly or indirectly participated in the fruitfulness of this document starting from individuals to institutions. First of all, I would like to thank in a very special way my Mentor, Pro. Fikre Enquselassie , Mr. Wondimu Ayele instructor at Addis Ababa University, who worked with me hand in hand, and vigorously, right from guidance on investigation and assessment phase to the final and most technical phase of this document.

Second, I would like to thanks Dr. Adamu Adisie, Mr. Endashwu Shiberu , Dr. Lucy Boulanger , Dr.Tatek Ambesse , and Mr. Abdulnaser Abagero for their kind and constructive inputs. The comments and suggestions you all gave me during field base stay were give brightness for this document.

Third, I would also like to thank my colleagues, Public Health Emergency Management staffs, and my classmates, cohort VII Field Epidemiology Training Program Residents, for their input during my presentations for parts of this document.

Forth, I would like to thank all study participants for their patience and hospitality to provide clinical specimens and epidemiological information for outbreak investigation part of this document.

Fifth, my gratitude goes to SNNP regional health bureaus, zonal health departments, woreda health offices and health facilities those were participated during investigation and assessment for their kind assistance and guidance.

Finally, I would also extend my acknowledgement to Ethiopian Public Institute (EPHI), Ethiopian Public Health Association (EPHA), and CDC for covering all the coasts used to conduct all separated papers indicated in this document.

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ACRONYM AND ABBREVIATION

AAU-SPH	Addis Ababa University School Of Public Health
AIDS	Acquired Immune-Deficiency Syndrome
ANC	Antenatal Care
ART	Anti-Retroviral Treatment
AWD	Acute Watery Diarrhea
CBN	Community Based Nutrition
CBR	Crude Birth Rate
CDR	Crude Death Rate
CDTI	Community Directed Treatment With Ivermectin
CI	Confidence Interval
CMR	Child Mortality Rate
CTC	Cholera Treatment Center
EFETP	Ethiopian Field Epidemiology Training Program
EFY	Ethiopian Fiscal Year
ENHS	Environmental Health Science
EOS	Enhanced Outreach Strategy
EPHA	Ethiopian Public Health Association
EPI	Extended Program On Immunization
FMOH	Federal Ministry Of Health
GR	Growth Rate
HDA	Health Development Army
HEW	Health Extension Worker
HIV	Human Immuno-Deficiency Virus
IDSR	Integrated Disease Surveillance And Response
IMR	Infant Mortality Rate
IPD	In Patient Department
IRS	Insecticide Residual Spray
LLITN	Long Lasting Insecticide Treated Net
MCH	Maternal And Child Health

MMR	Maternal Mortality Rate
NMR	Neonatal Mortality Rate
OPD	Out Patient Department
OPD	Outpatient Department
OPV	Oral Polio Vaccine
OR	Odds Ratio
OTP	Outpatient Therapeutic Program
P	P-Value
P.F	Plasmodium Falciparium
P.v	Plasmodium Vaivax
PHEM	Public Health Emergency And Management
PICT	Provided Initiated Counseling And Testing
PLWHIV	Peoples Living With HIV/AIDS
PMTCT	Prevention Mother To Child Transmission
PNC	Postnatal Care
PTB	Pulmonary Tuberculosis
RDT	Rapid Diagnostics Test
RDT	Rapid Diagnostic Test
RHB	Regional Health Bureau
Rx	Treatment
SNNPR	South Nation Nationalities Peoples Region
TB	Tuberculosis
TBA	Traditional Birth Attendant
TFU	Therapeutic Feeding Unit
TSF	Therapeutic Supplementary Feeding
TT	Tetanus Toxoid
UNICEF	United Nation Children Fund
VCT	Voluntary Counseling And Testing
WHO	World Health Organization
Wk	Week

EXECUTIVE SUMMARY

This document contains a two years Field Epidemiology Training Program outputs which is equivalent with thesis to be submitted to graduate school of public health for partial fulfillment of master degree in Field Epidemiology. It includes reports of diseases outbreak investigations, public health surveillance data analysis, surveillance system evaluation, narrative summary of disaster situation report, manuscripts, abstracts, and training reports.

Accordingly the document is organized to ten chapters; **chapter one** contains diseases outbreak investigations. I conducted two outbreak investigations as first Author and the investigations were conducted using case control study design. Investigation report contains abstract, introduction, methods, discussions, conclusion, recommendations, acknowledgement and references separately.

Chapter two contains report of Malaria surveillance data analysis in south omo zone health department. In data analysis five years data were used. Type of malaria species in the zone was clearly identified; trends and seasonality of malaria were also determined. And also the incidence rate and population at risk for malaria were identified.

Chapter three addresses surveillance system evaluation entitled "An Evaluation of Malaria Surveillance System in South Omo Zone". This chapter clearly presents the purpose and objectives of the surveillance and its progress towards its objectives. The surveillance attributes: simplicity, flexibility, stability, acceptability, representativeness, timeliness, data quality, and sensitivity were also assessed in the chapter.

Chapter four contains assessment of Dassench Woreda health profile. In the chapter health and health related data of the woreda populations were evidently presented which is very imperative for prioritizing high-flying problems. It is basic for planning and undertaking appropriate public health interventions; and is doorway point for operational public health researches. Stake holders of health and health related issues will access evidence based information from this chapter.

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

In **chapter six** abstracts of outbreak investigations. The abstract entitled "Investigation of AWD outbreak in Ethiopia's SNNPR Region and Investigation of Malaria outbreak in pastoralist

community of Dassench woreda ,South Omo Zone ,SNNPR Region, in Ethiopia's , September 2016 ".

Chapter seven includes the narrative disaster situation report. 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. This chapter clearly presents Belg season human health and nutrition need assessment conducted in GamoGofa Zone of SNNP Region.

One protocols or proposals for epidemiological projects were damped in **chapter eight**. The proposal entitled "Assessment of Prevalence and associated risk factor of Malaria in SalaMago Woreda of South Omo Zone , South Nation Nationalities peoples Regional State" was developed for epidemiological project to be submitted to Addis Ababa University School of Public Health.

Chapter nine describes training conducted on AWD outbreak control. The training addressed overview and epidemiology of AWD/Cholera, Set up and Organization of AWD Cases treatment Centre, About AWD Cases management Protocol, Who is most at risk?, General hygiene in CTCs, Sanitation and Hygiene precautions during Closure of CTCs, practical demonstration on stool specimen collection testing with RDT, house hold level water treatment procedure and Infection prevention during AWD/Cholera outbreak.

Finally, Public Health Emergency weekly bulletins were indicated in **chapter ten**. Of many weekly bulletins I was prepared during the two years field base attachment, I was includes only two of them in this document. The weekly bulletins were communicated to different stakeholders including ministry of health through Deputy Director General of Ethiopian Public Health Institute on weekly bases.

CHAPTER I - OUTBREAK INVESTIGATION

1.1 AWD OUTBREAK INVESTIGATION AT ARBAMINCH ZURIA WOREDA, GAMOGOFA ZONE SNNPR, JUNE 2016

Daniel T. Dinku[1, 2] , E. Fikre[3] , A. Wondimu[3] , A. Adamu[3] , A. Abdulnaser[4] , G. Markos[1,2]

[1]Ethiopian Field Epidemiology Training Program Resident, [2]PHEM officer, [3] Instructor at Addis Ababa University, [4]Resident advisor at Addis Ababa University

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Abstract

Introduction: Populations living in rural kebeles with inadequate water and sanitation infrastructure are at risk of epidemic disease. Acute Watery Diarrhea is one of a diarrheal disease caused by infection of the intestine with the bacterium Vibrio cholera, either type O1 or O139. Suspected Acute Watery Diarrheal disease (AWD) was reported from Areba Minch Zuria Woreda Health Office, GamoGofa Zone, SNNPR, Ethiopia on June 13 /2016. On June 17/2016 the regional health bureau deployed a team organized from WHO, UNICIEF and Public health emergency management to conduct the investigation and to describe the magnitude of the outbreak, identify risk factors, and implement control measures.

Methods: Descriptive followed by unmatched Case control (1:2) study was conducted on Areba Minch Zuria Woreda Health Office, GamoGofa Zone from June 21 to 30 /2016 and our samples are all eligible cases during study period. 50 active cases (40% of the total cases from the CTC center) and 100 controls (that are neighbor to the cases) were selected. We defined suspected cases and controls according to WHO guide line and the data were collected by principal and co investigator in face-to-face interviews of cases in CTC Center and house to house based on line list and controls were nearby living houses of the cases. Questionnaire included socio-demographics, knowledge and risk factors for AWD transmissions and a pre-test will be

employed in ten household that nearest to the CTC center. The data were first cleaned then entered and analyzed by epi-info version 7.2. Analytical and descriptive analysis was done and the results were presented by epi curve, graphs, tables and map.

Results: A total of 125 cases were reported from June 13/2016 to July 27/2016. From the total cases 89(71%) were male and 36(29%) were female. The mean age of cases was 24 with standard deviation of ±12 respectively. Five Kebeles (Shelemela, Elego, Kolashele, Gentasira and Wozeqa) were affected by the outbreak. Among the affected Kebeles Shelemela reported 40(32%) cases from the total reported cases. The overall attack rate was 5 per 1000 population. The sex specific attack rate was 7 for male and 3 for females per 1000 population; the highest AR was in Elego Kebele which is 7 per 1000 population. On multivariate analysis factors that statistically significant association with AWD outbreak were Drinking of lake water (OR: 6.7; 95%CI: 1.2 – 23.7 ; P:< 0.04) , Drinking of Cheka (Local drink) (OR: 5.6; 95%CI: 2.4 – 13.2 ; P:< 0.001) ,Using river water for washing utensils (OR: 4.1; 95%CI: 1.2-13.4; P: < 0.02). Water specimen from Lake Chamo and Sego River showed fecal contamination. 30 stool specimen was collected for laboratory investigation (2 positive for culture, 21 positive for RDT & 7 are Negative) and Vibrio cholera sera group 01, sera type ogawa identified.

Conclusion: In the woreda attack rate of AWD related to insufficient access to safe water therefore future epidemics will undoubtedly occur unless the Zonal and Woreda government should properly addressed the basic water and sanitation deficiencies in the community. Also woreda water office should provide continuously water treatment chemical to the community especially who living along the sides of Lake Chamo and Sego River.

INTRODUCTION

Cholera is a diarrheal disease caused by infection of the intestine with the bacterium Vibrio cholera, 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 salts can lead to severe dehydration and death within hours. The case-fatality rate in untreated cases may reach 30–50%. Treatment is straightforward (basically rehydration) and, if applied appropriately, should keep case-fatality rate below 1%. Cholera is usually transmitted through faecally 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 5 days), the number of cases can rise extremely [1].

EPIDEMIOLOGY

Cholera is vastly underreported, and precise measurements of the morbidity and mortality attributable to *V. cholerae* infection are lacking. However, there are an estimated 3 million cases of diarrheal illness and approximately 100,000 deaths worldwide caused by *V. cholera* annually [2].

Cholera is an acute enteric infection caused by the ingestion of bacterium Vibrio cholerae present in faecally contaminated water or food. Primarily linked to insufficient access to safe water and proper sanitation, its impact can be even more dramatic in areas where basic environmental infrastructures are disrupted or have been destroyed. Countries facing complex emergencies are particularly vulnerable to cholera outbreaks. Massive displacement of people or refugees to overcrowded settings, where the provision of potable water and sanitation is challenging, constitutes also a risk factor. In consequence, it is of paramount importance to be Cholera is vastly underreported, and precise measurements of the morbidity and mortality attributable to *V. cholerae* infection are lacking. However, there are an estimated 3 million cases of diarrheal illness and approximately 100,000 deaths worldwide caused by *V. cholera* annually [2].

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Cholera is characterized in its most severe form by a sudden onset of acute watery diarrhea that can lead to death by severe dehydration. The extremely short incubation period - two hours to five days - enhances the potentially explosive pattern of outbreaks, as the number of cases can rise very quickly. About 75% of people infected with cholera do not develop any symptoms. However, the pathogens stay in their faeces for 7 to 14 days and are shed back into the environment, possibly infecting other individuals. Cholera is an extremely virulent disease that affects both children and adults. Unlike other diarrheal diseases, it can kill healthy adults within hours. Individuals with lower immunity, such as malnourished children or people living with HIV, are at greater risk of death if infected by cholera [3].

Cholera affects an estimated 3 million people worldwide, and causes 58,000–130,000 deaths a year as of 2010. This occurs mainly in the developing world. In the early 1980s, death rates are believed to have been greater than 3 million a year. It is difficult to calculate exact numbers of cases, as many go unreported due to concerns that an outbreak may have a negative impact on the tourism of a country. Cholera remains both epidemic and endemic in many areas of the world [4, 5].

Although much is known about the mechanisms behind the spread of cholera, this has not led to a full understanding of what makes cholera outbreaks happen in some places and not others. Lack of treatment of human feces and lack of treatment of drinking water greatly facilitate its spread, but bodies of water can serve as a reservoir, and seafood shipped long distances can

spread the disease. Cholera was not known in the Americas for most of the 20th century, but it reappeared towards the end of that century [6].

Cholera continues to be an important public health problem among poorer communities, particularly in Africa which accounts for more than 90% of the annual cholera cases notified to the WHO .The modern history of the disease began in 1817 with the onset of the first (1817–1823) of 7 distinct pandemics which have occurred so far. The sixth and, presumably ,the fifth were caused by Vibrio cholera O1 of the classical biotype. The seventh originated on the island of Sulawesi in Indonesiain1961,and the causative agent was V. cholera O1 of the El Tor biotype(Kaper etal., 1995). This seventh cholera pandemic reached the African continent in1970 where there were at least 2 independent introductions of the infection (Lan and Reeves, 2002): the first one caused outbreaks in the west (Guinea, Sierra Leone, Liberia, Nigeria, and other coastal countries) and the spread of the disease in to the interior of the sub-Saharan states .The second route is thought to have originated in the Middle East entering Africa from the eastern countries of Djibouti, Ethiopia, and Somalia. Since 1970, parts of Ethiopia have been frequently affected by cholera, acting as sources of infection for the dissemination of the 1985–1986 large-scale epidemics in the Horn of Africa (Maimone et al., 1986; Coppo et al., 1995). From 1993 to 1999, they were again systematically involved as active focuses in the recurrent spreading of the disease in the region [7].

OBJECTIVE

General Objective

To describe the magnitude of cases and identify the risk factors associated with AWD Outbreak and to implement control measure in Areba Minch ZuriaWoreda,GamoGofa Zone, SNNPR Ethiopia June 2016.

Specific Objective

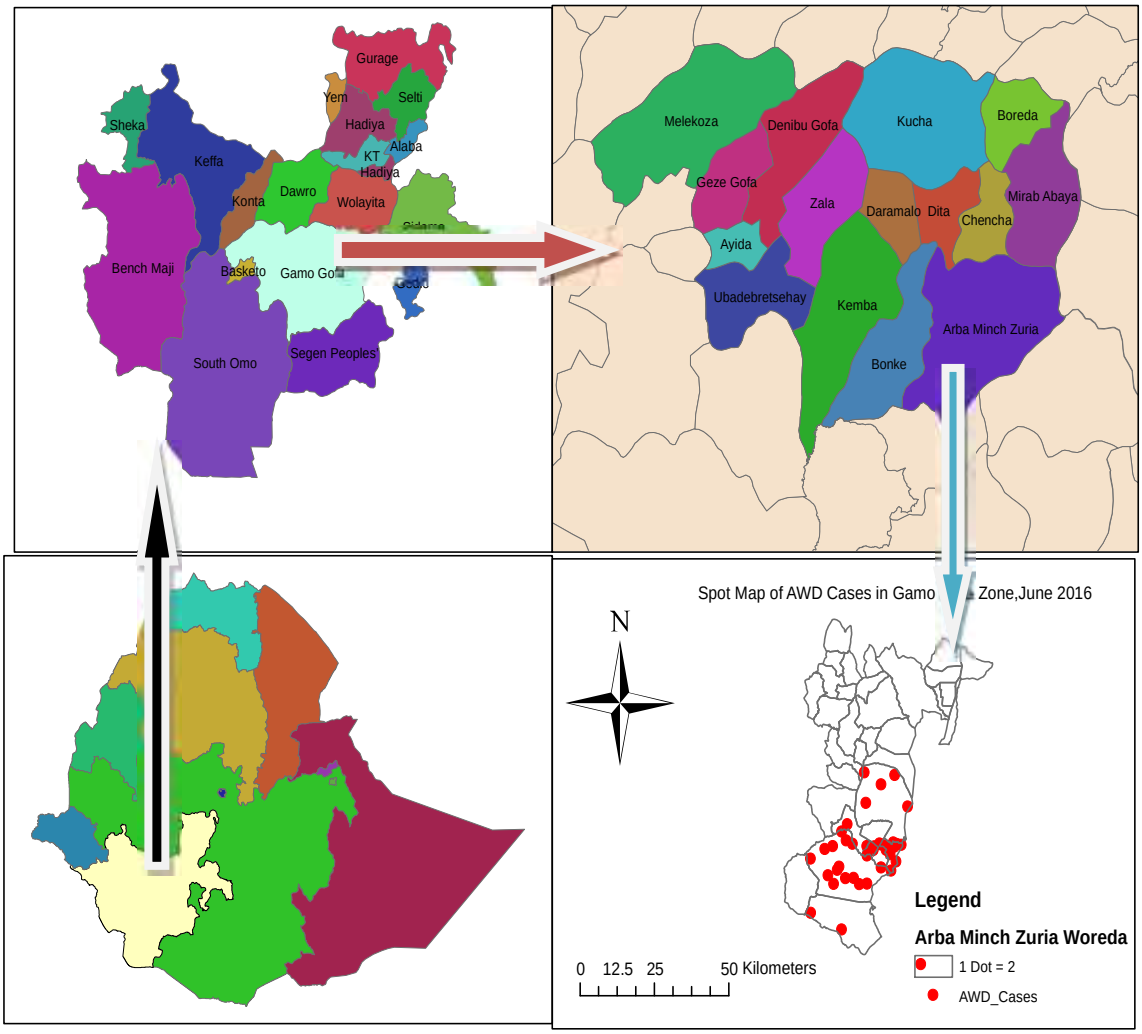
- To identify the etiologic agent responsible for the outbreak.
- To describe the magnitude of AWD Outbreak in Areba Minch ZuriaWoreda by place person and time
- To identify the associated risk factors of the disease and to implement control measure

METHODS AND MATERIALS

Study Area

GamoGofa zone is one of the largest zones in Southern Nations Nationalities and Peoples Region. Its capital Areba Minch is located 270Km to the south of Hawassa. The zone borders South Omo & Segen Area People Zone to the south, Basketo and Konta to the west,Dawuro and Wolayta to the North ,and Oromiya and Segen Area People to the East. The Zone has a population of 1,992,955 and administered with 15 Districts, 2 Town administrations, 452 rural and 34 urban kebeles. In the Zone there are 2 District and 1 general hospital, 73 health centers, and 471 health posts.

Areba Minch ZuriaWoreda is one of the administrative woreda of GamoGofa Zone. The Woreda borders Derashe and Amaro woreda to the South,Bonke woreda to the Weast. Dita,Chencha and Mirab Abaya Woreda to the North and AmaroWoreda and Oromiya Region to the East.Arba Minch Woreda has a population 202,489 and administrated with 35 rural kebeles . In the woreda there are 7 Health center and 33 health posts. The woreda latrine and water supply coverage were 90% and 85% respectively.


Gurage
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South Omo
Segen Peoples
Melekoza
Denibu Gofa
Kucha
Boreda
Geze Gofa
Zala
Daramalo
Dita
Chencha
Mirab Abaya
Ayida
Ubadebretsehay
Kemba
Arba Minch Zuria
Bonke
Spot Map of AWD Cases in Gamo Zone,June 2016
N
0 12.5 25 50 Kilometers
Legend
Arba Minch Zuria Woreda
1 Dot = 2
AWD_Cases

STUDY PERIOD

The study was conducted from June 21 to 30 /2016 in Minch ZuriaWoreda,GamoGofa Zone, SNNPR Ethiopia June 2016.

STUDY DESIGN

Descriptive followed by unmatched Case control (1:2) study was conducted.

STUDY POPULATION: - All population in five kebele that affected by AWD in ArebaMinch Zuria woreda

STUDY UNIT:-AWD patient in five AWD affected kebele

SAMPLE SIZE DETERMINATION

Our samples are all eligible cases from June 21 to 30 /2016 in the CTC center.

SAMPLEING TECHNIQUE

50 active cases from the CTC center and 100 controls that neighbor to the cases were selected.

DATA COLLECTION

The data were collected by principal and co investigator in face-to-face interviews of cases in CTC Center and house to house based on line list of cases and controls were nearby living houses of the cases.

QUESTIONNAIRES DESIGN

Questionnaire included independent variable like socio-demographics, knowledge and risk factors for AWD transmissions for both control and cases but included the clinical picture only for cases. A pre-test will be employed in ten household that nearest to the CTC center.

DATA ANALYSIS

The data were first cleaned then entered and analyzed by epi-info version 7.2. Analytical and descriptive analysis was done and the results were presented by epi curve, graphs, tables and maps.

DEFINITION OF CASES

Accordingly we used WHO case definitions for suspected and conformed.

Suspected case: A case of AWD 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 AWD epidemic, a patient aged 5 years or more develops acute watery diarrhea, with or without vomiting.

At the health post and at community levels, a suspected AWD case can be defined as follows:

- Any person 5 years of age or more with profuse acute watery diarrhea and vomiting.

Confirmed case:

- A suspected case in which *Vibrio cholerae*O1 or O139 has been isolated from their stool.

DEFINITION OF CONTROL

The controls were healthy people with no history of AWD. Two controls were selected for each AWD case.

RESULT

DESCRIPTIVE

A total of 125 cases were reported from June 13/2016 to July 27/2016. From the total cases 89(71%) were male and 36(29%) were female. The mean age of cases was 24 with standard deviation of ±12 respectively. Five Kebeles (Shelemela, Elego, Kolashele, Gentasira and Wozeqa) were affected by the disease. Among the affected Kebeles Shelemela reported 40(32%) cases from the total reported cases. The overall attack rate was 5 per 1000 population. The sex specific attack rate was 7 for male and 3 for females per 1000 population; the highest AR was in Elego Kebele which is 7 per 1000 population. 30 stool specimen was collected for laboratory investigation (2 positive for culture, 21 positive for RDT & 7 are Negative) and Vibrio cholera sera group 01, sera type ogawa identified. As observed in figure 1 below, female age of 30 from Selemela Kebele with the date of onset June 13, 2016 were index cases. She was admitted in Areba Minch Hospital on the same date of onset with acute watery diarrhea and vomiting symptoms.

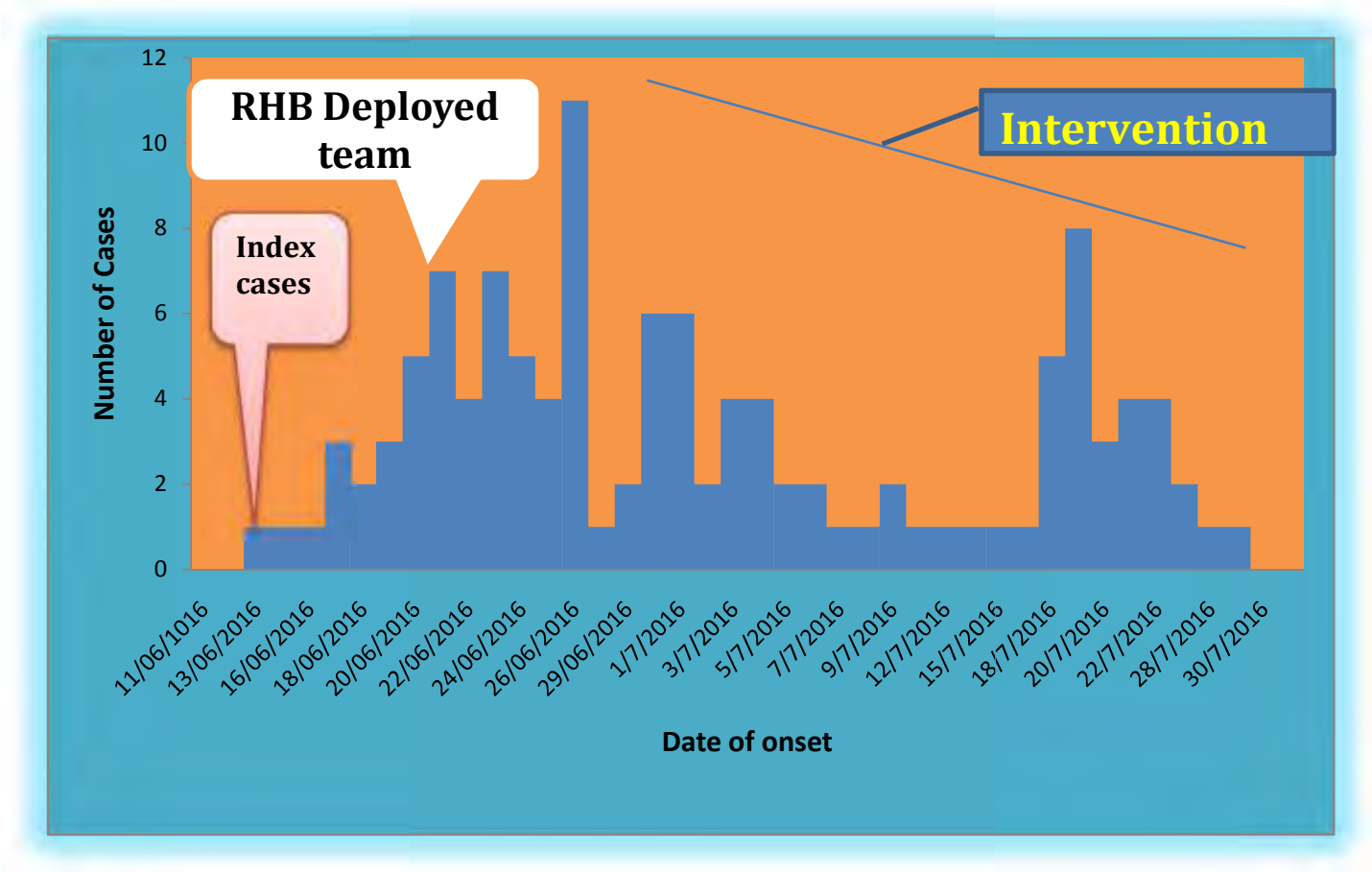

Figure 1: Distribution of AWD cases by date of onset, ArebaMinich Zuria Woreda ,GamoGofa Zone,SNNPR June 2016

Table 1Attack Rate by Kebeles Arba Minich zuria worda,GamoGofa Zone ,SNNPR. June 2016

S.no	Kebele	Total Population	Number of cases	Death	AR per 1000	CFR
1	Shelemela	10721	40	0	4	0%
2	Elego	5022	36	0	7	0%
3	Genta Sera	3452	15	0	5	0%
4	Wozeqa	5461	32	0	6	0%
5	Kolashele	3781	2	0	1	0%
		28437	125	0	5	0%

Table 2: Distribution of cases by kebele and Sex, and Sex specific attack rate ,Arba Minich zuria worda,GamoGofa Zone ,SNNPR.

Kebele	Population bysex		Cases by Sex		Attack rate by sex per 1000	
	Male	Female	Male	Female	Male	Femle
Shelemela	5253	5468	30	10	6	2
Elego	2461	2561	24	12	10	5
Genta Sera	1691	1761	13	2	8	1
Wozeqa	2676	2785	23	9	9	4
Kolashele	1855	1931	2	0	1	0
Total	13936	14506	92	33	7	3

Table 3: Demographic Characteristics of Cases and Control for AWD outbreak,Arba Minch Zuria Woreda,Gamo Gofa Zone,SNNPR,June13/2016 to July27/2016

Variable	Case	**Contro**
Sex		
Male	34(68%)	**40(40%)**
Female	16(32%)	**60(60%)**
Marital status		
Single	**20 (40%)**	**40(40%)**
Married	**18(36%)**	**38(38%)**
Divorced	**1(1%)**	**0(0%)**
Widowed	**2(2%)**	**1(1%)**
Not applicable (Under Age)	**9(18%)**	**20(20%)**
Occupation		
Government employer	**0(0%)**	**0(0%)**
Daily Laborer	**17(34%)**	**35(35%)**
Student	**10(20%)**	**27(27%)**
Farmer	**7(14%)**	**12(12%)**
Fisher man	**7(14%)**	**5(5%)**
House Wife	**5(10%)**	**16(16%)**
Shepherd	**2(4%)**	**4(4%)**
Merchant	**1(2%)**	**1(1%)**
Not applicable(Under Age)	**1(2%)**	**0(0%)**
Level of education		
Illiterate	**20(40%)**	**49(49%)**
Elementary school	**23(46%)**	**45(45%)**
Secondary school	**5(10%)**	**3(3%)**
Collage and above	**0(0%)**	**1(1%)**

ANALYTICAL

Unmatched case control study was conducted with 50 cases and 100 controls. On multivariate analysis, only Drinking of lake water (OR: 6.7; 95%CI: 1.2 – 23.7 ; P:< 0.04) , Drinking of Cheka (Local drink) (OR: 5.6; 95%CI: 2.4 – 13.2 ; P:< 0.001) and Using river water for washing utensils (OR: 4.1; 95%CI: 1.2-13.4; P: < 0.02) were statistically significant association with AWD and all the bivariate result as shown below.

Table 4: Bivariate and Multiariate analysis of risk factors for AWD Outbreak Areba Minich Zuria woreda, Gamo Gofa Zone SNNPR July 2016

Variable				**Crud**		**Adjusted**	
		Case	**Control**	**OR(95%CI)**	**P-Value**	**AOR**	**CI**
Drinking of Cheqa (It is local drink)	Yes	39(78%)	28(28%)	**9.1(4.1-20.3)**	**0.00**	**5.6**	**2.4 - 13**
	No	11(22%)	72(72%)				
Lake Water source for drinking.	Yes	9(18%)	3(3%)	**7.0(1.82-27.0)**	**0.001**	**6.7**	**1.2 – 23.7**
	No	41(82%)	97(97%)				
River Water source for washing utensils	Yes	38(76%)	56(56%)	**2.5(1.2-5.3)**	**0.02**	**4.1**	**1.2 - 13.4**
	No	12(24%)	44(44%)				
Do eat raw fish?	Yes	8(16%)	6(6%)	3.4(1.2-10.3)	0.02	2.3	0.54 – 10.4
	No	42(84%)	94(94%)				
Do you know acute watery diarrheal disease?	Yes	5(10%)	2(2%)	5.4(1.02-29.2)	0.028	2.78	0.93 -12.53
	No	45(90%)	(98%)				

INTERVENTION ACTIVITIES AND CONTROL MEASURES TAKEN

Regarding intervention a lot of activities conducted by establishing task forces in different thematic area such as

- **CTC center team** treating AWD cases in CTC center
- **Social mobilizations team** conducting In order to scale up community participation in the prevention AWD outbreak; using local media, with megaphone, community conversion in different village, in Church, in the market, in the school, in fisherman camps and in private agricultural institution.
- **Surveillance team** conducting searching of new cases in the village, contact tracing, follow up visiting on patient who discharge from the CTC center, disinfected any release from the patient, preparing disinfectant in different concentration and updating the line list.
- **Hygiene and sanitation team** conducting sanitation campaign, distributing and demonstrating water treatment chemical, visiting latrine in the house hold and taking any remedial action (maintenance, new construction & avail hand washing facility)
- **Regulatory team** conducting inspection on service deliver institution such as food and drink sellers , shops, government and private health facility and finally take any remedial action.
- **Coordination team** conducting coordination & evaluation overall activities and take any remedial action on daily bases. Some of the activities displays in photo and in table below.

Social Mobilization

Photo 1:- Photo shows Social Mobilization Activities Concerning AWD in ArebaMinch Zuria woreda June 2016

Cases are treated at CTC center

Photo 2:- Photo Shows When AWD Cases are treated at CTC Center in ArebaMinch Zuria woreda June 2016

Photo 3:- Photo Shows Distribution and Demonstration of Water Treatment Chemical

Photo 4:- Shows Sanitation Campaign & Disinfection of Contaminated Place in ArebaMinch Zuria woreda June 2016

Table 5:- Number and type of Water Treatment Chemical Distributed in ArebaMinch Zuria woreda June 2016

No	Kebeles	Population	HHs	Date from 13/06 to 15/07/2016				
				Water Treatment Chemical				HHs who receive soap
				Water pure	Water guard	Bishan gari	Total HHs	
1	Ganta Sera	7270	1484	776	20	80	876	129
2	Shele Mela	10,469	2137	1271	28	647	1946	540
3	Zeyise Eligo	7662	1564	326	40	490	856	281
4	Wozeka	5328	1087	555	12	335	902	37
	Total	30729	6272	2928	100	1552	4580	987

Table 6:- Number of inspected and newly constructed latrine in ArebaMinch Zuria woreda June 2016

No	Kebeles	Population	HHs	Date from 13/06 to 15/07/2016				HHs have no latrine
				Latrine				
				Visited HHs	Traditional	Improved	New Constructed	
1	Ganta Sera	7270	1484	461	130	284	27	20
2	Shele Mela	10,469	2137	1699	837	743	79	40
3	Zeyise Eligo	7662	1564	1116	625	364	115	12
4	Wozeka	5328	1087	952	291	506	5	150
	Total	30729	6272	4228	1883	1897	226	222

Table 7:- Different Institution Inspected During AWD Outbreak In ArbaMinch Zuria Woreda June 2016

No	Public Servicing Institution	Activities done	No. of institution
1	Food and Drinking Institution	Inspected	106
		Corrective action done	24
2	Cheka bet's	Inspected	132
		Corrective action done	58
3	Private Clinical	Inspected	15
		Corrective action done	0
4	Shops	Inspected	11
		Corrective action done	0
5	Butchers	Inspected	15
		Corrective action done	15

Photo 5:- Photo shows coordination team conducting daily review meeting during AWD Outbreak period in ArebaMinch Zuria Woreda June 2016

DISCUSSION

A total of 125 cases were reported from June 13/2016 to July 27/2016 and from which 89(71%) male and 36(29%) were female. Five Kebeles were affected by the disease and among the affected Shelemela Kebeles reported 40(32%) of cases from the total. The overall attack rate was 5 per 1000 population in the affected kebele. Vibrio cholera O1 has been isolated from stool specimen. In this investigation we identify different risk factors which have statistically significant association with the AWD outbreak. Lake Chamo was one of the source infections for the people living along the lake and fisherman. The salinity characteristics of lake water can also favor the growth of V.cholera. On multivariate analysis, only drinking of water from the lake, Drinking of Cheka (Local drink) and Using river water for washing utensils were statistically significant association with AWD outbreak. Fisherman and people who living in the lake side are uses lake water for drinking , washing utensils and for cooking purpose therefore this people are one of the vulnerable group to acquire the infection in our study.

The same case-control study conducted in Burundi to identify risk factors for cholera infection during an outbreak in Rumonge, a lakeshore town along Lake Tanganyika, in1992. The results of the study indicate that bathing in Lake Tanganyika and drinking water from the lake are positively associated with illness [8, 9].

A case-control study conducted in Kenya between June 1997 and March 1998, the researchers found that drinking water from Lake Victoria was associated with an increased risk of cholera. Analysis of the geographic patterns of residence of patients with diarrhea indicated that cholera patients were more likely to live in a village bordering Lake Victoria than diarrhea patients with other pathogens. The authors suggest that Lake Victoria may be an environmental reservoir for cholera, with water hyacinth potentially providing a suitable environment for growth, and that cholera may become endemic in western Kenya [10, 11,12].

Studies on cholera outbreak in Oromiya region conducted along the Ganale River and the individual attack rates were low (ranging from ~ 0.03% to ~ 4.12%), as was the overall attack rate for all 3 zones (almost 0.50%). The individual CTC case fatality rates ranged from 0% to 6.4%, and the overall case fatality rate was 1.11%. There was a trend toward men being disproportionately affected. This outbreak resulted primarily from poor sanitation and insufficient access to clean water. In Oromiya, the outbreak was addressed by a prompt and

effective response, which included village chairmen at the community level. The use of community-based workers was successful and likely contributed significantly to control of the outbreak [13].

Regarding intervention a lot of activities conducted by establishing task forces in different thematic area such as CTC center team, Social mobilizations team, Surveillance team, Hygiene and sanitation team, Regulatory team and Coordination team and finally the outbreak were controlled.

MAJOR CHALLENGES AND GAPS IDENTIFIED DURING THE ASSESSMENT

- Inadequate preparedness (no resources were mapped and prepared with anticipation of AWD outbreak)
- Lack of safe and adequate water supply
- Lack of food for admitted patients
- Shortage of budget
- Low sanitation facility of visited Sites (Kebeles which are affected by AWD)
- Lack of communal Latrines sites for daily laborer
- Sego river and "Cheqa" inter-relation
- High water table to construct communal/HH latrine in Eligo Kebele
- Shortage of water treatment chemicals and water truck
- The Zonal Water and Mine Department did not actively participate in the task force as well as did not request and provide the necessary water treatment supplies

CONCLUSIONS AND RECOMMENDATION

In the woreda high attack rate of AWD related to insufficient access to safe water therefore future epidemics will undoubtedly occur unless the Zonal and Woreda government should properly addressed the basic water and sanitation deficiencies in the community. Also woreda water office should provide continuously water treatment chemical to the community especially who living along the sides of Lake Chamo and Sego River and educated the community regarding use of water treatment chemical and the right time to wash their hands with soap.

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Annex 1: GamoGofa Zone AWD Outbreak Investigation Questionnaire

Consent Form

Title: Suspected Acute Watery Diarrhea Outbreak Investigation Arba Minch zuriyaworeda, GamoGofa Zone, Ethiopia, March 2016

Introduction: Hello, my name is..... . I am a member of AWD outbreak Investigation team. Thank you for taking the time to speak with us today. We are investigating AWD outbreak occurred Arba Minch zuriyaworeda, GamoGofa Zone We are very interested in your experiences and your point of view.

Purpose: To identify etiologic agent and assess the risk factors of AWD outbreak in Arba Minch zuriyaworeda, GamoGofa Zone.

Procedure: If you agree to take part, this interview will take about 30 minutes of your time. There are two parts. First, we will ask you about demographic information of you and your family, knowledge you have on acute watery diarrhea, your history of acute watery diarrhea, water, sanitation and hygiene information and your feeding practice.

Second, we will ask you for a stool and drinking water samples to test for acute watery diarrhea causative agents in your stool and drinking water. We need only small amount of samples. The samples will be tested at CTC Center and Public Health Laboratory ArbaMinch sub branch using a code so that no one will know about your results. All information collected during this study will be kept private and will only be known by the investigators.

Benefits: this project will help you and other people living in Arba Minch zuriyaworeda. We will use these results to prevent and control AWD outbreak in the woreda.

Risks: there is no risk to you from answering the questions or allowing us to take water and stool samples.

Privacy: we will keep information about you private. We will not collect your name. Only the investigators will have access to the data and only for investigation purpose. We will not use any information that might identify you when we present or publish the study's results.

Payment: there is no cost to you for being part of the project. The approximate time that this study will take is 30 minutes. There will be no involvement past today.

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

Participant Signature_____ Date_____

Name of persons obtaining consent_____ Signature Date

Thank For Your Cooperation!

No.	Question	Coding Classification	Go To
1. Demography			
1.1	Status	1 Case 2. Control	
1.2	Responder	_____	
1.3	Address	Region_____ Zone_____ Woreda_____ Kebele_____Got_____House No_____	
1.4	GPS coordinate of the house	Latitude_____Longitutde_____	
1.5	Ethnicity	1.Oromo 2.Somale 3.Tigre 4.Gurage 5.Amhara 6.Wolayita 8.Other(Specify)_____	
1.6	Age	_____ Year (s) _____Month(s)	
1.7	Sex	1.Male2.Female	
1.8	Occupation	1.Farmer2.Merchant3.Student 4. House wife5.Unemployed 6. Pastoralist 7. Gov't Employee 8.Private Employee9.Daily Laborer 10. Not applicable 11.Other_____	
1.9	What is your religious	1. Orthodox2. Protestant3. Muslim 4.Catholic5. other_____	
1.10	What is your marital status?	1. Single 2. Married 3.Widowed 4.Divorced 5. NA	
1.11	Level of Education	1.Illiterate2.Read and writing only 3.Elementary school(1-8)4.Secondary School(9-12) 5.Tertiary School(college+)	
1.12	How many family membersresiding with you?	_____	
2. Knowledge of AWD			
2.1	Do you know acute watery diarrheal disease?	1.Yes2.No	If No skip to 3.1
2.2	How do you think acute watery diarrheas transmit from person to persons (none proving)?	1.Contaminated food2.Contaminated water 3.Contact with patient4.Other(specify) _____	
2.3	What are you doing when you face acute watery diarrhea (none proving)?	1. Go to health facility2.Seek traditional healer3.Use ORS4.Use holy water5. stay at home 6 .Other(specify) _____	
2.4	Do you think acute watery diarrhea treatment center is source of infection/possible risk factor for AWD transmission?	1.Yes 2.No 3. I don't know	
2.5	Do you think AWD is preventable disease?	1. Yes 3. I don't know2.No	If 2 or 3 skip to Q2.7

No.	Question	Coding Classification	Go To
2.6	How do you prevent AWD (none proving)??	1.Using toilet2.Eating cooked food 3.Using purified water 4.Hand washing 5.Vaccine 6.Other(specify) _____	
2.7	How long does it take you to walk to the health facility from your house?	1. <10 m2. 10-30 m3.30 m – 1 hr 4. >1 hr5. >2 hr	
3. Past History of AWD			
3.1	Have you ever been sick of AWD?	1.Yes2.No	If No skip to Q 3.6
3.2	How many times you were sick of AWD in the last one year?	1.Once 2.Twice 3.More than two times	
3.3	Date and year of last sickness with AWD?	_____dd/mm/yyyy99. I don't know	
3.4	Where did you manage (none proving)??	1.At health facility 2.At home3.At holy water site4.Traditional healer 5. Others,_____	
3.5	How long you were sick of the diseases?	_____	
3.6	Was there sick family member of AWD in the past 5 years with the same complaints?	1. Yes 2.No3. Not Applicable	If answer is 2 or 3 skip to Q 4.1
3.7	Age of family members affected.	Male 1_____ 2_____ 3_____ 4_____ Female 1_____ 2_____ 3_____ 4_____	
3.8	Was there death in your family due to AWD in the past 5 years?	1.Yes2.No	
4. Clinical Pictures(Current infection)			
4.1	Do you have history of acute watery diarrheal disease recently?	1.Yes 2.No	If No skip to Q 4.7
4.2	When did the symptoms begin?	_____ dd/mm/yyy _____hour	
4.3	Frequency of defecation per day	_____	
4.4	Do you have the following symptoms?	1.Watery diarrhea 2.Vomiting 3.General body weakness4.Loss of consciousness 5.Muscle cramp6.Other(specify)_____	
4.5	Have you been treated with antibiotic for your recent complaints?	1.Yes 2.No	
4.6	What antibiotics did you take?	1. _____ 2. I don't know	
4.7	Where did you take the antibiotics?	_____	
4.8	Where did you admit	1. CTC 2. Hospital 3. Private clinic 4. Others, _____	
4.9	Is there any sick other person in your house?	1. Yes 2. No	
4.10	If yes, is that before or after your symptoms began?	1, Before, 2 After 3. At the same time	
4.11	Is there AWD sick person in your village?	1. Yes2. No 3 I don't know	
4.12	Did you have contact history with the same compliant in the past 7days before your symptoms onset	1.Yes2.No	
5. **Travel and Exposure History**			
5.1	Did you travel in the past 7days outside of your village before your symptoms onset?	1.Yes 2.No	

No.	Question	Coding Classification	Go To
5.2	If, yes where	_____	
5.3	Did you participate in funeral ceremony of AWD death	1.Yes2.No	If no skip to Q No. 5.6
5.4	Whendid you participate in funeral ceremony of AWD death	_____dd/mm/yyy	
5.5	Where did you participate in funeral ceremony of AWD death	_____	
5.6	Did you attend other public ceremonies /events(weeding, religious, bather , telethon)	1.Yes 2.No	If No skip to Q No. 6.1
5.7	5.8 What kind of food did you served at the ceremonies/ event?	5.9 _____	5.10
5.11	What kind of drink did you served at the ceremonies/ event? (if water mention sources)	_____	
6. WASH			
6.1	Where do you defecate?	1. Toilet2. open field	If No Skip to Q 5.4
6.2	If answer to Q6.1 is "toilet" who own it?	1. Private `2. Communal 3. Public	
6.3	show me the toilet	1.Clean 2.Unclean 3.Ventilated4.Sign of utilization	
6.4	If the answer to question number 6.1 is OFD, can you tell me the reason?	1. No toilet 2. Culture 3.Bad odor 4. Fear of falling down 5.Too far from my house 6. Physically damaged (toilet) 7.Other(specify)_____	
6.5	Is there facility to wash your hand after defecation near toilet?	1.Yes 2.No	
6.6	When do you wash your hand (none proving)?	1.After toilet2.Before food3.After cleansing child 4.Before preparing food5.Before feeding child 6.Other(specify) _____	
6.7	What items are you using for hand washing?	1. Plain water 2. Soap 3. Ash 4.Other(specify)_____	
6.8	What is the water source for your house hold for drinking purpose?	1.Pipe water2.Spring3.Hand dug well 4.Deep well5.Pond6.River 7. Lake 8. Bottled water 9.Other(specify) _____	
6.9	What is the water source for your house hold for washing utensils?	1.Pipe water2.Spring3.Hand dug well 4.Deep well5.Pond6.River 7.Lake 8.Other(specify) _____	
6.10	What is the water source for your house hold for cooking food?	1.Pipe water2.Spring3.Hand dug well 4.Deep well 5.Pond6.River 7.Lake 8.Other(specify) _____	
6.11	How many hours/minutes will take you or your family to fetch water from the water source?	_____hours _____minute 98. I cannot estimate	
6.12	What type of container are you using to fetch water from the source?	1.Jerry cane2.Bucket3.Ensira(Gan) 4.Other(specify) _____	
6.13	What type of water container are you/your family is using in your house for storage?	1.Jerry cane2.Bucket3.Ensira(Gan)4.Rotto 5. Other(specify) _____	
6.14	How was the water accessed from the storage container?	1.Pour2.Dip with cup 3.Other(specify)_____	

No.	Question	Coding Classification	Go To
6.15	Does the container have cover/lid (observe)?	1.Yes2.No	
6.16	Do you clean your water containers regularly?	1.Yes2.No	If No skip to Q6.19
6.17	What materials do you use to wash your water containers?	1.Soap 2.Only water3.Ash 4.Other(specify) _	
6.18	How often do you wash your water containers?	1.Every day2.Every other day 3.Once per week4.Other(specify) _____	
6.19	Do you think the water you are using is safe?	1.Yes2.No	
6.20	Could you purify the water?	1.Yes2.No	
6.21	What methods of water purification do you use (none proving)?	1.Boiling2.Filtration3.Sedimentation 4.Water chemicals5.Other(specify)_____	
6.22	For what purposes do you purify water (none proving)?	1.For drinking2.For cooking3.For washing hand 4.For cleaning food utensils5.Other(specify) _____	
6.23	Is there water purification chemical available in your community?	1.Yes2.No	
7. Feeding			
7.1	What is the cultural food in your area?	1.Rice 2.Enjera with wot 3.Porridge 4. Bread 5. Other(specify) _____	
7.2	Do you eat raw/uncooked food?	1.Yes2.No	If No skip to Q 7.4
7.3	In the past 7 days of your symptoms onset what kind of uncooked food did you eat?	1. Raw meat4. Raw green vegetables 2. Raw tomato 5. Raw fish meat 3. Raw milk 6. Other(specify) _____	
7.4	What kind of cooked food did you eat in the past 7days of your symptoms onset?	1.Enjer with wot2.Roasted meat 3.Other(specify) _____	
7.5	Do you re-heat cooked food if not eaten immediately?	1.Yes2.No	
7.6	Where do you keep the cooked food?	1.Room temperature2.Refrigerator 3.Other(specify) _____	
7.7	What are you doing with the leftover foods (none proving)?	1.Reheat and eat2.For domestic animals 3.Giving for beggars4.Street children 5.Dump in waste substance6.Other(specify) _____	
7.8	Is there fish supply in your village?	1.Yes2.No	
7.9	Do you eat raw fish?	1.Yes2.No	
7.10	Did you eat food from other house in the past 7 days of your symptoms	1.Yes2.No	

1.2 MALARIA OUTBREAK INVESTIGATION IN DASSENCH WOREDA, SOUTH OMO ZONE, SNNPR, SEPTEMBER 2016.

Daniel T. Dinku[1, 2] , E. Fikre[3] , A. Wondimu[3] , A. Adamu[3] , A. Abdulnaser[4] ,

[1]Ethiopian Field Epidemiology Training Program Resident, [2]PHEM officer, [3] Instructor at Addis Ababa University, [4]Resident advisor at Addis Ababa University

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ABSTRACT

Background; Malaria is parasitic and vector born disease which is transmitted by infected Anopheles mosquitoes. Malaria is one of the health problems in Dassench woreda as well as to Delerele kebele since the area is endemic to malaria. The purpose of this study was to describe the magnitudes of malaria outbreak and identify the risk factors that associated with the outbreak in Delerele kebele of Dassench woreda.

Method; Descriptive followed by unmatched case-control study design was conducted from September 29 to October 08/ 2016. Our samples are all eligible cases during study period and based on lab result 100 positive cases (26% of the total cases) and 200 controls that neighbor to the cases were selected. The data were collected by investigator and five nurses who give treatment service for malaria patient by moving house to house through different village. In face-to-face interviews and by observation different information were collected. Questionnaire included socio-demographics, knowledge and risk factors for malaria transmissions for both control and cases but included the clinical picture only for cases. The data were first cleaned then entered and analyzed by epi-info version 7.2. Analytical and descriptive analysis was done and the results were presented by epi curve, graphs, tables and map.

Result; A total of 386 malaria cases were reported from September 25 to October 13 of 2016 with attack rate of 14.6%. There was no death during the epidemic time. Out of total case 205(53%) are Male and 181(47%) were female. The mean age of cases was 14 with standard deviation of ±12 respectively. The proportion of slides that were positive (slide positivity rate in out of 625 examined, 386 were positive) 61.7%. The outbreak occurs in Delerele kebele and 11 small Iceland's in Lake Turkana. The confirmed cases were P.falciparum (253, 65.5%), and Mixed (133, 34.5%) malaria, which were confirmed microscopically and RDT method. Using Multivariate analysis, factors significantly associated with malaria outbreak were absence of bed net (OR: 2.37; 95%CI: 1.29- 4.34; P: < 0.005) , Sleeping outside the home (OR: 1.95; 95%CI: 1.1- 3.56; P: < 0.03) ,Presence of mosquito breeding site near to village (OR: 1.99; 95%CI: 1.09- 3.65; P: < 0.02) , Presence of patient with similar sign and symptom in the home (OR: 3.34; 95%CI: 1.8 - 6.1; P: < 0.0001).

Conclusion ; This study indicates that low coverage of ITNs, presence of natural vector breeding sites, 0.00% coverage of IRS in the last one year in affected kebele and sleeping outside the home (during the night due to high environmental temperature) and exposed to mosquito bite were more significant risk factors for the malaria outbreak in the affected kebele. It is recommended that the woreda Health office and other stakeholders should apply sound prevention and control program designed by the country (ITNs provision, Environmental management, and early treatment of cases, conducting IRS and Health promotion) in Delerele kebele and small Iceland's around Lake Turkana to prevent and to control the occurrence of outbreak of malaria

INTRODUCTION

Over the last decade, the world has made major progress in the fight against malaria. Since 2000, malaria mortality rates have fallen by more than 25% and 50 of the 99 countries with ongoing transmission are now on track to meet the 2015 World Health Assembly target of reducing incidence rates by more than 75%. A major scale-up of vector control interventions, together with increased access to diagnostic testing and quality-assured treatment, has been key to this progress [1].

Malaria still kills an estimated 660 000 people worldwide, mainly children under five years of age in sub-Saharan Africa. Every year, more than 200 million cases occur; most of these cases are never tested or registered. A recent plateauing of international funding has slowed down progress, and emerging drug and insecticide resistance threaten to reverse recent gains [1].

Ethiopia is among the few countries with unstable malaria transmission. Consequently, malaria epidemics are serious public health emergencies. While malaria is mostly an endemic disease, it may also occur as outbreaks, for example in areas with low seasonal transmission [3].
Ethiopia is also one of the most malaria epidemic-prone countries in Africa. Rates of morbidity and mortality increase dramatically (i.e. 3-5 fold) during epidemics. Since 2005, Ethiopia has scaled-up one of the largest and most ambitious malaria control programs in Africa, designed to support the country's Health Sector Development Plan (HSDP), the national strategic plan (NSP) and the national child survival strategy, in order to reduce under-five mortality rates by two thirds by 2015[4].

Possible precipitating factors of Malaria epidemics are: - abnormal weather conditions / rain fall, increase of vector capacity, deterioration of vector control operations, immigration of non- endemic into an endemic area, resistance to anti malaria drugs and constructions / dams, mining/[4].

The main vector control activities implemented in Ethiopia include IRS, LLINs and mosquito larval source reduction. (MoH, January 2012) The challenge now is maintaining the existing high LLIN coverage and increasing utilization rates. Further, targeting IRS based on a epidemiologically sound, affordable and sustainable approach continues to be a challenge [4].

While Ethiopia aims to achieve malaria elimination in selected geographical areas with historically low malaria transmission by 2015, outbreaks occurred in some areas of the country.

One of the affected Ethiopia's regions is SNNPR. South Omo Zone reported malaria case build up from Dassench district on 25/09/2016 G.C. Based on the report from South Omo Zonal health department team was deployed to conducted investigation in the affected kebele namely Delerele kebele and Iceland's around Lake Turkana. The woreda has a total population of 66,928 of whom (33,109 are male and 33,819 female) and 10,447 and 56,481 accounts for under 5 and above 5 age group respectively . The affected kebele (i.e Delerele Kebele) takes 2554 population. Almost all of the inhabitants were Pastoralist. The altitude of this woreda ranges from 350 to 400 meters above sea level. The climate of Dassench is arid. Important rivers and lake include in the woreda are Omo River and Lake Turkana respectively.

OBJECTIVE

GENERAL OBJECTIVE

To describe the magnitude, to identify risk factors associated with malaria out-break and to implement control measure in Delerele kebele of Dassench woreda September 2016.

SPECIFIC OBJECTIVE

1. To describe the magnitude and distribution of the outbreak by place, person and time
2. To identify the risk factor that associated with the outbreak
3. To propose and implement control measures

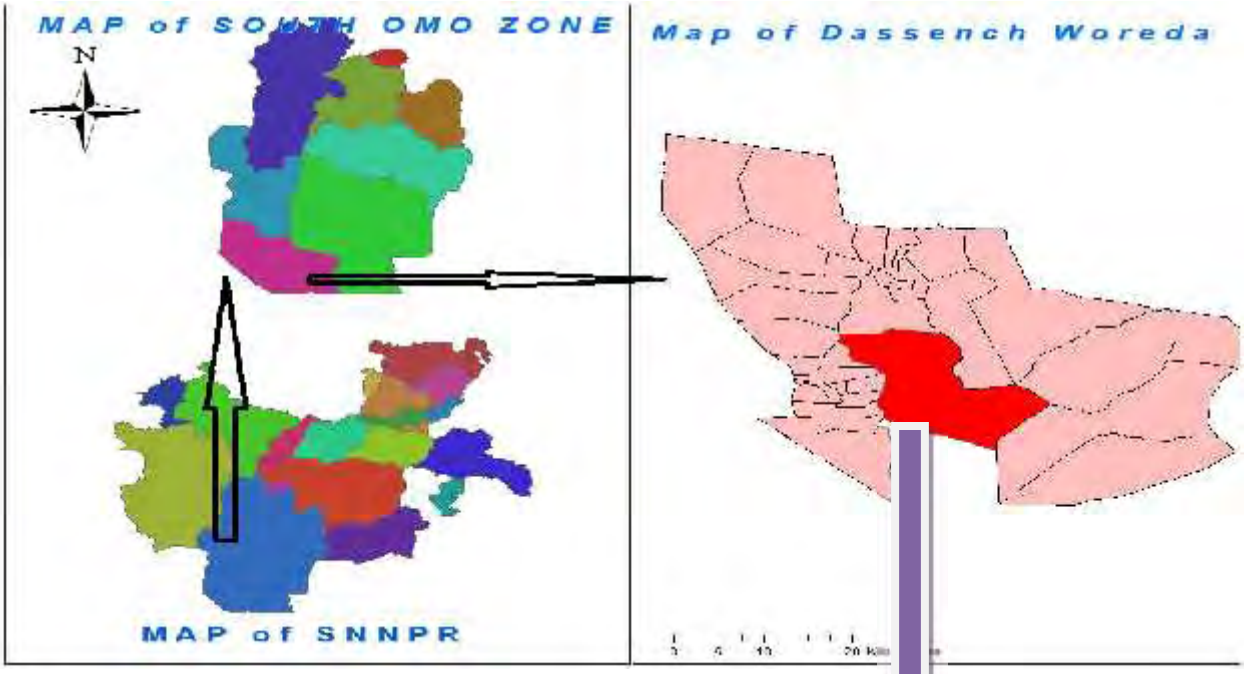
MATERIAL AND METHOD'S

STUDY PERIOD

The study was conducted in Delerele Kebele of Dassench district, South OmoZone from September 29 to October 08/ 2016.

STUDY AREA

Dassench is one of the pastoralist woreda in the SNNP region and located in the Southern part of the country. The altitude of the woreda is 350-370 meter above sea level and its size is 3284 square kilometer. The large portion of land mass of the woreda (99.83%) is plane & only 0.17% is Plato. The climate of the Woreda 100% Desert (Berehama) with annuls minimum temperature 28^0c and maximum 42^0c and average annual rainfall were 330mm. It comprises 39 rural and one urban kebele. The capital town of the woreda is called Omo Rate town which is 932 km far from Addis Ababa to the South West and 712 km far from Hawassa to the South direction. It is bordered on the North Hammer District, on the South it share international border with KENYA, on the East Hammer District and on the West with Gnagatom District. Delerele kebele is one of the 39 rural kebele in Dassench woreda and 31km far away from the woreda capital. The kebele also encircled by Omo River and Lake Turkana.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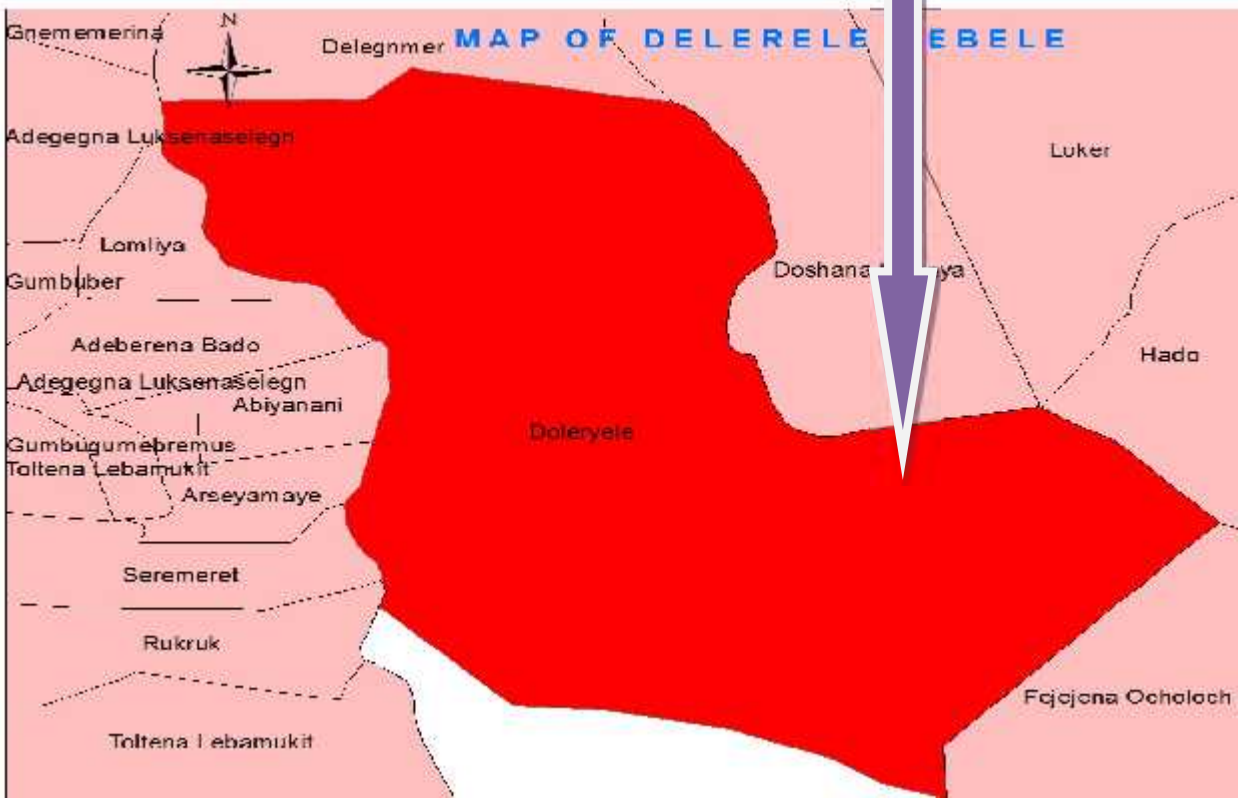
MAP of SNNPR
Map of Dassench Woreda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Seremeret
Rukruk
Fejejona Ocholoch
Toltena Lebamukit

STUDY DESIGNE

Descriptive followed by unmatched case-control study design was used.

SAMPLE SIZE DETERMINATION

Our samples are all eligible cases during study period which is from September 29 to October 08/ 2016.

SAMPLEING TECHNICQUE

In these regard 100 positive cases (26% of the total cases) and 200 controls that neighbor to the cases were selected from the village when treatment service given to confirmed malaria cases.

DATA COLLECTION

The data were collected by investigator and five nurses who give treatment service for malaria patient by moving house to house through different village. Based on laboratory result cases are selected and controls were nearby living houses of the cases. In face-to-face interviews and by observation different information were collected.

QUESTIONNAIRES DESIGN

Questionnaire included independent variable such as socio-demographics information, knowledge and risk factors for malaria transmissions for both cases and control but included the clinical picture only for cases.

DATA ANALYSIS

The data were first cleaned then entered and analyzed by epi-info version 7.2. Analytical and descriptive analysis was done and the results were presented by epi curve, graphs, tables and map.

DESCRIPTIVE EPIDEMIOLOGY

A case of malaria was defined as an acute febrile illness with a peripheral blood smear positive for malaria parasite or a positive rapid antigen test in a resident of Delerele kebele, Dassench district on September, 2016. Woreda weekly malaria surveillance reports were reviewed for 2015 and the 2016 data was compared with the threshold which is determined by doubling the previous year weekly malaria data to determine whether the epidemic threshold had been

crossed. Weekly Surveillance reports and facility patient registration book were reviewed. House to house active case search was conducted to address all febrile cases. An epidemic curve was constructed. Community leaders, patients and health workers were interviewed to collect qualitative information.

ANALYTICAL EPIDEMIOLOGY

A 1:2 case-control study was conducted to identify the risk factors. Cases were selected based on the case definition mentioned above and those peoples with no fever for the recent months were selected as controls and matched by age group, gender and living place. A structured questionnaire was used to collect information about selected practices, including indoor residual spraying (IRS), utilization of insecticide treated nets and suspected risk factors near to their house like :-Ponds, artificial water holding containers and stagnant waters. Bivariate analyses were conducted and association between the risk factor and exposure outcome were measured and tested using OR and confidence interval. Data entered and analyzed using Epi-info version 7.2.

LABORATORY METHOD

Laboratory technicians use microscope to detect malaria parasites and nurses & health extension workers confirm malaria species using Rapid Diagnostic Test.

RESULT

DESCRIPTIVE EPIDEMIOLOGY

A total of 386 malaria cases were reported from September 25 to October 13 of 2016 with attack rate of 14.6%. There was no death during the epidemic time. Out of total case 205(53%) are Male and 181(47%) were female. The mean age of cases was 14 with standard deviation of ±12 respectively. The alert threshold (i.e. 2015 doubled weekly data) had been crossed in week 37 to week 42, October 2016 in Dassench woreda. In the woreda also the baseline incidence rate was 5/10,000 in wk37 and become peak to 43/10,000 in wk40 (the 1st wk of October 2016). The proportion of slides that were positive (slide positivity rate in Delerele kebele, out of 625 examined 386 were positive) 61.7%. On that basis, the event was determined to be an outbreak and not a seasonal increase in the number of cases. The confirmed cases were P.falciparum (253, 65.5%), and Mixed infection (133, 34.5%) malaria, which were confirmed microscopically and RDT method. The outbreak occurs in Delerele kebele and 11 small Iceland's in Lake Turkana. There were internal population immigration in to the Iceland's area for seek of pasture to their cattle. As the community member described there are high number of malaria affected patients in that Iceland's area specially shepherd. The specific sites were not targeted for Indoor residual spray especially the Iceland's area because there is no governmental organization in the Iceland's.

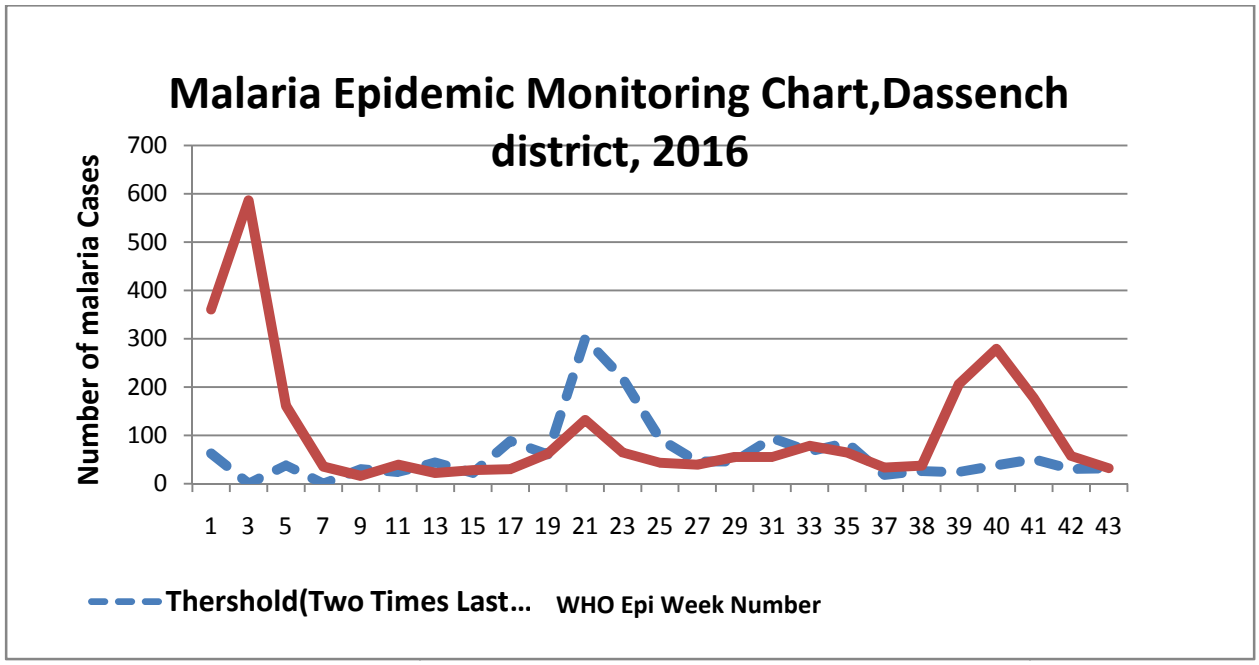

Figure 2: Malaria cases by weeks in Dassench Woreda ,South Omo Zone, Sept. 2016

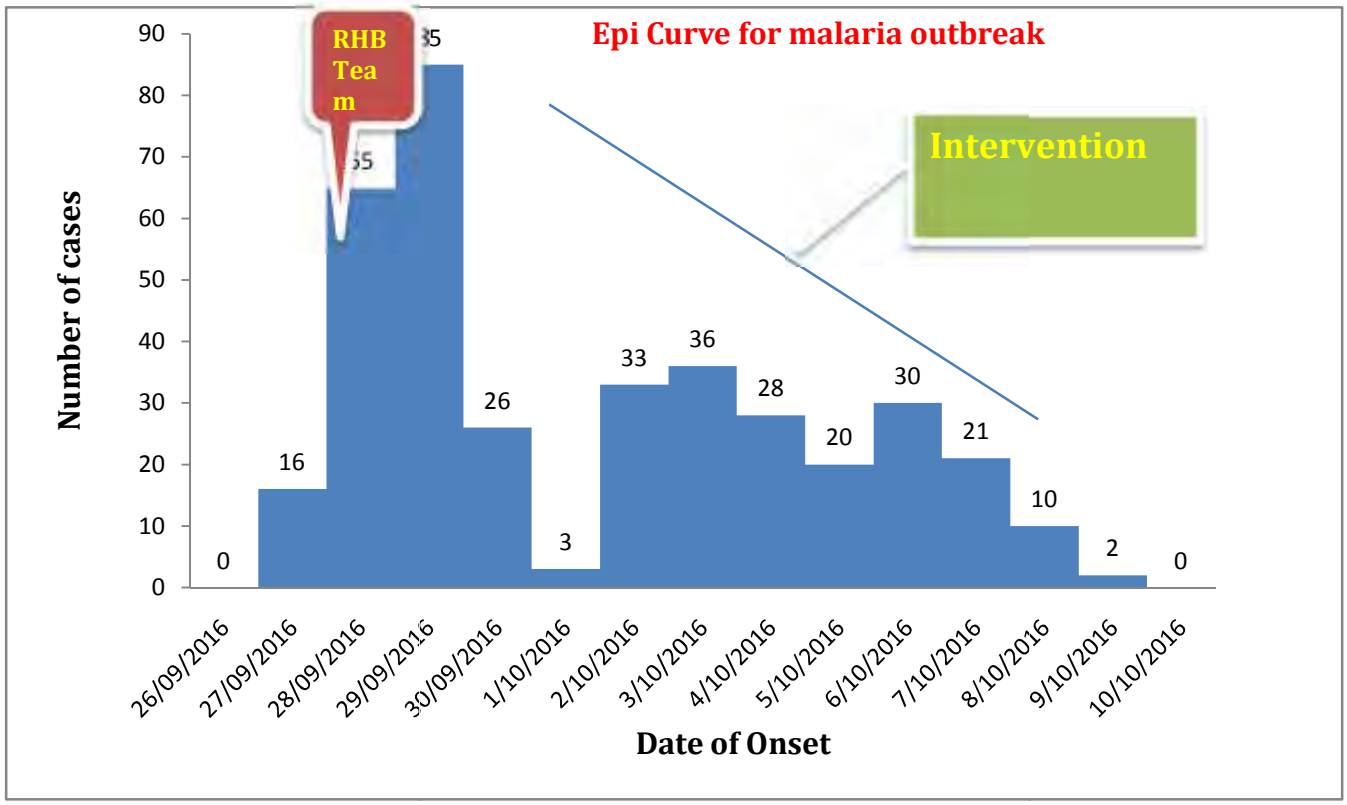

Figure 3: Distribution of malaria Cases by date of onset at Delerele Kebele,Dasseench Woreda, south Omo Zone SNNPR September ,2016

Table 8: Malaria cases and deaths by age and sex, Delerele Kebele, Dassench Wreda, South Omo Zone, SNNPR region, Ethiopia, from 39 to 41 week 2016

Characteristics		population	cases	Deaths	Cases fatality Rate (CFR%)	Attack Rate(AR%)
Age	<5	399	115	0	0	27.8%
	>5	2155	271	0	0	12.1%
Sex	Male	1263	207	0	0	15.6%
	Female	1291	179	0	0	13.6%
Total		2554	386	0	0	14.6%

ANALAYTICAL EPIDEMIOLOGY

100 newly diagnosed malaria cases were selected from 29/09/2016 to 08/10/2016 and 200 controls. The median age for cases and controls were 15 and 14 respectively. On Multivariate analysis, factors significantly associated with malaria outbreak were absence of bed net (OR: 2.37; 95%CI: 1.29- 4.34; P: < 0.005) , Sleeping outside the home (OR: 1.95; 95%CI: 1.1- 3.56; P: < 0.03) ,Presence of mosquito breeding site near to village (OR: 1.99; 95%CI: 1.09- 3.65; P: < 0.02) , Presence of patient with similar sign and symptom in the home (OR: 3.34; 95%CI: 1.8 - 6.1; P: < 0.0001).

Table 9:Bivariate and Multivariate analysis of risk factors for Malaria outbreak at Delerele kebele of Dassench woreda September 2016

Variable				**Cured**		**Adjusted**	
		Case	**Control**	**OR(95%CI)**	**P-Value**	**AOR**	**CI**
Do you have bed net in your home?	Yes	38(38%)	44(22.3%)	2.2(1.28-3.66)	0.003	**6.7**	**1.2 – 23.7**
	No	62(62%)	156(77.7%)				
Presence of patient with similar sign and symptom in the home	Yes	44(44%)	40(18.4%)	3.4(1.99-5.8)	0.001	**3.34**	**1.8 – 6.1**
	No	56(56%)	160(81.6%)				
Sleeping outside the home during night time	Yes	38(38%)	44(22%)	2.1(1.2-3.67)	0.003	**1.95**	**1.1- 3.5**
	No	62(62%)	156(78%)				
Presence of mosquito breeding site near to village	Yes	78(78%)	101(50.5%)	3.3(1.9-5.9)	0.001	**1.99**	**1.09 - 3.65**
	No	22(22%)	99(49.5%)				
Do you know about malaria sign and symptom?	Yes	37(37%)	37(18.5%)	2.5(1.5-4.4)	0.004		
	No	63(63%)	163(81.5%)				

LABORATORY

Between 25/09/2016 and 12/10/2016 and a total of 625 malaria blood tests done by Microscopy and Rapid Diagnostic Test (RDT) and 386 of them resulted positive for malaria species in

Delerele Kebele of which 253 (65.5%) were *P. falciparum* while the remaining 133 (34.5%) were Mixed infection (*P. falciparum and P.*vivax).

ENVIROMENTAL ASSESSEMENT

Environmental assessment revealed the presence of stagnant water, Ponds and tick grass which was favorable for mosquito breeding around Lake Turkana and on the bank of Omo River.

Figure 4: Shows Photo of Identified risk factor in malaria affected kebeles of Dasseench woreda September 2016

INTERVENTION

Health professionals assigned for those affected areas and gave house to house treatment and listed all cases. By prioritizing the affected Iceland's more than 2000 ITNs distributed. Training was given for 10 persons selected by woreda health office how to conduct larvicide chemical (abet chemical) on the breeding site and 30 Liter abet chemical was given for affected kebele. Health education was given about the cause, transmission and prevention of the disease to the community.

Figure 5: Shows Photo of different interventions (Case Treatment & Environmental Management) in Iceland's of Delerele kebele, Dassench woreda September 2016

Figure 6: Shows photo of ITNs distribution, Data collection & Social Mobilization in Malaria affected area of Delerele kebele, Dassench Woreda.

DISCUSSION

Malaria is mainly seasonal with unstable transmission in the highland fringe areas and of relatively longer transmission duration in lowland areas, river basins and valleys [5]. During the investigation season tried to identify the history of outbreak in kebele and there was an outbreak in the local village and in Delerele kebele in January 2016. This kebele are found near to Lake Turkana and have a wide grazing land, therefore shepherd coming with their cattle to find pasture from different kebeles and staying for a long period of time.

A total of 386 malaria cases were reported from September 25 to October 13 of 2016 with attack rate of 14.6%. There was no death during the epidemic time. Out of total case 205(53%) are Male and 181(47%) were female. The alert threshold (i.e. 2015 doubled weekly data) had been crossed in week 37 to week 42, October 2016 in Dassench woreda. In the woreda also the baseline incidence rate was 5/10,000 in wk37 and become peak to 43/10,000 in wk40 (the 1st wk of October 2016). The proportion of slides that were positive (slide positivity rate in Delerele kebele, out of 625 examined 386 were positive) 61.7%. On Multivariate analysis, factors significantly associated with malaria outbreak were absence of bed net (OR: 2.37; 95%CI: 1.29-4.34; P: < 0.005) , Sleeping outside the home (OR: 1.95; 95%CI: 1.1- 3.56; P: < 0.03) ,Presence of mosquito breeding site near to village (OR: 1.99; 95%CI: 1.09- 3.65; P: < 0.02) , Presence of patient with similar sign and symptom in the home (OR: 3.34; 95%CI: 1.8 - 6.1; P: < 0.0001).

This study indicates that low coverage of ITNs associated with increased risk of malaria and in contrast studies in Kenya shows that achieving high LLINs coverage has been associated with sharp decreases in malaria cases [5].

Presence of natural vector breeding sites also associated with increased malaria risk and similar analytic approach in India indicated that people living closer to established vector breeding sites were at higher risk for malaria than those living farther away [6,7].

Who sleeping outside the home during the night time (due to high environmental temperature) exposed to mosquito bite and it was significant risk factors for the malaria outbreak in the affected kebele.

According to woreda health office report Deltamethrine spray were not conducts in delerele kebele in the last two year. In addition to vector proliferation, absence of indoors residual spray may have contribution to the occurrence outbreak in a place. This low coverage would at most lead to a very modest effect on transmission [7]. Finally a lot of intervention activities are conducted and the outbreaks were controlled.

CONCULSION

The malaria outbreak in Dassench woreda in 2016 was multifactorial and determinants included low coverage of ITNs, vector breeding in stagnant water bodies, 0.0 coverage of IRS and sleeping outside the home during the night due to high environmental temperature that exposed to mosquito bite were more significant risk factors for the malaria outbreak in the affected kebele.

RECOMMNDATION

- It is recommended that the woreda Health office and other stakeholders should apply sound prevention and control program designed by the country (ITNs provision, Environmental management, Early treatment of cases, conducting IRS and Health promotion) in Delerele kebele and small Iceland's around Lake Turkana to prevent and to control the occurrence of outbreak of malaria
- Regional health bureau and zonal health department should give especial attention in continuous provision of malaria prevention methods like LLINs and IRS in the woreda.
- Woreda health office attention may be needed for the shepherd who move place to place for the seek of pasture in prevention of malaria; Health Education and also to have early treatment where they have worked
- Introducing mosquito repellents to the residences and highly moveable people(shepherd) with cheap cost or free
- The woreda should give more stress in community mobilization and empowerment in prevention and control of malaria

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Annex 2: Dassench Woreda Malaria Outbreak investigation Questionnaire

Malaria Outbreak Questionnaire, Dassench District South Omo Zone, Ethiopia, September 2016.

I. Socio-demographic information:

1. ID number of respondent_____
2. Age in years_____
3. Sex: M☐ F ☐
4. Address: Region _____Zone_____ Woreda_____ kebele _____village_____
5. Occupation: Employed ☐ unemployed ☐ Student☐ Pastoralist ☐ farmer
6. Total family members _____
7. Ethnicity: _____
8. Religious: Orthodox, ☐ Protestant, ☐ Muslim ☐ other ☐
9. Marital status : Married, ☐ single ☐ Widowed ☐ Divorced☐
10. Education status: Illiterate ☐ Primary, ☐ Secondary ☐ tertiary ☐, non-formal ☐
11. Case status
    a) Case Yes ☐ ,
    b) Control yes☐

II. Clinical presentations:

***(For case only)**

12. What was the first symptom? _____
13. When was the 1st symptom started(date of onset of symptoms) DD/MM/YY_____
14. What were others symptoms?
    a) Fever: Yes ☐ No☐, if yes duration of fever____ Was it constant fever?: Yes ☐ No☐ or every other days fever? Yes ☐ No☐
    b) Vomiting : Yes ☐ No☐
    c) Diarrhea : Yes ☐ No☐,
    d) Anorexia (appetite loss): : Yes ☐ No☐,
    e) Headache: Yes ☐ No☐

f) sweating,: Yes ☐ No☐,

g) Chilling and shivering : Yes ☐ No☐,

h) Weakness : Yes ☐ No☐,

i) Caught: : Yes ☐ No☐,

j) back pain : Yes ☐ No☐,

k) muscle pain : Yes ☐ No☐,

l) rigor: Yes ☐ No☐,

➡ ***Ask the following signs (M to Y) for complicated malaria only***

m) Altered consciousness (e.g. confusion, sleepy, drowsy, comma) Yes ☐ No☐,

n) Not able to drink or feed Yes ☐ No☐,

o) Severe dehydration, Yes ☐ No☐,

p) Persistent fever, Yes ☐ No☐,

q) Frequent vomiting Yes ☐ No☐,

r) Convulsion or recent history of convulsion Yes ☐ No☐,

s) Unable to sit or stand up Yes ☐ No☐,

t) pallor (Anemia) Yes ☐ No☐,

u) No urine output in the last 24 hours Yes ☐ No☐,

v) Bleeding Yes ☐ No☐,

w) Jaundice (yellowish coloration) Yes ☐ No☐,

x) Difficult breathing Yes ☐ No☐,

y) Other conditions that cannot be managed at this leve_____
_____

15. Did you visit health facilities? Yes☐ No☐, if yes, when did you visit health facilities? DD/MM/YY_____

16. Did you get any treatment 1.Yes ☐ No☐, If yes, what treatment did you get?

(a) Coartem Yes ☐ No☐, was it for PF Yes ☐ No☐,

(b) Chloroquine? Yes ☐ No☐, was it for PV Yes ☐ No☐,

(c) Quinine tablets Yes ☐ No☐, was it for pregnant and <5 Kg? Yes ☐ No☐,

(d) Quinine injection Yes ☐ No☐, was it for sever malaria Yes ☐ No☐,

(e) Other treatment given

_____
_____
_____

17. Did you recover completely after the treatment: Yes-☐ No ☐

18. Place of residence during 2 weeks before onset of illness;_____

19. Blood samples taken: Yes-☐ No ☐

20. If yes Q18, what was the result : Positive ☐ negative ☐

III. Risk Factors:

***(For both cases and controls)**

21. Specific living areas _____

22. Sleeping areas in side home _____outside home_____

23. Do you stay outside over night? Yes-☐ No☐

24. Is there anybody in your home with similar sign and symptoms? Yes-☐ No☐

25. Did you travel outside your village in the past 2-3 wks Yes-☐ No ☐

26. If yes Q 24, indicate

(a) date of travel DD/MM/Y_____

(b) the place of travel

(c) date when you returned back DDMMYY_____

27. If Q 24 is yes, were there sick patients (same symptoms) in the place where you have been Yes-☐ No☐

28. is there a similar sick patient in your house hold Yes-☐ No☐

29. Do you have bed net in your household Yes-☐ No☐, If is yes, how often do you use Always☐ Sometimes ☐Never ☐

30. Do mothers and children given priority of using bed nets? Yes-☐ No☐

31. If yes Q 28 the number of bed nets _____

32. Was deltamethrine sprayed this year? Yes-☐ No☐

33. If yes Q31 when?_____

34. If yesQ31 how many? Once ☐ twice ☐

IV. Environmental investigation

35. Place of stay during night? _____

36. Is there any artificial water -holding containers close to your home? such as :

a. old tires: Yes-☐ No☐,
b. Plant in the containers /flower –pots Yes-☐ No☐,
c. plant with temporary water pools Yes-☐ No☐,
d. Open deep well: Yes-☐ No☐,
e. Broken glass bottles Yes-☐ No ☐,
f. Cans Yes-☐ No☐,
g. Plastic container Yes-☐ No☐,
h. Gutter to collect rainwater: Yes-☐ No☐,
i. Uncovered water storage/ septic tank Yes-☐ No☐,
j. Stagnant water Yes-☐ No☐,

37. Presence of mosquito vectors/ mosquitoes breeding sites around the home or vicinity? Yes-☐ No☐,

38. If Q36 yes, presence of larvae in breeding sites Yes-☐ No☐,

39. Types of house screened Yes-☐ No ☐, unscreened Yes-☐ No ☐,

40. Do you use repellents Yes-☐ No☐,

41. Protective clothing Yes-☐ No☐,

42. Waste collection: Yes-☐ No☐,

43. Unprotected irrigation Yes-☐ No☐,

44. Presence of Intermittent rivers cloths to the community Yes-☐ No☐,

45. Presence of tick grass Yes-☐ No☐,

V. Awareness assessment

46. Do know malaria? Sign and symptoms ----------

---

47. How it transmitted?---

---

48. How it can be prevented?---

CHAPTER II- MALARIA SURVEILLANCE DATA ANALYSIS REPORT

2.1 MALARIA SURVEILLANCE DATA ANALYSIS IN SOUTH OMO ZONE, SNNPR ETHIOPIA , FROM 2003 TO 2007EFY

ABSTRACT

Background: More than a million people die of malaria cases each year in the world, most of them in Africa. In Ethiopia, malaria remains to be one of the major public health problems that causes significant barrier to both public health and socio-economic development. We conducted a descriptive malaria surveillance data analysis in South Omo Zone and proposed possible recommendations useful for control and Prevention activities.

Methods: Data on malaria indicators were collected from the Integrated Disease Surveillance and Response system database and Public Health Emergency Management core process from 2003 to 20007EFY. Reporting units were standardized over time with 1999EFY census populations. The data was analyzed to indicate the trend of malaria Morbidity and Mortality rate in the Zone.

Result: The total malaria outpatient during 2003 was 88/1000 which was then raised to reach its maximum point in 2006 which was 95/1000. However, this was then decreased by half in the year 2007 and reaches 48/1000 in malaria population. In South Omo Zone the total estimated annual malaria prevalence rate for the calendar years 2003 was 88 per 1000 and 48/1000 in 2007 , and the prevalence rate of confirmed malaria cases for the same period accounts for 31 cases per 1000 population and 36/1000 respectively . The Average Reported malaria in-patient admissions and deaths in this zone were 107 per 100,000 and 2 per 100,000 per year respectively.

Conclusion: Malaria continued to be a major cause of ill-health in South Omo Zone. Even though different malaria control strategies were designed to rollback to its minimum level, still malaria cases were not decreased as expected that the prevalence rate of total malaria and confirmed malaria cases would be rising from 2003 through 2006 and showed slight decline to 2007. Therefore, the zonal health department should do operational research on verifying the reason for increasing number of malaria cases especially in those woreda who reports high number of cases in the zone.

INTRODUCTION

Malaria still remains one of the most important parasitic diseases of the developing world although it is known to human kind since ancient times in different forms. It is caused by Plasmodium malaria parasite and kills approximately 1-3 million people and causes disease in 300- 500 million people annually. Pregnant women are the main adult risk group in most endemic areas of the world. The disease poses a major public health challenge, which restricts the development in the poorest countries [1-3].

In low-transmission areas when there is appreciable heterogeneity in the distribution of malaria, it becomes increasingly important to identify the population groups most susceptible to infection and to target resources appropriately. When the case incidence is reduced sufficiently, health facilities can begin to report details of individual malaria cases to Woreda level. These reports can be used to construct a case register that provides more detailed information on the principal locations and population groups affected by malaria.

Ethiopia is among the few countries with unstable malaria transmission. Consequently, malaria epidemics are serious public health emergencies. In most situations, malaria epidemics develop over several weeks, allowing some lead-time to act proactively to avoid larger numbers of illnesses and to prevent transmission. Approximately over 68 million people (68%) live malaria-endemic areas in Ethiopia, chiefly at altitudes below 2,000 meters. Malaria is mainly seasonal in the highland fringe areas and of relatively longer transmission duration in lowland areas, river basins and valleys. Although historically there have been an estimated 10 million clinical malaria cases annually, cases have reduced since 2006. Malaria is a public health priority problems and also have high Epidemic potential which causes high Outpatient morbidity which leads to high socio economic impacts in Ethiopia [4,6,7].

The main malaria parasites are Plasmodium falciparum and Plasmodium vivax, accounting for 60% and 40% of all cases, respectively. Anopheles arabiensis is the main vector; Anopheles pharoensis is also widely distributed in the country and is considered to play a secondary role in malaria transmission [4, 5, and 8].

Information on the number and distribution of malaria cases and deaths is critical for the design and implementation of malaria control program. It is needed to determine which areas or

population groups are most affected by malaria, so that resources can be targeted to the populations most in need. Information on the incidence of disease in relation to past levels is needed to alert program about epidemics, so that control measures can be intensified. Data on changes in disease incidence and mortality are also needed in order to judge the success of a program and to determine whether it is performing as expected or whether adjustments in the scale or blend of interventions are required. The capacity of malaria surveillance systems to provide information on the distribution and trends in malaria varies widely across the globe.

Surveillance systems can help program managers to do this, by providing information on the populations in which the incidence of malaria is highest (and therefore to whom resources should be targeted) and on changes in incidence over time that require attention.

The main source of information for malaria surveillance in the control phase is reports of confirmed malaria cases, malaria inpatients and malaria deaths obtained from all or selected public sector health facilities. These may be complemented by data from household surveys on the prevalence of parasitaemia and intervention coverage. In high- and moderate-transmission areas, monthly counts of malaria cases, inpatients and deaths can be used to determine trends over time and the geographical distribution of malaria. At health facility level, data on individual patients are used to investigate the circumstances surrounding each admitted case and death, so as to identify program weaknesses and potential improvements. As transmission is reduced and the risk of epidemics increases, more frequent analysis of cases is undertaken at health facility level to allow early detection of potential outbreaks. Moreover, as the numbers of severe cases and deaths diminish health facilities can report details of each malaria inpatient and death to Woreda level so that a Woreda register of severe cases can be assembled and action taken to address persistent problems [4].

Public health surveillance plays great important roles in reduction of morbidity and mortality of malaria by ongoing, systematic collection, analysis, interpretation and dissemination of data regarding to health-related event for use in effective and efficient Decision making purpose in public health action to enhance the sustainable development of the country.

This continuous analysis of surveillance data is important for detecting outbreaks and unexpected increases or decreases in disease occurrence, monitoring disease trends, and evaluating the effectiveness of disease control programs and policies. This information is also

needed to determine the most appropriate and efficient allocation of public health resources and personnel. Routine malaria surveillance data is useful for assessing incidence and trends over time, and in stratification for targeting of malaria control.

This surveillance data will be collected through Ethiopian Field Epidemiology residents and then analyzed and interpreted to see the general trends of malaria morbidity and mortality by place, person and time in SNNPR Region, South OmoZone health Department.

OBJECTIVE

GENERAL OBJECTIVE

- To analyze malaria surveillance data in South Omo Zone, SNNPR, February 2016.

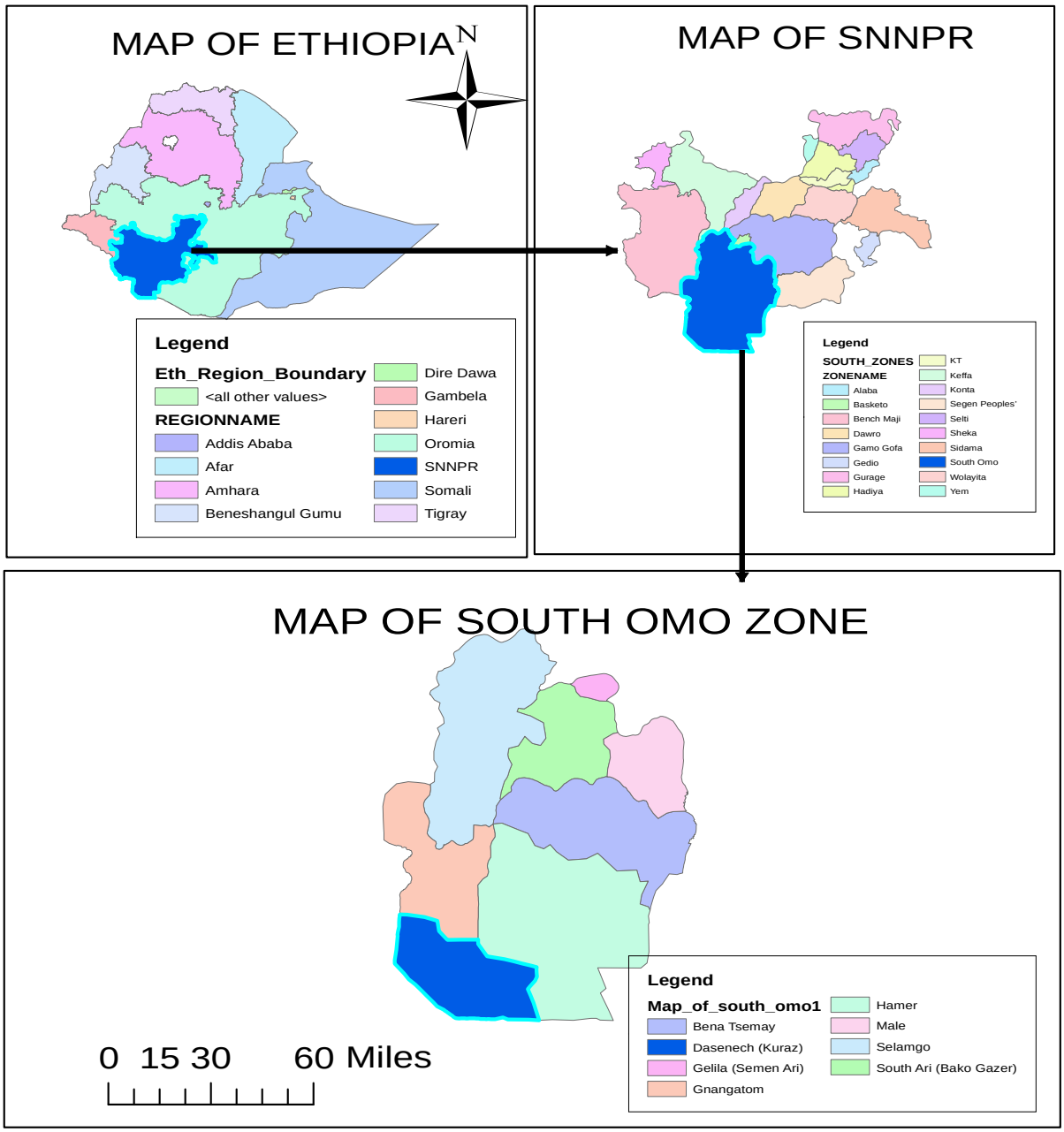
SPECIFIC OBJECTIVE

- To describe malaria trend in the zone from 2003-2007EFY.
- To describe the malaria data by place, person and time in South Omo Zone from 2003-2007EFY.
- Malaria morbidity and mortality in South OmoZone, SNNPR from 2003-2007EFY.
- To determine major transmission season.

MATERIALS METHOD'S

STUDY AREA

South Omo Zone is one of the zone in SNNPR regional state located at Southwestern part of Ethiopia. Astronomically it lies between4.43---6.46 degree North latitude and 35.79---36.06 degree South longitude. It is bordered with GamoGofa Zone in the North, KENYA in South,Segen peoples Zone in East, Borena Zone from Oromia region in South Eastern direction and Bench Maji Zone & South Sudan in the Western direction. The 2008EFYtotal population of the zone is estimated to be714,588 having land area of 22,836 km2 with population density of 32 per KM^2.743 Km away to South Weast of Addis Ababa .This Zone Contains 8 woreda' s and 1 Administration town in which further divided into 235 Rural and 19 Urban kebele's .The zone has lowest altitude about 350 meter above sea level in the southern extreme, near lake Turkana to 3,500 meter above sea level in northern part.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Afar
Amhara
Beneshangul Gumu
Dire Dawa
Gambela
Hareri
Oromia
SNNPR
Somali
Tigray
MAP OF SNNPR
Legend
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ZONENAME
Alaba
Basketo
Bench Maji
Dawro
Gamo Gofa
Gedio
Gurage
Hadiya
KT
Keffa
Konta
Segen Peoples'
Selti
Sheka
Sidama
South Omo
Wolayita
Yem
MAP OF SOUTH OMO ZONE
Legend
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Bena Tsemay
Dasenech (Kuraz)
Gelila (Semen Ari)
Gnangatom
Hamer
Male
Selamgo
South Ari (Bako Gazer)
0 15 30 60 Miles

STUDY PERIOD

Malaria five years data (from 2003 to 2007EFY) were collected in February 2016, Organized, analyzed and interpreted accordingly Using Microsoft excels 2007.

CASE DEFINITION

SUSPECTED CASE DEFINITION

Any person with fever or fever with headache, rigor, back pain, chills, sweats, Myalgias, nausea, and vomiting diagnosed clinically as malaria [8].

CONFIRMED CASE DEFINITION

A suspected case confirmed by microscopy or RDT for plasmodium parasites [8].

PRESUMED MALARIA (CLINICAL MALARIA)

Suspected malaria case without a diagnostic test to confirm malaria but nevertheless treated presumptively as malaria [2].

TOTAL MALARIAOUTPATIENTION:- it is the total malaria (either clinical or by confirmation)

POPULATION AT RISK:- Populations at high risk for malaria are those living in areas where the number of reported cases is ≥1 per 1000 per year, and those at low risk are living in areas with < 1 case of malaria per 1000 per year (defined at the lowest administrative level for which data are provided). Other parts of the country are free of malaria transmission.

STUDY DESIGN AND SAMPLING PROCEDURE

Descriptive retrospective cross sectional study design were used to assess data from PHEM reporting format which includes malaria items encompassing total malaria cases (clinical and confirmed) for out-patients, in-patients and deaths; confirmed out-patient malaria cases by species; in-patient cases and deaths for malaria; and out-patients, in-patients and deaths for malaria in pregnancy. Incidence estimates for summary malaria indicators by year and month were obtained by summing the appropriate indicator over the time period in question using the relevant population denominator (population at malaria's area) for each reporting unit.

DATA PROCESSING ANALYSIS TECHNIQUE

Microsoft Excel 2007 was used and all eligible key indicators were entered manually and finally data were organized, analyzed and displayed in different Figures.

DATA DISSEMINATION

Written report (both hard and soft copies) was prepared and shared to Addis Ababa University/School of Public Health Ethiopia Field Epidemiology Training Program Resident advisors and coordinators , SNNPR Regional Health Bureau, and finally to South OmoZone Health department .

ETHICAL CONSIDERATION

This five year data were collected after having written consent letter from SNNPR Regional Health Bureau to zone to get ethical clearance. After discussing the purpose and method of the study, permission was sought from the South OmoZonal health department head before the data collection.

RESULT

The total malaria outpatient during 2003 was 88/1000 which was then raised to reach its maximum point in 2006 which was 95/1000. However, this was then decreased by half in the year 2007 and reaches 48/1000 in malaria population. In South Omo Zone the total estimated annual malaria prevalence rate for the calendar years 2003 was 88 per 1000 and 48/1000 in 2007 , and the prevalence rate of confirmed malaria cases for the same period accounts for 31 cases per 1000 population and 36/1000 respectively . The Average Reported malaria in-patient admissions and deaths in this zone were 107 per 100,000 and 2 per 100,000 per year respectively.

Table 10: Total IPD and Mortality of Malaria in South Omo Zone, SNNPR Region (from 2003-2007EFY) in February 2016

Major Malaria Indicators	2003	2004	2005	2006	2007
Total Malaria Outpatient cases/1000	88	90	74	95	48
Confirmed Malaria cases /1000	30	44	54	62	35
Malaria Inpatient cases /100,000	96	163	135	83	59
Malaria Inpatient death /100,000	2	3	2	3	1
Malaria In Pregnancy Outpatient/100,000	57	55	32	20	35
Malaria in pregnancy inpatient /100,000	2	6	6	1	1

The malaria trend in this zone increase from 2003-2006 EFY as indicated in figure 1 but, started to decrease and reached its lowest point in 2007 regarding of the increment of health facilities and strength of the surveillance system in the zone.

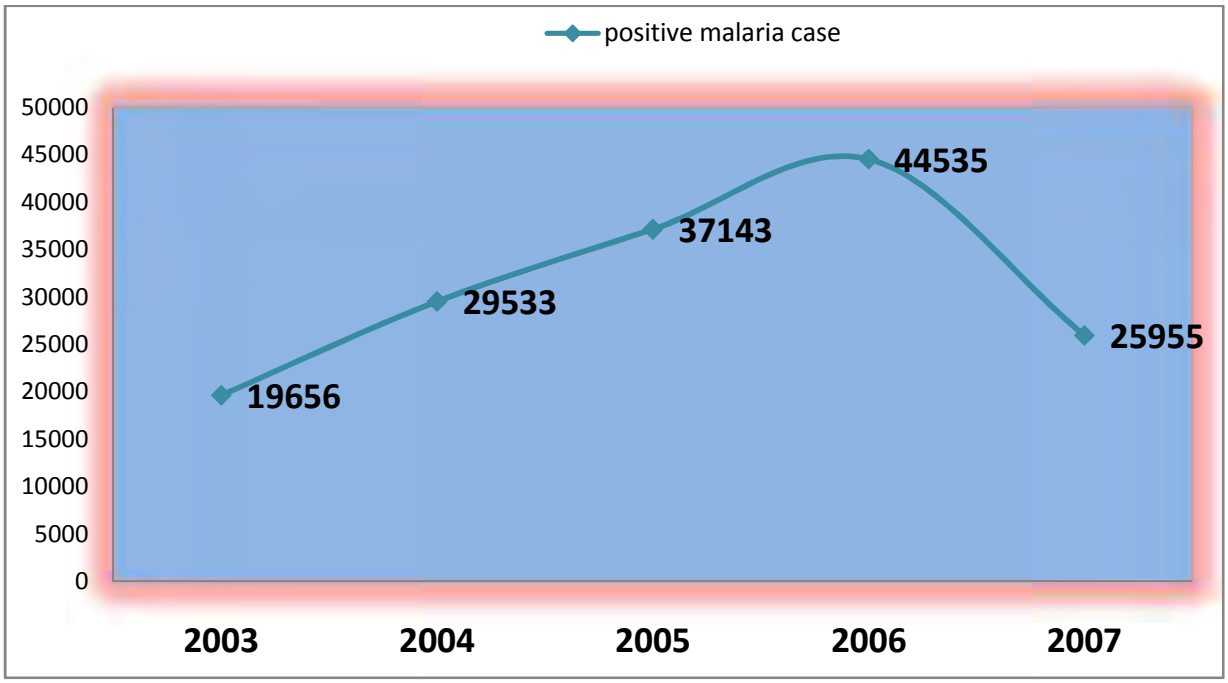

Figure 7: Malaria trend in South Omo Zone, SNNPR Region (from 2003-2007EFY) in February 2016

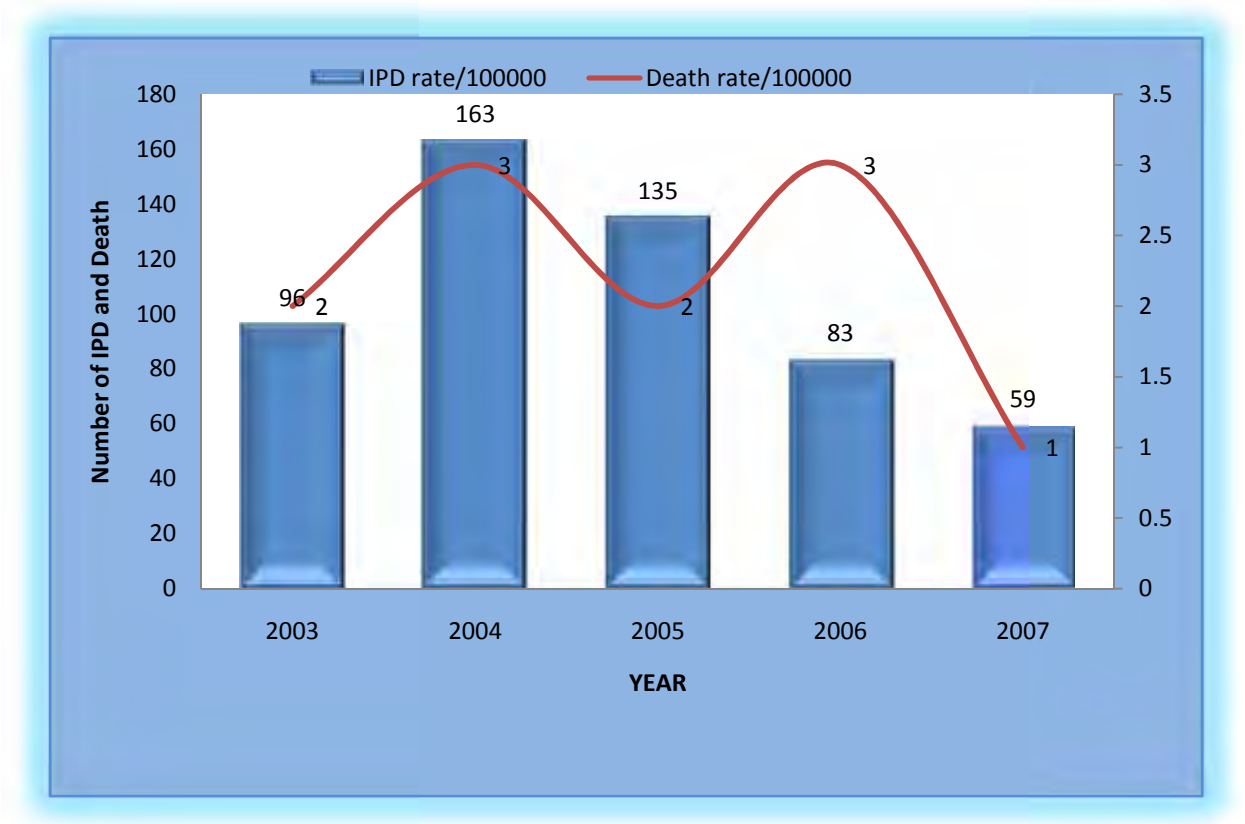

Figure 8: IPD and Death rates of Malaria Cases in South Omo Zone, SNNPR (from 2003- 2007EFY) in February 2016

The malaria IPD rate decreases dramatically from 163/100,000 population in 2004 to 59/100,000 in 2007 and malaria death rates was 2 in 2003&2005, but 3 in 2004&2006 then decreases in the same way to 1/100,000 in 2007 .

Table 11: Malaria In pregnancy in South Omo Zone, SNNPR region (from 2003-2007EFY) in February 2016

Indicators	2003	2004	2005	2006	2007
Total Pregnancy Expected	22292	22952	236333	24729	25057
Number Malaria in Pregnancy out patient	367	366	219	145	256
Number Malaria in Pregnancy Inpatient	13	42	39	8	7
Number of death Rate in pregnancy	0	0	0	0	0
Rate Of Malaria In Pregnancy in OPD/10,000	6	6	3	2	4
Rate Of IPD In pregnancy IPD/100,000	2	6	6	1	1

Table 12: Malaria Case Distribution in South Omo Zone, SNNPR region with list of species of plasmodium by Woreda (from 2003-2002EFY) in February 2016

WORED	2003	2004	2005	2006	2007	PF	PV	Mixed total	%of PF	%of PV	%of Mixed	%Total
Hammer	3796	7341	4217	21680	4417	22096	6233	1100	75	21	4	100
B/Tsemay	18496	14554	5119	9841	3440	21867	2777	579	87	11	2	100
Dassench	3233	4755	1721	3492	2153	9214	704	241	91	7	2	100
South Ari	2990	3916	3484	3192	1882	5109	3172	547	58	36	6	100
North Air	2936	2581	2040	2643	3551	4382	2902	378	57	38	5	100
Nygatom	1513	1490	1111	911	2654	3229	1477	265	65	30	5	100
Salamago	6620	10731	18826	13371	4164	27205	15061	2527	61	33	6	100
Malle	5907	2955	4346	5329	3374	9563	2576	560	75	20	5	100
JinkaTawona	4429	3861	1839	1199	414	6281	1270	204	81	16	3	100
Jinka Hospital	7776	7473	7868	9911	4815	2514	2581	204	47	49	4	100
Total	57696	59657	50561	68077	34868	111459	38753	6605	71	25	4	100

In this zone the average proportion of plasmodium species from 2003 to 2007 was 71%, 25% and 4%, Falciparum, Vivax and mixed respectively and this shows that Plasmodium falciparum is the dominant species .

Table 13: Trend of prevalence Rate of malaria cases in South Omo Zone, SNNPR region (from 2003- 2007EFY) in February 2016

Year (EFY)	Total Population at risk	Total malaria cases (Confirmed + Clinical)	Incidence Rate of total malaria cases/1000	Confirmed malaria cases	confirmed Incidence Rate/1000
2003	644274	57696	90	19656	31
2004	663356	59657	90	29533	45
2005	683022	50561	74	37143	54
2006	714725	68077	95	44535	62
2007	724183	34868	48	25955	36
Average	685912	54172	80	31364	46

The prevalence rate of total malaria increases in 2003, 2004 &2006 and shows slight decrease in 2005&2007. The prevalence rate of confirmed malaria cases were increased from 31/1000 population in 2003 to 62/1000 population in 2006 and decrease to 36/1000 in 2007. Both the total and confirmed malaria cases reached its highest point during the year 2006.

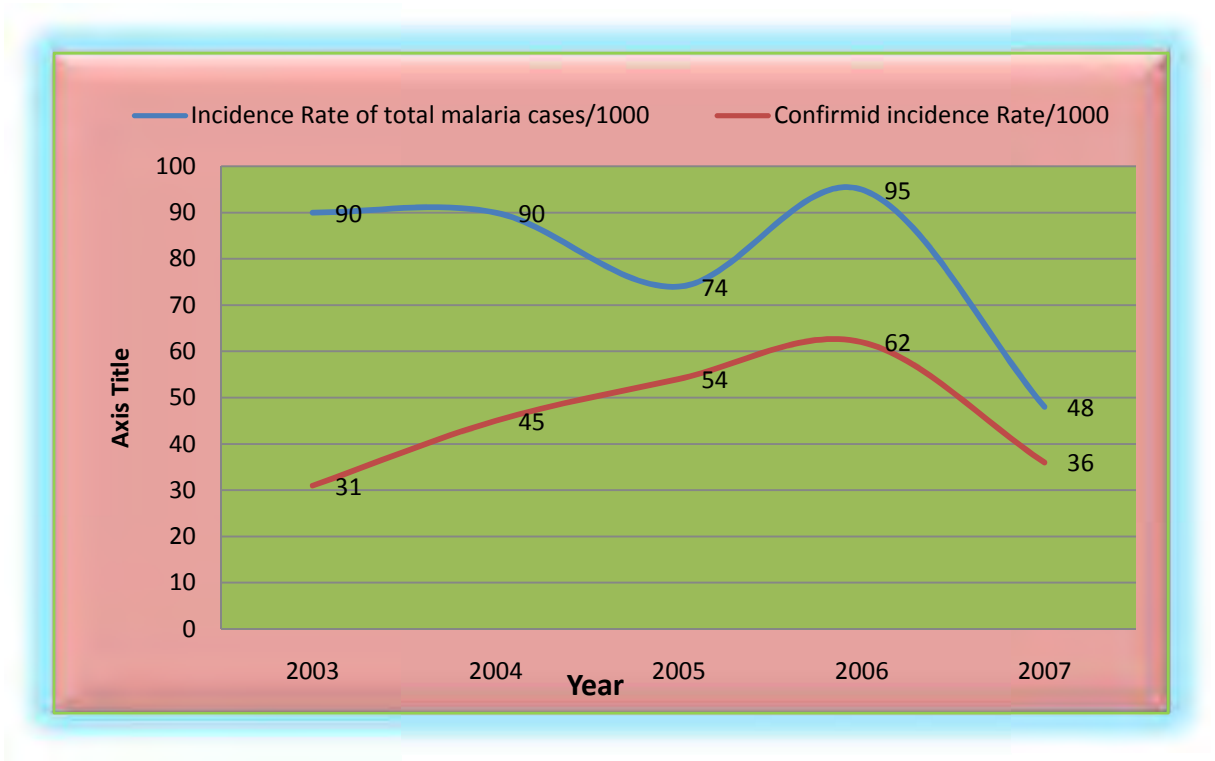

Figure 9: The total Malaria prevalence and confirmed Rate in the South Omo Zone, SNNPR region (from 2003- 2007EFY) in February 2016

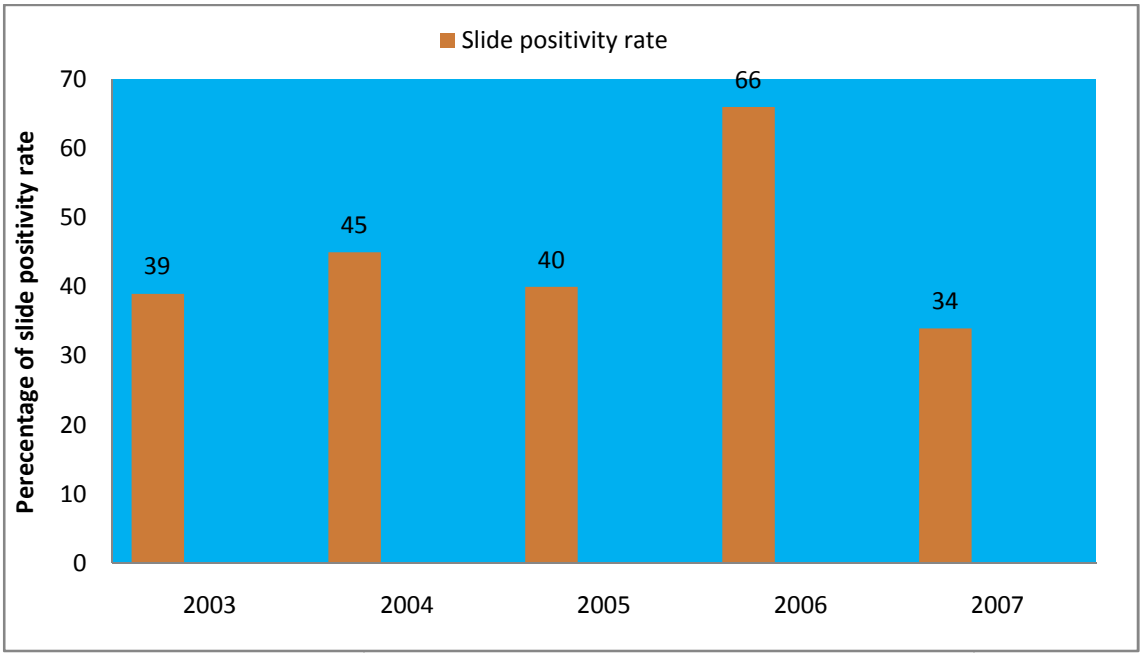

Figure 10: Malaria slide positivity rate of South Omo Zone, SNNPR region (from 2003- 2007EFY) in February 2016

The malaria positivity rate increases from 39% in 2003 to its maximum point 66% in the year 2006. The positivity rate attains its minimum point 34% in the year 2007EFY.

Table 14: Malaria treated by Confirmatory test and treated with clinical sign and symptom in South Omo Zone, SNNPR region(from 2003- 2007EFY) in February 2016

Serial Number	Woreda Name	2003		2004		2005		2006		2007	
		Treated Clinically	Treated by test	Treated clinically	treated by Test	Treated Clinically	Treated by Test	Treated Clinically	treated By Test	Treated Clinically	Treated by test
1	Hammer	2799	997	3790	3551	13	4204	5369	16311	47	4365
2	B/Tsemay	12456	6040	7426	7128	1601	3518	3997	5844	756	2693
3	Dassench	1619	1614	3011	1744	259	1462	305	3187	1	2152
4	South Ari	1351	1639	1634	2282	1060	2424	1991	1201	600	1282
5	North Air	1505	1431	849	1732	870	1170	1525	1118	1340	2211
6	Nygatom	846	667	529	961	320	791	140	771	873	1781
7	Salamago	3889	2731	3739	6992	1568	17258	2635	10736	1083	7081
8	Malle	5144	763	1674	1281	1009	3327	1277	4052	98	3276
9	Jinka Town	1441	2988	1545	2316	284	1555	697	502	20	394
10	Jinka Hospital	6990	786	5927	1546	16434	1434	9098	813	4095	720
11	Total	38040	19656	30124	29533	13418	37143	27034	44535	8913	25955

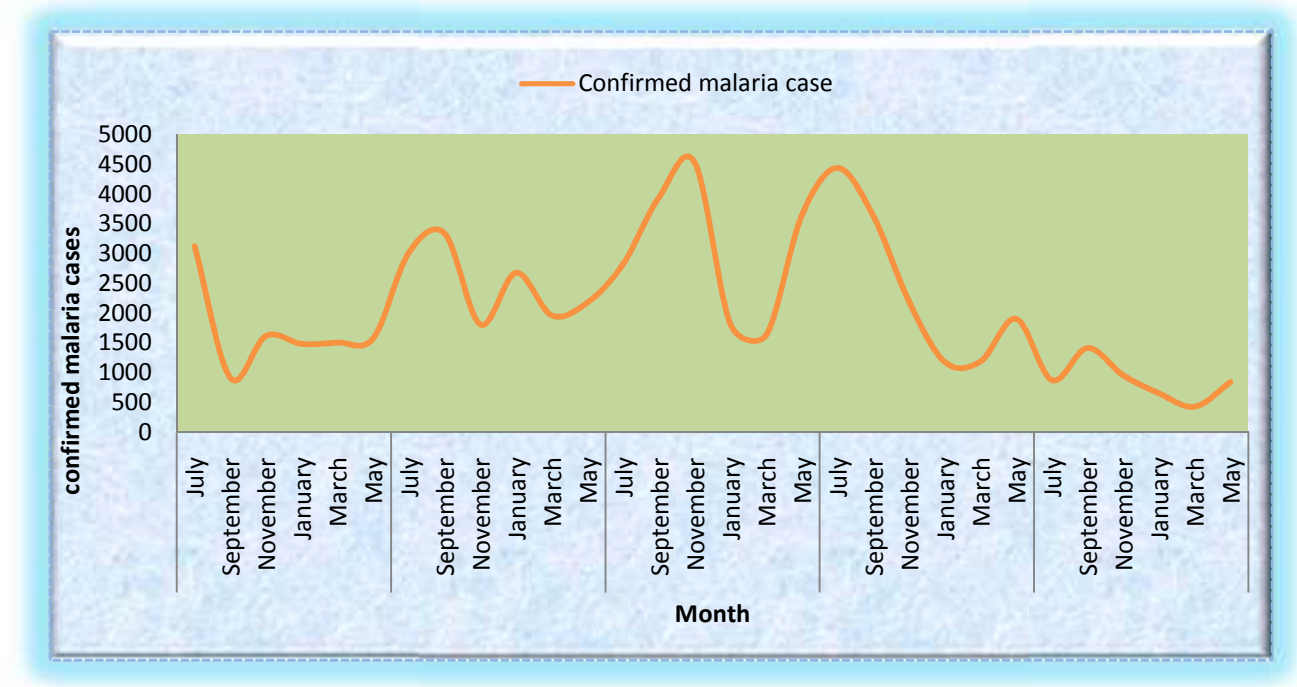

Figure 11: Trend of Confirmed malaria cases in South Omo Zone, SNNPR region (from 2003- 2007EFY) inFebruary 2016

From the Figure 11 we can easily understand that the malaria morbidity is higher following rainy season starting from July to September and reaches its highest point during the month of September.

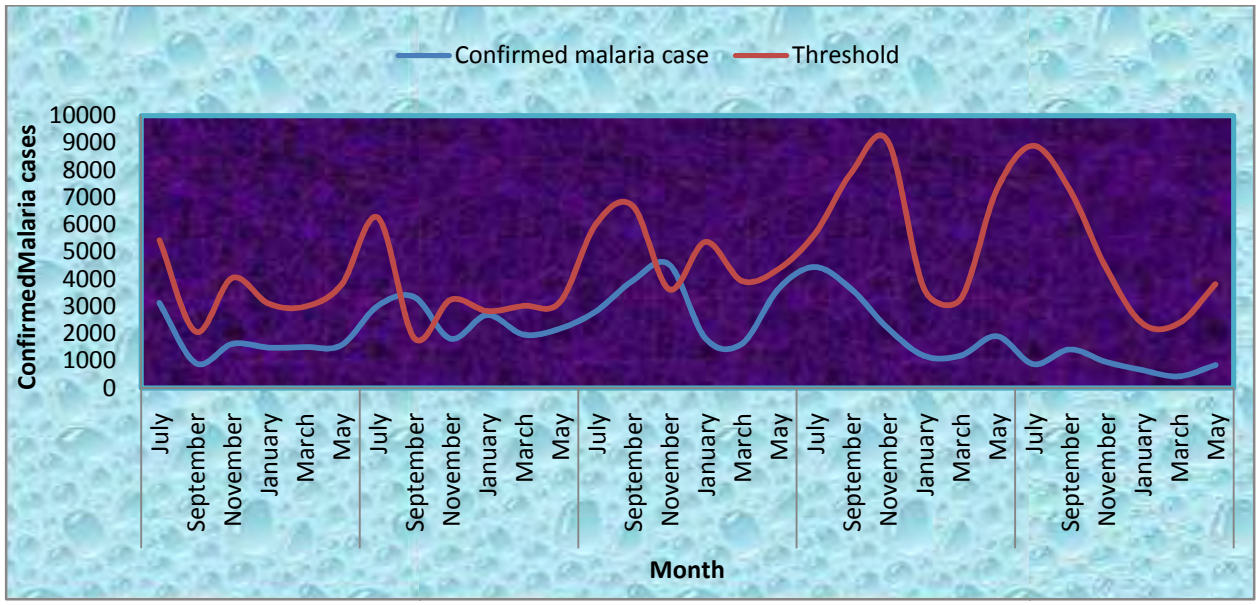

Figure 12 : Trend of Confirmed malaria cases and Expect threshold in South Omo Zone, SNNPR region (from 2003- 2007EFY) in February 2016

In the control of the status of malaria outbreak monitoring tool (threshold) i.e. the second largest number) is very important .So in the Figure 12 indicated that there is an outbreak between the month of September through November of 2004 and, 2005EFY.

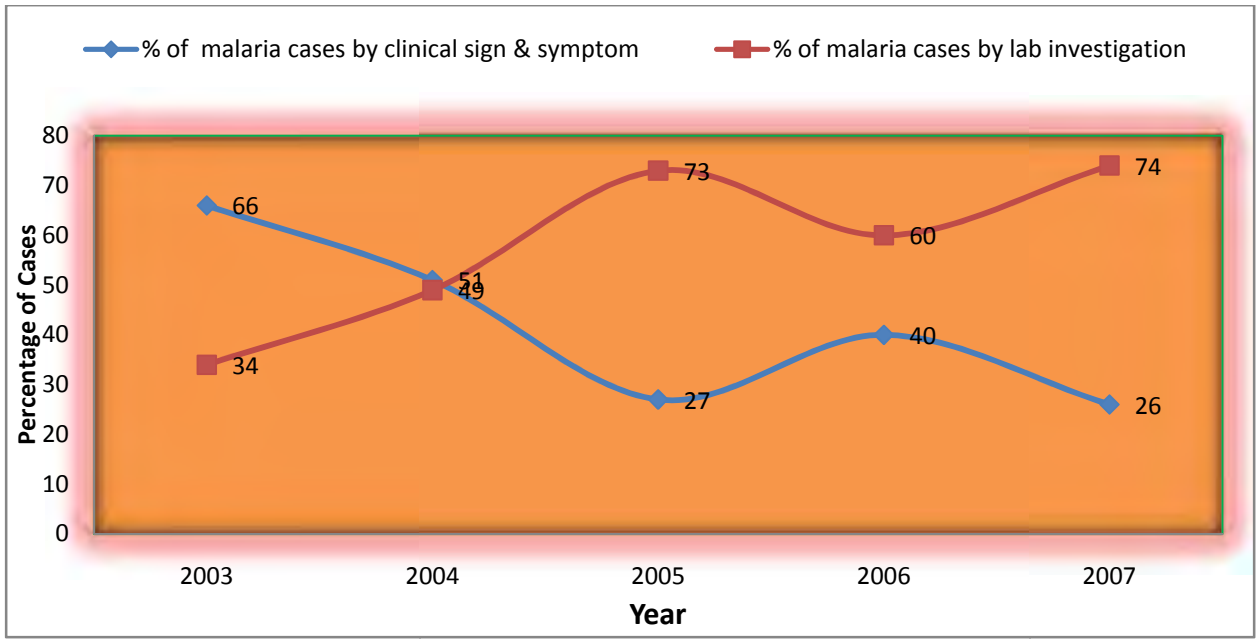

Figure 13: Percentage of malaria cases treated typically by Sign and symptoms and By Laboratory Investigation in South Omo Zone, SNNPR region (from 2003-2007EFY) in February 2016

The cases treated with laboratory diagnosis using microscope and the Rapid Diagnostic kit increases from 2003 through 2007EFY however, the malaria cases treated without either of Laboratory or RDT diagnosis (presumptive treatment) decreased with the increment of time. In 2007 only 26 percent of malaria patient were treated with clinical sign and symptom while 74% of the total patients treated with either of microscopic or RDT test results.

Table 15: Trend Of confirmed Malaria by woreda in South Omo Zone, SNNPR region (from 2003- 2007EFY) in February 2016

S.No	WOREDA	2003	2004	2005	2006	2007	threshold
1	Hammer	997	3551	4204	16311	4365	4204
2	BenaTsemay	6040	7128	3518	5844	2693	6040
3	Dassench	1614	1744	1462	3187	2152	2152
4	South Ari	1639	2282	2424	1201	1282	2282
5	North Ari	1431	1732	1170	1118	2211	1732
6	Nygatom	667	961	791	771	1781	961
7	SalaMago	2731	6992	17258	10736	7081	10736
8	Malle	763	1281	3327	4052	3276	3327
9	Jinka Town	2988	2316	1555	502	394	2316
10	Jinka Hospital	786	1546	1434	813	720	1434
	Total	19656	29533	37143	44535	25955	37143

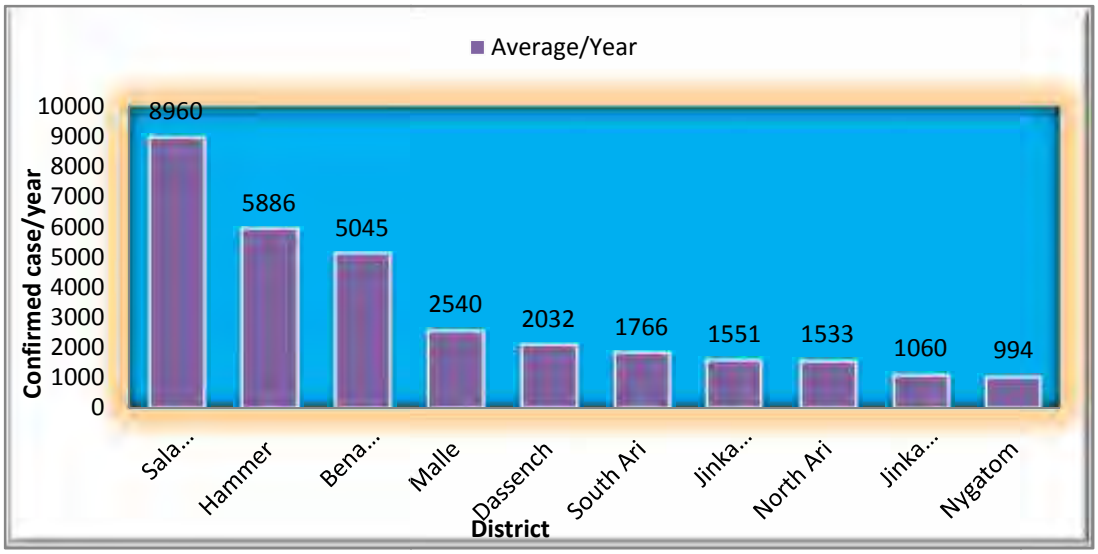

Figure 14: Average number Of Malaria Cases reported per year in Wordas of South Omo Zone, SNNPR (from 2003- 2007EFY) in February 2016

The burden of malaria as depicted in figure 14 SalaMago, Hammer and BenaTsemayWoreda reported the highest number in the past five years. Except North Ari the rest were registered as the hot spot woreda's in this Zone.

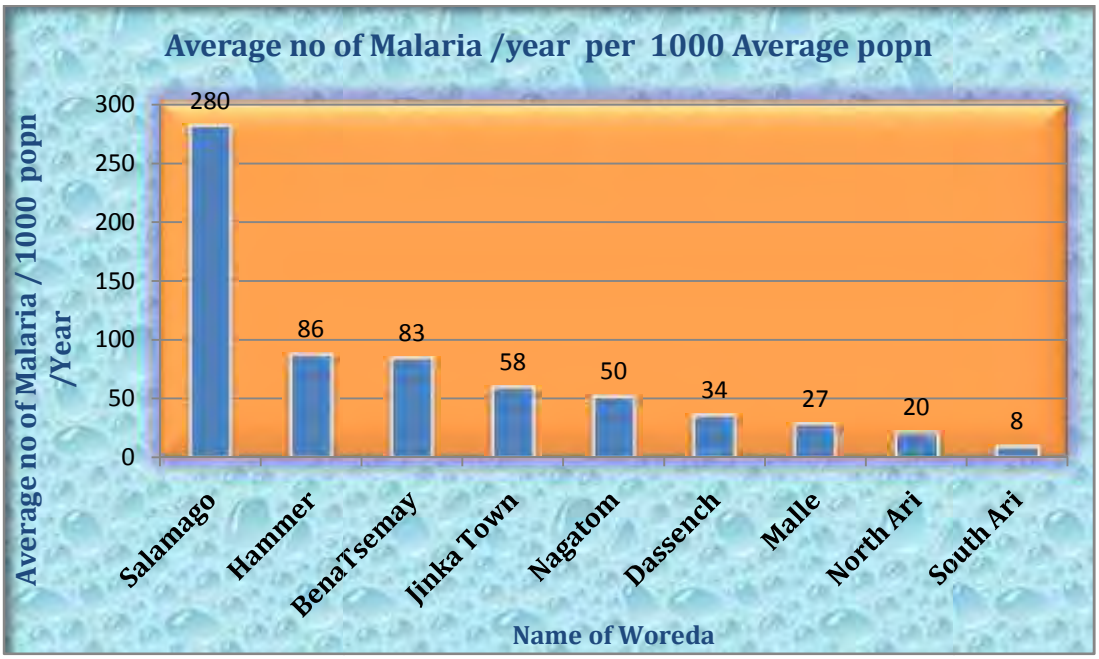

Figure 15: Average number of malaria cases per year per 1000 average population in different woreda of south omo zone (From 2003 to 2007 EFY) in February 2016

Table 16: Percentage of plasmodium species in South Omo Zone, SNNPR region (from 2003- 2007EFY) in February 2016

Year	PF	Pv	Mixed	Total cases	% of PF	% of PV	%of Mixed
2003	15805	3448	403	19656	80	18	2
2004	20554	7312	1637	29503	70	25	5
2005	25704	10670	1407	37781	68	28	4
2006	31075	11108	2352	44535	70	25	5
2007	18959	6185	806	25950	73	24	3
Average	22419	7745	1321	31485	72	24	4

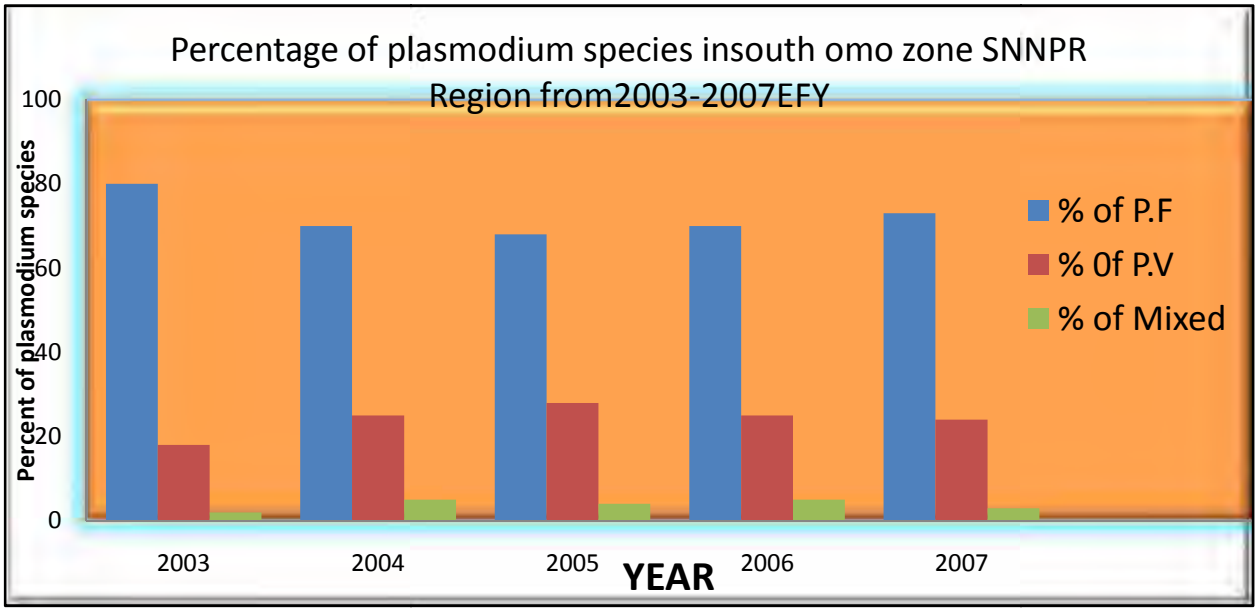

Figure 16: Average Percentage of Plasmodium distribution in South Omo Zone, SNNPR region (from 2003- 2007EFY) in February 2016

Table 17: Percentage of plasmodium species in Woreda , South Omo Zone, SNNPR region (from 2003- 2007EFY) in February 2016

S/N	WOREDA	2003	2004	2005	2006	2007	PF	PV	Mixed total	%of PF	%of PV	%of Mixed	Total
1	Hammer	997	3551	4204	16311	4365	22095	6233	1100	75	21	4	100
2	B/Tsemay	6040	7128	3518	5844	2693	21867	2777	579	87	11	2	100
3	Dassench	1614	1744	1462	3187	2152	9214	704	241	91	7	2	100
4	South Ari	1639	2282	2424	1201	1282	5109	3172	547	58	36	6	100
5	North Ari	1431	1732	1170	1118	2211	4382	2902	378	57	38	5	100
6	Nygatom	667	961	791	771	1781	3229	1477	265	65	30	5	100
7	Salamago	2731	6992	17258	10736	7076	27205	15061	2527	61	33	6	100
8	Malle	763	1281	3327	4052	3276	9563	2576	560	75	20	5	100
9	JinkaTawn	2988	2316	1555	502	394	6281	1270	204	81	16	3	100
10	JinkaHospital	786	1546	1434	813	720	2514	2581	204	47	49	4	100
	Total	19656	29533	37143	44535	25950	111459	38753	6605	**71**	**25**	**4**	100

Table 18: Average Percentage of Plasmodium species distribution across the woreda in South Omo Zone, SNNPR region (from 2003- 2007EFY) in February 2016

WOREDA		% of PF	%of PV	%of Mixed	PF:PV ratio
1	Hammer	75	21	4	75:21
2	B/Tsemay	87	11	2	87:11
3	Dassench	91	7	6	91:7
4	South Ari	58	36	5	58:36
5	North Ari	57	38	5	57:38
6	Nygatom	65	30	6	65:30
7	Salamago	61	33	5	61:33
8	Malle	75	20	3	75:20
9	JinkaTawn	81	16	4	81:16
10	JinkaHospital	47	49	4	47:49
Average		70	26	4	70:26

Even though the distribution of plasmodium species in some woreda varies from the prior knowledge of the falciparum to Vivax (60:40) ratio, Still plasmodium falciparum species is higher than that of the plasmodium Vivax except data from Jinka Hospital shows that plasmodium Vivax is relatively higher than that of plasmodium Falciparum**.**

DISCUSSION

This data showed that malaria occurred throughout the year regardless of the woreda in the zone. However, the malaria diseases transmission is predominantly higher after the rainy season in this zone with varying incidence proportion among the woreda' which coincide with major planting and harvesting season for farmers and it aggravates economic loss. The total malaria outpatient during 2003 was 88/1000 which was then raised to reach its maximum point in 2006 which was 95/1000. However, this was then decreased by half in the year 2007 and reaches 48/1000 in malaria population. In addition to this the confirmed malaria prevalence rate in this zone was similarly raised from 31 cases per 1000 population in 2003 to 62/1000 population in2006 then decreases to 36/1000 population in 2007. The Average Reported malaria in-patient admissions and deaths in this zone were 107 per 100,000 and 2 per 100,000 per year [9].

A study conducted in Kola Diba, North Gondar, indicated that there was an increase in the number of malaria cases from 2008–2010 with the peak number of malaria cases being reported most recently in 2010 [10].

The malaria Morbidity and admitted patient increased in this zone in the first three years of study (2003,2004 & 2005) and it decreased in the last two years of study (2006 &2007). For example, The IPD rates increased from 96/10,000 in 2003 to 135/100,000 in 2005 and it is decreased from 83/100,000 in 2006 to 59/100,000 in 2007.

Even though the plasmodium species also varies from woreda to woreda the plasmodium Falciparium is abundant species in all woredas of South Omo Zone. When we see the their distribution of plasmodium (ratio of plasmodium Falciparium to Plasmodium vivax) in Hammer,B/Tsemay,Dassench,South Ari,North Ari,Nygatom,Salamago,Malle and JinkaTawn were 77:23 ,88:12 ,92:8, 61:39 ,60:40 ,67:33 ,64:36 ,75:25 and 80:20 respectively which is relatively matches with the national standard of the plasmodium distribution of falciparum versus vivax

which is in the ratio of 60 : 40[,4,5,8,12] .When we analyzed the average plasmodium species from 2003-2007 is **74:26** respectively.

LIMITATION

- The data segregated by sex and age was limited. Only segregated by two categories; above and under 5 years.

CONCULSION

Malaria continued to be a major cause of ill-health in South Omo Zone zone. Even though different malaria control strategies were designed to rollback to its minimum level, still malaria cases were not decreased as expected that the prevalence rate of total malaria and confirmed malaria cases were rising from 2003 through 2006 and showed slight decline to 2007 and the transmission is higher after the rainy season with varying incidence proportion and it coincide with major planting and harvesting season for farmers and it aggravates economic loss. SalaMago, Hammer and BenaTsemay woredas were reporting high number of malaria cases in the zone during study period.

RECOMMENDATION

- The recent reporting format lacks some important indicator variables such as different age category for analysis so it should be incorporated.
- Strengthen continuous Malaria surveillance data analysis in the Zone and communicate the finding with decision makers , planners other and steak holders
- The zonal health department should do operational research on verifying the reason for increasing number of malaria cases especially in those woreda who reports high number of cases in the zone.

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CHAPTER III-EVALUATION OF SUREVILLANCE SYSTEM

3.1 EVALUATION OF SOUTH OMO ZONE MALARIA SURVEILLANCE SYSTEM November 2016

ABSTRACT

Background: Public health surveillance is the ongoing, systematic collection, analysis, interpretation, and dissemination of data regarding a health-related event for use in public health action to reduce morbidity and mortality and to improve health. The evaluation focuses on how well the system operates to meet its purpose and objectives. Therefore, the surveillance system should be evaluated periodically to improve quality, efficiency and usefulness. We evaluated malaria surveillance system to describe the existing surveillance system for malaria in South Omo zone.

Methods: A cross-sectional study design was applied to assess the core and supportive function, and key attributes of the surveillance system for malaria in South Omo Zone on 2008 EFY. Based on agro ecology of the Zone, one from pastoralist woreda, one from semi pastoralist, one from agrarian woreda and one from town administration surveillance units were selected. Hospital and the zonal PHEM surveillance units were purposively included in the study. From each selected woreda one health centers and two health posts from each selected health centers were evaluated. Data was obtained through observation, review of document, interview of officers and focal persons. We used Microsoft excel to calculate proportion rate and ratio, and to construct figure and tables. Ethical clearance was obtained from Regional Health Bureau PHEM, then South Omo Zone health department PHEM.

Result: We evaluated a total of 18 surveillance units. The zonal PHEM reported 8,461 clinical malaria cases, 30,812 confirmed cases, 681 admissions and 14 death in 2008 EFY. Dassench woreda in 2008EFY reported to the ZHD were 449 (5.3%) clinical cases, 6636 (21.5%) confirmed malaria cases, 176 (25.8%) inpatient cases, and 1(7.1%) deaths but the actual report from health center shows that clinical cases, 723 (9.8%) , confirmed malaria cases 7258 (24.7) , inpatient cases 213 (28.6%), and2(15.3%) deaths. South Ari in 2008EFY reported to ZHD 1060 (12.5%) clinical cases, 2349 (7.6%) confirmed malaria cases, and 6(1%) inpatient and zero death

but the actual report from health center shows that clinical cases, 1123 (13.9%), confirmed malaria cases 2411 (8.7%), inpatient cases 13 (2.3%) and zero deaths.

BenaTsemay woreda in 2008EFY reported to ZHD 1679(19.8%) clinical cases, 2477 (8%) confirmed malaria cases, and 28(4.1%) in patient and zero death but the actual report from health center shows that clinical cases, 1882 (21.4%), confirmed malaria cases 2653 (10.2%), inpatient cases 37 (6.7%), and 0 deaths.

Jinka Town administration health office in 2008EFY reported to ZHD 415(5%) clinical cases, 1687(5.5%) confirmed malaria cases, and 34(5%) in patient and zero death but the actual report from health center shows that clinical cases, 439 (5.8%), confirmed malaria cases 1693 (5.7%) , inpatient cases 44 (6.3%), and zero deaths.

For case confirmation, all health posts used RDT, health centers used RDT and microscope, and Hospital used microscope. Only woreda health office and Zonal health department surveillance unit's prepared epidemic preparedness plan which is not supported by budget. Standards and guidelines were available at 16(88.9%) evaluated surveillance units two health posts in Dassench woreda lacks the standard guidelines. Report completeness of health posts was 83.35%, health centers 91.65%, Hospital 100%, woreda 88%, and zonal PHEM has 82%.

Conclusion:-There are discrepancies of number of malaria cases between what the woreda health office reported to zonal health department and the actual number of malaria in the registration book at health facility. The standard case definition was available but they didn't used consistently at all levels. We observe functional computers in different surveillance units, but there was a gap to utilize the current technologies to store, analyze and interpret data for public health action efficiently. Even though Epidemic Preparedness and Response plan (EPRP) was available in a few surveillance units but not supported by budget. All surveillance units were not used malaria monitoring chart and in some visited surveillance unit malaria cases are cross the reference line but the system didn't recognize the presence of outbreak in the place. When we see the completeness except Jinka Hospital, all visited surveillance units have less than regional target which 90% , so that it is difficult to say the place were free of public health emergency unless the surveillance unit achieve the completeness to 90%. The malaria surveillance system in South Omo Zone is useful, easy to implement acceptable, flexible, stable, but poor quality

data and low in completeness, therefore still the system needed to be strength especially in the pastoralist woreda.

INTRODUCTION

Public health surveillance is the ongoing, systematic collection, analysis, interpretation, and dissemination of data regarding a health-related event for use in public health action to reduce morbidity and mortality and to improve health [1-4]. The importance of conducting public health surveillance evaluation is to guide immediate action for events of public health importance, measure the burden of disease, detect new emerging health events, identify the population at risk, monitor trends of burden of diseases or other health event, detect outbreaks/epidemics/pandemics, guide the planning, implementation, and evaluation of programs to prevent and control disease or other health problem, injury, or adverse exposure, detect changes in health practices, prioritize the allocation of health resources, provide a basis for epidemiologic research hypothesis, and evaluate public policy. Evaluation of a public health surveillance system focuses on how well the system operates to meet its purpose and objectives. The purpose of evaluating a surveillance system is to promote the best use of public health resources by ensuring that only important problems are under surveillance and that surveillance systems operate efficiently [5].

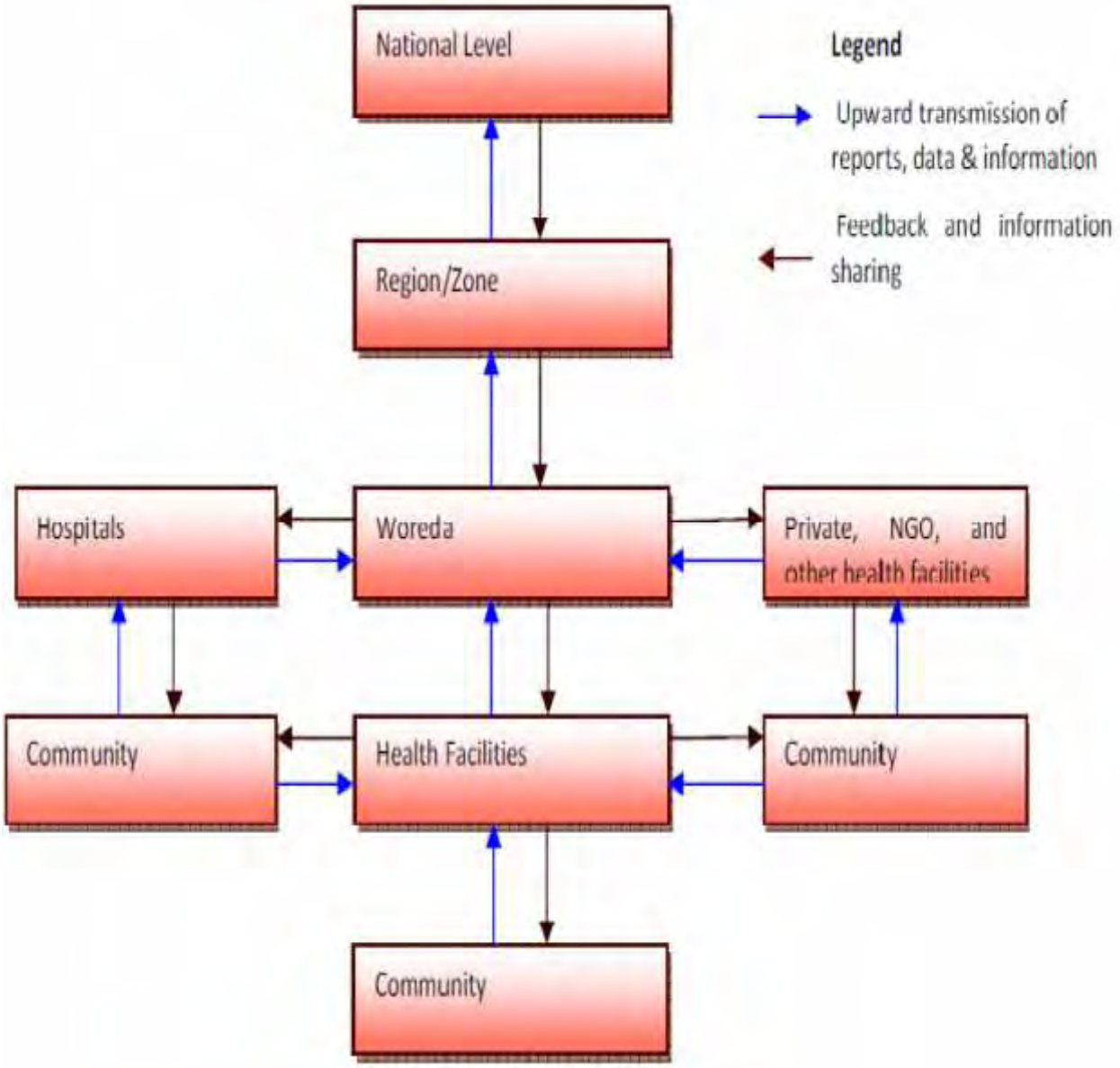
The public health system is continually challenged by recurrent and unexpected disease outbreaks and is facing the challenge of managing health consequences of natural and human made disasters, emergencies, crisis, and conflicts. PHEM is designed to ensure rapid detection of any public health threats, preparedness, and other related to logistic and fund administration, and prompt response to and recovery from various public health emergencies ranging from recurrent epidemics, nee emerging infections, nutritional emergencies, chemical spills, and bioterrorism. The system comprised of emergency preparedness, early warning, response, and recovery. Surveillance of priority diseases is the major component of early warning. Malaria is of the reportable priority diseases and public health problem in Ethiopia. Information on the number and distribution of malaria cases and deaths is critical for the design and implementation of prevention and control programs [6].

Malaria is one of the most severe public health problems worldwide. It is a leading cause of morbidity and mortality in many developing countries, where young children and pregnant women are the groups most affected. 3.4 billion People (half the world's population) live in areas at risk of malaria transmission in 106 countries and territories [7]. Malaria kills a child somewhere in the world every minute. It infects approximately 219 million people each year (a range of 154 – 289 million), with an estimated 66,000 deaths, mostly children in Africa. 90% of malaria deaths occur in Africa, where malaria accounts for about one in six of all childhood deaths. The disease also contributes greatly to anemia among children, a major cause of poor growth and development. The cost for malaria intervention is the remaining challenge**.** It is estimated that a US $5.1 billion is required annually to achieve universal coverage and fully scale-up malaria interventions around the world [8].

Malaria is ranked as the leading communicable disease in Ethiopia, accounting for about 30% of the overall Disability Adjusted Life Years lost [9]. Malaria transmission in Ethiopia is unstable**.**

Around 65.3 million people (68%) live in malaria endemic area, mostly an altitude of below 2000 meters[10]. Enhanced surveillance for malaria cases and deaths aides' ministry of health to determine which areas and/or population groups are most affected and enables countries to monitor changing disease patterns. Strong malaria surveillance systems also help countries design effective health interventions and evaluate the impact of their malaria control programs. Malaria surveillance is currently weakest in countries with the highest malaria burden, interpreting it difficult to accurately assess disease trends and plan interventions. At present, only one tenth of the 219 million cases that are estimated to occur each year are detected and reported through national malaria surveillance systems. (WHO's uncertainty range for malaria cases is 154 million to 289 million.) Only 58 of the 99 countries with ongoing malaria transmission produce sufficiently complete and consistent data on malaria that allow a reliable assessment of malaria trends over time [11].

The overall purpose of surveillance of these diseases is to monitor the trend against the seated tolerance limits, as early warning and early response system, and pick any deviation from the limit at the earliest point in time for prompt response. Furthermore as early warning system, it guides risk mapping and preparedness; and prevention and risk aversion actions like immunization, vector control and so on.


National Level
Legend
Upward transmission of reports, data & information
Feedback and information sharing
Region/Zone
Hospitals
Woreda
Private, NGO, and other health facilities
Community
Health Facilities
Community
Community

RATIONAL OF STUDY

The public health system of the South Nations Nationalities and peoples region (SNNPR) is continuously affected by different recurrent and unexpected disease outbreaks and is facing the challenges of managing health consequences in different parts of regions. Malaria is one of public health problem and selected priority disease in the region and it is the second cause of morbidity and the third cause of mortality in south omo zone in 2008EFY. South Omo Zone is one of the 15 zones and 4 special woreda in the region. Still malaria is the public health problem among priority diseases in the zone. The surveillance system evaluation of the zone has not yet been done in the area. The surveillance system of the area should be evaluated regularly. As a result it is difficult to estimate how much the surveillance system is strong or not to tackle these health event problems. So this cross-sectional study is designed to evaluate malaria surveillance in this zone.

OBJECTIVE

GENERAL OBJECTIVE

- To evaluate the surveillance system for malaria in South Omo Zone, SNNPR from5 to 20 November 2016.

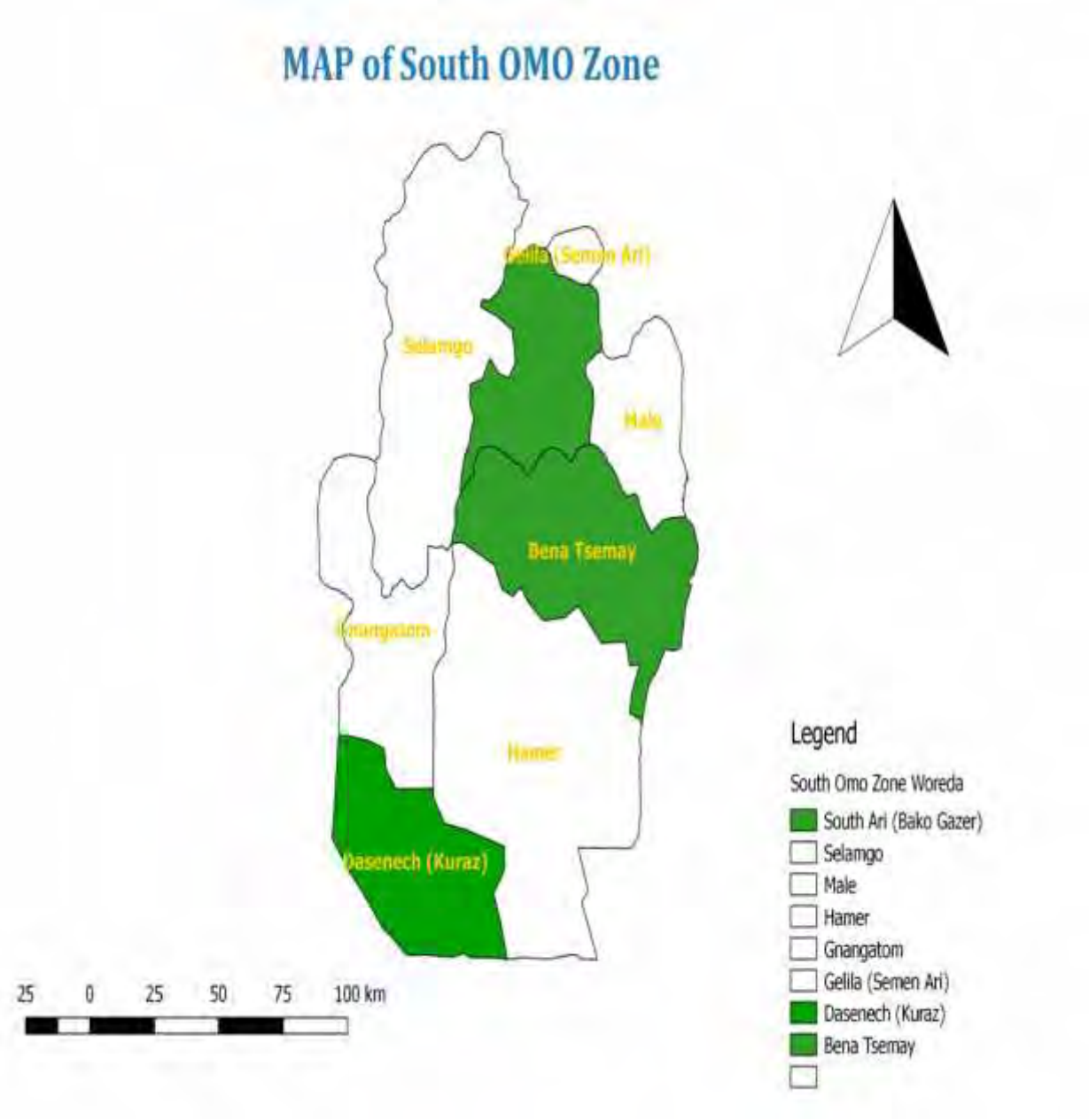
SPECIFIC OBJECTIVE

- To describe the existing surveillance system for malaria in South Omo Zone.
- To assess core and supportive functions of the system
- To assess surveillance system key attributes

METHO'S

STUDY AREA: The study was conducted in South Omo Zone. The total population of the zone was 724,183 with 358,253 Male and 365,930 Female populations. Administratively there were 8-rural Woreda and 1-town administration. Jinka town administration and all 8- rural woredas are known malaria endemic areas. Out of 269 kebeles in the zone 237 kebeles were known to be malarious. Also 4-rural woredas are hot spot woredas (Dassench, Gnangatom, Hammer and Salamago). Regarding to health facility distribution in the zone, there was 1-General Hospital, 32-governmental health centers, and 237- health posts. Zonal health department, woreda health

office, health centers, and health posts were taken as the study units of the surveillance system evaluation.



MAP 4: Area Map of Selected Woredas for Malaria Surveillance Evaluation, South Omo Zone, SNNPR, November 2016

STUDY DESIGN: We used a cross-sectional descriptive study design using the CDC "updated guideline for evaluating public health surveillance system" published in 2001 as a frame work for evaluation [5].

STUDY PERIOD: We conducted the surveillance system evaluation from November 5-20/2016 in South Omo Zone., SNNPR

SAMPLE SIZE DETRMINITION: Including zonal health department we identified a total of 18 reporting units among the selected woredas

SAMPLEING TECHINQUE: Before selection of a sample we conducted a discussion with zonal PHEM core process for sample selection. Based on agro ecology of the Zone, one from pastoralist woreda, one from semi pastoralist, one from agrarian woreda and one from town administration surveillance units were selected. Hospital and the zonal PHEM surveillance units were purposively included in the study. From each selected woreda one health centers and two health posts were evaluated. Thus a total of 3-Woreda health office, 1- town administration health office, 4-health centers, and 8-health posts were included in the study.

DATA COLLECTION: We obtained data through observation, review of document, review of outputs, quantitative interviews of the PHEM officers, disease prevention and health promotion, and IDSR focal persons in health centers and health posts.

DATA ANALYSIS AND PRESENTATION: We used Micro-soft Excel 2010 to calculate frequency, ratio, rate, and proportion. We also used Microsoft excel to construct tables and figures.

ETHICAL CONSIDERATION: Official permission was obtained from RHB, and then from the respective selected institutions for evaluation.

RESULT

In 2016 South Omo Zone received a surveillance report from a total of 270 reporting units (237-health posts, 32-governmental health centers, and one Hospital, no private health facilities were included in the reporting units).

The population resided in the zone was the population under surveillance for malaria disease surveillance. We conducted surveillance system evaluation at 18 reporting units (8-health posts, 4-health centers, 3-woreda health office, 1- town administration, General hospital and zonal

health department. There are discrepancies of number of malaria cases between what the woreda health office reported to zonal health department and the actual number of malaria in the registration book at health facility.

MALARIA

In 2008 EFY South Omo Zone reported a total malaria cases 39,968 of which 8461 clinical malaria cases, 30,812 confirmed malaria cases (examined by microscope or RDT), 681 inpatient cases, and 14 deaths through surveillance units.

Dassench woreda:- In 2008EFY the district reported to the ZHD were 449 (5.3%) clinical cases, 6636 (21.5%) confirmed malaria cases, 176 (25.8%) inpatient cases, and 1(7.1%) deaths but the actual report from health center shows that clinical cases, 723 (9.8%) , confirmed malaria cases 7258 (24.7) , inpatient cases 213 (28.6%), and2(15.3%) deaths.

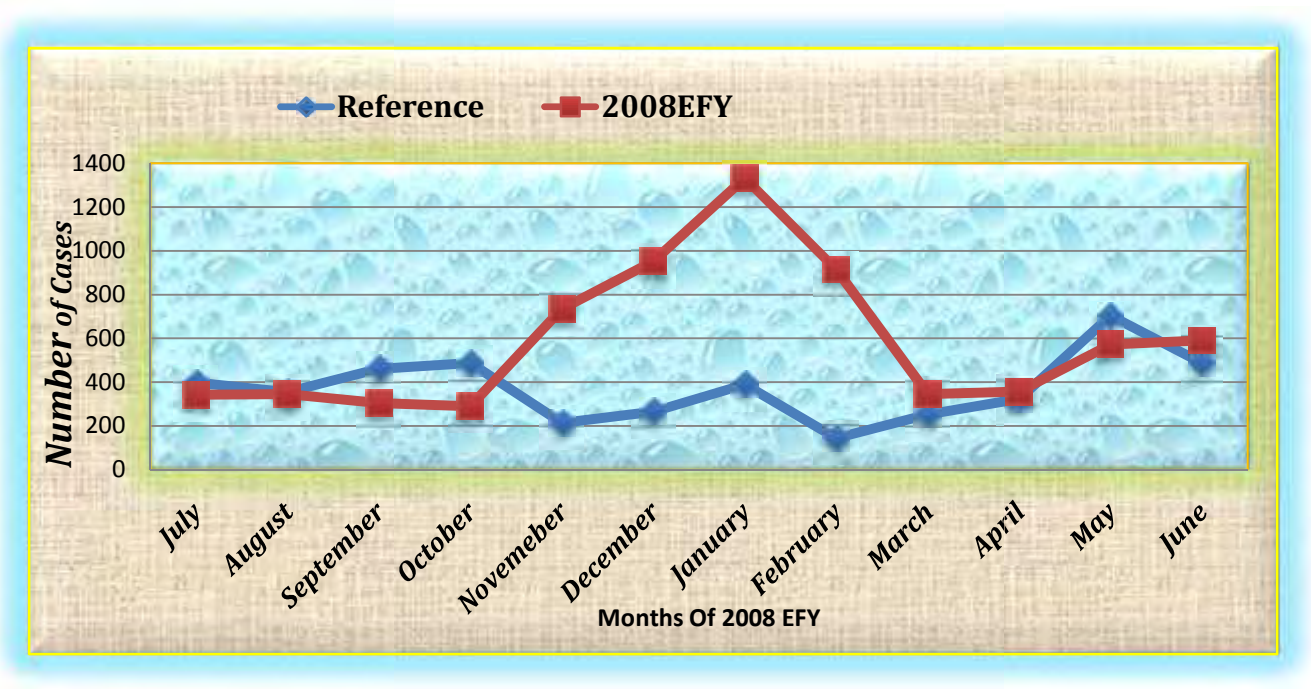


Figure 18: Malaria Monitoring Chart By Month's At Dassench Woreda South Omo Zone SNNPR, (in 2008 EFY) November 2016

South Ari Woreda:- In 2008EFY the district reported to ZHD 1060 (12.5%) clinical cases, 2349 (7.6%) confirmed malaria cases, and 6(1%) inpatient and zero death but the actual report from health center shows that clinical cases, 1123 (13.9%), confirmed malaria cases 2411 (8.7%), inpatient cases 13 (2.3%) and zero deaths.

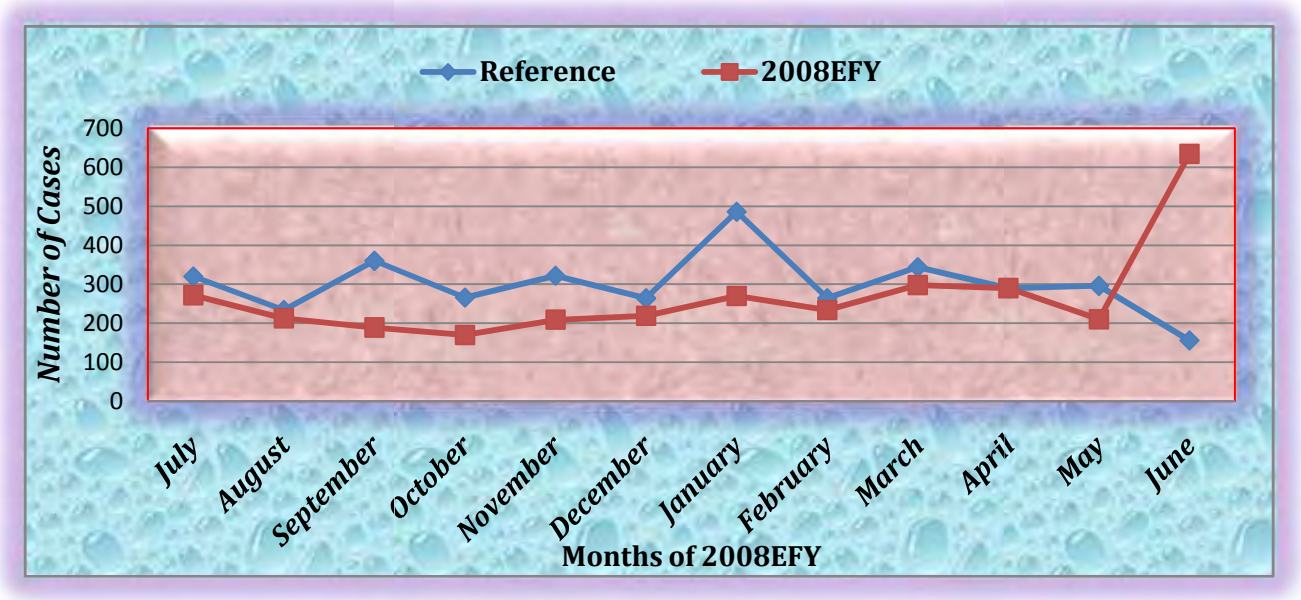


Figure 19: Malaria Monitoring Chart by Month at South Ari Woreda South Omo Zone SNNPR, (in 2008 EFY) November 2016

Bena Tsemay Woreda:- In 2008EFY the Woreda reported to ZHD 1679(19.8%) clinical cases, 2477 (8%) confirmed malaria cases, and 28(4.1%) in patient and zero death but the actual report from health center shows that clinical cases, 1882 (21.4%), confirmed malaria cases 2653 (10.2%), inpatient cases 37 (6.7%), and 0 deaths.

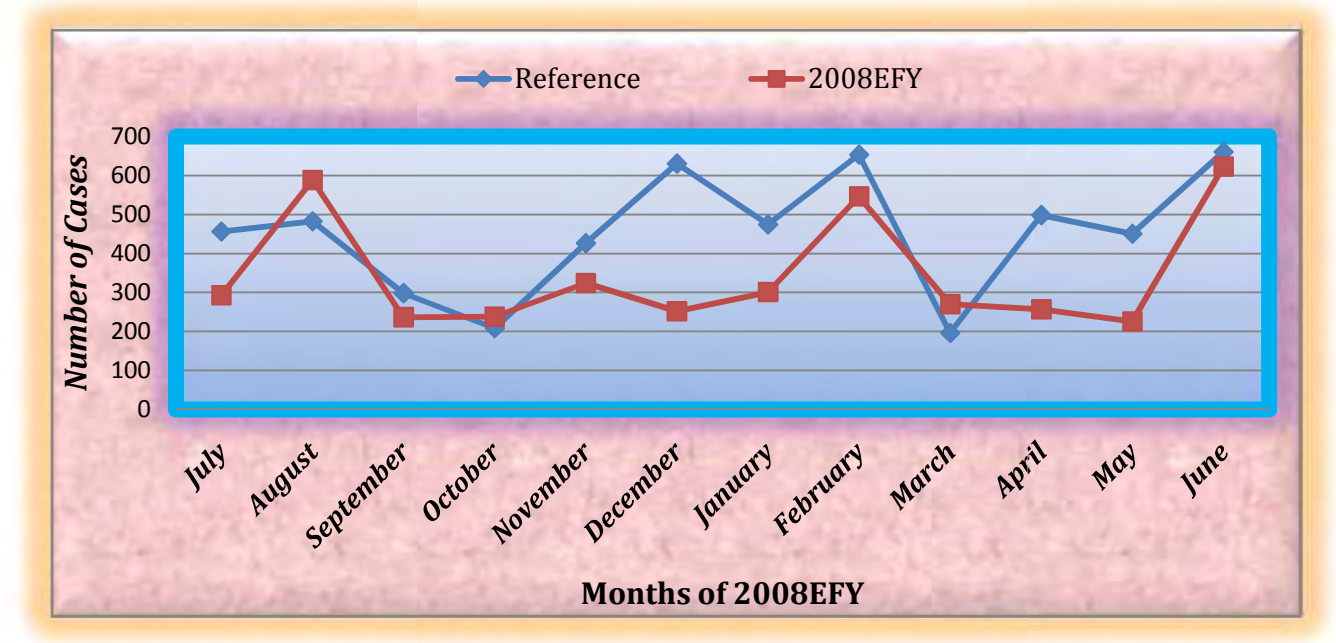


Figure 20: Malaria Monitoring Chart By Monthh At Bena Tsemay Woreda South Omo Zone SNNPR, (in 2008 EFY) November 2016

Jinka Town Administration: - In 2008EFY the town administration health office reported to ZHD 415(5%) clinical cases, 1687(5.5%) confirmed malaria cases, and 34(5%) in patient and zero death but the actual report from health center shows that clinical cases, 439 (5.8%), confirmed malaria cases 1693 (5.7%) , inpatient cases 44 (6.3%), and zero deaths.

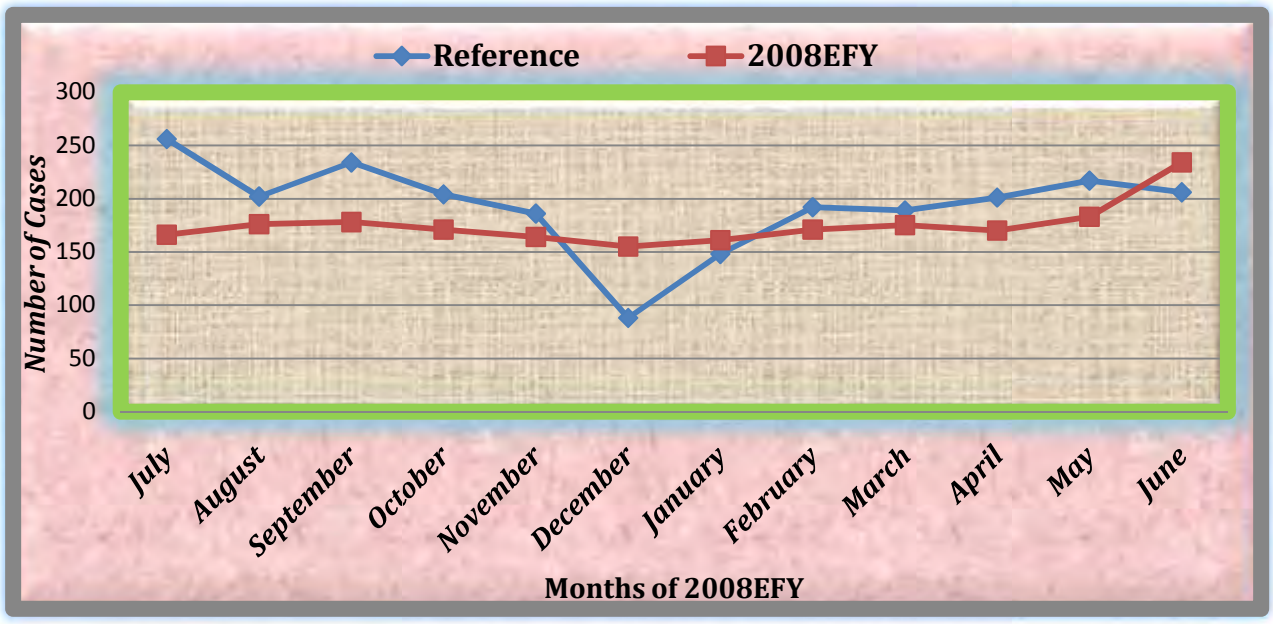


Figure 21: Malaria Monitoring Chart by Monthh at Jinka Town Administration, South Omo Zone SNNPR, (in 2008 EFY) November 2016

MALARIA PREVALENCE

In 2008EFY(2015/2016), Dassench woreda reported malaria cases with prevalence of 108.7 per 1000 population, South Ari woreda 14.5 per 1000 population , Bena Tsemay 63.4 per 1000 population and Jinka Town Administration health office reported 72.3 per 1000 population.

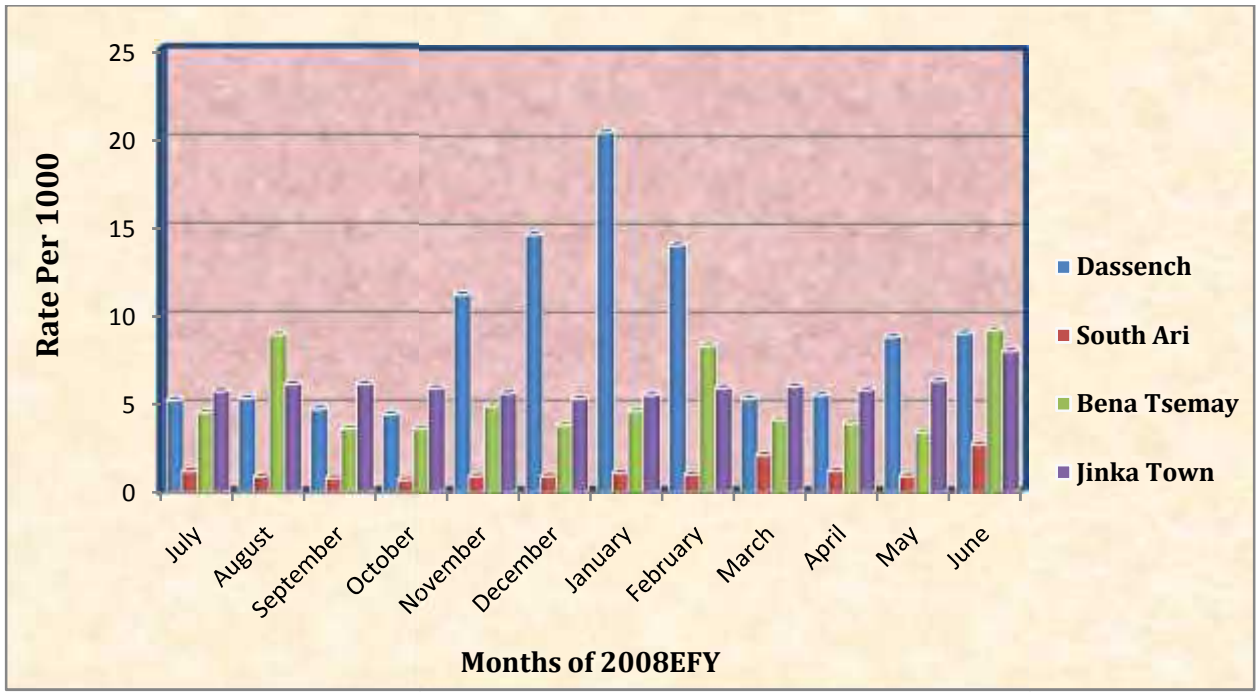


Figure 22: Malaria prevalence by Month and Woreda at Dassench, South Ari, BenaTsemay and Jinka Town Administration , South Omo Zone , SNNPR, (in 2008 EFY) November 2016

CORE FUNCTION SURVEILLANCE

CASE DEFINITION: Case detection is the process of identifying cases and outbreaks. For malaria case detection, the WHO malaria standard case definitions was available in 18(100%) evaluated reporting units. Two types of standard case definition of immediately and weekly reportable diseases/ conditions were posted at all evaluated reporting health units. These were Standard case to be used at health centers and above, which is prepared only in English and a simplified case definition called, a community case definition for immediately and weekly reportable diseases / conditions for health posts and community level, which is prepared both in English and Amharic.

STANDARD CASE DEFINITION USED FOR MALARIA AT HEALTH CENTER AND ABOVE

Suspected: Any person with fever or fever with headache, rigor, back pain, chills, sweats, myalgia, nausea, and vomiting diagnosed clinically as malaria.

Confirmed: A suspected case confirmed by microscopy or RDT for plasmodium parasites

COMMUNITY CASE DEFINITIONS USED FOR MALARIA AT HEALTH POST AND COMMUNITY LEVEL

Suspected:

- Any person with fever or fever with headache, back pain, chills and vomiting.

Confirmed:

- Suspected case confirmed by RDT.

CASE REGISTRATION

Case registration is the process of recording the cases identified. At health post level, 6 (75%) identified cases were recorded in the family folder and in malaria log book but the rest two health posts in Dassench woreda recorded only in malaria log book, it is because of nomadic nature the people they didn't registered the households in family folder. 100% health centers (n=4) and Hospital (n= 1) were using malaria registration book given by regional health bureau for laboratory results, outpatient (OPD) and inpatient (IPD) , abstract books for OPD and IPD malaria cases.

CASE CONFIRMATION

Case/outbreak confirmation refers to the epidemiological and laboratory capacity for confirmation. In the evaluated surveillance units /health facilities (n= 13), cases were confirmed at health post, health center, and Hospital level. 8 (100%) health posts were using RDTs, 4 (100%) health centers were using both RDT and microscopy, Hospital was using only microscopy to confirm malaria cases. In 2008 EFY the evaluated surveillance units examined 21353 cases with RDT and Microscope and confirmed 13,149 malaria cases (6,681 = PF, 4,454 = PV and Mixed =2014). There are an outbreak was detected in Dassench woreda and confirmed through these evaluated Surveillance units.

REPORTING

Reporting is the process by which surveillance data moves through the surveillance system from the point of generation. Table 1 shows malaria data reported in surveillance system from different woredas of south omo zone in 2008EFY.

Table 19: Reported malaria cases through surveillance system, South Omo Zone, SNNPR, (in 2008 EFY) November 2016

S.no	Reporting unit	Out Patient Department(OPD)			Inpatient Department (IPD)	
		Tested (RDT/Microscopy)	**Clinical**	**Confirmed**	**Case**	**Death**
1	Hammer	11950	628	5937	160	5
2	Dasenech	7412	449	6636	176	1
3	Benatsmay	6048	1679	2477	28	0
4	Salamago	13304	406	8900	36	0
5	Debub Ari	4212	1060	2349	6	0
6	Malle	9320	695	3452	49	0
7	Semen Ari	1583	955	1969	0	0
8	Nyangatom	2785	1065	2296	2	0
9	Jinka Zonal Hospital	11462	4763	2417	190	8
10	Jinka Town	3681	415	1687	34	0
	total	62380	8461	30812	681	14

DATA ANALYSIS AND INTERPRETION

Surveillance data should be analyzed routinely and the information interpreted for use in public health actions. No analyses were conducted at health post level. Analysis of surveillance data were expected from health centers, Hospital, woreda health office, and zonal health department. But out of the total evaluated surveillance units 1/10 (10%) of reporting unit (zonal health department) only analyzed the routine surveillance data and used for public health action weekly.

EPIDEMIC PREPAREDNESS

Epidemic preparedness is the existing level of preparedness for potential epidemics and includes availability of preparedness plans, stockpiling, designation of isolation facilities, setting aside of resources for outbreak response. Out of the total evaluated surveillance units excluding health posts, 5/10 (50%) prepared their epidemic plan (1-Town administration health office, 3-woreda health office, and Zonal department). 5/8 (62.5%) health posts established epidemic management

committee at kebele level, which was led by Kebele chairman. No written regular minutes were observed at health post level. But they said that "we discussed several times at kebele level and the minute book is in kebele manager office". Out of the rest evaluated reporting units, 7/10 (70%) units built their rapid response team (2/4(50%) HC, 3/4 (75%) woreda health office, 1(100%) zonal PHEM, and 0% Zonal hospital). For woreda health office, epidemic management committee was built at woreda administrative office, which was led by woreda chief administrator. 10 (100%) of the evaluated reporting units (HC, WoHO, ZHD, and Hospital) had no scheduled regularly meeting time, and the minute was recorded/written irregularly. 4 (100%) woreda health office and zonal health department were established multi-sectorial preparedness and response task force. Zonal health department were supported by external non-governmental partner, called IFHP was supporting on Malaria Training by paying the per diem for trainee. 0/4 (0%) woreda health office were allocated budget for emergency response. 4 (100%) health centers, and woreda health office were available motor vehicle for emergency condition.

RESPONSE AND CONTROL

The surveillance system was providing data for public health action. Woreda health office and zonal health department were using this data for response and control activities.

FEEDBACK

No written feedback was given at all for health development armies at village level. 27 (100%) health posts were providing oral feedbacks to health development army. 13/14 (92.9%) health centers, woreda health office, and zonal health department were giving written feedbacks every quarter. To monitor the given feedbacks at health center level one health workers was assigned. At woreda health office and zonal health department level, one or more officers were assigned to each and every health center and woreda respectively.

Supportive function of surveillance system

STANDARDS AND GUIDLINE

Standards, norms and guidelines are necessary for implementing, monitoring and evaluating surveillance and response systems. Out of the visited surveillance units, for 16/18 (88.8%) health facilities, woreda health office, and zonal health department, have a national guidelines and using the standard case definition for priority diseases but two health posts in Dassench woreda lacks the standard guidelines. 18 (100%) health facilities, woreda health office, and zonal department posted the cases definition for all diseases in the wall. For all health centers, Hospital, woreda health office, and zonal health department the case-based reporting formats were observed in their office. Guidelines for specimen collection, handling and transportation to the next level were available in 3/4 (75%) health centers, 4 (100%) woreda health office, Hospital and zonal health department. The line lists for reporting outbreaks were not available in 1/4 (25%) of health centers, 100% woreda health office, Hospital, and zonal health department.

TRAINING

Training refers to the needs for capacity building for staff involved with surveillance and response systems through knowledge transfer. Health development armies were trained by health extension worker and one health worker assigned from the satellite health center. 6 (88.9%) of health extension workers, 5 (100%) of health center and Hospital focal persons, and 7(100%) of PHEM officers at woreda and zonal health department were trained and gave orientation for their working staffs after training. No laboratory professionals were trained on public health surveillance. Out of the total 12 surveillance staff (7 PHEM officers & 5 IDSR focal person) excluding health extension worker 8 (66.7%) of them have got computer skill by themselves. Most skilled were from zonal health department and woreda health office.

SUPERVISION

Supportive supervision helps to strengthen the capacity of staff and ensure that the right skills are used appropriately, the necessary logistics are in place, and that planned activities are implemented according to schedule. Health posts have no formal supervision plan for development armies. They were giving supportive supervision for health development armies at

a time of contact/during home visit. But no supervisory checklist was observed at any health post level. 8 (100%) health posts were supervised every fifteen days by their health center and woreda health office. 3/4 (75%) of health centers were developed supervision plan for health posts.

4 (100%) of health centers conducted supervision for health posts. One health center did conduct the supervision without developing a plan. 0/4 (0%) of health centers notified their supervision plan prior to supervision.

The zonal health department supportive supervision schedule for all woredas was observed in their office. The written and phone call plan for supervision was provided prior to supervision for all woreda health office. A minimum of two health centers from each selected woreda were included in one quarter supervision. In similar manner at least two health posts were included from each supervised/selected health center. Five to ten Households from each supervised health posts were observed/supervision conducted in each selected woreda in one quarter. The health centers, woreda health office, and zonal health department were using the standardized checklist given from higher levels. The supportive supervision feedback given at each level was observed at all evaluated surveillance units.

COMMUNICATIONFACILITIES

In order to support the function of reporting and feedback in any surveillance system, an appropriate and effective medium for communication at each level of surveillance should be defined, instituted and maintained. Health development army (HDA) who living in two agrarian woreda and in one town administration was providing the routine report from their village by means of hard copy and oral report but in pastoralist woreda the system not well functional. Friday was the report day for HDA. Health posts were providing the routine report by two means. One was by using hard copy but only 2/8(25%) health posts have the three month consecutive copies of reports which is already documented in the file and the other was by means of their mobile phones. The report day for health post was Monday morning up to mid-day. 6/8 (75%) Health posts were using mobile phone access. All health centers, 4/4 (100%) were using hard copy, fixed line and mobile phone for routine report. The report day for health centers was from Monday afternoon to Tuesday mid-day local time. Woreda health offices were using fixed line and mobile phone. Zonal health department and Hospital were using electronic mail, fixed line, mobile phone, fax, and hard copy.

RESOURCE

Surveillance and response activities can only be performed if the required and appropriate financial, human and logistic resources are in place.

HUMAN RESOURCE

6/8 (75%) health posts, 2/4 (50%) health centers, 1/4 (25%) woredas, Hospital and zonal health department were using the expected human resources based on BPR structure.

LOGISTIC RESOURCE

For surveillance system activities, all health centers, all woreda health office, and zonal health department used technologies that facilitate documentation, analysis, reporting and communication (computer, printer, photocopy machine, telephone) and only zonal health department used fax machine. Health posts and health centers were not using any of the technologies

Budget (financial resources)

In all evaluated woreda there is no budget were allocated for any emergency condition by health centers, Hospital, woreda health office, and zonal health department.

MONITORING AND EVALUATION

MONITORING

At all level (health posts, health centers, and woredas) the health worker were assigned to monitor all planned activities. At health post level one health worker from the catchment health center was assigned to monitor all activities in the kebele and support health extension workers one times per a week. At woreda health offices level at least two focal people was assigned to follow up the whole health center catchment one times per a week. The zonal health department was assigned one or two focal person for monitoring and continuous follow up for each woreda two to times per a month. 9/18(50%) of evaluated surveillance units was used malaria monitoring/ norm chart.

EVALUATION

All the surveillance units were evaluating their performance on every two week in their facility and quarterly base along with other core processes, and NGOs.

COORDINATION

It is necessary to ensure effective coordination between implementers and stakeholders for effective and efficient implementation of surveillance and response systems. 4 (100%) woreda health office and zonal health department were working along with rural development, Education office, Water office, NGOs like AMREF ETHIOPIA, WHO etc.

SURVEILLANCE QUALITY

COMPLETENESS OF REPORTING SITES/SURVEILLANCE FORMS

Completeness of reporting sites is the proportion of reporting sites that submitted the surveillance report irrespective of the time when the report was submitted.

In 2008 EFY health posts were reported an average of 83.35% completeness ranging from 66.7% to 100%. The average completeness of the health center was 91.65% and it ranges from 83.35 to 100%. The average completeness of woreda health office 88%, Hospital was 100%, and Zonal health department were 82%.

TIMELINESS OF REPORTING

It is the single most important measure of timeliness whether data are submitted in time to begin investigations and implement control measures. In 2008 EFY timeliness of reporting health posts to health center was an average of 77.8% ranging from 66.6% to 89%. The average timeliness of the health center was 83.3% and it ranges from 66.6 to 100%. The average timeliness of woreda health office 85 % it ranges from 78 % to 92%, Hospital was 100%, and Zonal health department were 78%.

USEFULNESS OF SURVEILLANCE SYSTEM AND SURVEILLANCE DATA

18 (100%) of respondents were accepted as the surveillance system and its data was helpful to detect cases early on time to permit accurate diagnosis, to estimate the magnitude of morbidity and mortality, permit assessment of the effect of prevention and control program, and estimate research intended to lead to prevention and control.

SIMPLICITY OF THE SYSTEM

Simplicity is the structure of the system and the ease of implementation. At all evaluated surveillance units, the cases definition was easy for case detection, the surveillance formats allowed all professionals to fill data, was easy to record and report data on time, allowed updating data on the formats, the time to fill the format was 5-15 minutes. But confirmation of measles IgM antibody and AFP/polio was too long (one to two moths).

ACCEPTIBILITY OF THE SYSTEM

Acceptability of a system is a reflection of the willingness of the surveillance staff to implement the system, and of the end users to accept and use the data generated through the system. 8/18(44.4%) reporting agents from evaluated sites accepted and well engaged and the rest are disappointed due to lack refreshment training and motivation by comparing with other core process. Health posts, health centers, woreda health offices, and zonal health department were using the surveillance data for prevention and control. Health professionals were using the standard case definition to identify cases. All reporting units were using the given surveillance reporting formats.

FLEXIBILITY OF THE SURVEILLANCE SYSTEM

The surveillance system was easy to add new diseases or to remove an existing one. It was easy for modification of frequency of reporting frequency and can be operated with other system. There was possibility to incorporate new variable for a diseases or an event.

SENSITIVITY IN SURVEILLANCE SYSTEM

Malaria cases were identified using the standard case definition in all evaluated reporting units and malaria monitoring threshold were using to detect malaria outbreaks. Data reported by surveillance system was used for immediate public health action. IRS spray was conduct in evaluated woreda and abet chemical also applied in stagnant water surface by identifying the mosquito larva in water body surface through surveillance.

STABILITY

Still the system was not interrupted due to lack of resources. In the absence of budget from donor, the government was running all activities along with other integrated services.

DATA QUALITY

6/8 (75%) health posts reported incomplete surveillance report. 6/8 (75%) of them reported clearly and has a good records to read and understand. 3/4 (75%) of health centers sent complete and clearly recorded report for woreda health office. 3/4 (75%) of woreda health office sent complete and clear data report to zonal health office.

REPRESENTATIVE

Representativeness is the degree to which the reported cases reflect the occurrence and distribution of all the cases in the population under surveillance. At health post level the surveillance report incorporated the population under surveillance. But the private health facilities found at kebele, and woreda level were not included in surveillance report. Still people were using private health facilities for malaria and other disease treatment.

DISCUSSION

We evaluated a total of 18 surveillance units. The zonal PHEM reported 8,461 clinical malaria cases, 30,812 confirmed cases, 681 admissions and 14 death in 2008 EFY. Dassench woreda in 2008EFY reported to the ZHD were 449 (5.3%) clinical cases, 6636 (21.5%) confirmed malaria cases, 176 (25.8%) inpatient cases, and 1(7.1%) deaths but the actual report from health center shows that clinical cases, 723 (9.8%) , confirmed malaria cases 7258 (24.7) , inpatient cases 213 (28.6%), and2(15.3%) deaths. South Ari in 2008EFY reported to ZHD 1060 (12.5%) clinical cases, 2349 (7.6%) confirmed malaria cases, and 6(1%) inpatient and zero death but the actual report from health center shows that clinical cases, 1123 (13.9%), confirmed malaria cases 2411 (8.7%), inpatient cases 13 (2.3%) and zero deaths.

BenaTsemay woreda in 2008EFY reported to ZHD 1679(19.8%) clinical cases, 2477 (8%) confirmed malaria cases, and 28(4.1%) in patient and zero death but the actual report from health center shows that clinical cases, 1882 (21.4%), confirmed malaria cases 2653 (10.2%), inpatient cases 37 (6.7%), and 0 deaths.

Jinka Town administration health office in 2008EFY reported to ZHD 415(5%) clinical cases, 1687(5.5%) confirmed malaria cases, and 34(5%) in patient and zero death but the actual report

from health center shows that clinical cases, 439 (5.8%), confirmed malaria cases 1693 (5.7%) , inpatient cases 44 (6.3%), and zero deaths.

For case confirmation, all health posts used RDT, health centers used RDT and microscope, and Hospital used microscope. Only woreda health office and Zonal health department surveillance unit's prepared epidemic preparedness plan which is not supported by budget. Standards and guidelines were available at 16(88.9%) evaluated surveillance units two health posts in Dassench woreda lacks the standard guidelines. Report completeness of health posts was 83.35%, health centers 91.65%, Hospital 100%, woreda 88%, and zonal PHEM has 82%.

Public health surveillance is the ongoing, systematic collection, analysis, interpretation, and dissemination of data regarding a health-related event for use in public health action to reduce morbidity and mortality and to improve health [1-4]. The recommended WHO case definition for malaria was available and used for malaria case detection at all evaluated surveillance units. Cases were registered in family folder, and registration books at health facility level. Malaria cases were confirmed at all nearest health facility level. No need to refer malaria case for confirmation to distant health facilities. By using the malaria monitoring chart as shown in **figure 17,** malaria outbreak was seen in Dassench woreda between November and April 2008EFY (Malaria case line of the year crossed the reference line in between November and April, and June). In South Ari woreda Malaria case line of the year crossed the reference line in June 2008EFY. The "case building up " was also detected in Bena Tsemay woreda (in August, October and March of 2008EFY) and in Jinka town in December & January of 2008EFY and this case building up show that there was unrecognized malaria outbreak in evaluated woredas. Computers and trained personnel were available at woreda health office, but surveillance data was not entered in to the computer and analyzed by person, place, and time. No surveillance data was interpreted and used for public health action. At Zonal level, in visited woredas and in town administration health office a multi sectorial PHEM coordination forum is conducted monthly bases to review and plan emergency preparedness and response activities but the frequency of meeting is irregular. No rapid response team at health center conducted scheduled regular meeting.

Written feedback given by higher level was observed at health facility and office level but it lacks continuity. Almost all evaluated reporting units not met the minimum WHO standard of completeness except Jinka Hospital.

Staff was well engaged in surveillance data reporting but complains with lack of refreshment training. Still incomplete data was reported from health posts and that result with the report completeness will be below at higher level from the standard. Data from private health facilities were not included in the surveillance reporting [4-5].

LIMITATION

We could not calculate sensitivity and specificity in terms of case detection. We could not get variables required for calculating sensitivity and specificity.

CONCULSION

There are discrepancies of number of malaria cases between what the woreda health office reported to zonal health department and the actual number of malaria in the registration book at health facility. The standard case definition was available and used consistently at all levels. Although there were functioning computers different surveillance units, but there was a gap to utilize the current technologies to store, analyze and interpret data for public health action efficiently. Even though Epidemic Preparedness and Response plan (EPRP) was available in a few surveillance units but not supported by budget. Monitoring and evaluation system was well established, but the surveillance units were not used malaria monitoring chart to follow the trend of malaria cases and due to this reason in some visited surveillance unit the number of malaria cases are cross the reference line but the system are not recognize the presence of outbreak in the place. The completeness and data quality in visited unit which is not uniform. Except Jnka Hospital, all visited surveillance units have less than regional target which is 90% , so that it is difficult to say the place were free of public health emergency unless the surveillance unit achieve the completeness to 90%. Concerning acceptability of the system most of the reporting agents in the evaluated site accepted the system but not well engaged due to lack refreshment training and motivation from PHEM core process owner and in some places it was the reason for turnover of the staff from surveillance unit. In general the malaria surveillance system in South Omo Zone is useful, easy to implement, acceptable, flexible, stable, but poor quality data, and still the system needed to be strength especially in the pastoralist woreda.

RECOMMENDATION

- To capacitate the new surveillance staff, and to refresh/update the existing one training should be facilitated by woreda and zonal health department with the computer technologies,
- Epidemic preparedness plan should be prepared and used by health centers, and woredas to response emergency condition
- Malaria monitoring tool should be prepared and posted on the wall at all surveillance units for easy track of malaria changes.
- All private health facilities should be incorporated in to surveillance reporting units

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Annex 3: Surveillance System Evaluation Check List

Surveillance system evaluation Questionnaire of 2016

I. Regional /Zonal Level/Woreda/Health facility Questionnaire

Background Information of Region/Zone

1. Name of Region/Zone_____

2. Number of Zone/Woreda:_____ 1. Total_____ 2. Urban_____ 3. Rural_____

I. Availability of a National Surveillance Manual

1. Is there a national manual for surveillance?

   1. Yes 2. No 3. Not applicable 4. Unknown

2. If yes, describe (last update, diseases included, case definitions, surveillance and control, integrated or different for each disease):

   _____

   _____

   _____

3. Is surveillance/IDSR included in the annual health plan (EFY 2005) of the zone/Region?

   1. Yes 2. No

II. Case Detection and Registration

4. Do you have standard case definitions for the Country's priority diseases like Meningitis, AFP /polio, malaria, Meningitis Neonatal tetanus and measles? (Observed the standard case definition for each priority disease)

III. 1. Yes 2. No 3. Unknown 4. Not applicable

IV. Data reporting

5. Is the Zone /region responsible for providing surveillance forms to Woreda/Zones? 1. Yes 2. No 3. Unknown 4. Not applicable

6. If yes, is there shortage of appropriate surveillance forms at any time during the last 6 months?
7. 1. Yes 2. No 3. Unknown 4. Not applicable
8. What are the reporting units for the surveillance system?
    1. Public health facilities
    2. NGO health facilities
    3. Military health facilities
    4. Private health facilities
    5. Others_____
9. Number of Zonal/Woreda reported (either directly or through an intermediate level) received each reporting period at the regional/zonal level during the past 3 months:

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

    Weekly: _____ /12 times the number of Woredas

    Immediately:_____ /------ times the number of Woredas
10. On time (use national deadlines)

    Number of weekly reports received on time: /12 times the number of Woredas
11. Was there any report of the immediately reportable diseases in the past 1 month?

    1. Yes 2. No
12. If yes, with in what time is the report received after detection of the case/ diseases?
    1. Less than 1 hour
    2. 2-24 hour
    3. 1- 2 days
    4. 3- 7 days
    5. After 1 week

13. Means of reporting to next level by:

    1. E-mail 2. Telephone 3.Fax 4. Radio

V. Data analysis

Does the regional level/Zonal Level

14. Describe data by person (case based, outbreaks, and sentinel)? Observed description of data by age and sex:

    1. Yes 2. No 3. Unknown 4. Not applicable

15. Describe data by place? Observed description of data by Woreda (tables, maps)

    1. Yes 2. No 3. Unknown 4. Not applicable

16. Describe data by time? Observed description of data by time:

    1. Yes 2. No 3. Unknown 4. Not applicable

17. Perform trend analysis? Observed line graph of cases by time

    1. Yes 2. No 3. Unknown 4. Not applicable

18. List disease(s) for which line graph is observed

    _____

    _____

    _____

    _____

19. Have an action threshold defined for each priority disease? (Meningitis, Measles, AFP/polio, malaria)

    1. Yes 2. No 3. Unknown 4. Not applicable

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

21. How often do you analyze the collected data?

    1. Daily

    2. Weekly

    3. Every 2 weeks

    4. Monthly

    5. Quarterly

    6. As needed……..

22. Have appropriate denominators? Observed presence of demographic data (E.g. population by Woreda and hard to reach groups)

    1. Yes 2. No 3. Unknown 4. Not Applicable

VI. Outbreak Investigation

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

24. List the diseases: _____

    _____

    _____

25. Of those, number of investigated outbreak: (Observe reports & take copies) _____

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

27. Number of outbreaks in which findings were used for action: [Observe report] _____

28. Number of Woredas that looked for risk factors [observe in reports]

    _____

29. Number of Woredas that used the data for action [observe in final report]

    _____

VII. Epidemic preparedness(relevant for epidemic prone diseases)

30. Does the Region/Zone have a written emergency preparedness plan for any of the outbreak disease relevant to the area? (Observed a written plan)

    1. Yes 2. No 3. Unknown 4. Not applicable

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

    Has the region/Zone had emergency stocks of drugs, vaccines, and supplies at all times in past 1 year?

    1. Yes 2. No 3. Unknown 4. Not applicable

32. Has the Region/zone experienced shortage of drugs, vaccines or supplies during the most recent epidemic (or outbreak)?

    1. Yes 2. No 3. Unknown 4. Not applicable

33. Do you have a standard case management protocol for Meningitis, Malaria, AFP (polio), measles (Observed the existence of a written case management protocol for at least 1 priority disease)

    1. Yes 2. No 3. Unknown 4. Not applicable

34. If yes, list:_____

35. Is there a budget line for epidemic response?

    1. Yes 2. No 3. Unknown 4. Not applicable

36. Is there a regional/Zonal epidemic management committee? Observed minutes (or report) of meetings of epidemic management committee

    1. Yes 2. No 3. Unknown 4. Not applicable

37. Does the region/Zone have a rapid response team for epidemic?

    1. Yes 2. No 3. Unknown 4. Not applicable

VIII. Response to epidemics

38. Does the region/Zone respond within 48/24 hours of notification of most recently reported outbreak: Observed that the region/zone responded within 48 hours of notification of most recently reported outbreak (from written reports with trend and intervention)

    1. Yes 2. No 3. Unknown 4. Not applicable

39. Has epidemic management committee evaluated its preparedness and response activities during the past year (Observe written report to confirm)?

    1. Yes 2. No 3. Unknown 4. Not applicable

IX. Feedback

40. How many feedback reports has the regional/zonal level produced in the last year? Observed the presence of a report that is regularly produced to disseminate surveillance data

    1. Yes 2. No 3. Unknown 4. Not applicable

X. Supervision

41. How many supervisory visits have you made in the last 6 months? _____

    Obtained required number of visits from regional/zonal level _____

42. The most usual reasons for not making all required supervisory visits. (Text)

    _____

    _____

    _____

    _____

XI. Training

43. What percent of your subordinate personnel have been trained in surveillance? _____

44. Have you been trained in disease surveillance?

    1. Yes 2. No 3. Unknown 4. Not applicable

45. If yes, specify when, where, how long, by whom?

    _____

    _____

    _____

    _____

    _____

    _____

    ____

XII. Resources

Percent of sites that have:

46. Data management

Computer	1. Yes	2. No	3. Unknown	4. Not applicable
Printer	1. Yes	2. No	3. Unknown	4. Not applicable
Photocopier	1. Yes	2. No	3. Unknown	4. Not applicable
Data manager	1. Yes	2. No	3. Unknown	4. Not applicable
Statistical package	1. Yes	2. No	3. Unknown	4. Not applicable

47. Communications

Telephone service	1. Yes	2. No	3. Unknown	4. Not applicable
Fax	1. Yes	2. No	3. Unknown	4. Not applicable
Radio call	1. Yes	2. No	3. Unknown	4. Not applicable
Satellite phone	1. Yes	2. No	3. Unknown	4. Not applicable

XIII. Surveillance

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

    1. Yes 2. No 3. Unknown 4. Not applicable

49. Is there a budget source for surveillance in the Regional/zonal level?

    1. Yes 2. No 3. Unknown 4. Not applicable

50. If yes, what is the proportion: % _____

51. How could surveillance be improved? (Opportunities for strengthening surveillance)

    _____

    _____

XIV. Surveillance Co-ordination

52. Is there a focal unit for surveillance at the regional/zonal level? [Observe organo-gram to confirm]

    1. Yes 2. No 3. Unknown 4. Not applicable

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

_____

_____

___

XV. Questionnaire for Attributes and level of Usefulness in 2016

54. What is the incidence / Prevalence of priority disease in your area

S/N	Diseases	2011		2012		2013		2014		2015	
		case	Death	Case	Death	case	Death	case	Death	case	Death
1	Meningitis										
2	Malaria										
3	AFP										
4	Measles										

55. Does the surveillance system help for these selected priority diseases?

1. To detect outbreaks of these selected priority diseases early?

1. Yes 2. No

2. To estimate the magnitude of morbidity and mortality related to these diseases, including identification of factors associated with these diseases?

1. Yes 2. No

3. Permit assessment of the effect of prevention and control programs?

1. Yes 2. No

4. Interventions and diseases trends analyzed

1. Yes 2. No

XVI. Describe Each System Attributes:

I. Simplicity:

1. Is the case definition of Meningitis, malaria, AFP (polio), neonatal tetanus, Meningitis and measles easy for case detection by all level health professionals?

1. Yes 2. 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?

1. Yes 2.No

4. How long it takes to fill the format? 1. <5 minute 2. 10-15minuts 3. >15 minutes

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

A. MENINGITIS _____

B. Measles _____

C. AFP (Polio) _____

D. Malaria _____

II. Flexibility:

1. Can the current reporting formats be used for other newly occurring health event (disease) without much difficulty?

1. Yes 2. No

2. Do you think that any change in the existing procedure of case detection, reporting, and formats will be difficult to implement?

1. Yes 2. 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 collectors/ reporting sites?

   1. Yes 2. No

2. Review the last months 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(i.e. 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?

   1. Yes 2. No

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

3. If No, what is the reason for their poor participation in the surveillance activity?

   1. Lack of understanding of the relevance of the data to be collected
   2. No feedback / or recognition given by the higher bodies for their contribution; i.e. no dissemination of the analysis data back to reporting facilities

3. Reporting formats are difficult to understand
4. Report formats are time consuming
5. Other

_____

_____

_

V. Representativeness:

1. What is the health service coverage of the zone/ region? _____%
2. Do you think, the populations under surveillance have good health seeking behavior for these diseases?
   1. Yes 2. No
3. Do you think is well represented by the surveillance data?
   1. Yes 2. No

VI. Stability:

1. Was the new BPR restructuring affect the procedures and activities of the surveillance of these diseases? 1. Yes 2. No
2. Was there lack of resources that interrupt the surveillance system? 1. Yes 2. No

WOREDA (INTERMEDI LEVEL) QUESTIONNAIRE

_____

Identifiers

Assessment team_____ Woreda_____

Date_____ region/province_____

Interviewer _____ country_____

Respondent_____ surveillance system_____

_____

Is the Woredas has available national surveillance manual?

1. Is there a national manual for surveillance at this site?

ObsObserve national surveillance manual:

Yes € No € unknown € Not Applicable €

I. Case confirmation_____

Is the Woredas has the capacity to transport specimens to a higher level lab

2. Does the Woreda have the capacity to transport specimens to a higher level lab?

3. Yes € No € unknown € Not Applicable €

4. Does the Woredahas fully employed woreda focal person On PHEM?

Yes € No € unknown € Not Applicable €

5. Does the Woreda have guidelines for specimen collection, handling and transportation to the next level?

Yes € No € unknown € Not Applicable €

II. Data reporting_____

6. Have you lacked forms recommended for the country at any time during the last 6 months?

Yes € No € unknown € Not Applicable €

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

Weekly: _____ /12 times the number of health facilities

Immediately: _____/----- times the number of health facilities

On time (use national deadlines)

8. Number of weekly reports submitted on time: ____/12 times the number of health facility

9. Number of immediately reports submitted on time: _____/3 times the number of health facilities

10. Is the Woredas have means for reporting to next level?

How do you report:

- ***a.*** Mail
- ***b.*** Fax
- ***c.*** Telephone
- ***d.*** Radio
- ***e.*** Electronic
- ***f.*** Other

Strengthening reporting

11. How can reporting be improved?

_____

_____

III. Data analysis_____

12. I. Is the WoredaDescribe data by person (case based, outbreaks, sentinel)

ObsObserved description of data by age and sex

Yes € No € unknown € Not Applicable €

13. Describe data by place

ObsObserved description of data by place (locality, village, work site etc)

Yes € No € unknown € Not Applicable €

14. Describe data by time

ObsObserved description of data by time

Yes € No € unknown € Not Applicable €

15. Perform trend analysis

ObsObserved line graph of cases by time

Yes € No € unknown € Not Applicable €

16. List:

_____

_____

17. Have an action threshold for each priority disease

Does the Woreda you have an action threshold for any of the country priority diseases?

Yes € No € unknown € Not Applicable €

18. If yes, what is it? _____cases _____% increase _____rate

(Ask for 2 priority diseases)_

_____

_____

19. Have appropriate denominators

Does the Woreda have demographic data at site (E.g. population <5 yr, population by village, total population)

20. Yes € No € unknown € Not Applicable €

21. Who is responsible for data analysis? _____

22. How often does the Woreda analyze the collected data?

- ***a.*** Daily
- ***b.*** Weekly
- ***c.*** Every 2 weeks
- ***d.*** Monthly
- ***e.*** Quarterly
- ***f.*** As needed

IV. Outbreak investigation

23. Does the Woredas were investigated outbreaks in the past 6moths?

Yes € No €

Number of outbreaks suspected in the past 6 months:_____

Investigated_____?

have you ever conducted an outbreak investigation

Has your Woreda ever investigated an outbreak?

Yes ☐ No ☐ unknown ☐ Not Applicable ☐

V. Epidemic preparedness

24. have your Woreda a plan for epidemic preparedness and response?

(Obs) Observed a written plan of epidemic preparedness and response

Yes ☐ No ☐ unknown ☐ Not Applicable ☐

25. have your Woreda have emergency stocks of drugs and supplies at all times in past 1 year?

ObsObserved the stocks of drugs and supplies at time of assessment

Yes ☐ No ☐ unknown ☐ Not Applicable ☐

26. Has the Woreda experienced shortage of drugs, vaccines or supplies during the most recent epidemic (or outbreak)?

Yes ☐ No ☐ unknown ☐ Not Applicable ☐

27. Is there a budget line or access to funds for epidemic response?

Yes ☐ No ☐ unknown ☐ Not Applicable ☐

28. Does your Woreda that have an epidemic management committee?

ObsObserved minutes (or report) of meetings of epidemic management committee

Yes ☐ No ☐ unknown ☐ Not Applicable ☐

29. Does the Woreda have a rapid response team (RRT) for epidemics?

Yes ☐ No ☐ unknown ☐ Not Applicable ☐

VI. Responses

30. Does the Woreda implemented prevention and control measures based on local data for at least one reportable disease or syndrome?

Yes ☐ No ☐ unknown ☐ Not Applicable ☐

31. In how many time do you respond to Epidemic situation?

ObsObserved that the Woreda responded within 48 hours of notification of most recently reported outbreak (from written reports)

Yes ☐ No ☐ unknown ☐ Not Applicable ☐

32. Does your Woredaachieved acceptable case fatality rates (e.g. 10% for Meningococcal CSM 1% for Cholera) during the most recent outbreak?

Yes ☐ No ☐ unknown ☐ Not Applicable ☐

Obswhat was the case fatality rate for most recent outbreak? (Observe from outbreak report)

33. Has epidemic management committee evaluated their preparedness and response activities during the past year? (observe written report to confirm)

Yes ☐ No ☐ unknown ☐ Not Applicable ☐

VII. Feedback

34. Does the Woreda gives written feedback to the lower/higher level in the last year?

Yes ☐ unknown ☐ Not Applic ☐

ObsObserved the presence of a written report that is regularly produced to disseminate surveillance data (Woreda and higher)

35. How many feedback bulletin or reports has the Woreda received in the last year from the higher level? a) 1 b) 3 c) 6 d) 9 E) 12 F) Not received

VIII. Supervision

36. How many times have you been supervised by the higher level in the last 6 months?

ObsObserved supervision report or any evidence of supervision in last 6 months

Yes ☐ No ☐ unknown ☐ Not Applicable ☐

37. Number of Observed appropriate review of surveillance practices in the Woreda in the past 6 month?_____

38. How many supervisory visits have you made in the last 6 months?

Expected ☐ Achieved: ☐ Not Done: ☐

(Obtain required number of visits from central level)_____

39. The most usual reasons for not making all required supervisory visits. (Text)

Reason 1_____

Reason 2_____

Reason 3_____

IX. Training

40. Number of health personnel (in position of responsibility) trained in disease surveillance?

_____

41. If yes, specify when, where, how long, by whom?

_____

40. Number of Health personnel in the Woredahave been trained in surveillance and epidemic management? _____

X. Resources

42. I. Do the Woreda have Important Logistics?

- ***a.*** Electricity
- ***b.*** Bicycles
- ***c.*** Motor cycles
- ***d.*** Vehicles/ambulance

43. Data management

- ***a.*** Stationery
- ***b.*** Calculator
- ***c.*** Computer
- ***d.*** Printer
- ***e.*** Statistical package

44. Communication

- ***a.*** Telephone service
- ***b.*** Fax
- ***c.*** B radio
- ***d.*** Computers that have modems

45. Information education and communication materials

- ***a.*** Posters
- ***b.*** Megaphone
- ***c.*** Flipcharts or Image box
- ***d.*** VCR and TV set
- ***e.*** Generator
- ***f.*** Screen
- ***g.*** Projector (Movie)
- ***h.*** Other:

46. Hygiene and sanitation materials

- ***a.*** Spray pump
- ***b.*** Disinfectant

XI. Surveillance co-ordination:

47. Is there a surveillance co-ordination focal point within the Woreda epidemic management committee?

Yes ☐ No ☐ unknown ☐ Not Applicable ☐

XII. Satisfaction with surveillance system

with surveillance system

48. Are you satisfied with the surveillance system?

Yes ☐ No ☐ unknown ☐ Not Applicable ☐

49. If no, how can the surveillance system be improved?

_____

_____

50. Opportunities for integration

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

_____

_____

_____

HEALTH FACILITY [Hospital/Health Center] QUESTIONNAIRE

Identifiers

Assessment team_____ Type of health facility_____

Date_____ Woreda Name_____

Interviewer_____ Region/province_____

Respondent_____ Country_____

Name of health facility_____ Surveillance system _____

---

1. Is there a national manual for surveillance at the Hospital? Health center?

ObsObserve national surveillance manual:

Yes ☐ No ☐ unknown ☐ Not Applicable ☐

I. Case detection and registration

2. Does Hospital/Health Center that have a clinical register?

ObsObserved the existence of a clinical register ?

Yes ☐ No ☐ unknown ☐ Not Applicable ☐

3. Does the Health Center/Hospital correctly register cases?

ObsObserved the correct filling of the clinical register during the previous 30 days

Yes ☐ No ☐ unknown ☐ Not Applicable ☐

4. Does the health center/Hospital has fully employed focal person On PHEM?

5. Yes € No € unknown € Not Applicable €

6. Does the Health Center/Hospital have standardized case definitions for priority diseases(Meningitis, AFP (polio), measles, malaria?

Yes____ No ____ unknown ____ Not Applicable_____

II. Case confirmation

7. Does the Hospital/Health center 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. Does the Hospital/Health Center have necessary materials required to collect specimen?

Stool ? Y: € N: €U :€ N/A:€

blood/serum Y: € N: € U :€ N/A:€

CSF Y: € N: €U :€ N/A:€

9. Does The Hospital/Health Center have the capacity to handle specimens like sputum, stool, blood/serum and CSF until shipment?

Y: € N: €U :€ N/A:€

10. Does the Hospital/health Center have proper cold chain management during shipment?

Y: € N: €U :€ N/A:€

11. Does the Hospital/health Center have the capacity to ship specimens to a higher level lab?

Y: € N: €U :€ N/A:€

12. Does the Hospital/health Center have packing materials for shipment of specimens at health facility?

Y: € N: €U :€ N/A:€

III. Data reporting

13. Does the Hospital/health Center have appropriate surveillance forms for that site at all times over the past 6 months?

Y: € N: €U :€ N/A:€

14. Does the Hospital/health Center have accurately report 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. ObsMeasles Y: € N: € U :€ N/A:€

b. ObsMalaria Y: € N: € U :€ N/A:€

c. ObsAFP (polio) Y: € N: € U :€ N/A:€

a. ObsMeningitis Y: € N: € U :€ N/A:€

15. Does the Hospital/health Center have 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

ObsWeekly: /12 times the number of sites

Obsimmediately: /-- times the number of sites

16. On time (use national deadlines)

ObsNumber of weekly reports submitted on time:-_____ /12 times the number of sites

ObsNumber of immediately reports submitted on time: ___/-- times the number of sites

17. Does the Hospital/health Center have have means for reporting to next level by e-mail, telephone, fax or radio

How do you report?

a. Mail

b. Fax

c. Telephone

d. Radio

e. Electronic

f. Other

18. Strengthening reporting

How can reporting be improved?

_____

_____

_____

IV. Data analysis

Percent of sites that:

19. Does the Hospital/health Center have describe data by person (outbreaks, sentinel)?

ObsObserved description of data by age and sex

Y: € N: €U :€ N/A:€

20. Does the Hospital/health Center have describe data by place

ObsObserved description of data by place (locality, village, work site etc)

Y: € N: €U :€ N/A:€

21. Does the Hospital/health Center have describe data by time ?

ObsObserved description of data by time

Y: € N: €U :€ N/A:€

22. Does the Hospital/health Center have Perform trend analysis?

ObsObserved line graph of cases by time

Y: € N: € U:€ N/A:€

23. Does the Hospital/health Center have an action threshold for each priority disease?

Do you have an action threshold for any of the Country priority diseases?

Y: € N: €U :€ N/A:€

24. If yes, what is it (Ask for 2 priority diseases)? _____cases ____ % increase _____rate

25. In the Hospital/health Center Who is responsible for data analysis? _____

26. In the Hospital/health Center have How often do you analyze the collected data?

- ***a.*** Daily
- ***b.*** Weekly
- ***c.*** Every 2 weeks
- ***d.*** Monthly
- ***e.*** Quarterly
- ***f.*** As needed……..

27. Does the Hospital/health Center have appropriate denominators

ObsObserved presence of demographic data at site (E.g. population <5 yr., population by village, total population)

Y: € N: €U :€ N/A:€

V. Epidemic preparedness

28. Does the Hospital/health Center have a standard case management protocol for epidemic prone diseases

ObsObserved the existence of a written case management protocol for 1 epidemic prone disease

Y: € N: €U :€ N/A:€

VI. Epidemic response

29. Does the health Center/Hospital implemented prevention and control measures based on local data for at least one epidemic prone diseases

Y: € N: €U :€ N/A:€

30. Does your Hospital/health center achieved acceptable case fatality rates? (e.g. 10% for Meningococcal CSM 1% for Cholera) during the most recent outbreak

ObsObserved that the health facility achieved an acceptable case fatality rate for most recent outbreak

Y: € N: €U :€ N/A:€

VII. Feedback

Does your Hospital/health center have received a report or bulletin from a higher level during the past year on the data they have provided?

Y: € N: € U:€ N/A:€

31. How many feedback bulletin or reports has the health facility received in the last year? ___

32. Does your Hospital/health center conducted at least semi-annual meetings with community members to discuss results of surveillance or investigation data ?

Y: € N: € U:€ N/A:€

How many meetings has this the Hospital/health Center conducted with the community members in the past six months? _____

VIII. Supervision:

33. How many times have you been supervised in the last 6 months?_____

34. 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

ObsObserved supervision report or any evidence for appropriate review of surveillance practices

Y: € N: € U:€ N/A:€

IX. Training

35. Does health personnel In Hospital/Health center trained in disease surveillance and epidemic management?

Y: Þ N: ÞU :Þ N/A:Þ

36. Number of Health Personnel trained _____

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

_____

X. Resources

38. Number of Hospital/Health center that have Logistics

- ***a.*** Electricity
- ***b.*** Bicycles
- ***c.*** Motor cycles
- ***d.*** Vehicles

39. Data management in Health Center/Hospital

- ***a.*** Stationery
- ***b.*** Calculator
- ***c.*** Computer
- ***d.*** Software
- ***e.*** Printer
- ***f.*** Statistical package

40. Communications in Health Center/Hospital

- ***a.*** Telephone service
- ***b.*** Fax
- ***c.*** Radio call
- ***d.*** Computers that have modems

41. Information education and communication materials in Health Center/Hospital

- ***a.*** Posters
- ***b.*** Megaphone
- ***c.*** Flipcharts or Image box
- ***d.*** VCR and TV set
- ***e.*** Generator
- ***f.*** Screen
- ***g.*** Projector (Movie)
- ***h.*** Other:

42. Hygiene and sanitation materials in Health Center/Hospital

- ***a.*** Spray pump
- ***b.*** Disinfectant

43. Protection materials (list) _____ _____ _____

_____

_____

XI. Satisfaction with surveillance system

44. Satisfaction with the surveillance system in Health Center/Hospital

Are you satisfied with the surveillance system?

45. Y: € N: € U :€ N/A:€

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.)

_____

_____

_____

Health Post Level Questionnaire

Identifiers

Assessment team	Type of health facility
Date	Woreda
Interviewer	Region/province
Respondent	Country
Name of health facility	Surveillance system

---

1. Number of Health Post with national surveillance manual

Is there a national manual for surveillance at Health Post?

ObsObserve national surveillance manual:

Yes No Unknown Not applicable

I. Case detection and registration _____

2. Does the Health Post that have a clinical register ?

Yes No Unknown Not applicable

3. Does the Health Post correctly register cases during the previous 30 days?

Yes No Unknown Not applicable

4. Does the Health Post have standardized case definitions for the priority diseases (each priority disease) Meningitis, AFP (polio), measles, malaria?

Yes No Unknown Not applicable

II. Data reporting _____

5. Does the Health Post have appropriate surveillance forms for that site at all times over the past 6 months

Yes No Unknown Not applicable

6. Does the Health Post 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. ObsMeasles Y N U N/A

b. ObsMalaria Y N U N/A

c. ObsAFP (polio) Y N U N/A

d. ObsMeningits Y N U N/A

7. Does the Health Post that reported each reporting period to the next higher level during the past 3 months?

Yes_____ No_____ no Known_____ Not applicable_____

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

ObsWeekly: /12 times the number of sites

Obsimmediately: /-- times the number of sites

9. On time (use national deadlines)

ObsNumber of weekly reports submitted on time:-_____ /12 times the number of sites

ObsNumber of immediately reports submitted on time: ___/-- times the number of sites

10. Does the Health Post have means for reporting to next level by e-mail, telephone, fax or radio

How do you report?

a. Mail

b. Fax

c. Telephone

d. Radio

e. Electronic

f. Other

11. Strengthening reporting

How can reporting be improved?

_____

_____

_____

III. Data analysis_____

Percent of sites that:

12. Does the Health Post describe data by person (outbreaks, sentinel)

ObsObserved description of data by age and sex

Yes No Unknown Not applicable

13. Does the Health Post describe data by place

ObsObserved description of data by place (locality, village, work site etc)

Yes No Unknown Not applicable

14. Does the Health Post describe data by time

ObsObserved description of data by time

Yes No Unknown Not applicable

15. Does the Health Post Perform trend analysis

ObsObserved line graph of cases by time

Yes No Unknown Not applicable

IV. Epidemic response_____

16. Does the Health Post implemented prevention and control measures based on local data for at least one epidemic prone disease for at least one epidemic prone disease?

Yes No Unknown Not applicable

V. Feedback_____

17. Does the Health Post have received a report or bulletin from a higher level during the past year on the data they have provided

Yes No Unknown Not applicable

18. How many feedback bulletin or reports has the health facility received in the last year? _____

19. Does the health post receive at least 1 report or bulletin from a higher level during the past year on the data they have provided ?

Yes No Unknown Not applicable

20. Doe the health post conducted at least semi-annual meetings with community members to discuss results of surveillance or investigation data?

Yes No Unknown Not applicable

21. How many meetings has the health post conducted with the community members in the past six months? _____

ObsObserved 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

VI. Supervision:_____

22. Is HEWs was supervised in the past 6 months?

Yes No Unknown Not applicable

23. How many times have you been supervised in the last 6 months?_____

24. 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

ObsObserved supervision report or any evidence for appropriate review of surveillance practices

Yes No Unknown Not applicable

VII. Training _____

25. Number of HEWs trained in disease surveillance and epidemic management?

Yes No Unknown Not applicable

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

_____

VIII. Resources_____

27. Does the Health post have

a. Electricity

b. Bicycles

c. Motor cycles

d. Vehicles

28. Data management

- *a.* Stationery
- *b.* Calculator
- *c.* Computer
- *d.* Software
- *e.* Printer
- *f.* Statistical package

29. Communications

- *a.* Telephone service
- *b.* Fax
- *c.* Radio call
- *d.* Computers that have modems

30. Information education and communication materials

- *a.* Posters
- *b.* Megaphone
- *c.* Flipcharts or Image box
- *d.* VCR and TV set
- *e.* Generator
- *f.* Screen
- *g.* Projector (Movie)
- *h.* Other:

31. Hygiene and sanitation materials

- *a.* Spray pump
- *b.* Disinfectant

32. Protection materials (list) _____ _____ _____

_____

_____

IX. Satisfaction with surveillance system_____

33. Satisfaction with the surveillance system

Are you satisfied with the surveillance system?

Yes No Unknown Not applicable

34. If no, how can the surveillance system be improved? _____

_____

35. Opportunities for integration

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

_____

_____

_____

CHAPTER IV- HEALTH PROFILE DISCRIPTION REPORT

4.1DASSENCH WOREDA HEALTH PROFILE ANALYSIS SOUTH OMO,SNNPR ,2016

BACKGROUND

Health profile description is a system of collecting, organizing and summarizing health and others health related events. This includes, demographic, socio-economic, vital statistics, political, cultural and others aspect of a particular geographic areas of interest. It helps in prioritizing health and others health related condition occurred within the communities. The summarized data and 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 Dassench district health profile which will help in identifying the district's health and health related events to use it for programs planning and intervention. Dassench district is one of the 8 districts in the South OmoZone & found in south of the Zonal town Jinka with a population of 65353.-- It also found 712km from Hawassa in the South direction. Malaria and other communicable diseases are common in the district. Due to this I have selected the district to identify the gaps since no profile description conducted before.

RATIONALE OF THE STUDY

Describing health profile of Dassench district is helpful to address the current gap of community health of the district, and for stakeholder's priority setting; and it is important to understand the demographic, socio-economic, morbidity and mortality and other data of the district. Health profile generates data which can be used at community level. The finding from the health profile description project will help the district and other stakeholders for public health decision making.

OBJECTIVE

GENERAL OBJECTIVE

To assess and describe health related issues about health status, health indicators and to identify problems for priority setting.

SPECIFIC OBJECTIVE

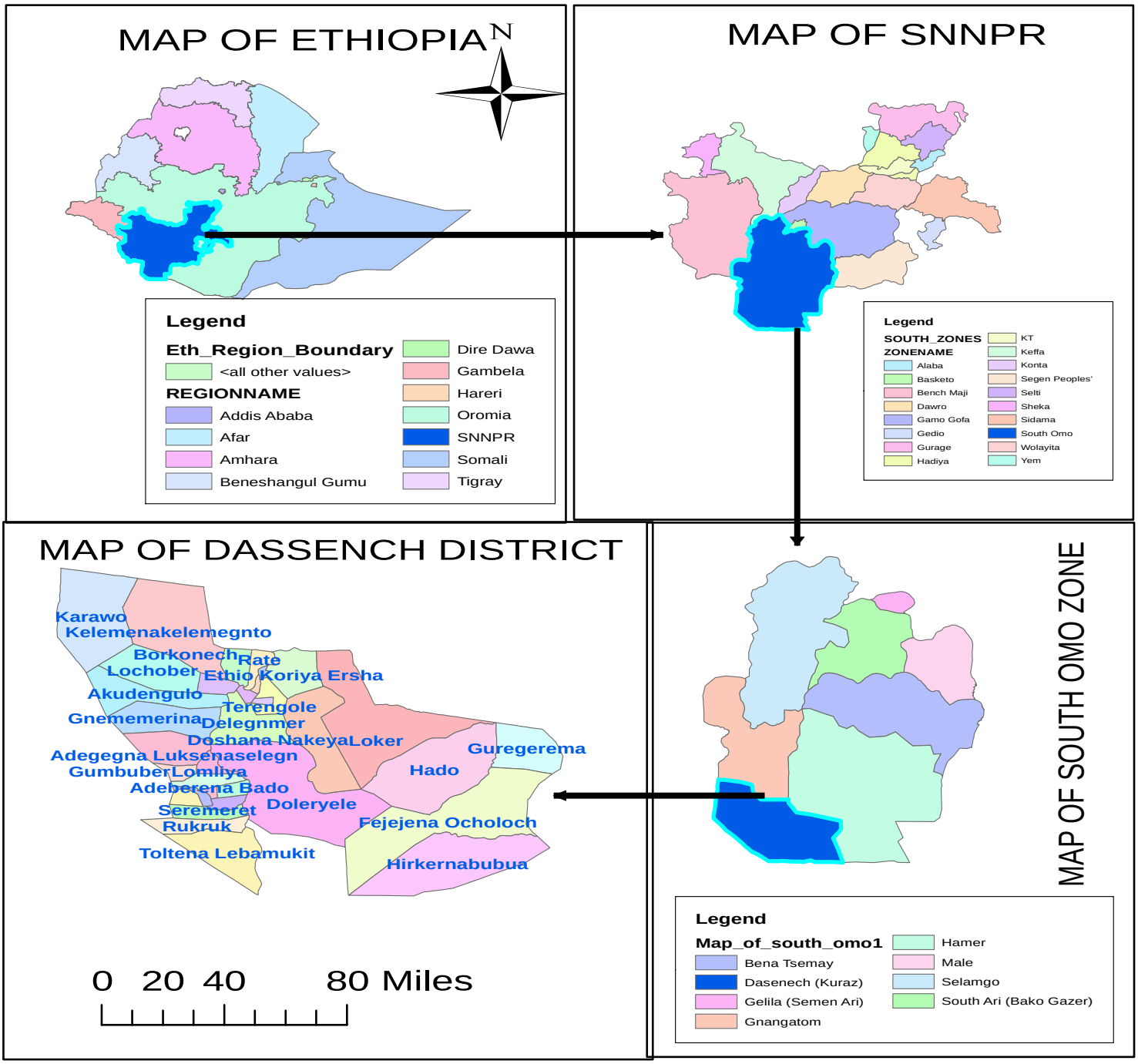
- To assess health status and indicators of the district
- To describe disease burden/magnitude and other health related events
- To describe existing health information
- To assess human resources of the district
- To identify priority problem setting
- To offer recommendations

METHOD'S

- Review available data in health offices and health institutions
- Review available data in Finance, Education, Agriculture, Culture & Tourism, Water.
- Review of publications and literatures about the area
- Interview and discussion with concerned health office heads, experts, professionals etc by using checklists
- Personal observation
- Data will be processed and analyzed by Microsoft Excel and Epi-info (as necessary).
- The findings will be communicated to Dassench district health office, South OmoZone Health Department and other stakeholders.

STUDY AREA AND SYUDY PERIOD

- The study will be conducted in Dassench district, South OmoZone from Februay1 to 14/ 2016.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Bench Maji
Dawro
Gamo Gofa
Gedio
Gurage
Hadiya
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Keffa
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Wolayita
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Ethio Koriya Ersha
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Terengole
Gnememerina
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Doshana Nakeya
Loker
Adegegna Luksenaselegn
Guregerema
Gumbuber
Lomiya
Hado
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Doleryele
Seremeret
Rukruk
Fejejena Ocholoch
Toltena Lebamukit
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Dasenech (Kuraz)
Gelila (Semen Ari)
Gnangatom
Hamer
Male
Selamgo
South Ari (Bako Gazer)

STUDY DESIGN: Cross-sectional descriptive

STUDY UNITY: Woreda health office and health facilities, and other responsible sectors in the Woreda.

DATA COLLECTION: Structured questioners were developed and used to collect primary and secondary data. Interviews were conducted with relevant officers of the Woreda health, education, water, Agriculture, administrative and others offices based on need data.

DATA ANALYSIS: - Using Microsoft Excel

RESULT

HISTORICAL BACKGROUND

Dassench District is located in the Southern part of the country in the SNNPR Region. As the Woreda administration office mentioned verbally, the name Dassench meaning MANY, this is because of the community composed from different 8 sub ethnic group (Shir, Koro, Oro, Rendle,Rele,Elele, Narech and Enikorya)and the Shir ethnic come from Turkana, Koro ethnic come from Samuru ethnic in Kenya,Rendele ethnic come from Somalia and the rest are natives to the district.The altitude of the woreda is 350-370 meter above sea level and its size is 3284 square kilometer. The large portion of land mass of the woreda (99.83%) is flat & only 0.17% isPlato. The climate of the Woreda 100% Desert (Berehama) with annuls minimum temperature 28^0c and maximum 42^0c and the mean temperature 34-36^0c and annual rainfall of 330mm.

GOVERNMENT AND ADMINSTRATION

Dassench is one of the **157**woredas in the South region and its part of the administrative of South Omo Zone. It composed of 39 rural kebele and one (1) urban administrative (Omo Rate) Town. The capital town of the woreda is called Omo Rate Town, which is 932 km far from Addis Ababa to the South West and 712 km far from Hawassa to the South direction.

It is bordered on the North Hammer District, on the South it share international border with KENYA, on the East Hammer District and on the West with Gnangatom District.

DEMOGRAPHY AND VITAL STATISTICS

According to the 1999EFY projections, in the year 2007EFYDassench District population was 65, 353 of which 32,023(49%) are male and 33,330(51%) are female. Besides this almost all people were living in rural area and figure 22 show distribution of population by sex.

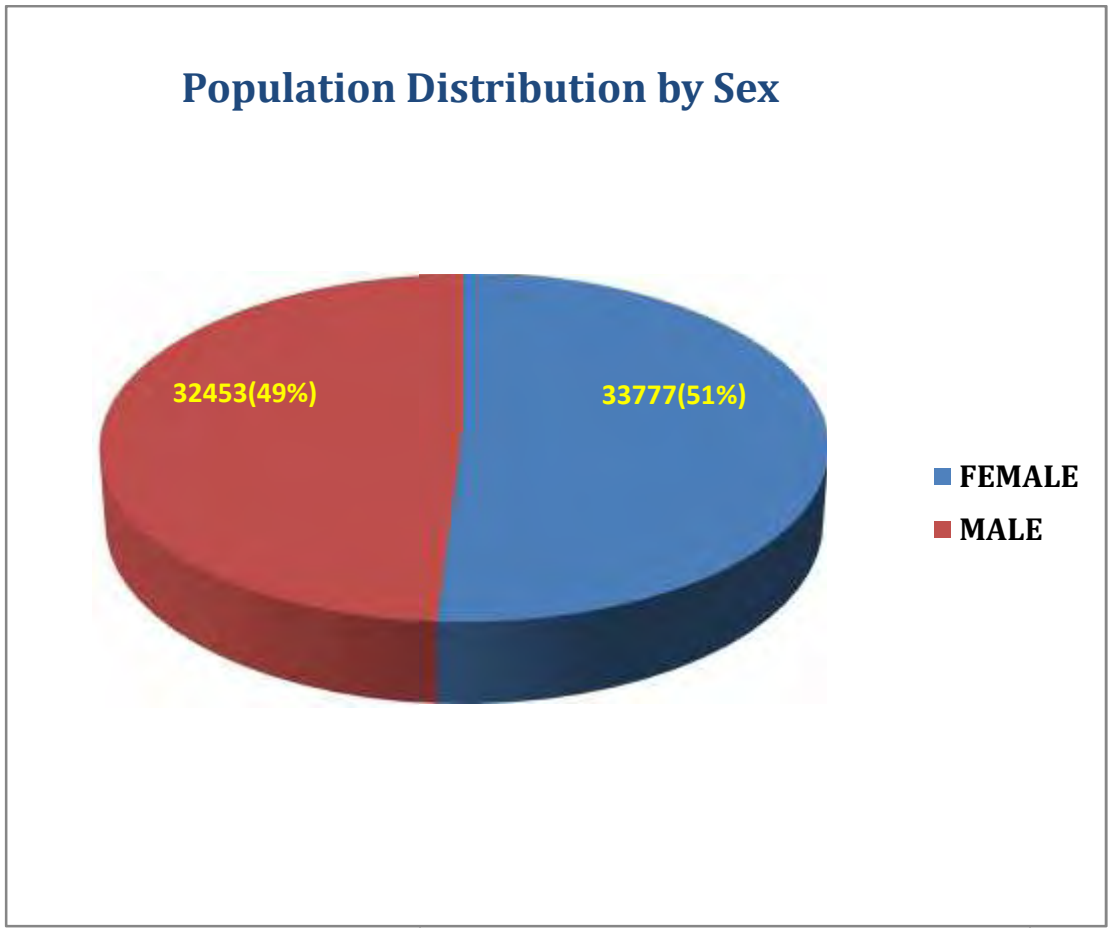

Figure 23: Population distribution by sex, Dassench district, SNNPR region, 2007 EFY

Table 20: Population in different groups, Dassench district, SNNPR region, 2007 EFY

S/N	Description	Percentage	Population	Remark
1	Total Population	100.0%	66230	
2	Male	49.0%	32453	
3	Female	51.0%	33777	
4	Urban	5.1%	3380	16% Nationally
5	Rural	94.9%	62850	84% Nationally
6	Population growth rate	2.9%		2.6% Nationally
7	6-59 months age group	13.94%	9232	13.18% Nationally
8	24-59 month age group	10.43%	6908	10.72% Nationally
9	Under one years	3.19%	2112	3.16% Nationally
10	Under three years	8.31%	5504	8.04% Nationally
11	Under five years	15.61%	10338	14.59% Nationally
12	Women 15-49 years	23.30%	15431	23.40% Nationally
13	< 15 years	47.87%	31704	44.98% Nationally
14	15-24 age group	19.27%	12763	20.58% Nationally
15	15-59 age group	48.27%	31975	50.17% Nationally
16	Pregnant women	3.46%	2291	3.36% Nationally
17	Non pregnant women in reproductive age	19.84%	13140	20.04% Nationally

HEALTH INFRASTRUCTURE

The woreda have a total of three health center and twenty one health posts. This make the woreda health service coverage 100% which means health center established to provide both the preventive and curative services and it comprises five satellite health posts and is expected to serve for 25,000 people while health posts serve for 5000 people. When we look the woreda HP to population ratio 1:3,154 and HC to population ratio 1:22,077 while the national figure indicating on 2003 health and health related indicator HP: Pop 1:5,426 and HC: pop 1:30, 794, but the land area of kebele here in pastoralist community very large and they are living very dispersedly, in the mean while for the seek of grazing land the community move from one place

another and this situation may reduces the coverage of health service. Moreover the woreda have one private clinic and one drug venders in Omo Rate town.

HUMAN RESOURCE

Based on 2007 data health workers found in the Woreda were 6 Health officers, 17Nurse (diploma), 5 Midwifery (diploma), 4 Pharmacy technician, 3 Laboratory technician, 1 Environmental health worker and 36 HEW.

Table 21: Professional to Population Ratio, Dassench district, SNNPR region, 2007 EFY

Profession	Profession to population ratio Dassench district	Profession to population ratio National 2004 EFY health Indicator
Health Officer	1: 10,892	1:17,128
Nurse	1:4,668	1:2,299
Midwifery Nurse	1:16,338	1:21811
HEW	1: 1,815	1:2807

WOREDA HEALTH SYSTEM

Under the woreda health office there are five main core processes which is Health Promotion& Disease Prevention, Health and Health Related Service & product Quality control, Public Health Emergency Management, Curative and Rehabilitative and Multi-Sectoral HIV/AIDS Response. Moreover under the supervision of the woreda a total of 3 health center and 21 health posts were found. Additionally three NGO working in health and related activities in the woreda they are AMRAF, Save the Children and Health Limited.

MATERNAL HEALTH SERVICE

As of 2007 EFY, there were 2291 eligible pregnant women in the Woreda. Of this, 1655(72.2%) received antenatal care service Four times during their pregnancy and 839(37%) attended their delivery by skilled health professional, 121 women attend their delivery by health extension worker 1096(48%) receive postnatal care service. Comparing this figure with regional figure based on 2007EFY health and health related indicator; antenatal coverage of the region was

86%, delivery by skilled health professional 62%, and postnatal coverage 75%. In general this indicated that maternal health service delivery relatively lower in Dassench woreda comparison with the regional figure. Moreover among pregnant women attended for ANC follow up at health center, 2619 were tested for HIV and 3 positive for the test and 3 of them received ARV prophylaxis at the health center.

EXPANDED PROGRAM OF IMMUNIZATION

The district has conducted both static and outreach immunization services in 2007 EFY, (2014/2015).Out of 2292 targeted populations, immunization coverage for children < 1year of age was 87% (1999/2292) for BCG, 98 %(2081/2112) for Penta1, 94% (1980/2112) for penta3, for measles and fully vaccinated 1797/2112 (85%) and 1728/2112(82 %) respectively. PCV1 and PCV3 was 98%and 92%. Dropout rate for Penta1to Penta3 is 4%which is acceptable from the standard and Penta1 to measles was 13.3% , which is not acceptable from the standard. This makes the Woreda performed less comparing with its Zone and the regional coverage.

FAMILY PLANNING

The woreda contraceptive acceptance rate was 1561(39%) while the regional and national contraceptive acceptance rates are 84% respectively which indicate the woreda performing very low.

DISEASE PREVENTION AND CONTROL

The main indicator of disease prevention and controls includes top ten cause of morbidity and mortality particularly disease like malaria, HIV, TB and Leprosy. Based on this the detailed listed below.

TOP TEN LEADING CAUSES OF MORBIDITY IN THE WOREDA

Table 22: Top Ten Leading Causes of OPD visit, Dassench district, SNNPR region, (2007 EFY) in February 2016

Rank	Diagnosis	Cases	Percent
1	Malaria	2140	18.77
2	Acute Febrile Illness(AFI)	1976	17.33
3	Other Unspecified Infectious and Parasitic disease	1465	12.85
4	Typhoid fever	883	7.75
5	Trauma (Injury and Fracture)	699	6.13
6	Pneumonia	690	6.05
7	All Respiratory Disease	666	5.84
8	Urinary Tract Infection	473	4.15
9	Infection of the skin & subcutaneous Tissue	450	3.95
10	Diarrhea(non-bloody)	275	2.41
Total Leading causes of Morbidity		9717	100

MALARIA

Malaria is one of the leading causes of morbidity in the woreda. Moreover all thirty nine rural and one urban kebele of the woreda are malarious and the populations also at risk for the disease and the woreda ITN coverage in 2007 EFY was 14%.

Table 23: Malaria Case by Parasitic Specious Dassench Woreda, SNNPR Region, (2006 to 2008 EFY) in February 2016

Indicator	2006	2007	2008(7month)
Total Malaria confirmed and clinical	3022	1949	3853
Malaria outpatient confirmed case	2954	1899	3817
Total malaria inpatient case	68	50	36
Total malaria death	0	0	1
Total malaria suspected fever examined by RDT and Microscopy	9471	9046	11024
PF	2715	1686	3502
PV	369	245	350
PF rate	88%	84%	90.9%

Malaria is the leading cause of morbidity & admission in the district and plasmodium falciparum is the most prevalent species in the district. There are malaria epidemic in the district from22/04/2008-26/05/2008EFY and here are in detail.

Malaria outbreak in the district from 22/04/2008-26/05/2008EFY with a total of 3048 positive malaria cases out of these 1661(54.5%) were Male and 1387(45.5%) are Female, male population is more affected than female.

Table 24: Number of Malaria cases in Dassench district by age category (from 22/04-26/05/2008EFY) in February 2016

S.no	Age Category	Number of cases	percentage
1	<5yrs	613	20.2%
2	5-14yrs	1043	34.3%
3	15-44yrs	1318	43.3%
4	45+	80	2.6%

REASON FOR OUTBREAK

- Because of Elino season there are a heavy rain in the district and which lead to present many potential areas for mosquitoes breading site.
- Absence health post in village at which outbreak rise.

ACTIVIYIS IN RESPONSE TO EPIDEMIC

- Case treatment given to 3048 Patient
- 5503sqm area of Water surface treated by abate chemical every week
- IRS conduct on 3894 houses and 27,065 population protected
- 600 ITNs given to Highly vulnerable community (pregnant& children)
- Health education was given to 11,567 people

HIV/AIDS AND STI

A total of 13,677 persons (clients) were counseled and tested for HIV in 2007 EFY, of these 5475 were female). Out of total screened, 45 clients were positive for HIV virus.Number of patient on ART and cases were ever enrolled on ART 130 and 37 respectively in HC. The district health office in collaboration with Zonal Health Department supplied 570500 condoms in line with health education to prevent youth from HIV virus infection.

Adult HIV/AIDS prevalence of the district is 0.4%. In addition, all health center in the woreda provides VCT, integrated MCH, PMTCTservice to the public and only one health center that provide ART service to the community.

TB AND LEPORSY

Indicators of TB and Leprosy includes TB case detection rate, TB treatment success rate, TB cure rate, TB defaulter rate, TB death rate, and new case of leprosy.

Table 25: Tb/Leprosy Indicator, Dassench Woreda, SNNPR Region, (2007 EFY) February 2016

TB and Leprosy Indicator	Number	Percentage (%)
Total TB case	45	
PTB Negative case	19	
PTB Positive case	26	
Extra PTB case	32	
TB detection rate	26	37%
TB treatment completion rate		100%
TB cure rate		90%
TB treatment success rate		100%
TB defaulter rate		10%
Death on TB Rx		0%
Total TB case screened for HIV	45	100.0%
New case of leprosy	0%	0%

NUTRITION

In regarding on nutritional status of the woreda MUAC measurement was conduct for 7312 children whose age range from 6-59 months and from the total the number children moderately affected (MAUC 11-11.9cm) 836 and sever acute malnutrition (MUAC <11cm) are 163 respectively. Vitamin A supplementation and Deworming program conducted two times annually and the coverage were 73%, 85%respectively.

Table 26: Public Health Emergency Management of Immediately and Weekly Reportable Diseases, Dassench Woreda, SNNPR Region, (2007 EFY) in February 2016

PHEM reportable disease	Case	Death
AWD	0	0
Measles	0	0
NNT	0	0
AFP	0	0
Anthrax	0	0
Dracunculiasis /Guinea worm	0	0
SARS	0	0
Small pox	0	0
VHF	0	0
YF	0	0
Pandemic Influenza	0	0
Rabies	0	0
Malaria	1993	0
Meningitis	0	0
Dysentery	264	0
RF	0	0
Typhoid Fever	1432	0
Epidemic Typhus	22	0
SAM	255	0

HYGIENE AND ENVEROMENTAL HEALTH

Based on 2007 health and health related indicator, to measure the hygiene and environmental health of the community there are two basic indicators; these are safe water supply and household access to any type of latrine. In order to achieve the woreda environmental health and hygiene there were two types of water providing institute in Dassench woreda (urban and rural). In the urban there are 2 water treatment plant and serves for 689 households and the town annual water utilization increase from year to year. Sixty one water schemes providing drinking water for the rural 39 kebeles peoples. Of which 46(75%) are shallow well and 15(25%) hand dug well. However, almost all health institution have no water supply (Two health center and Twenty one health post) in 2007 EFY. The district safe water coverage was 19%.

In 2007 the latrine coverage of Omo rate town (capital of the district) 85% while the rural (39 kebeles) coverage was 8.8%, this makes the woreda latrine coverage 16.5%. Moreover the woreda solid and liquid waste management coverage data not

BUDGET ALLOCIATION FOR HEALTH SECTOR

The woreda budget for all sector in 2004 EFY was 20,604,750birr while in 2005 EFY is 22,256,852birr. Of which budget allocation for health mentioned below in **table 10**

Table 27: Budget allocation for health, DassenchWoreda, SNNPR Region, 2007 EFY.

Institutes	Budget allocation in Birr				
	2004 EFY	2005 EFY	2006EFY	2007EFY	2008EFY
TotalDistrict budget	20,604,750	22,256,852	28,006,078	32,428,014	44,938,585
Health sector budget	1,633,028	2,026,749	1,363,111	3,148,163	6,094,743
Percentage of Health	7.9%	9.1%	4.8%	9.7%	13.5%

ECONOMY

The main economy of the woreda is livestock and 97.5% of the district people are pastoralist and others constitute 2.5%. Moreover the woreda had a total of 200480 hectare for irrigation farming and only 1,560 hectare are covered with different plant. Up on it various sorts of cereals, vegetable and fruits are being produced; example maize, sorghum, cottons, onion, tomato, banana, etc are some of the agricultural products by irrigation and also economy sources of the woreda.

EDUCATION

Dassench district has 13 primary schools, subdivided into 11 first cycles and 2 second cycles,1 secondary schools and 36 alternative basic education schools. . In 2007 EFY (2014/2015) 6,425 students were enrolled to school in the district. First cycles elementary schools (grade 1-4) have a total pupils of 2670(33%) with 1442 (54%) were female. Second cycle school (grade 5-8) have total students of 697; with 229 (33%) of female. There are 36 alternative basic education schools has a total of 2904; with 1341(46%). The district has one secondary schools (grade9-10) in the district has total of 154; with 55(36%) female students. The majority of students enrolled in secondary school were male (64%).The total educational coverage of the district is 37.22% and which is very low coverage when compared to zonal & regional coverage. Out of 52 schools (both primary and secondary) in the district 16 schools have anti-HIV/AIDS clubs.

TRANSPORT, COMMUNICATION AND ELECTRIC POWER

There is only one road which connects the district with the zonal capital. Within the woreda there are rural roads which connect Twenty five kebeles only with the town OmoRate but the rest Fifteen Kebeles have no rural roads access. Most of this road have poor quality and have no any maintenance for many decades. In the rainy season unable to access some kebele because of the flood from OmoRiver bursting over the road. There are also village and an Iceland around in Lake Turkana which is hard to reach through land transport and only needs boat& Air transport. This low coverage of transportation in the district still continued as agreat challenge to conduct any developmental activities in rural kebeles. On the other way the woreda have communication facility like mobile phone. OmoRate town (capital of the district) only has electricity access four

hours per day during night time. Two health center and Twenty one health post have no electric power supply. There is no Bank service in the district.

IDENTIFIED PROBLEM

- Low coverage of delivery attended by skilled person in health center.
- Low coverage of contraceptive acceptance rate in the district.
- Dropout rate for Penta1 to measles is 13.3%, which is very high &not acceptable value from the standard.
- Malaria is the leading cause of Morbidity & Admission in the district.
- Low coverage of TB detection rate.
- Low coverage of any type of latrine in the district.
- Lack of electricity, and water supplies observed in all health institutions (Both HC& HP).
- Lack of road accesses & public transport in rural kebeles.
- Unable to find required essential drug data in the woreda per year in order to know if there is any essential drug shortage in comparative to what they have now.
- Number of Health Post & Health extension worker not accessible in all kebele.
- Moreover there was limited data on HIV/AIDS and malaria at woreda health office level.
- The district has low educational coverage.
- Additional problem – Shortage of human resource, both Professional & supportive staff.
  -Turnover of the staff

CONCLUSION AND RECOMMENDATION

Priority should give to maternal and child health, prevention of malaria, TB detection rate and latrine coverage. The district government should give emphasize on infrastructure accessibility in rural kebeble (kebele road, health posts per kebele level, electricity).The pure water supply coverage of the district is very low and it is difficult provide quality service in the health institution and it is also difficult to prevent water born disease, therefore the district government should work hard on the provision of pure water supply to the community as well as to health institution. In ordered to prevent turnover of experienced health personnel it is better to take any affirmative action based on the district capacity.

REFERENCE

1. Health and Health Related Indicator, 2007 EFY.(2014/15 GC)
2. The 2007 Population and Housing Census of Ethiopia
3. South Omo Zone Health Department &DassenchWoreda Health Office 2007EFY annual report.

Annex 4: Health Profile data collection Tool (Checklist)

1. **Historical Aspects of the area (if available)**
   - How and why the name given Dassench for the district?
     _____
   - When was the district established? _____
   - Any other historical aspect_____
2. **Geography and Climatic condition**
   - Map of the district
   - Square area of the District _____
   - Altitude _____ latitude_____ longitude_____
   - Average Annual rain fall _____
   - Average Annual temperature _____
   - Distance from: zone town_____ Region town_____ Addis Ababa_____
   - Types of climate_____
   - Land bodies_____
   - Water bodies_____
3. Political and administrative organization
   - Total number of kebeles: _____
   - Rural _____
   - Urban_____
   - Boundaries, north_____, east_____ west_____ south_____
4. **Population & population structures- Demographic information**
   - Estimation of total Population in 2007 E.C_____2008E.C_____
   - Male_____ _____
   - Female_____ _____
   - Urban_____ _____
   - Rural_____ _____
   - House hold_____ _____
   - Population size by age group: <1 year____< 3 years _____<5 years_____ ____<15_____ 15-24_____> 65 Years_____
   - Women child bearing age_____%_____
   - Percentage of pregnant women_____
   - Sex ratio_____
   - Dependency ratio_____

- **Estimated Population size by kebele in 2007 E.C**

Sr. no	Name of the Kebele	2007 E.C			2008 E.C		
		Male	Female	Total	Male	Female	Total
1							
2							

- **Types of religion found in the district and estimation**

S.No	Type of religion	Popu. In No	%
1	Orthodox		
2	Catholic		
3	Protestant		
4	Muslim		
5	Others		

- **Ethnic composition**

S.No	Type of ethnic	No	%
1	Dassench		
2	Amhara		
3	Gofa		
4	Wolaita		
5	Basketo		

5. Economy

- Main source of income _____
- Stable food for community_____
- Average income level per house hold_____
- Average income per capita _____
- Number of population engaged in:
  - ✓ Agriculture _____
  - ✓ Government employee_____
  - ✓ merchandise_____
  - ✓ Husbandry _____
  - ✓ Hotel and catering _____
  - ✓ Others (specify) _____

Employment

- Number of people employed_____

- Number of people un employed_____
- Ratio of Employed to un employed_____

6. Education

- Percentage of literacy in eligible age group_____
- Percentage of illiteracy in eligible age group_____

A. Teachers and students data

Sr. no	Type of School	# Schools	# teachers			# Students			Student Dropout rate		
			Male	Female	Total	Male	Female	Total	M	F	Tot
1	Primary										
	1-4										
	5-8										
	1-8										
2	Secondary										
	9-10										
	11-12										
	Total										
1	Private school										
	Primary										
	Pre school										
	1-4										
	5-8										
	1-8										
	Others (Take note)*										

*_____

B. School health activities:

- Schools with functional latrines _____
- Schools with HIV/other Health clubs_____
- School with youth clubs_____

- Number of public libraries_____
- Others_____

7. Institutions with different Facilities in the district

Types of facility	Number of institutions having utilities/facilities		
	Health center	Health post	School
Water supply			
Electric power			
Telecommunication			
Transportation			

8. Disaster status in the area

- Types of disaster commonly occurred in the district_____
  _____
- Was there any disaster occurred in the district in the last one year?

Yes (specify) _____

No of people affected_____

- No_____
- Was any disease outbreak occurred in the last one year?

- Yes (specify) _____ _____
  No of cases_____
  No of death_____
- No_____
  - Was any nutritional problem? Yes_____ No_____
    If yes, numbers of people were affected_____
    If yes, types of interventions have taken_____
    _____
  - Is there disaster management committee in the district? Yes_____ No_____

9. Vital statistics and health indicator 2007 E.C

CBR_____
CDR_____
CMR_____
PNMR_____
IMR_____
MMR_____GR_____

10. Health status

- District health coverage_____%

10.1 Number of existing health facilities in the district

Sr. no	Type of Health facility	Quantity
1	Hospital	
2	Health center	
3	Private clinic	
4	Pharmacy	
5	Drug store/Rural drug vender	
6	Diagnostic Laboratories	
7	Health posts	

10.2 **Human resource data in the health sector**

Sr. no	Type		In number		
			Male	**Female**	**Total**
1	Physicians				
2	Health officers				
3	Laboratory technician/technologist				
4	Pharmacy technician/Pharmacist				
5	Nurses	Bsc			
		Diploma			
6	Midwife				
7	X-Ray technician				
8	Environmental health professional				
9	HEWs				
10	HIT-Health information Technology				
11	Other administrative staff				

10.3 **Ratio of health facility and professional to population (2007 E.C)**

Sr. no	Description		Ratio
1	Hospital to population		
2	Health center to population		
3	Health post to population		
4	Physician to population		
5	Health officer to population		
6	Nurse to population		
7	Midwife to population		
8	HEWs to population	Town	
		Rural	

10.4 Top ten causes of morbidity admission and adult morbidity in the district in 2007 E.C

10.4.1 Top ten leading causes of OPD visit (morbidity)

Sr. no	Adult			Pediatrics		
	Types causes	**In No**	**%**	**Types causes**	**In No**	**%**
1						
2						

10.4.2 Top ten causes of admissionsin 2007 E.C

Sr. no	Adult			pediatric		
	Types causes	**In No**	**%**	**Types causes**	**In No**	**%**
1						
2						

10.4.3 Top ten causes of deaths (mortality) in 2007 E.C

S/n	Adult			Pediatrics		
	Types causes	**In No**	**%**	**Types causes**	**In No**	**%**
1						
2						

10.5 Status of primary health care components

10.5.1 MCH and EPI coverage of the district in 2007 E.C

Sr. no	Description		Coverage		DOR
1	ANC coverage	1st round			
		4th round			
2	PNC coverage				
3	HF delivery coverage				
4	BCG vaccination coverage				
5	OPV	1			
		3			
6	Rota vaccination coverage	1			
		2			
7	Penta3	1			
		3			

8	PCV	1			
		3			
9	Measles vaccination vaccine				
10	Fully vaccination				
11	Contraceptive prevalence				
12	TT2+ coverage for pregnant				
13	TT2+ coverage for no pregnant				

10.5.2 Environmental health status in 2007 E.C

Sr. no	Description	Number (%)
1	Latrine coverage	
2	Number of house hold having latrine	
3	Safe water supply coverage	
4	Number of kebeles accessed to safe water supply	
5	ODF kebeles	
6	Separating of domestic animals from human living house	

10.5.3 Health Education

Total number of people who have got heath education_____ male _____ female_____

- **Exempted Health services/education**

_____

_____

10.5.4 Endemic diseases

- **Malaria prevention and control program in 2007 E.C**

Sr. no	Description		Number and/or %
1	Number of MalariousKebeles		
2	ITN coverage		
3	Coverage of Insecticide chemical spray		
	Total No of cases per year-2007 E.C	<5 years of age	
		>5 years of age	
4	positivity rate	PF	
		PV	
		Mixed	
5	Mortality rate	PF	
		PV	
		Mixed	

	Cases treated based on lab finding	PF	
		PV	
		Mixed	

Supplies: RDT_____
Coartem _____
ITN_____

- **Prevention and control of TB/Leprosy** in 2007 E.C

Sr. No	Description		Population no. (%)
1	Prevalence of Pulmonary TB		
2	Pulmonary TB	Smear positive	
		Smear negative	
3	Prevalence of Extra PTB		
4	TB detection rate		
5	TB cure rate		
6	TB success rate		
7	TB defaulter rate		
8	Death rate		
9	Total TB patients screened for HIV		
10	HIV patients screened for TB		
11	Prevalence of Leprosy		

- **Prevention and control of HIV/AIDS in 2007 E.C**

Sr. No	Activities		In No			%	Remark
			M	F	Total		
1	Total people screened for HIV						
2	VCT service						
3	PICT						
4	PMTCT						
5	HIV Prevalence	< 5 yrs of age					
		➢ 5 yrs of age					
6	Total PLWHIV						
7	Currently on ART	< 5 yrs of age					
		➢ 5 yrs of age					
8	Ever started on ART	< 5 yrs of age					

		➢ 5 yrs of age					
9	Condom Distribution in No						

10.6 **Health sector expenditure and financing 2004- 2008 EFY**

	Source	2004 EFY	2005 EFY	2006 EFY	2007 EFY	2008 EFY
1	Total district budget (Birr)					
2	Allocated to health sector (Birr)					
3	Total per capital health expenditure(Birr)					

- **Health sector budget distribution**

Sr. no	**Health institution**	**2004 EFY**		**2005 EFY**		**2006 EFY**		**2007 EFY**		**2008 EFY**	
		Salary* (birr)	Recurrent (birr)	Salary (birr)	Recurrent (birr)	Salary (birr)	Recurrent (birr)	Salary (birr)	Recurrent (birr)	Salary (birr)	Recurrent (birr)
1											

***Salary =** Salary + Allowance

Health Care financing /HCF/ (_____to_____ EFY)

Sr. No	Name of the Health HFs	HCF Started at (EFY)	Budget Allocated (birr)			Budget Utilized (birr)			Remark
			200…	200…	200..	200..	200...	200…	
1									

- **Fee Waiver (FW)**

Budget Allocated (Birr) _____

Sr. no	**Name of Kebele**	**Total Population**	**Selected people for FW**	**# people get service**	**Budget Utilized (Birr)**

10.7 Nutrition intervention that are undertaking in the district

1. OTP sites Yes_____ No_____
2. TFU program Yes_____ No_____
3. SF program Yes_____ No_____
4. CBN program Yes_____ No_____

5. EOS program Yes_____ No_____
6. Others Yes_____ No_____

10.8 Availability of essential drugs

_____

_____

11. Community Health Services

Status of services provided by community health workers

CHWs_____

HEWs) _____ ICCM, plan_____ achievement_____

Community TB, planned_____ Achievement_____, _____

Number of HAD_____ 1 to 5 network _____ members_____

12. What do you think the major Health problems of the district?

_____

_____

13. What do you think solutions of the addressed problems?

_____

_____

14. What are common zoonotic diseases in the district?

1. _____
2. _____
3. _____

CHAPTER V-SCIENTIFIC MANUSCRIPTS FOR PEER REVIEWED JOURNALS

5.1 AWD OUTBREAK INVESTIGATION IN ARBAMINCH ZURIA WOREDA, GAMOGOFA ZONE, SNNPR, JUNE 2016

ABSTRACT

Introduction: Populations living in rural kebeles with inadequate water and sanitation infrastructure are at risk of epidemic disease. AWD is one of a diarrheal disease caused by infection of the intestine with the bacterium Vibrio cholera, either type O1 or O139. Suspected acute watery diarrheal disease (AWD) was reported from Areba Minch Zuria Woreda Health Office, GamoGofa Zone, SNNPR, Ethiopia on June 13 /2016. On June 17/2016 the regional health bureau deployed a team organized from WHO, UNICIEF and Public health emergency management to conduct the investigation and to describe the magnitude of the outbreak, identify risk factors, and implement control measures.

Methods: : Descriptive followed by unmatched Case control (1:2) study was conducted on Areba Minch Zuria Woreda Health Office, GamoGofa Zone from June 21 to 30 /2016 and our samples are all eligible cases during study period. 50 active cases (40% of the total cases from the CTC center) and 100 controls (that are neighbor to the cases) were selected. We defined suspected cases and controls according to WHO guide line and the data were collected by principal and co investigator in face-to-face interviews of cases in CTC Center and house to house based on line list and controls were nearby living houses of the cases. Questionnaire included socio-demographics, knowledge and risk factors for AWD transmissions and a pre-test will be employed in ten household that nearest to the CTC center. The data were first cleaned then entered and analyzed by epi-info version 7.2. Analytical and descriptive analysis was done and the results were presented by epi curve, graphs, tables and map.

Results: A total of 125 cases were reported from June 13/2016 to July 27/2016. From the total cases 89(71%) were male and 36(29%) were female. The mean age of cases was 24 with standard deviation of 12 respectively. Five Kebeles (Shelemela, Elego, Kolashele, Gentasira and Wozeqa) were affected by the outbreak. Among the affected Kebeles Shelemela reported 40(32%) cases from the total reported cases. The overall attack rate was 5 per 1000 population. The sex specific attack rate was 7 for male and 3 for females per 1000 population; the highest

AR was in Elego Kebele which is 7 per 1000 population. On multivariate analysis factors that statistically significant association with AWD outbreak were Drinking of lake water (OR: 6.7; 95%CI: 1.2 – 23.7 ; P:< 0.04) , Drinking of Cheka (Local drink) (OR: 5.6; 95%CI: 2.4 – 13.2 ; P:< 0.001) ,Using river water for washing utensils (OR: 4.1; 95%CI: 1.2-13.4; P: < 0.02). Water specimen from Lake Chamo and Sego River showed fecal contamination. 30 stool specimen was collected for laboratory investigation (2 positive for culture, 21 positive for RDT & 7 are Negative) and Vibrio cholera sera group 01, sera type ogawa identified.

Conclusion: In the woreda attack rate of AWD related to insufficient access to safe water therefore future epidemics will undoubtedly occur unless the Zonal and Woreda government should properly addressed the basic water and sanitation deficiencies in the community. Also woreda water office should provide continuously water treatment chemical to the community especially who living along the sides of Lake Chamo and Sego River.

BACKGROUND

AWD is a diarrheal disease caused by infection of the intestine with the bacterium Vibrio cholera, either type O1 or O139. Both children and adults can be infected. About 20% of those who are infected develop acute watery diarrhea and 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 salts can lead to severe dehydration and death within hours. The case-fatality rate in untreated cases may reach 30–50%. Treatment is straightforward (basically rehydration) and, if applied appropriately, should keep case-fatality rate below 1%. Cholera is usually transmitted through fecally contaminated water or food and human beings are the only natural reservoir.

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 Prevention is based on access to safe water and hygienic food handling and preparation practices. Because the incubation period is very short (it ranges from 2 hours to 5 days), the number of cases can rise extremely[1].

Researchers have estimated that each year there are1.3 to 4.0 million cases of cholera, and 21,000 to 143,000 deaths worldwide due to cholera [1].

In Africa reports at the end of March 2016 with 6,030 cases affecting 3 countries (Nigeria, Benin and DRC) in the West and Central Africa region, the current epidemic situation is slightly calmer than in previous years. However, this rather favorable situation should be taken with great caution given the significant challenges observed in surveillance, early detection and early response to cholera alerts in the region [2].

We received reports of suspected AWD outbreak from Areba Minch Zuria Woreda Health Office, GamoGofa Zone, and SNNPR, Ethiopia on June 13 /2016. On June 17/2016 the SNNPR bureau deployed a team organized from WHO, UNICIEF and Public health emergency management. We investigated the area to identify causative agent, identify risk factors, to control the outbreak and propose recommendations to prevent future occurrences.

METHODS

DESCRIPTIVE EPIDEMIOLOGY

We compiled daily outbreak data from the line list in the CTC center from June13/2016 to July28/2016. We defined a suspected case of AWD 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; or In an area where there is a cholera epidemic, a patient aged 5 years or more develops acute watery diarrhea, with or without vomiting. At the health post and at community levels, a suspected cholera case can be defined as follows: Any person 5 years of age or more with profuse acute watery diarrhea and vomiting. When we say confirmed case: A suspected case in which *Vibrio cholerae*O1 or O139 has been isolated from their stool.

We interviewed each of the confirmed and suspected case-patient and reviewed medical records to collect information regarding demographic characteristics, signs and symptoms, number of household members present and affected, food habits, laboratory investigations and outcome. We described the outbreak over time. We calculated the attack rate by age and sex.

LABORATORY INVESTIGATION

We collected thirty acute phase stool specimens from a random sample of suspected case patients who had not taken antibiotics. We sent those to the laboratory in CTC center for RDT test and to the GamoGofa zone public health laboratory for stool culture.

CASE CONTROL STUDY

We conducted unmatched case control study during the last 15 days of June 2016. We compared each suspected case-patient with a control subject selected from the next-door neighbors' without history of acute watery diarrhea. We designed a structured questionnaire and we collected information regarding demographic characteristics, food handling practices, source of drinking water, and sanitation practices and clinical history of the suspected cases and controls.

We calculated matched odds ratio (MOR) for discordant pairs and 95% confidence interval (CI) using Epi Info version7.2. We protected confidentiality of participants through codes and obtained oral consent before interviews. The investigation was exempted ethical clearance from

SNNPR Health Bureau since it was part of the regional state level public health response to the outbreak.

ENVIRONMENTAL INVESTIGATION

As hypothesis-generating interviews among suspected case-patients and the geographical distribution pointed to village along Sego River and fisherman camps along Lake Chamo, we interviewed the community and reviewed their hygienic practices. We conducted open interviews with suspected case patients, health workers and local leaders to collect information regarding the local water supply and sanitation. We visited the village to assess the sanitary situation and collected water specimens from the lake and river water for bacteriological analysis.

RESULT

DESCRIPTIVE EPIDEMIOLOGY

The daily average reported rate of suspected cases ranged between 4 and 6 per 1000 populations during the outbreak period. A total of 125 cases were reported from June 13/2016 to July 27/2016. From the total cases 89(71%) were male and 36(29%) were female. The mean age of cases were 24 SD of ±12 respectively. Five Kebeles (Shelemela, Elego , Kolashele, Gentasira and Wozeqa) were affected by the disease. Among the affected Kebeles Shelemela reported 40(32%) cases from the total reported cases. The overall attack rate was 5 per 1000 population. The sex specific attack rate was 7 for male and 3 for females per 1000 population; the highest AR was in Elego Kebele which is 7 per 1000 population. Clinical symptoms included acute watery diarrhea and vomiting dehydration

The outbreak started on 13 June, 2016 had two peaks on during the last week of June and third week of July and ended on 29 July, 2016 (**Figure 23**). Suspected cases clustered around to fisherman camps along Lake Chamo and village along Sego River.

Suspected case-patients who reported consumption of water from the lake and consumption Cheka (local drink) that made from river had an earlier date of onset than others. Based on the distribution of suspected cases over time, the trawling questionnaires that pointed to Lake and Cheka, we generated the hypothesis that two sources i.e. Cheka and Lake water could be the source of the outbreak.

LABORATORY INVESTIGATION

According to CTC center records, 21 of the 125 suspected case-patients stool were positive for Cholera rapid test, seven were negative for RDT test and two stool specimens were taken for culture and only one stool specimen grew Vibrio cholera (sero group 01, sero type ogawa) and 96 cases had not been tested.

CASE CONTROL STUDY

We identify 50 cases (27 suspected and 23confirmed cases) with AR: 5/1000, higiest among 15-44 years old group and no death. The outbreak started on 13 of June, peaked twice during the last week of June and third week of July and lasted till 29 July. Cases were clustered around Lake Chamo in fisherman camp and villages along with sego river and suspected cases are more likely than controls to drink lake water; to use river water to wash their utensils and to drink check (local drink that made from river). On multivariate analysis, the factors associated with cholera were Drinking of lake water (OR: 6.7; 95%CI: 1.2 – 23.7 ; P:< 0.04) , Drinking of Cheka (Local drink) (OR: 5.6; 95%CI: 2.4 – 13.2 ; P:< 0.001) ,Using river water for washing utensils (OR: 4.1; 95%CI: 1.2-13.4; P: < 0.02). Water specimen from Lake Chamo and Sego River showed fecal contamination.

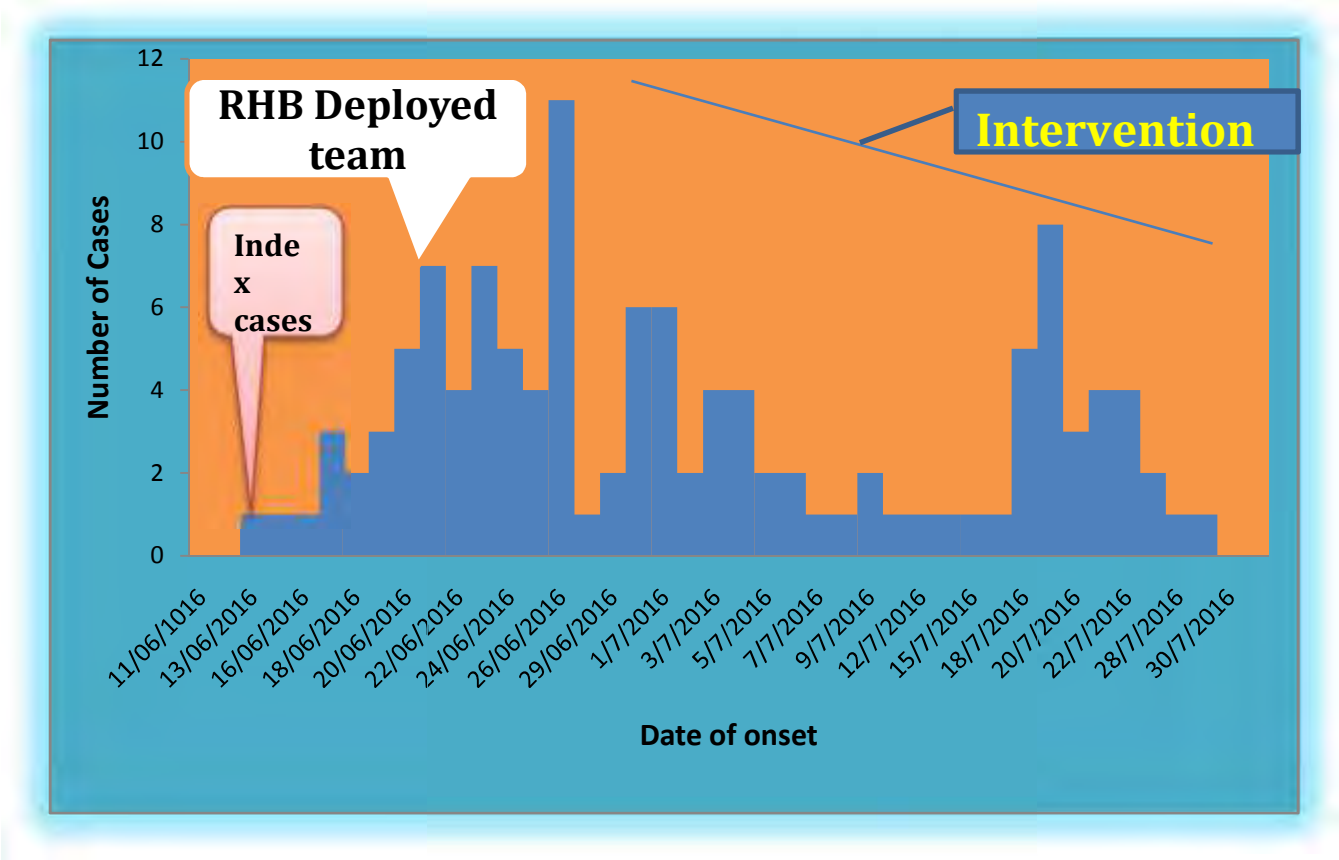

Figure 24: Distribution of cholera cases by date onset, ArebaMinich Zuria Woreda ,GamoGofa Zone,SNNPR

Table 28: Attack Rate by Kebeles Arba Minich zuria worda,GamoGofa Zone ,SNNPR

S.no	Kebele	Total Population	Number of cases	Death	AR per 1000	CFR
1	Shelemela	10721	40	0	4	0%
2	Elego	5022	36	0	7	0%
3	Genta Sera	3452	15	0	5	0%
4	Wozeqa	5461	32	0	6	0%
5	Kolashele	3781	2	0	1	0%
	Total	28437	125	0	5	0%

Table 29: Bivariate analysis of risk factors for AWD Areba Minich Zuria woreda, Gamo Gofa Zone SNNPR ,July 2016

Variable		Case	Control	OR(95%CI)	P-Value
Drinking of Cheqa (It is local drink)	Yes	39(78%)	28(28%)	9.1(4.1-20.3	0.00
	No	11(22%)	72(72%)		
Do you know acute watery diarrheal disease?	Yes	5(10%)	2(2%)	5.4(1.02-29.2)	0.028
	No	45(90%)	(98%)		
Where do you defecate? **Toilet**	Yes	31(62%)	75(75%)	0.54(0.26-1.12)	0.01
	No	19(38%)	25(25%)		
Water source for drinking. Lake	Yes	9(18%)	3(3%)	7.0(1.827-27	0.001
	No	41(82%)	97(97%)		
River	Yes	3(6%)	1(1%)	6.31(0.64-62.4	0.07
	No	97(97%)	99(99%)		
Hand dug well	Yes	37(74%)	43(43%)	0.14(0.05-0.45)	0.001
	No	13(26%)	57(57%)		
Water source for washing utensils. Lake	Yes	9(18%)	6(6%)	3.4(1.2-10.3)	0.02
	No	41(82%)	94(94%)		
River	Yes	38(76%)	56(56%)	2.5(1.2-5.3	0.02
	No	12(24%)	44(44%)		
Hand dug well	Yes	3(6%)	37(37%)	0.1(0.31-0.37	0.0005
	No	47(94%)	63(63%)		
Water source for cooking food. Lake	Yes	10(20%)	4(4%)	6(1.8-20)	0.001
	No	40(80%)	96(96%)		
River	Yes	37(74%)	25(25%)	8.5(3.9-18.5)	0.00
	No	13(26%)	75(75%)		
Hand dug well	Yes	3(6%)	69(69%)	0.03(0.01-0.09)	0.00
	No	47(94%)	31(31%)		
Do you clean your water container regularly?	Yes	8(16%)	30(30%)	0.5(0.22-1.2)	0.10
	No	42(84%)	70(70%)		
Could you purify the water?	Yes	4(8%)	15(15%)	0.5(0.13-1.9)	0.5
	No	46(92%)	85(85%)		
Do you eat raw/uncooked food?	Yes	41(82%)	28(28%)	11.5(4.9-26.9)	0.00
	No	9(18%)	72(72%)		
Do you reheat cooked food if not eaten immediately?	Yes	2(4%)	2(2%)	4.2(0.37-47)	0.21
	No	48(96%)	98(98%)		
Do eat raw fish?	Yes	8(16%)	6(6%)	3.4(1.2-10.3)	0.02
	No	42(84%)	94(94%)		
Did you eat food from other house in the past day of your symptoms	Yes	35(70%)	10(10%)	21(8.1-51)	0.00
	No	15(30%)	90(90%)		

ON MULTIVARIATE ANALYSIS (LOGISTIC REGRESSION)

Table 30: Bivariate and Multivariate analysis of associated risk factors for AWD outbreak Areba Minich Zuria woreda, Gamo Gofa Zone SNNPR, June 2016

Variable				Crud		Adjusted	
		Case	Control	OR(95%CI)	P-Value	AOR	CI
Drinking of Cheqa (It is local drink)	Yes	39(78%)	28(28%)	**9.1(4.1-20.3)**	**0.00**	**5.6**	**2.4 - 13**
	No	11(22%)	72(72%)				
Lake Water source for drinking.	Yes	9(18%)	3(3%)	**7.0(1.82-27.0)**	**0.001**	**6.7**	**1.2 – 23.7**
	No	41(82%)	97(97%)				
River Water source for washing utensils	Yes	38(76%)	56(56%)	**2.5(1.2-5.3)**	**0.02**	**4.1**	**1.2 - 13.4**
	No	12(24%)	44(44%)				
Do eat raw fish?	Yes	8(16%)	6(6%)	3.4(1.2-10.3)	0.02	2.3	0.54 – 10.4
	No	42(84%)	94(94%)				
Do you know acute watery diarrheal disease?	Yes	5(10%)	2(2%)	5.4(1.02-29.2)	0.028	2.78	0.93 -12.53
	No	45(90%)	(98%)				

DISCUSSION

A total of 125 cases were reported from June 13/2016 to July 27/2016 and from which 89(71%) male and 36(29%) were female. Five Kebeles were affected by the disease and among the affected Shelemela Kebeles reported 40(32%) of cases from the total. The overall attack rate was 5 per 1000 population in the affected kebele. Vibrio cholera O1 has been isolated from stool specimen. In this investigation we identify different risk factors which have statistically significant association with the AWD outbreak. Lake Chamo was one of the source infections for the people living along the lake and fisherman. The salinity characteristics of lake water can also favor the growth of V.cholera. On multivariate analysis, only drinking of water from the lake, Drinking of Cheka (Local drink) and Using river water for washing utensils were statistically significant association with AWD outbreak. Fisherman and people who living in the lake side are uses lake water for drinking , washing utensils and for cooking purpose therefore this people are one of the vulnerable group to acquire the infection in our study.

The same case-control study conducted in Burundi to identify risk factors for cholera infection during an outbreak in Rumonge, a lakeshore town along Lake Tanganyika, in1992. The results of

the study indicate that bathing in Lake Tanganyika and drinking water from the lake are positively associated with illness [8, 9].

A case-control study conducted in Kenya between June 1997 and March 1998, the researchers found that drinking water from Lake Victoria was associated with an increased risk of cholera. Analysis of the geographic patterns of residence of patients with diarrhea indicated that cholera patients were more likely to live in a village bordering Lake Victoria than diarrhea patients with other pathogens. The authors suggest that Lake Victoria may be an environmental reservoir for cholera, with water hyacinth potentially providing a suitable environment for growth, and that cholera may become endemic in western Kenya [10, 11,12].

Studies on cholera outbreak in Oromiya region conducted along the Ganale River and the individual attack rates were low (ranging from ~ 0.03% to ~ 4.12%), as was the overall attack rate for all 3 zones (almost 0.50%). The individual CTC case fatality rates ranged from 0% to 6.4%, and the overall case fatality rate was 1.11%. There was a trend toward men being disproportionately affected. This outbreak resulted primarily from poor sanitation and insufficient access to clean water. In Oromiya, the outbreak was addressed by a prompt and effective response, which included village chairmen at the community level. The use of community-based workers was successful and likely contributed significantly to control of the outbreak [13].

Regarding intervention a lot of activities conducted by establishing task forces in different thematic area such as CTC center team, Social mobilizations team, Surveillance team, Hygiene and sanitation team, Regulatory team and Coordination team and finally the outbreak were controlled.

CONCLUSION AND RECOMMENDATION

In this investigation we identify different risk factor which is statistically significant association with the cholera outbreak. Lake Chamo was one of the source infections for the people living along the lake and fisherman.

On the basis of these conclusions, we formulated a number of recommendations. First, we educated the community regarding use of water treatment chemical and the right time to wash their hands with soap.

Second future epidemics will undoubtedly occur unless the Zonal and Woreda government properly addressed the basic water and sanitation deficiencies in the district. From the total affected individual the three top vulnerable groups are daily laborer, fisherman and farmers who live along the side of lake chamo were identified, therefore follow up and surveillance should be strengthen in the place. Mode of transmission is through contaminated water or food.

Finally we recommended that the prevention activities AWD outbreak requires a coordinated multidisciplinary approach.

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CHAPTER VI- ABSTRACT FOR SCIENTIFIC PRESENTATION

6.1 INVESTIGATION OF AWD OUTBREAK IN ARBANINCH ZURIA WOREDA, SNNP REGION, ETHIOPIA,JUNE 2016

Introduction: In mid June 2016, Areba Minch Zuria Woreda, GamoGofa Zone, was affected by an outbreak of acute watery diarrhea, subsequently confirmed to be caused by Vibrio cholerae O1. Regional Health bureau deployed a team organized from WHO and PHEM core process. We investigated the outbreak, confirmed the etiologic agent, and identified risk factors.

Methods: Descriptive followed by unmatched Case control (1:2) study was conducted on Areba Minch Zuria Woreda Health Office, GamoGofa Zone from June 21 to 30 /2016 and our samples are all eligible cases during study period. 50 active cases (40% of the total cases from the CTC center) and 100 controls (that are neighbor to the cases) were selected. We defined suspected cases and controls according to WHO guide line and the data were collected by principal and co investigator in face-to-face interviews of cases in CTC Center and house to house based on line list and controls were nearby living houses of the cases. Interview was made using structured questionnaire.

Results: The cholera cases mapped along the Lake Chamo and Sego River. The overall attack rate in the affected kebele was 5 per 1000 population; the highest AR was in Elego Kebele which is 7 per 1000 population. Factors associated with Cholera were Drinking of lake water (OR: 6.7; 95%CI: 1.7-26.0; P:< 0.002) , Eating of row fish from the Lake(OR: 3.2; 95%CI: 1.0-9.7; P: < 0.02), Drinking of Cheka (OR: 8.4; 95%CI: 3.8-18.4; P: < 0.001).

Discussion: In this study drinking of lake water, drinking Cheka and eating raw fish was statistically significant association with the cholera outbreak and these are the source infection for the people who living along and working on the lake Chamo and Sego river.

Conclusion: In the district high attack rate of AWD related to insufficient access to safe water, therefore future epidemics will undoubtedly occur unless the basic water and sanitation deficiencies are properly addressed.

6.2 MALARIA OUTBREAK INVESTIGATION IN PASTORALIST COMMUNITY OF DASSENCH WOREDA, SOUTH OMO ZONE, SNNPR REGION, ETHIOPIA'S, SEPTEMBER 2016

Background; Malaria is parasitic disease which is transmitted by infected Anopheles mosquitoes. Malaria is a major public health problem in Dassench woreda and the purpose of this study was to verify the existence and identify the risk factors in Delerele kebele and adjacent Iceland's in Lake Turkana.

Method; Unmatched case – control study of 100 cases and 200 controls was conducted in the Delerele kebele from September 20 to 29, 2016. Data collected on clinical bases, risk factors and knowledge assessment about the disease .Statistical analysis done using epi info version 7.2.

Result; The attack rate of malaria in the affected kebele was 5 per 1000 population. The bulk of the cases were found in age range from 5–14 followed by the age group 1–4. Cases are confirmed with microscope and RDT method. P.falciparum accounts (243, 65%), and Mixed are (129, 35%) respectively. Using vicariate analysis, factors significantly associated with malaria outbreak were absence of bed net (OR: 2.2; 95%CI: 1.28-3.66; P: < 0.003), Sleeping outside the home (OR: 2.1; 95%CI: 1.20-3.67; P: < 0.003), Presence of mosquito breeding site near to village (OR: 3.4; 95%CI: 1.93-5.92; P: < 0.0001),

Conclusion; Low coverage of ITNs, presence of breeding site and sleeping outside the home during the night due to high environmental temperature and exposed to mosquito bite were factors that contributed for the transmission of malaria. So we recommended that the woreda health office continued to promote for ITNs use and health extension worker should strengthen health education about the method how to prevent themselves from mosquito bite while they are sleeping outside the home during night.

CHAPTER VII-NARRATIVE SUMMARY OF DISASTER SITUATION VISITED

7.1 THE "BELG SEASON' HUMAN HEALTH AND NUTRITION EMERGENCY NEEDS ASSESSMENT IN GAMOGOFA ZONE, SNNPR, JUNE 2016

INTRODUCTION

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

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

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

Therefore, early vulnerability assessment and provide necessary resource for at risk population is very important to minimize loss of health budget, school drop rate, and production power due to health consequence of natural and manmade disasters and epidemic diseases. Hence, as usual 2016 Belg pre assessment was conducted to identify areas where emergency assistance (health, nutrition) might be needed due to acute problems and come up with reasonable estimates of the size of the population needing emergency assistance for the upcoming 6 months period.

BACKGROUND

The combination of communicable diseases and malnutrition is a major public health problem, particularly among infants and children. The relationship is synergistic; malnutrition compromises natural immunity leading to increased susceptibility to infection and more frequent and severe episodes of communicable diseases. Likewise, infection can aggravate or precipitate malnutrition through decreased appetite and intake, mal absorption, nutrient loss or increased metabolic needs. Among young children, malnutrition is an underlying cause in over 60% of deaths resulting from diarrhea, over 50% of deaths as a result of pneumonia and malaria, and over 40% of deaths as a result of measles. Nutritional and communicable disease interventions must be integrated to address the overall impact of malnutrition on mortality from communicable diseases effectively (1).

In Ethiopia severe food shortages are often associated with factors which increase the risk of communicable diseases, such as lack of safe food and water, poor sanitation, overcrowding, lack of access to basic health services and weakness of preventive public health measures such as immunization and vector control(3).

In SNNPR in a normal year, about 1.3 million people (about 9% of the total regional population) are not able to feed themselves for 6 months of a year due to chronic food insecurity , this period of critical food shortage lies usually between February and July in most parts of the region(3).

South Nations Nationalities and Peoples Region (SNNPR) is one of the nine regional states of Ethiopia. The region is divided into 15 administrative zones and 4 special woredas, 22 city administrations. SNNPR has a total population of 18,719,008 in the 2015/16 (CSA). An estimated 88.3% of the total population lives in rural, while 11.7% in urban. Population Density ranges between 4 persons per sq km in Salamago of South Omo to 1080 persons per sq km in

Wenago of Gedeo zone. Altitude ranges between 376 to 4207 meters above sea level and mean annual rainfall ranges between 500-2200 mm.

GamoGofa zone is one of the largest zones in Southern Nations Nationalities and Peoples Region. Its capital Areba Minch is located 270Km to the south of Hawassa. The zone borders SOUTH OMO & SEGEN AREA PEOPLE to the south, BASKETO and KONTA to the west,DAWURO AND WOLAYTA to the North ,and OROMIYA and SEGEN AREA PEOPLE to the East.The Zone has a population of 1,992,955 and administered with 15 Districts, 2 Town administrations, 452 rural and 34 urban kebeles. In the Zone there are 2 District and 1 general hospital, 73 health centers, and 471 health posts.

RATIONALE OF THE ASSESSMENT

Major public health emergencies frequently occurring in the region are due to communicable disease outbreaks (Measles, Malaria, Meningitis, AWD), Malnutrition, natural hazards (flooding, landslides).This year due to lack of the “Belg” rainfall malnutrition, malaria and other health emergencies are expected in some of the high risk woredas. Therefore conducting seasonal assessment on those high risk woredas is very important to monitor the situation, define priorities and guide the planning for emergency responses.

OBJECTIVE

GENERAL OBJECTIVE

- To analyze current situation of malnutrition, malaria and other health emergencies in the selected high risk woredas.

SPECIFIC OBJECTIVE

- To get accurate information to analyze current situation of malnutrition.
- To monitor the trend of diseases of epidemic potential and public health emergencies in the woreda and compare with previous years trend to make the necessary preparation

METHOD'S

ASSESSEMENT AREA AND PERIOD

The assessment was conducted in Four woredas of GamoGofa Zone(MirabAbaya,Kamba, Zala and UbaDeberTsehay) selected by Early Warning and Response Department based on their prior or current experience of health and nutritional emergencies from June, 07-18 , 2016.

ASSESSEMENT DESIGNE

This study a cross sectional type aimed to assesses and analyzes the emergency situations with emphasis to malnutrition, malaria and measles in selected woredas. Hence a rapid assessment technique mainly reviewing of secondary data and key informant interview and discussion with district health officials were employed.

DATA COLLECTION PROCESS

Data was collected by using structured checklist. Respondents were woreda Public Health Emergency and Disease prevention and control core processes focal persons and woredas health office heads.

DATA ANALYSIS

Data was analyzed using MS excel and result presented using graphs, tables and narrative report.

RESULT

A total of four high risk woredas from GamoGofa zones were selected for the assessment. In 2008 in all four woredas (MirabAbaya,Kamba, Zala and UbaDeberTsehay) the number of malaria cases reported increased significantly compared with the same months of 2007EFY(from October to May) and also increased significantly compared with the past eight months trend**.** In Kamba and Zala woreda the report of malnutrition increased significantly .But in UbaDebretsehay and Mirab Abaya woreda the number of reported cases of malnutrition were decreased. Regarding of other epidemic porn disease no woreda has report of measles, meningitis and AWD in the last eight months in 2008 EFY. The last eight months trend for reported cases of malaria and malnutrition for the woredas with increasing in case report is shown in the table and figure below.

Table 31: Distribution malaria cases among the four selected woreda of GamoGofa zone from October to May in 2007& 2008 EFY

	Mirab Abaya		Kamba		UbaDbeberTsehay		Zala	
Months	Cases		Cases		Cases		Cases	
	2007	2008	2007	2008	2007	2008	2007	2008
Oct	111	166	404	168	208	262	317	402
Nov	167	101	390	258	188	269	404	369
Dec	116	118	321	375	353	537	327	409
Jan	76	121	201	385	18	716	308	440
Feb	45	131	188	400	64	578	306	635
Mar	88	138	199	375	189	587	235	433
Apri	79	219	246	406	130	439	290	487
May	101	220	282	405	251	685	325	439
Total	783	1214	2231	2772	1401	4073	2512	3614

Table 32Malnourished caseloads in four Woredas of Gamogofa zone, Oct 2015 to May 2016.

Woredas	Oct	Nov	Dec	Jan	Feb	March	April
Kamba	153	251	204	227	224	193	195
UbaDebretsehay	128	153	120	160	77	40	40
Zala	67	60	58	68	72	82	74
Mirab Abaya	10	19	14	14	23	25	14

ZONAL LEVEL FINDING

COORDINATION

In assessed zones multisectoral coordination forum are available. In the forum all relevant government, nongovernmental and UN agencies are represented and leaded by zonal administrators having head of health department as secretary. However, the forums not meet regularly only they meet when outbreak occurred.

OUTBREAK

During the last eight month October to May, 2008EFY AWD and Malaria outbreaks were reported from the assessed zone . In Areba Minch town &Areba Minch Zuria woreda there is an ongoing AWD outbreaks, a total of 587 cases with 5 death were reported, starting from 28/06/2008E.C and there are also ongoing malaria outbreak in UbaDbeberTsehay woreda from January to May 2008E.C ,a total 3005 cases were reported.

ANTICIPATED EPIDEMIC

Malaria, AWD, Measles and Malnutrition are the major anticipated risks in four woreda of assessed zones.

PUBLIC HEALTH EMERGENCY MANAGEMENT

Public health emergency preparedness and response plan is available in assessed Zones. However the plans were not supported by budget but when outbreaks occurred resources were mobilized from the region and other nongovernmental and UN organizations. In assessed Zones there is a trained staff on Public Health Emergency Management. Rapid Response Team is available in visited Zones and the team is activated if outbreak or emergency situation occurred.

STOCK

The zones have no sufficient drugs and medical supplies to treat diseases of major public importance such as malaria, measles, meningitis and AWD.

REQUIREMENT

Being endemic area for malaria and low ITN utilization; presence of ongoing Malaria and AWD outbreak; low immunity for meningitis and previous outbreak report; low safe water, latrine and utilization coverage; shortage of annual rain fall could make Malaria, Measles, Malnutrition and AWD are the anticipated risk in the assessed zones as the following below in the table.

Table 33: Type of Risk and Population at Risk Identified at Woreda Level, June 2016

Zone	Woreda at Risk	Type of risk	At risk population
GamoGofa	Mirab Abaya	Malaria	66076
	Kamba	Malaria	122758
	UbaDbeberTsehay	Malaria	61929
	Zala	Malaria	84741
	Mirab Abaya	AWD	93459
	Kamba	AWD	192930
	UbaDbeberTsehay	AWD	85979
	Zala	AWD	91965
	Mirab Abaya	Measles	14589
	Kamba	Measles	30116
	UbaDbeberTsehay	Measles	13421
	Zala	Measles	14347
	Mirab Abaya	Malnutrition	1321
	Kamba	Malnutrition	2455
	UbaDbeberTsehay	Malnutrition	1238
	Zala	Malnutrition	1695
	Mirab Abaya	Meningitis	66076
	Kamba	Meningitis	122758
	UbaDbeberTsehay	Meningitis	61929
	Zala	Meningitis	84741

FINDINGS ON WOREDA LEVEL

COORDINATION

Functional multisectoral coordination committees were present in all assessed woreda. In addition assessed woredas have public health emergency and preparedness plan but not supported by enough amount budget.

TOP FIVE CAUSES OF MORBIDITY

Table 34: Top five causes of morbidity by age group, 2008 EC

Zone	Woreda	Rank	Top five causes of morbidity	
			Below five year	**Above five year**
	Mirab Abaya	1	Pneumonia	Typhoid fever
		2	Diarrhea	AFI
		3	AFI	Trauma
		4	All Respiratory Disease	Malaria
		5	Infection of skin & subcutaneous tissue	Infection of skin & subcutaneous tissue
	Kamba	1	Pneumonia	Malaria
		2	Diarrhea (Non bloody)	Typhoid fever
		3	Malaria	AFI
		4	AFI	Injury
		5	Infection of skin & subcutaneous tissue	Helmentiasis
	UbaDbeberTsehay	1	Malaria	Malaria
		2	Pneumonia	AFI
		3	Diarrhea (Non bloody)	Trauma (Injury ,Fracture)
		4	AFI	Pneumonia
		5	All Respiratory Disease	All Respiratory Disease
	Zala	1	Pneumonia	AFI
		2	Diarrhea (non Bloody)	Trauma
		3	AFI	Pneumonia
		4	Malaria	Muskulosekelatal and connective
		5	Infection of skin & subcutaneous tissue	Typhoid fever

OUTBREAK

During eight month period (October-May) period there is malaria outbreak UbaD/Tsehayworeda and no outbreak occurred in the rest three assessed woredas. However there are ongoing AWD outbreaks were reported from adjacent woredas which is Arba Minich Zuria woreda and ArbaMinich Town.

PREPAREDNESS

At the district level there are no enough emergency drugs used to be manage the cases in case of any outbreak. All visited districts could not keep emergency drugs at district store, they distribute any drugs they received from zonal health department to health facilities. In case of any outbreak they will mobilize necessary drugs from health facilities.

RISK FACTOR

MALARIA

All assessed woredas are endemic for malaria. 16 Kebeles (66,076 populations) in Mirab Abayaworeda, 27 Kebeles(12,2758 population) in Kamba, 12Kebeles(61,929 population) in UbaDbeberTsehay and 33Kebeles(84,741 population) in Zalaworedas are identified as malarias. Although malaria control and prevention activates are conducted in the area, the following risk factors were identified: presence of malaria endemic area and malaria breeding site, interrupted or potentially interrupting rivers, ITN utilization and IRS coverage is very low in some Woredas.

MENINGITIS

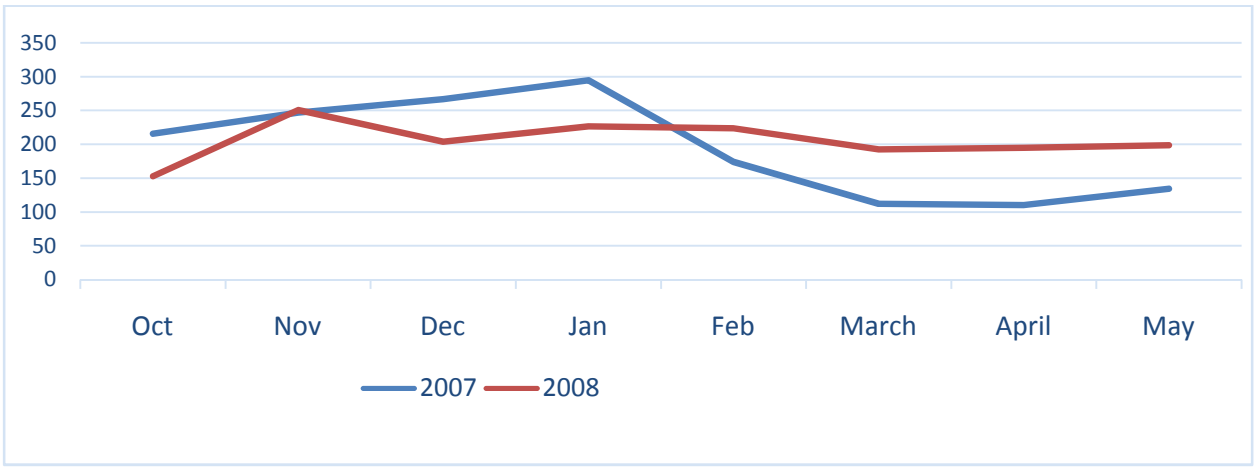
In all the four visited districts there are no meningitis epidemics in the last three years. Even though, GamoGofa zone are found near to the meningitis belt area the four visited districts were not reporting meningitis cases. In all woredas of the zones including the four visited woreda were conducted mass Meningitis vaccination in October 2014 (2007E.C). As they are found near to meningitis belt and fear of dry seasons in the districts enhancing surveillance and close monitoring is very crucial.

AWD

There was no AWD epidemic in the last eight months (October to May) in four assessed woredas. However there is an ongoing AWD outbreak were reported from adjacent woredas which is ArbaMinichZuria woreda ArbaMinich Town.

MEASLES

There was no MEASLES epidemic in the last eight months (October to May) in four assessed woredas. In addition, measles vaccination coverage are 89% in Mirab Abayaworeda, 100% in Kambaworeda, 93% in UbaDbeberTsehay and 100% in Zalaworedare respectively.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Oct
Nov
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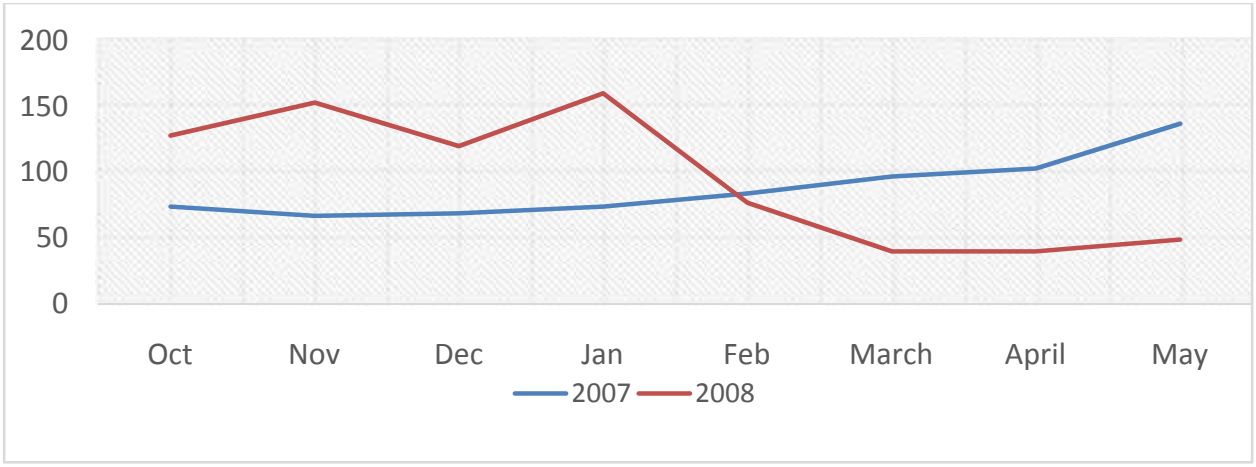
Jan
Feb
March
April
May
2007
2008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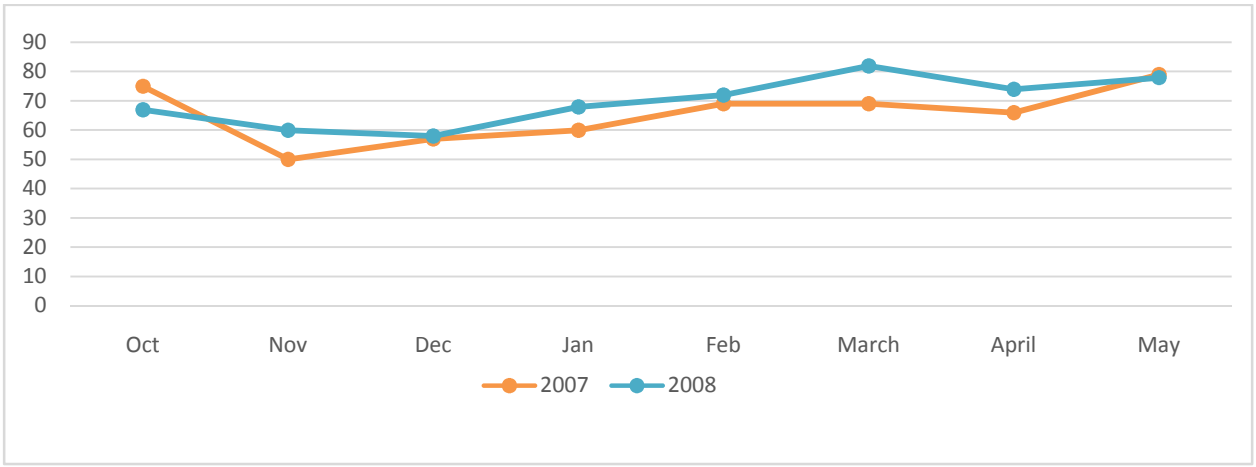
2007
2008


90
80
70
60
50
40
30
20
10
0
Oct
Nov
Dec
Jan
Feb
March
April
May
2007
2008

4/MIRAB ABAYA WOREDA

KEY FINDING

- As reported by Chief Administrator of the Woreda, the district has been critically affected by recurrent drought in the past four years and as a result Household food insecurity is a mounting challenge.
- There are 4 HCs and 27 HPs in the Woreda. The coverage of both OTP and SC is 100%. Only few cases were admitted and being managed in all the OTP sites in the past eight months, on average not more than 16 per month in the Woreda.

CONCLUSION

There was a functional multi-sectoral coordination forum in four assessed woredas. However they are not meeting regularly. All assessed woredas have their own public health emergency preparedness and response plan but not supported by enough amount of budget. Malaria, measles, AWD and meningitis were the main anticipated risk in the visited woreda.During the last eight month October to May, 2008EFY AWD and Malaria outbreaks were reported from the assessed zone. In Areba Minch town &Areba Minch Zuriaworeda there is an ongoing AWD outbreaks, a total of 587 cases with 5 deaths were reported, starting from 28/06/2008E.C and there are also ongoing malaria outbreak in UbaDbeberTsehayworeda from January to May 2008E.C, a total 3005 cases were reported. Strong multi-sectoral committee which could be leaded by administrative body is needed to prevent and control any epidemic. The member of the committee is expected to be a heads of all government sectors at level, NGO and religious leaders. At zonal level the committee should be conduct meeting twice a week in case of outbreak. To detect early and institute prompt response emergency preparedness and response plan is highly needed at each level. Emergency and life saving drugs are also expected to be stockpiled at district level to timely mobilize and minimize loss of life. The current food security situation in all the visited Woredas of Gamogofa was very poor. Recurrent drought has caused serious food insecurity at the household level which in turn contributed to slightly increased cases of malnutrition in children under five, pregnant and lactating women. The result of monthly CHD screening in the assessed woredas showed that totally 8,117 children under five and 3,322 pregnant and lactating woman identified as moderately malnourished

Risks of food shortages are primarily due to the unsatisfactory meher harvest. The harvest failed due to erratic and reduced rainfall. This is the fourth consecutive year of crop failure in Woredas like Mirab Abaya. Seed availability for future harvests are limited due to lack of rain and it also prevents land preparation for meher harvests. The Belg assessment indicated that health emergency preparedness and response including the availability of drugs and medical supplies is relatively limited to address the current and anticipated degree of the problem.

Given the high prevalence of malnutrition being compounded by malaria and water shortages and the poor food security outlook, it is clear that all the assessed Woredas require food relief until the next meher harvest.

RECOMMENDATION

Disease control and prevention activities for major epidemic prone disease (measles, malaria, AWD and meningitis) should be strengthening. Zonal and woreda level EPRP should be supported by budget. In addition minimum emergency drugs and supplies should avail at zone and woreda level stock for preparation and timely response.

All the four Woredas of Gamogofa zone, given the current situation of acute malnutrition being aggravated by failed crops due to lack of sufficient rain in the past two months and other related factors, the situation requires close monitoring in the coming at least 6 months. The Zonal health department and Woreda health offices should ensure necessary CMAM supplies, strengthening the capacity of health workers and health extension workers.

It is also important to strengthen the community mobilization and awareness creation sessions to increase the health seeking behavior of the community and demand preventive and curative nutrition care services before a child getting to severe level.
Accelerated efforts are also needed to improve the multi-sectorial nutrition coordination bodies and task forces at Woreda levels so as to bring the issue to the attention of all potential sectors.

TFP sites (Health facilities) require extensive support to strengthen performance and to improve their nutrition information documentation and service, supply report tracking system.

REFERENCE

1. Communicable diseases and severe food shortage. WHO Technical Note, Oct, 2010

2. Severe acute malnutrition guideline Feb, 2009, Ethiopia

3. Emergency preparedness and response plan document, SNNPR 2010

Annex 5: Health and Nutrition Emergency Needs Assessment Check List

ACRONOMY

AWD	Acute watery Diarrhea
CHD	Community health day
Cm	Cent meter
CTC kit	Cholera treatment center kit
dd	Due date
EC	Ethiopian calendar
EFY	Ethiopian fiscal year
GAM	Global acute malnutrition
GC	Gregorian calendar
HC	Health center
HEW	Health Extension worker
MAM	Moderate acute malnutrition
Mm	Month
MUAC	Mid upper arm circumference
NGO	Non Governmental organization
OTP	Outpatient therapeutic program
PLW	Pregnant and lactating women
RDT	Rapid diagnostic test
RUSF,	Ready to use supplementary food
RUTF	Ready to Use therapeutic Food
SAM	Sever acute malnutrition
SC	Stabilization center
TSFP	Target supplementary program
Vit A	Vitamin A

Rapid Meher assessment- Health and Nutrition Sector: Woreda level Questionnaire

Interviewer name _____ Institution:_____

Interview Date: (dd) ____/(mm)_____/2016_____ Region:_____

Zone:_____Woreda_____

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

SECTION I: SOCIO- DEMOGRAPHIC PROFILE				
Woreda total population:	M:_____F:_____		Under 5_____	Total:____
	No. of women of reproductive age (age 15-49 yrs.) _____			
	No. of pregnant women :_____			
1.1. Special Population *(if any):*	Pastorals____	Refugees____	IDPs____	Migrant Workers___
1.2. water availability at health centers(HC)	No. of health center _____	No. of HC with water access_____		No. of HC with water access_____

SECTION II: HEALTH PROFILE	
2.1. Coordination	
Is there a multi sectoral PHEM coordination forum? if yes how frequently meet----------	Yes□ No□
Is there a Public Health Emergency preparedness and response plan? Does it include reproductive health?	Yes□ No□
Is there accessible emergency response fund? If yes how much allocated----------	Yes□ No□

2.2. Morbidity (List top 5 causes of Morbidity) in the year 2008 EC (2015-2016GC)		
a. Morbidity below 5	b. Morbidity above 5	
1.	1.	
2.	2.	
3.	3.	
4.	4.	
5.	5.	

2.3. List number of cases/deaths from Tekemet 2007 to Megabit 2008 (October 2015–March 2016)

Month	AWD				Malaria				Measles				Meningitis				Other (specify)
	Cases		Deaths		Cases		Deaths		Cases		Death		Cases		Death		
	2007	2008	2007	2008	2007	2008	2007	2008	2007	2008	2007	2008	2007	2008	2007	2008	

Oct																	
Nov																	
Dec																	
Jan																	
Feb																	
Mar																	

2.4. Outbreak?

Was there any outbreak in the last 3 months? 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)_____

Type of outbreak _____Number of cases _____Deaths _____(specify the time period)_____

Is there any ongoing outbreak of any 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)_____

2.5. Preventive treatment given

Within the last six month Vit A supplementation give to children 6-59 months	Yes□	No□
Within the last six month Deworming given to to children 2-5years	Yes□	No□

2.6. Preparedness: Is there emergency drugs and supplies enough for 1 month? Or easily accessible on need?

Ringer Lactate (to treat AWD cases)	Yes□	No□	
ORS (to treat AWD cases):	Yes□	No□	
Doxycycline *(to treat AWD cases)*:	Yes□	No□	
Consumables : Syringes, Gloves *(for AWD management):*	Yes□	No□	
Amoxil susp (measles)	Yes□	No□	
Tetracycline ointment (measl es	Yes□	No□	
Vit A (measles)	Yes□	No□	
Coartem for Malaria	Yes□	No□	
Lab supply: RDT for Malaria	Yes□	No□	
Lab supply: RDT (pastorex) for M eningitis	Yes□	No□	
LP set	Yes□	No□	
Number of CTC kit available: (for AWD)	Yes□	No□	
Are there emergency reproductive health kits in health facilities to provide Basic Emergency Obstetric and New Born Care?	Yes□	No□	If No, list

		the missing medicines and supplies_ _____ _____
Are there emergency reproductive health kits in hospitals to provide Comprehensive Emergency Obstetric and New Born Care?	Yes□ No□	If No, list the missing medicines and supplies_ _____ _____
Are there emergency medicines and supplies to support care of rape survivors?	Yes□ No□	
Main shortage (if any): Specify		
Is budget allocated for emergency Rapid response by the woreda?		

SECTION III: RISK FACTORS			
Diseases	**Risk factors for epidemics to occur**	**Yes**	**No**
Malaria	Malaria endemic area		
	Presence of malaria breeding site		
	Interrupted or potentially interrupting rivers		
	Unprotected irrigation in the area		
	LLINs coverage <80%		
	Indicate the coverage of IRS 2008		
	Depleted prevention and control activities		
	Number of malarious kebeles and total population in these Kebeles	Keb _____ pop ___	
Meningitis	Was there Meningitis epidemic in the last 3 years (If yes specify date)		
	Has vaccination been conducted in the past 3 years		
	If yes : Indicate the date and number of people vaccinated	date	No
AWD	Was there AWD epidemic in the last three years (If yes specify date)		
	Latrine coverage		
	Latrine utilization		
	Safe water coverage		
Measles	Is there ongoing measles outbreak		
	What is the measles vaccination coverage of 2008, less than one year		
	Has SIA been conducted in 2008 EFY		
	If yes, Indicate the month and number of children vaccinated including the age group Month---------- Age group----------		

Any other observations you made or any risks of epidemics?

_____

_____

_____

What were the major challenges in your Epidemic response experience?

_____

_____

_____

Section IV: Nutrition – SAM and MAM Management in the woreda - October 2015 to March 2016

SAM Management

4.1 Facilities with SAM management in the woreda

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**
Is there sufficient supplies for 3 months of :		
RUTF		
F100		
F75		
2nd line drugs		
Is there sufficient woreda level storage for SAM treatment at woreda level?		

water availability at stabilization center (SC)		

4.4. Is there weekly SAM report? yes _____ No_____ (if yes observe)

4.5 How many HEW are there in the woreda? _____ How many have been trained in SAM management? ____ (_____% of HEW trained in SAM management)

MAM Management

4.6. TSFP programme in the woreda

	Yes	**No**
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 woreda? _____

4.9. What screening modality is used in the woredas? EOS _____, CHD ____, Routine____, vitamin A and de-worming coverage from Oct 2015– March, 2016

Vitamin A _____ De-worming _____

4.10. Screening performance for children in the woreda

Month	Target Children 6-59 months	# of screened children	Screening Coverage (%)	# of Children with no odema and MUAC <11 cm			# of chidren 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 woreda

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

18 Was there flood disaster in the last 6 months in the **Region /Zone**? Yes□ No□

19 If yes, How many weredas affected _____, population affected_____

20 Human Death due to flooding_____ yes or no

21 If yes how many in number_____

22 Are there displaced people due to flooding? Yes or No

23 If Yes , how many_____ PLW_____Children <2 yrs (___) (<6months, _____ 6-23 months_____)

24 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

_____

_____

_____

_____

HHAPTER VIII – PROTOCOL/PROPOSAL FOR EPIDEMIOLOGIC RESEARCH PROJECT

8.1 Assessment of Prevalence and associated risk factor of Malaria in SalaMago Woreda of South Omo Zone, SNNPR, Ethiopia, September 2017

EXECUTIVE SUMMARY

Background: Ethiopia is one of the most malaria epidemic-prone countries in Africa. Rates of morbidity and mortality increase dramatically (i.e. 3-5 fold) during epidemics. According to Ethiopia's Federal Ministry of Health (FMOH), in 2009/2010, malaria was the leading cause of outpatient visits and health facility admissions, accounting for 14% of reported outpatient visits and nearly 9% of admissions. Malaria was also among the ten leading causes of inpatient deaths among children under five years of age. About 65.3(68%) million of the population is living in this area making malaria is the leading public health problem in Ethiopia.

Objective: To assess malaria prevalence and associated risk factors in SalaMago Woreda, South Omo Zone, SNNPR in September 2017.

.**Method**: Community based cross-sectional survey will be conducted among 559 during September 2017 using a multi-stage cluster sampling techniques. All kebeles in the area will be listed with their respective number of village and households in salamago woreda. The listed kebeles will be clustered using low and high. At first stage 11 kebele, second stage 28 villages, third stage 559 house hold will be selected. Data will be collected by using both quantitative and qualitative methods. Blood specimen also will collect from each study unit for microscopic examination. Data will be entered to the computer and will be analyzed by using Epi info Version 7.2. This laboratory based malaria data will be used to employ case-control study to associate independent variables in the study. The dependent variables (test positives and negative results) will be associated with independent variables by using 2x2 table and logistic regression model.

Work plan: Data collection will be started on September 15 and ends on September 30, 2017. The study will be completed in November 2017.

Budget: The required cost for the study is estimated **123,370**ETH Birr.

INTRODUCTION

Malaria is caused by Plasmodium parasites, spread to people through the bites of infected Anopheles mosquitoes, which bite mainly between dusk and dawn. According to the latest estimates, released in December 2013, there were about 207 million cases of malaria in 2012 (with an uncertainty range of 135 million to 287 million) and an estimated 627 000 deaths (with an uncertainty range of 473 000 to 789 000) [1].

Malaria mortality rates have fallen by 45% globally since 2000 and by 49% in the WHO African Region. Most deaths occur among children living in Africa where a child dies every minute from malaria. Malaria mortality rates among children in Africa have been reduced by an estimated 54% since 2000 Vector control is the main way to reduce malaria transmission at the community level. It is the only intervention that can reduce malaria transmission from very high levels to close to zero [1].

The most malaria cases and deaths occur in sub-Saharan Africa [2]. This region has some of the poorest countries of the world with 90% of deaths occurring (approximately 3,000 deaths each day)**.** The disease remains one of the leading causes of morbidity and mortality in the tropics. It is the most important and widespread of the tropical deadly diseases. Human Malaria is a parasitic disease caused by apicomplexan protozoan (single celled) coccidian. These parasites are haematozoans or haemosporinas of the family plasmodiidae. A contributing factor to the malaria problem in sub-Saharan Africa is the diversity of the parasite that infects humans. Four species infect man of which Plasmodium falciparum is the most virulent. In sub-Saharan Africa, P. falciparium poses the greatest threat because of its high level of mortality and the complications arising [2].

Malaria is a leading cause of death for children, who represent 86% of all malaria deaths [3]. Children are at risk because they lack developed immune systems to protect against the disease. Moreover, Pregnancy reduces immunity to malaria, increasing the risk of infection, severe illness, and death for the woman; other adverse outcomes include spontaneous abortion stillbirth, low birth weight, and neonatal death. Other high-risk groups include travelers, refugees, displaced persons, and migrant workers entering endemic areas [3].

Furthermore, malaria remains inextricably linked with poverty. The highest malaria mortality rates are being seen in countries that have the highest rates of extreme poverty (proportion of population living on less than US$ 1.25 per day). The number of LLINs delivered to endemic

countries in sub-Saharan Africa dropped from a peak of 145 million in 2010 to an estimated 66 million in 2012[4]. This will not be enough to fully replace the LLINs delivered 3 years ago; indicating that total bed net coverage will decrease unless there is a massive scale-up in 2013. A decrease in LLIN coverage is likely to lead to major resurgences in the disease.

STATEMENT OF THE PROBLEM

Globally (2012), 219 million malaria cases and 660 deaths were occurred, of which 90% was in Africa. Also malaria has been a major challenge to both public health and socio-economic development particularly in countries sub-Saharan African. 75% of the geographical area of Ethiopia has significant malaria transmission risk. The nature of the topography, variations in climatic conditions and concentration of populations in highland indicates the long history of malaria in country . About 65.3(68%) million of the population is living in this area, making malaria is the leading public health problem in Ethiopia [5].

According to Ethiopia's Federal Ministry of Health (FMOH), in 2009/2010, malaria was the leading cause of outpatient visits and health facility admissions, accounting for 14% of reported outpatient visits and nearly 9% of admissions. Malaria was also among the ten leading causes of inpatient deaths among children under five years of age. Because a large proportion of the population does not have access to health care services, these figures probably under-estimate the true burden of malaria in the country [6].

In Africa today, malaria is understood to be both a disease of poverty and a cause of poverty. Annual economic growth in countries with high malaria transmission has historically been lower than in countries without malaria. Economists believe that malaria is responsible for a 'growth penalty' of up to 1.3% per year in some African countries. In Ethiopia, malaria is at the forefront among the health problems of the country. The actual number of malaria cases that occur annually throughout the country are estimated to be about 4-5 million. Due to climatic and geographic factors, the disease occurs in different parts of the country in epidemic form [7].

Malaria is the number one public health problem in Ethiopia and a major cause of illness and death [8].

Due to the high population pressure and depletion of agricultural land in highland areas, there has been a massive population movement to the lowlands, particularly in the last two decades.

Most of the population movements are from malaria free or places of moderate endemicity to highly malarious areas [8], like SalaMago Woreda.

South Nations, Nationalities, and Peoples region has intense malaria transmission (<1500m, with rainfall >1000mm).

SalaMago is one of the hot spot and pastoralist woreda in South Omo Zone at which malaria transmission occurs throughout the year. Even if malaria transmission occurs throughout the year the peak transmission season of the area is between March-April and July-September following rainy season. It is one of malarious woreda in the region and has recent malaria epidemic history in the area.

Moreover malaria is the top morbidity cause among top ten causes of morbidity in the district for the last 4 years and it causes a considerable amount of workdays lost by the victim, economic cost, and absenteeism from school, reduction of productivity and time spent of the family due to malaria episode of their children.

To roll back malaria the ministry of health set goals of the National Strategic Plan for Malaria Prevention, Control, and Elimination 2011–2015 which include By 2015, achieve malaria elimination within specific geographical areas with historically low malaria transmission and achieve near-zero malaria death in the remaining malaria-endemic areas of the country. [9]

The IRS and ITN's coverage in the last three years (from 2006 to 2008EFY) in SalaMago woreda were greater than 90% but the cause for the increase of the malaria cases is not clearly known and no study has conducted in the area till today regarding malaria.

Therefore it is relevant to conduct this study in ordered to quantify the magnitude of malaria cases, to identify associated risk factors and to propose the possible solution in scientific manner.

SIGNIFICANCE OF THE STUDY

Although the government did tremendous efforts, still malaria episodes in the country remain to be the highest burdensome. Since the woreda is among the main hot spots from the region with frequent outbreaks; and among the biggest contributors of malaria burden in the Region. The Woreda is almost 100% malarious; the main transmission follows unstable pattern that follows the two rainy seasons (Belg and Meher rainy seasons), and given that the area is currently in development corridor of sugar factory with large-scale coverage of sugarcane irrigation throughout the year and too many worker (may be two times as high as from the woreda native population) coming to the factory from another place. The number of malaria cases increases in the woreda since 2005EFY and it is the leading woreda in reporting high number of malaria cases in South Omo Zone and also one of the ten top woreda who report high number of malaria cases in weekly IDSR report to the region in 2016.

The Ministry of Health in collaboration with the Regional Health Bureaus and Zonal Health department has been implemented prevention activities so far; though the prevalence remains high and still seeks additional efforts to know the main risk factors. Generally, surveys can be used to improve the design of malaria control programs, and help identify indicators of program effectiveness [10].

Therefore, health planners and Decision makers are willing to have evidence regarding up on this issue due to malaria increment from time to time in the Woreda despite the higher intervention of the cases. This calls for a need to identify and calculate prevalence or magnitude and determine associated risk factors of malaria in SalaMago Woreda.

LITERATURE REVIEW

Malaria is a leading cause of mortality and morbidity in many developing countries, where young children and pregnant women are the groups most affected [11]. In 2012, there were about 219 million cases and an estimated 660,000 deaths due to malaria globally with about 90% of these cases occurring in Africa[12, 13].Malaria remains a serious public health problem, causing 1.2 million deaths and 300 to 660 million clinical cases in tropical and subtropical areas each year[14]. More than 90% of the lethal cases occur in children under five years of age in Africa [15].

According to records from the Ethiopian Federal Ministry of Health, about 75% of the geographic area of the country has significant malaria transmission risk (defined as areas <2,000 m), with about 57.3 million (68%) of the country's total population living in these areas, making malaria the leading public health problem in Ethiopia. On average, 60%-70% of malaria cases have been due to P. falciparum, with the remainder caused by P. vivax. Anopheles arabiensis is the main malaria vector; A. pharoensis, A. funestus and A. nili play a role as secondary vectors. The FMOH reported a total of 3,384,589 malaria cases from July 2011 - June 2012, with 1,793,832 (53.0%) of these laboratory confirmed, with 1,061,242 (59.2%) *P. falciparum* and 732,590 (40.8%) P.vivax. Ethiopia reported 936 malaria deaths in 2011, according to the 2012 World Malaria Report. Malaria transmission peaks bi-annually from September to December and April to May, coinciding with the major harvesting seasons. This has serious consequences for Ethiopia's subsistence economy and for the nation in general. Major epidemics occur every five to eight years with focal epidemics as the commonest form. Early diagnosis and prompt treatment is one of the key strategies in controlling malaria. Indoor Residual Spraying (IRS) and Long-Lasting Insecticidal nets (LLINs) are major malaria vector control tools in Ethiopia [16-18].

Results on incidence of malaria among children living near dams in Tigray region , northern Ethiopia shows over the 1 year period of surveillance 160 incident cases were detected in at risk communities during 11 392 child months at risk, giving a rate of 14.0 episodes/1000. For control villages, 23 cases in 11 938 child months gave 1.9 episodes per 1000, giving a 7.3- fold increased incidence close to dams. This is a highly significant difference, with a 95% confidence interval of 4.7 to 11.3. Of the total 183 cases, 107 were diagnosed as *P falciparum*, 73 as *P vivax*, and

three as mixed. The proportion of *P vivax* infections was not significantly different between at risk and control groups. Six children experienced second *P vivax* episodes, which were excluded. The seasonal variations in incidence are shown together with rainfall patterns. The overall results are presented stratified by altitude and season. For the dams below 1900 m the overall incidence for the year in at risk communities was 60.6 episodes/1000 child months at risk compared with 7.0 in controls; a rate ratio of 8.7 (95% confidence interval 4.2 to 17.9). Similarly for the higher dams overall rates were 6.0 and 1.2; rate ratio 5.0 (2.7 to 9.0). The difference in incidence between the two altitude bands was significant for the at risk communities (rate ratio 10.1; 7.3 to 14.0) and the control communities (5.8; 2.4 to 13.9). In two high altitude dams (2100 and 2225 m) no cases were detected in either at risk or control populations from a total of 7388 child months at risk [19].

Household survey results are reported for the overall sample and by two domains: for Oromia and SNNPR, whereas comparison of CDTI/non-CDTI areas will be reported elsewhere. *Characteristics of study households and participants* As shown in Table 1, a total of 1,607 households were selected for the survey. The overall mean household size was 5.5 persons (95% CI 5.3–5.8) with household size ranging from 1 to 18. Our proxy indicators of wealth (electricity, radio, TV) were reported in 3.5% (95% CI 1.2–9.6), 38.6% (95% CI 31.2–46.5), and 1.2% (95% CI 0.6–2.4) of households, respectively. The majority of households, 69.8% (95% CI 60.0–78.1), had a thatch roof; walls made from sticks, 95.4% (95% CI 89.5–98.1); and floors of compacted earth, 88.5% (95% CI 80.4– 93.5). Concerning sample population and those recruited for net usage interview and malaria parasite prevalence, a total of 8,974 people were enumerated of whom 149 (1.7%) were excluded from analysis due to missing data on age or sex. Net usage was assessed for all the 8,825 people included in the sample. When we see household and individual characteristics of net ownership and use, of the 8,825 people included in the sample, the overall mean age was 19.4 years (95% CI 18.9–20.0) and 49.9% were male. There were 1458 children under five years of age (16.5% of sample) and 174 women who reported being pregnant (2.0%) living in the selected households. The proportion of children less than five years old in the sample was higher in Oromia (18.7%) than in SNNPR (14.3%), $p < 0.0001$, whereas the number of pregnant women was no different between regions. A total of 4,722 people in even numbered households were eligible for malaria testing of whom 3,856 (81.7%) were included in the analysis. Participation was significantly higher in Oromia (85.0%) than in SNNPR (78.4%), p <

0.0001. Of the 3,856 people examined for malaria parasites, 712 (18.5%) were children under five years. The proportion of children under five in the sample tested was greater in Oromia (21.9%) than in SNNPR (14.8%), $p < 0.0001$[20].

Studies on prevalence and risk factors of malaria in Ethiopia shows, toilet facilities, availability of television, number of rooms per person, main material for walls, number of months the room was sprayed, number of mosquito nets per person, age and family size were found to be significant main effects. In addition to the main effects, five significant two-way interaction terms and one three-way interaction terms was obtained. The two-way interaction terms were: the interaction between main source of drinking water and main material of the room's roof; use of anti-malarial spray and use of mosquito nets; time taken to collect water and floor material; gender and main source of drinking water; gender and main material of the room's floor; and gender and use of anti-malarial spray. Three-way interaction between gender, main source of drinking water and availability of electricity was also significant. Age, family size, toilet facilities, availability of television, number of persons per room, wall material and number of month's anti-malarial spray was used were the significant main effects, which were not involved in significant interaction terms. Accordingly, the effect of these variables can be directly interpreted using the odds ratio (OR) [21].

When we see estimates of socio-economic, demographic and geographic factors based on the result for a unit increase in age, implies a reduction of the odds of a positive malaria test by 3.0% (OR = 0.970, p - value = 0.0001). Furthermore, for a unit increase in family size, the number of persons infected by malaria in the household increased by 5.1% (OR = 1.057, p - value < .0001). Furthermore, compared to households which had no toilet facilities, those with a pit latrine were at lower risk of malaria diagnosis (OR = 0.725, p value = <.0001) as well as households with flush toilets (OR = 0.552, p - value = <.0001). Households who were using mosquito nets were found to be at a lower risk of malaria compared to the households who were not using mosquito nets (OR = 0.91, p - value = <.0001). Furthermore, for a unit increase in the number of nets, the odds of positive malaria diagnosis test decreases by 54% (OR = 0.46, p - value = <0.0001) for the household [21].

Interaction effects

The relationship between gender, main source of drinking water and availability of electricity is indicate the risk of positive malaria RDT is higher for unprotected water use by female

respondents. However, for both males and females, positive RDT is low for households using tap water and electricity. With reference to households that have tap water for drinking and corrugated iron-roofed houses, the risk of positive malaria RDT was significantly lower than for households living in stick and mud-roofed houses and drinking unprotected water (OR = 8.09624, p-value < 0.0001). Higher positive malaria diagnosis test was found for households that reportedly used unprotected water for drinking. The OR values for the interaction between gender and main material of the room's floor is given. Based on the result, positive malaria diagnosis test was significantly higher for females than for males who reported that the material of the room's floor was earth/ local dung (OR = 1.358, p - value < .0001) as well as those who reported that the material of the room's floor was wood (OR = 2.415, p - value < 0.0001). There was however, higher positive malaria diagnosis test found for both males and females who reported that the material of the room's floor was wood. Positive RDT was significantly higher for respondents living in a room with a wooden or earth/local dung floor than for those living in a room with a cement floor for respondents who took 40–90 minutes to collect water. But, for respondents who took less than 40 minutes to collect water, positive RDT was low. Prevalence of malaria was significantly higher for male than for female respondents who were living in a house treated with anti-malarial spray. For both males and females who were living in a house that had not been sprayed, the risk of positive malaria was significantly higher. On the other hand, for males living in a house that had not been treated with anti-malarial spray, the risk of malaria infection for males is more than that of females. The use of mosquito nets and applying anti malarial spray to the walls of the house altered the risk of malaria. The risk of malaria was low for individuals who lived in houses that had been sprayed and used malaria nets. It is shown that the estimated risk of malaria was higher for individuals with no mosquito nets [21].

Studies results on prevalence of malaria infection in Butajira area, south-central Ethiopia shows that , the overall prevalence of malaria was 0.93% [95% CI (0.79-1.07)] (178 malaria cases among 19,207 people). However, the prevalence varied among the villages, with the highest prevalence of 2.8% in Dadesso and Horosso villages (both below 1,850 masl), and the lowest prevalence (0.0%) at Sunke Wenz and Akababi village (2,100- 2,180 masl) (data not presented). Malaria varied with altitude, with a prevalence of 1.91% [95% CI (1.55-2.27)] in low, 1.37% [95% CI (0.87-1.87)] in mid-level and 0.36% [95% CI (0.25-0.47)] in high altitude zones. The highest prevalence was found at low altitude between October and November 2009 [22].

Two persons with P. vivax-positive slides, one from the lowlands and one from the highlands, reported that they had travelled outside their villages. Malaria infection varied among age groups, and in a different way at varying altitudes. At mid-level altitudes, malaria infection reached its peak in children aged one to four years, and at low altitude in children aged one to nine years. However, malaria prevalence at higher altitude was low and was similar across all age groups. Plasmodium falciparum malaria occurred rarely throughout the survey periods, with relatively more cases during the survey performed in October - November 2009 in the low altitude zone. Plasmodium vivax was found in all survey periods; however, the prevalence of Plasmodium vivax differed with respect to survey period and altitude [22].

OBJECTIVE

GENERAL OBJECTIVE

To assess malaria prevalence and risk factors in SalaMago Woreda, South Omo Zone, SNNPR, 2017/2018

SPECIFIC OBJECTIVE

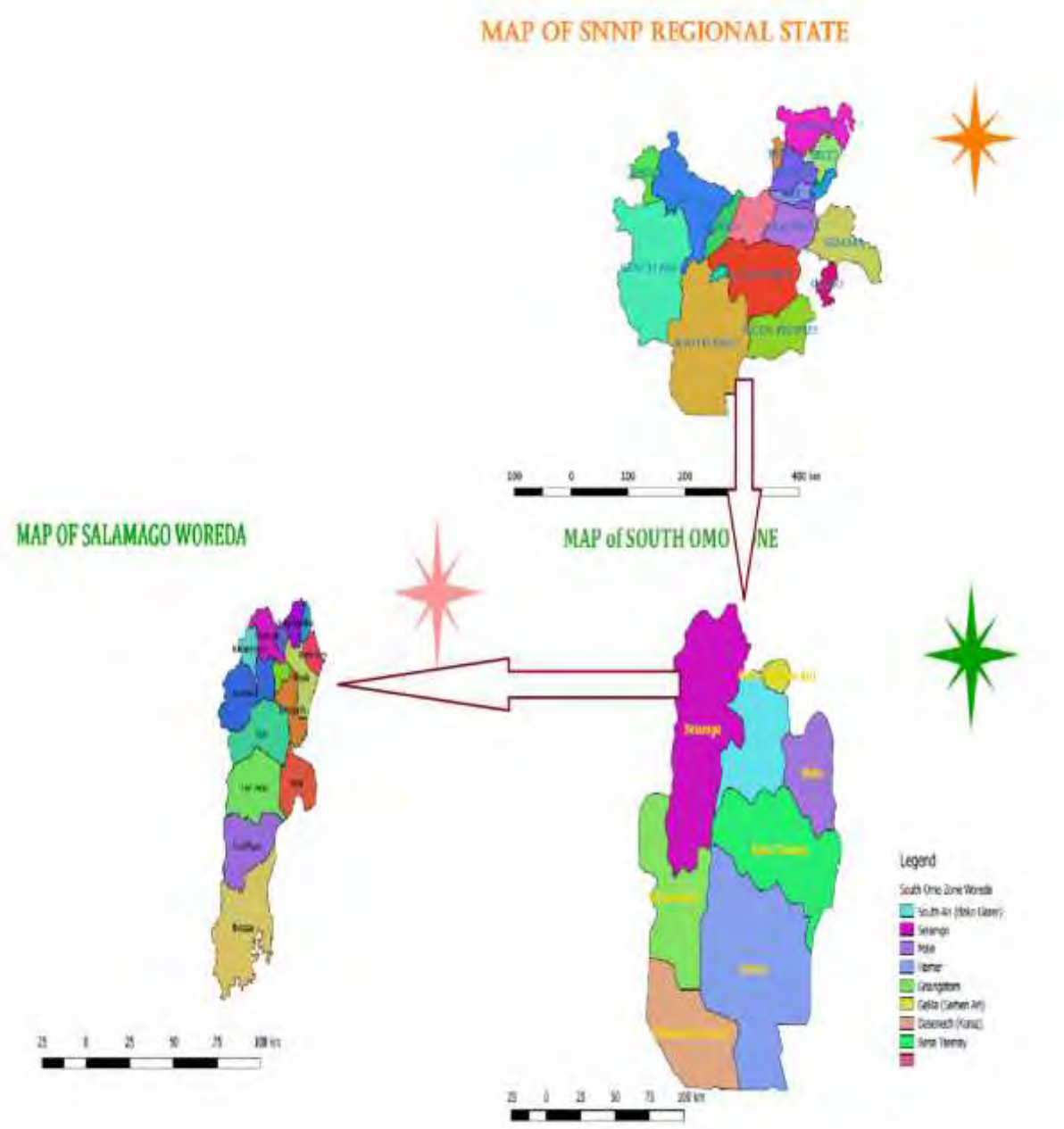
To determine malaria prevalence by species in SalaMago Woreda

To determine factors associated with high malaria morbidity in SalaMago Woreda

Method's

STUDY AREA AND PERIOD

The study area, SalaMago Woreda is the main lowland of South Omo Zone, which is 867 Km south weast of Addis Ababa and far from the Regional Capital Hawassa by about 627 Km. Surrounded by South Ari woreda in the east, Basketo and Konta Special Woreda in the north, BenchMaji Zone in west and Gnagatom Woreda in the south. SalaMago Woreda is among the Woredas listed as the top malaria hotspot Woredas region. The population of SalaMago Woreda is 35,730 population; of which 17,579 (49%) are males and 17,791(51%) females. There are a total of 4 health centers and 16 health posts in the area. The study will be conducted September through October 2017.


MAP OF SNNP REGIONAL STATE
MAP OF SALAMAGO WOREDA
MAP of SOUTH OMO ZONE
Legend

STUDY DESIGN

We will use community based cross-sectional study in SalaMago Woreda from September to October 2017.

SOURCE POPULATION All households living in SalaMago Woreda of South Omo Zone;

STUDY POPULATION Households in the selected Kebeles of the Woreda;

SAMPLE SIZE DETERMINATION

A single proportion formula with a 95% confidence interval (CI) prevalence of 21% with margin of error 5%, and power of 80% will be used to calculate sample size. Based on this the sample size can be calculated as follows.

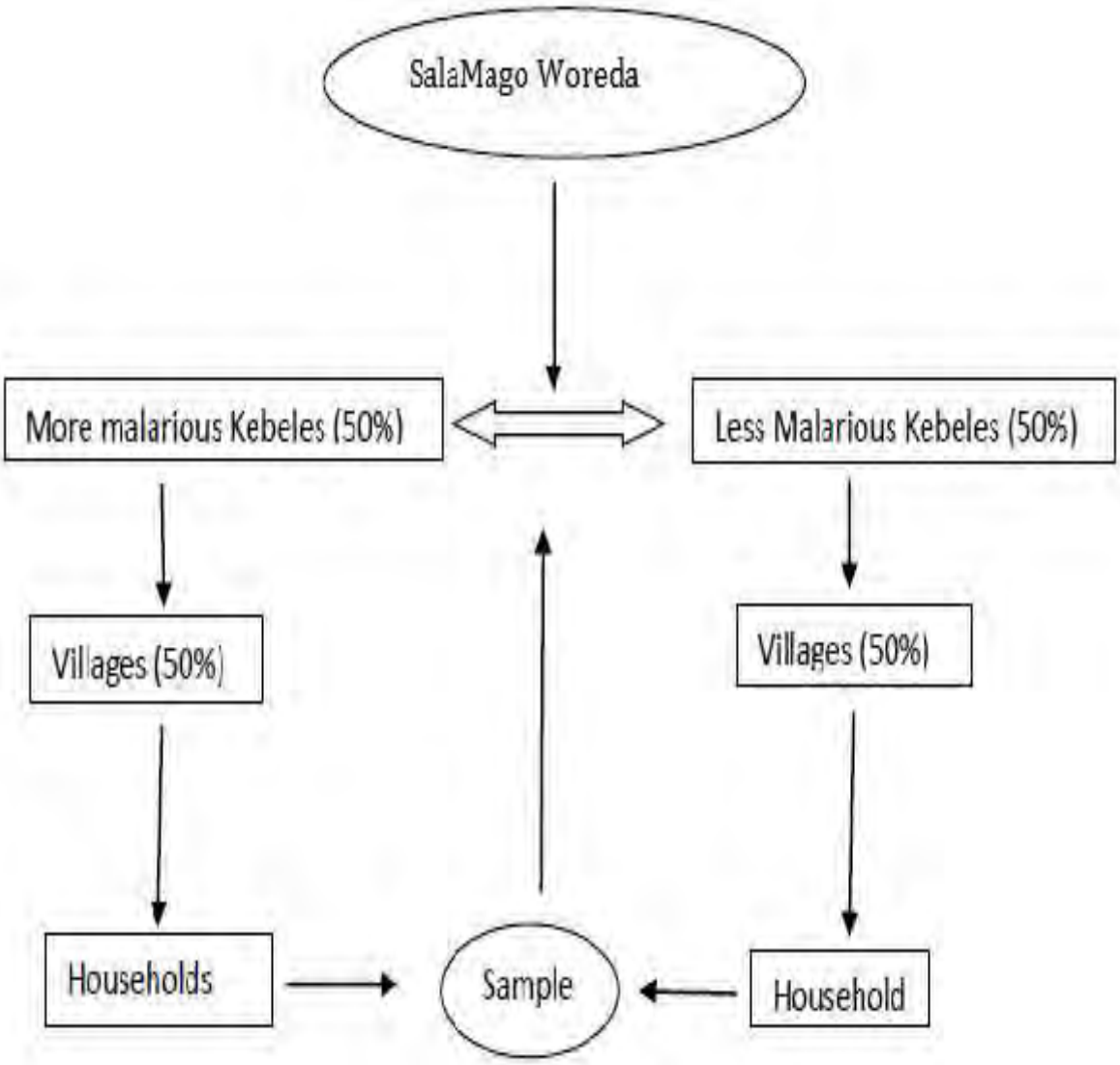
$N= Z^2 * pq/d^2$ $=(1.96)^2*0.21(1-0.21)/ (0.05)^2 = 254$. Because of cluster sampling in the study we used 2 as a design effect and it will be 508 households and we expect 10% (51) non respondent participant that makes our sample size 559.

To determine each malaria species in the district, we will examine blood specimen by preparing thin and thick blood smear from selected household member and which will be tested by microscope.

SAMPLING TECHNIQUE

To draw the sample we use a multi-stage cluster sampling techniques and all kebeles in the area will be listed with their respective number of village and households in salamago woreda. The listed kebeles will be clustered using low and high. In the woreda there are 21 kebeles of this 15 kebeles are high malarious and 6 kebeles were less malarious. At first stage 11 kebele, second stage 28 village and on third stage 559 house hold will be selected.

A systematic random sampling method will be used to select the households in the selected villages. The total number of the sample size for the village will be dividing to the number of household in the village to get the interval. The first household will be selected by lottery method. Then, households will be selected based on the interval calculated. Only one family member will be included from the selected households.


SalaMago Woreda
More malarious Kebeles (50%)
Less Malarious Kebeles (50%)
Villages (50%)
Villages (50%)
Households
Sample
Household

DATA QUALITY, COLLECTION AND MANAGEMENT

Data will be collected by using both quantitative and qualitative methods. The quantitative component will comprise of a household survey that include questions on household socio-demographic and economic characteristics(age, sex, occupation, educational level, marital status, ethnicity, religion, income, housing structure, structure of the roof of house, number of sleeping beds,) knowledge, attitude, and practice factors(LLINs coverage, use, and perceptions, use and perception on IRS, presence and use of repellant, cause and mode of transmission of malaria, recognition of malaria sign and symptoms), behavioral factors(use of governmental and private health facilities, health seeking behavior, correct use of malaria medication when he/she get ill with malaria, taking full course of malaria medication, use of traditional medicine, travel history to malarious area, working times), geographic factors(presence of stagnant water, distance of stagnant water from living house, presence of interrupted river, distance of interrupted river from living house, elimination and draining of stagnant water and interrupted river. Qualitative component of the household survey will include observation of the presence and use of nets, open ended question related to use and non-use of LLIs, observation of the correct hanging of bed nets, and procedure of hanging of bed nets.

A pre-test will be employed in ten household in the nearest Kebele of the district. Training will be given for both data collectors and supervisors. Two supervisors will be assigned for four data collectors. This study will obtain data from community and health facility using a pretested and structured questionnaire. Blood specimen will collected from each study unit for microscopic examination.

DATA ANALYSIS

Data completeness will be verified first by field supervisor, then by principal investigator. Data entry, cleaning and statistical analysis will be done by using Epi Info version 7.2. Individuals whose blood specimen will be positive for malaria by microscope during data collection will be classified in to cases and those who were tested by microscope and negative test result will classified in to controls. This laboratory based malaria data will be used to employ case-control study to associate independent variables in the study. The dependent variables (test positives and negative results) will be associated with independent variables by using 2x2 table and logistic regression model.

ETHICAL CONSIDERATION

Ethical clearance was obtained from school of public health of A.A.U, from SNNP regional state Health Bureau, South Omo Zone Health department and SalaMago Woreda Health Offices. The purpose of the study was explained to responsible member of each selected household before interview and examination. Verbal consent was obtained from head of each selected household.

RESULT DISSEMINATION

Written report, both hard and soft copies, will be prepared and shared to Addis Ababa University, School of Public Health, Ethiopian Field Epidemiology Training Program Resident coordinators, mentors, advisors, public health emergency management of core process (PHEM) of South, Nations, Nationalities, and regional health bureau(SNNP RHB), SalaMago district and other concern body.

OPERATIONAL DEFINITION

Hot spot area: A small cluster of households typically less than 1km2 near a mosquito breeding site, but within a larger area of malaria transmission.

Case definitions: Confirmed malaria cases: Suspected malaria case in which malaria parasites have been demonstrated in a patient's blood by microscopy or a rapid diagnostic test.

Negative malaria cases: are cases testing negative reported by RDT/microscopy.

Breeding site: Small, temporary/permanent, and sunlit water collections such as rain pools for breeding mosquitoes

Indoor residual spray: the application of long-acting chemical insecticides on the walls and roofs of all houses and domestic animal shelters in a given area, in order to kill adult vector mosquitoes that land and rest on these surfaces

Long Lasting Insecticide: protecting people from being bitten by infected mosquitoes.

WORK PLAN

Table 35: Work plan for malaria prevalence and risk factor assessment, SalaMago Woredaof South Omo Zone, SNNPR, 2017

S.no	Activities	Months in 2017					
		March	April	August	September	October	November
1	Literature review						
2	Proposal writing & submission						
3	Supervisors and data collector training						
4	Data collection and entry						
5	Data analysis						
6	Draft report preparation						
7	Final report submission						

BUDGET BREAKDOWN

Annex 6: Budget breakdown for malaria prevalence and risk factor assessment, SalaMago Woreda, South Omo Zone, SNNPR, 2017

S.N	Activity	Quantity	Unit	Days	Unit cost	Total cost in ETB
1	Perdium for Training of Data & Sample collector and Supervisors	6	Birr	2	300	5400
2	Perdium for Trainer	3	Birr	2	300	1800
3	Perdium for data collector	4	Birr	15	300	18000
4	Perdium for supervisor	2	Birr	15	300	9000
5	Perdium of investigator for supervision	1	Birr	15	300	4500
6	Perdium of Mentor's for supervision	2	Birr	20	300	12000
7	Perdium for Language Translator	3	Birr	15	100	4500
8	Perdium for Laboratory Technician	2	Birr	15	300	9000
9	Perdium for Data Analysis	1	Birr	15	300	4500
10	Perdium for Secretary	1	Birr	10	300	3000

11	Car rent	1	Birr	15	1500	22500
12	Fuel cost	650	Liter	15	17	11050
	Sub Total					**105250**
	Lab reagent & Supplies					
13	Slides	30	pack		100	3000
14	Lancet	12	pack		100	1200
15	Gemisa Stain	1	bottle		300	300
16	Write Stain	1	bottle		300	300
17	Methanol	1	Liter		100	100
18	Ethanol	1	Liter		100	100
19	Cotton	2	Roll		75	150
20	Glove	2	Box		100	200
	Sub Total					**5350**
	Stationary					
21	Pen	15	no		10	150
22	Pencil	15	no		8	120
23	Note pad	15	no		15	225
24	Fillip Chart	2	no		75	150
25	A4 Paper	3	Pack		250	750
26	Mobile cards	3	Birr	10	50	1500
27	Printing and copy Service					4000
	Sub Total					**6895**
	Total					**117495**
	5%Contengency					**5875**
	Grand total					**123370**

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CHAPTER IX – TRAINING

9.1 ACUTE WATERY DIARRHEA (AWD) OUTBREAK CONTROL

EXECUTIVE SUMMARY

AWD/Cholera is a diarrheal disease caused by infection of the intestine with the gram-negative bacteria *Vibrio cholerae*, either type O1 or O139. Both children and adults can be infected.

It is one of the key indicators of social development and remains a challenge to countries where access to safe drinking water and adequate sanitation cannot be guaranteed. This training was given to create awareness for health worker to manage AWD cases and to control the spread of AWD outbreak in DugunaFango woreda of Wolayita Zone. Power point presentations, discussions and demonstration were used as training methods. Hard copies of the training materials were given for the trainees. The training was given for 16 (2 Females and 14 Males) trainees from health centers, hospitals and PHEM officer from woreda health office for one days (March 4/2016). The training addressed overview and epidemiology of AWD/Cholera, Set up and Organization of AWD Cases treatment Centre, About AWD Cases management Protocal, Who is most at risk?, General hygiene in CTCs, Sanitation and Hygiene precautions during Closure of CTCs, practical demonstration on stool specimen collection testing with RDT, house hold level water treatment procedure and Infection prevention during AWD/Cholera outbreak. The way forward was directed by head of regional health bureau emphasizing on social mobilization, on case treatment protocol and water treatment chemical distribution and utilization of data at all levels. During training day there is no any payment for trainees since the woreda was in emergency of AWD outbreak.

INTRODUCTION

Cholera is a diarrheal disease caused by infection of the intestine with the bacterium Vibrio cholera, either type O1 or O139. Both children and adults can be infected. About 20% of those who are infected develop acute watery diarrhea and 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 salts can lead to severe dehydration and death within hours. The case-fatality rate in untreated cases may reach 30–50%. Treatment is straightforward (basically rehydration) and, if applied appropriately, should keep case-fatality rate below 1%. Cholera is usually transmitted through fecally contaminated water or food and human beings are the only natural reservoir.

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 Prevention is based on access to safe water and hygienic food handling and preparation practices. Because the incubation period is very short (it ranges from 2 hours to 5 days), the number of cases can rise extremely [1].

Researchers have estimated that each year there are 1.3 to 4.0 million cases of cholera, and 21,000 to 143,000 deaths worldwide due to cholera [1].

In Africa reports at the end of March 2016 with 6,030 cases affecting 3 countries (Nigeria, Benin and DRC) in the West and Central Africa region, the current epidemic situation is slightly calmer than in previous years. However, this rather favorable situation should be taken with great caution given the significant challenges observed in surveillance, early detection and early response to cholera alerts in the region [2].

We received reports of suspected cholera outbreak from DugunaFango woreda Health Office, Wolayita Zone, SNNPR, Ethiopia on February 28/2016. On March 03/2016 the SNNPR bureau deployed a team organized from WHO, UNICIEF and Public health emergency management to identify causative agent, identify risk factors, to control the outbreak and propose recommendations to prevent future occurrences.

OBJECTIVE

GENERAL OBJECTIVE

- To give awareness for health worker about management of AWD cases and controlling the spread of outbreak in DugunaFango woreda of Wolayita Zone, March 2017.

SPECIFIC OBJECTIVES

- To give awareness about Set up and Organization of AWD Cases treatment Centre
- To give awareness about AWD Cases management protocol
- To give awareness about sanitation and Hygiene precautions during Closure of CTCs
- To show practical demonstration on stool specimen collection testing with RDT
- To give awareness about house hold level water treatment procedure and preparation of different concentration of chlorine solutions.

METHODS AND MATERIALS

Date of the training, number of trainees and duration of training were decided by Woreda health office. Training schedule was drafted by PHEM and Woreda health office. Training topics were identified and trainers were assigned based on their interest and areas of expertise. For each training sections moderators were also assigned.

All trainees' addresses were registered and documented upon their arrival. After each presentation the floor was opened for questions and discussions. A number of questions were raised by trainees and answers were given by trainers. Demonstration was conducted to familiarize the trainees on how to collect stool specimen and testing with RDT. throat swab samples. The trainees were also practically shown how the specimen is correctly collected during the demonstration phase. Trainees from the hospital were also invited to present their experience and challenges they faced during management of cases in CTC center. Finally at the end of the training hard copy of the training handout were provided to all trainees.

ACHIEVEMENT

Even though the time given is short the training was successfully conducted according to the schedule. All expected trainees from the health center participated. Totally 16(2 Female and 14 Male) trainees and 4 trainers attended the training.

Three (18%) were health officer, 9(56%) were clinical nurses, 2 (12%) were pharmacy technician and 2(12%) were laboratory technician. Following each presentation heated discussions were held. The importance of presence of review meeting on daily bases in the CTC center was raised by participants and got acceptance. The objective of the training was also clearly presented.

ACKNOWLEDGEMENT

Our sincere thanks go to regional health bureaus for sending us to the AWD affected woreda. We also express our gratitude to all trainees for their active participation and for constructive comments and suggestions they raised throughout the training. Last but not the least we acknowledge the Dimtu H/Centers, DugunaFango Woreda H/Office and Wolayita Zone Health Department for technical support.

Annex 7: Main points that include in the Training of Acute Watery diarrheal diseases Management

Assessment for Level of Dehydration

Status	No Dehydration	Some Dehydration	Severe Dehydration
Check for pulse	Present	Rapid, weak (Thready)	None pulse
General condition of the patient	Well, alert	Restless, irritable‡	Lethargic or unconscious ‡
Eyes sunken?	No	Yes (sunken)	Yes (very sunken and dry)
Mouth & tongue	Moist	Dry	Very dry
Thirst*	Drinks normally	Thirsty, drinks eagerly‡	Drinks poorly or Not able to drink‡
Skin pinch**	Goes back quickly	Goes back slowly‡	Goes back very slowly (> 2 seconds) ‡
Decide	The patient has no signs of dehydration	If the patient has 2 or more signs, including at least 1 major sign, there is some dehydration	If the patient has 2 or more signs, including at least 1 major sign, there is severe dehydration
Treat	Maintain Hydration PLAN A	Oral Rehydration PLAN B	IV + ORS + Antibiotic PLAN C

**Patient should be offered fluid to observe for this sign*
*** Abdominal skin has to pinched and released to observe for this sign*
‡Major signs

Plan A: Oral rehydration therapy for patients with no dehydration

Age	Amount of solution to take after each loose stool	ORS Sachets needed
Less than 2 years	50 – 100 ml	1 sachet per day for 2 days
2 to 9 years	100 – 200 ml	1 sachet per day for 2 days
10 years and above	As much as wanted	2 sachets per day for 2 days

Plan B: Oral rehydration therapy for patients with moderate dehydration

Age*	<4 months	4-11 months	12-23 months	2-4 years	5-14 years	15 years or older
Weight	< 5 kg	5-7.9 kg	8-10.9 kg	11-15.9 kg	16-29.9kg	30 kg or more
ORS solution in ml	200-400	400-600	600-800	800-1200	1200-2200	2200-4000

**Use age only when the patient's weight is not known. If the weight is known, calculate the amount of ORS bymultiplying the patient's weight in kg by 75.*

Plan C: Intravenous rehydration for patients with severe dehydration

Age	First give 30ml/kg IV in	Then give 70ml/kg IV in
Infants (<1year)	1 hour	5 hours
1year old and above	30 minutes	2 ½ hours

Commonly used antibiotic for treatments of severe cases of cholera patients

Age*	< 4 months	4-11 months	12-23 months	2-4 years	5-14 years	15 years and above
Weight	< 5 kg	5-7.9 kg	8-10.9 kg	11-15.9 kg	16-29.9kg	30 kg and above
Doxycycline 100mg capsules one single dose			½ capsule	1capsule	2 capsules	3 capsules
Tetracycline 250mg capsules four times /day for 3 days					For age 8 years and above 250 mg each time	500 mg each time
Amoxicillin 250mg/5ml 3 times /day for 3 days	1 TSP	1 ½ TSP	2 TSP	250 mg capsule	250mg capsule	500mg
Erythromycin 250mg ***adults:*** 4 times per day for 3 days ***children:*** 3 times per day for 3 days	½ TSP	1 TSP	1 TSP	1 ½ TSP	250 mg tab	250 mg

Preparation of desired concentration of chlorine solution from commonly available chlorine sources

Available chlorine forms	To prepare 2% Chlorine		To prepare 0.2% Chlorine		To prepare 0.05% Chlorine	
	Solution	Water	Solution	Water	Solution	Water
Yellow container Birkina 5% solution	1 liter	1.5 liter	400ml	10 liter	100ml	10 liter
Blue container 10% solution	500ml	2 liter	200ml	10 liter	50ml	10 liter
Calcium hypochlorite (HTH) at 70% active chlorine	30g or 2 tbs*	1 liter	30g or 2 tbs	10 liter	30g or ½ tbs	10 liter
Chlorinated lime at 30% active chlorine	60g	1 liter	60g	10 liter	1.5g	10 liter
Sodium hypochlorite concentrate at 15% active chlorine	166 ml	1 liter	16 ml	1 liter	33 ml	10 liter
Sodium dichloro- isocyanurate (NaDCC) at 1g active chlorine per tablet	20 tabs	1 liter	20 tabs	10 liter	5 tabs	10 liter
Aquatab (1g/tablet)	20 tabs	1 liter	20 tabs	10 liter	5 tabs	10 liter

*tbs = table spoon (1 tablespoon = 3 teaspoons)

Uses of different concentration of chlorine solutions

Concentration of chlorine	Indication
0.05%	✓ Gloved hands, bare hands and skin washing, ✓ Rinsing dishes ✓ washing of new patient on arrival
0.2%	✓ Disinfection of floors, spraying of homes of patients ✓ Spraying of beds in CTC, foot spray and foot bath at entrance ✓ disinfection of cloths by soaking for 10 minutes ✓ Equipments
2%	✓ Disinfection of vomitus and excreta ✓ Disinfection of corps

Steps for Effective case management of AWD

1. Assess the patient's level of dehydration.
2. Rehydrate the patient according to the level of dehydration (no, some, or severe dehydration).
3. Monitor the patient frequently, and reassess their hydration status at intervals recommended by the guideline.
4. Collect a rectal swab sample from the first 5 suspected cholera patients seen at the health facility.
5. Give an oral antibiotic to patients with severe dehydration.
6. Allow the patient to resume feeding if vomiting has stopped.
7. Continue monitoring the patient and replacing fluid losses until the diarrhea stops.
8. Give the patient a 2-day supply of ORS for home use and instructions on homecare.
9. Advise the family on follow up and preventive actions from cholera

CHAPTER X – PUBLIC HEALTH EMERGENCY MANAGEMENT WEEKLY BULLETIN

10.1. Public Health Emergency Management Week 41 Bulletin (2016)

Weekly PHEM report completeness

All zones and special woredas has delivered weekly PHEM report in the 41th epidemiological week of 2016. Out of expected 4,625 governmental health facilities in the region, 4,376 health facilities submitted PHEM report in the week. Subsequently, 95 % of PHEM report completeness has been attained at the regional level in this week while the regional target is 90% and above.

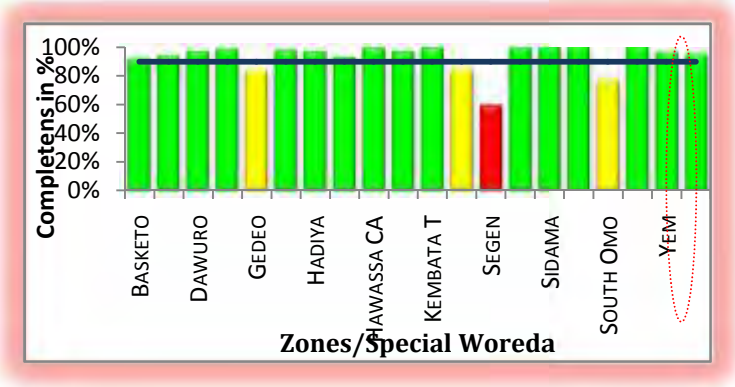

Fig.1: PHEM report completeness by zones/special woredas in SNNPR, Week 41, 2016

As it is presented in figure 1 above, six zones namely Silite, Sheka, Sidama, Wolayita, Kembata Tembaro and Hawassa town reported 100% while Segen zone, Gedeo, South Omo and Konta special woreda reported far below the target of report completeness in the week. Therefore, Low performing special Woredas and zones need support from the RHB.

1. Malaria

In this week, a total of 33,496 suspected malaria cases were examined by RDT/microscopy and 4,481 cases were reported as confirmed malaria. Of which P.falciparum cases were 2,594 (58 %) and P.vivax cases were 1,887 (42%). In general, a total of 4,590 confirmed and clinical cases of malaria were reported in the region. Of these cases, 4,481 (98 %) were outpatients and 109 (2%) were inpatients.

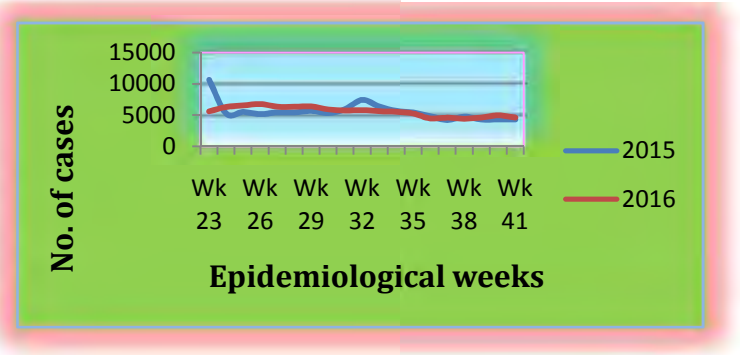

Fig.2: Trend of Malaria cases over the last 19 weeks in SNNPR, week 41, 2016

The number of malaria cases during the week decreased by 365 compared to the previous week (a total of 4,955 total malaria cases were reported in week forty). As it is depicted in figure two above, the number of malaria cases remains stable since week 38. However, the number of cases in week 39, 40 and 41 is a little bit higher than the same week of last year.

South omo reported the highest malaria incidence rate with 86 cases per 100,000 populations in the week. The incidence rate has decreased in the week in zone as compared to last week. South omo reported 101 cases per 100,000 populations in week 40. Konta and Basketo special woreda reported the second and third highest cases with 70 and 67malaria cases per 100,000 populations in the week respectively.

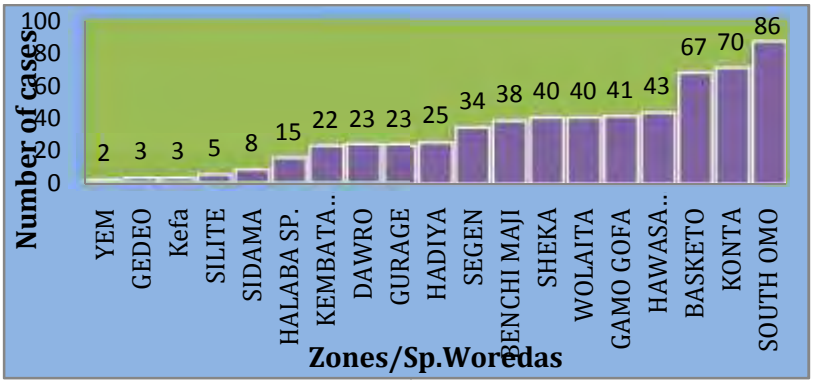

Fig.3: Malaria cases per 100,000 populations by zones/Sp.woredas in SNNPR, week 41, 2016

Among woredas, Salamago woreda from South omo zone reported the highest malaria case in the week with 212 cases. The woreda reported 171 and 250 cases in week 39 and 40 respectively. Dassench and Kucha woreda are among top three woredas in the week with 177 and 110 cases in the week respectively. (See fig 4).

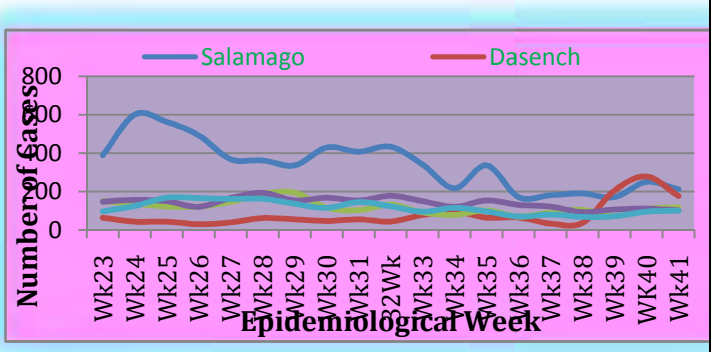

Fig.4: Trend of malaria cases in five highest reporting woreda in SNNPR, Week 40 in 2016.

In the last one month, Salamago reported the highest malaria case in the region with 823 cases. Dasench woreda and Shone town reported the second and third highest malaria case with 699 and 427 cases.

S.NO.	WOREDAS	WK 38	WK 39	WK 40	WK 41	TOTAL
1	Salamago	190	171	250	212	823
2	Dasench	37	206	279	177	699
3	Shone taHO	113	100	117	97	427
4	Arba Minch	92	106	111	101	410
5	kucha	105	73	110	119	407
6	Yeki	174	59	95	55	383
7	Uba	128	110	131	2	371
8	Hawassa sub	112	80	81	87	360
9	Zalla WoHO	68	71	95	100	334
10	Arba Minch	97	85	66	81	329

Table 36: Top 10 woredas with highest malaria case in last one month, SNNPR, week 41,2016.

2. Meningitis

In this week, 13 suspected meningitis cases with zero death were reported in the region. The cases are reported from Sodo Hospital (1), Adare Hospital (1), Hawassa referral Hospital (2), Bona Hospital (1), Dilla Zuria WoHo (1), Masha WoHo(1) , Hawassas Sub City(3),Durame Hospital(1),Bonga Hospital and Karat Hospital (1). The number of meningitis cases increased by 3compared to week 40 (10 cases were reported in week 40).

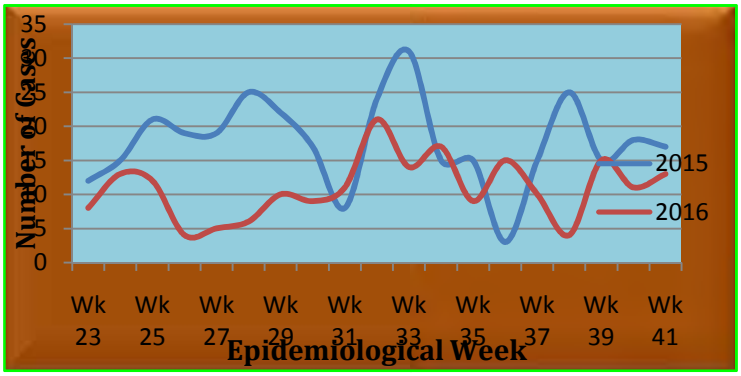

Fig.5: Trend of suspected meningitis cases over the last 19 weeks in SNNPR, week 41, 2016.

3. Dysentery

There was a total of 563 reported cases of dysentery with zero death in this week. Only one case was in patient cases. The number of dysentery cases increased by 102 as compared to the previous one week (461 cases were reported in week 40).

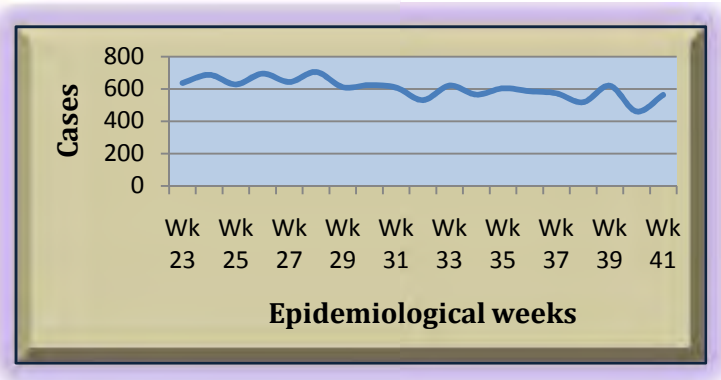

Fig. 6: Trend of dysentery cases for the last 20 weeks, SNNPR, week 41, 2016.

During the week, Hawassa Sub City reported the highest number with 32 dysentery cases followed by Enemor Ener woreda and Tula sub city with 26 and 26 cases respectively in the region.

4. Severe Acute Malnutrition

A total of 687 severe acute malnutrition (SAM) cases were reported in the region. Of these 582 were outpatient

and 105 were inpatient cases with five deaths during the week. Each death was reported from Dilla Hospital, Hawassa sub city, Hawassa referral Hospital, Alle and Burji woreda.

Generally, the number of SAM cases increased at the regional level by 35 when compared to week forty (n= 652). As shown in figure 7, the outpatient SAM (OTP) case increased in the week by 45 compared to week 40. However, the number of inpatient SAM (SC) case has decreased by 10 in the week.

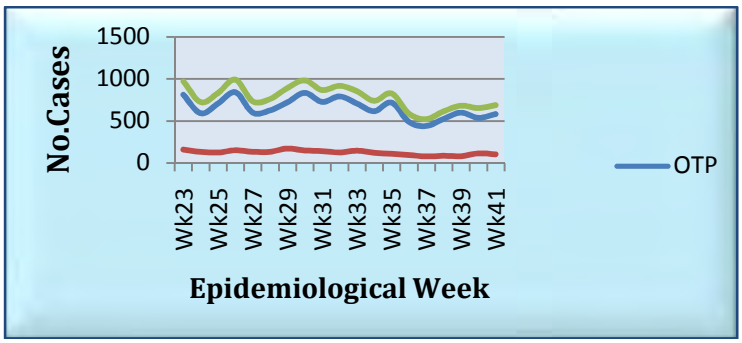

Fig.7: Trend of Severe Acute Malnutrition (SAM) cases over the last 19 weeks in SNNPR week 41, 2016.

Figure 8 depicts that Sidama zone reported the highest number of SAM cases (n= 154) followed by Hadiya and Gamo gofa zone with 96 and 95 case in the week

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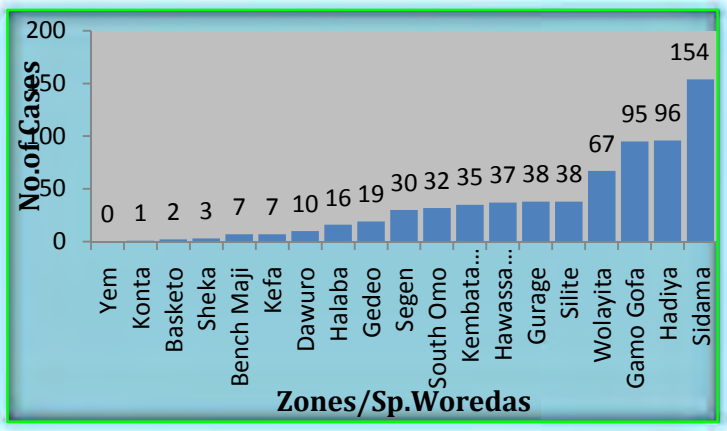

Fig. 8: Number malnutrition cases by zones/ Sp.woredas, SNNPR, week 41, 2016.

When disaggregated by woreda, Bensa, East Badwacho, and Kemba, are top threes for SAM cases during the week in the region with 29, 25, and 20 cases respectively.

5. Measles

No Measles cases were reported in the week.

6. AFP

During the week, Two AFP case was reported in the region. The case was reported from Meskan and Mihur Aklil woreda, Gurage zone.

7. AWD

Active AWD outbreak is ongoing in Wondo genet woreda and Hawssa town in the region during the week.

8. Anthrax

Zero anthrax case was reported in the region in the week.

9. Maternal Death

During the week, Three Maternal Death was reported in the region. The death was reported from Dugona fango Woreda , Yem Special Woreda and Sodo Hospital.

10. NNT

One death of NNT was reported in the week from Butajira Hospital.

11. No case yellow fever, AHI, SARS, Pandemic influenza, Viral Hemorrhagic Fever, Guinea worm, Smallpox, and Rabis reported in the region in this reporting period.

Contact us:
Email: phemsnnpr@gmail.com
Tele: 0462120281

Your comments will have a significant role in improving our bulletin!

About this newsletter:

The PHEM bulletin is the weekly bulletin of the south Nations nationalities and People's Regional State Health Bureau, Public health emergency management core process. It is prepared and disseminated on a weekly basis.

10.2. Public Health Emergency Management Week 39 Bulletin (2016)

Highlight of the week

- ✓ AWD outbreak is ongoing actively in Wondo genet, Hawassa and Meskan woredas in the region.
- ✓ 1.6 per 100,000 population NMFR rate has been achieved in last 39 weeks (9 month) in 2016.
- ✓ Second round PHEM basic training is provided

Weekly PHEM report completeness

Except Basketo special woreda, all zones and special woredas has delivered weekly PHEM report in the 39th epidemiological week of 2016. Out of expected 4,625 governmental health facilities in the region, 4,336 health facilities submitted PHEM report in the week. Subsequently, 94 % of PHEM report completeness has been attained at the regional level in this week while the regional target is 90% and above.

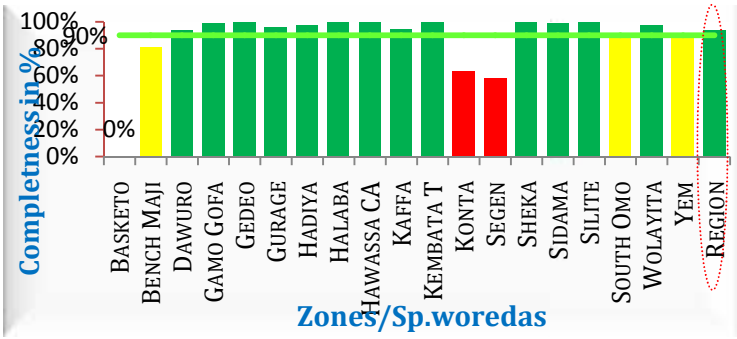

Fig.1: PHEM report completeness by zones/special woredas in SNNPR, Week 39, 2016

As it is presented in figure 1 above, six zones namely Silite, Sheka, Gedio, Halaba, Kembata Tembaro and Hawassa town reported 100% while Segen zone and Konta special woreda reported far below the target of report completeness in the week. In contrast, Basketo special woreda did not submit report at all in the week. Therefore, Low performing special Woredas and zones need support from the RHB.

1. Malaria

In this week, a total of 29,432 suspected malaria cases were examined by RDT/microscopy and 4,549 cases were reported as confirmed malaria. Of which P.falciparum cases were 2,699 (59 %) and P.vivax cases were 1,850 (41%). In general, a total of 4,597 confirmed and clinical cases of malaria were reported in the region. Of these cases, 4,556 (99 %) were outpatients and 41 (1%) were inpatients.

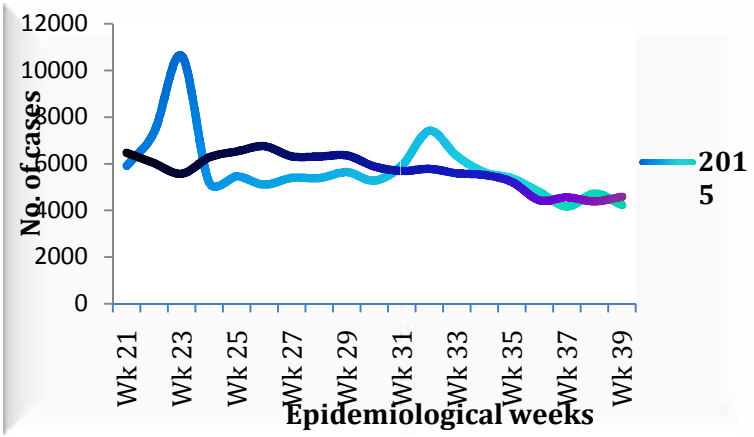

Fig.2: Trend of Malaria cases over the last 18 weeks in SNNPR, week 39, 2016

The number of malaria cases during the week increased by 197 compared to the previous week (a total of 4,400 total malaria cases were reported in week thirty eight). As it is depicted in figure two above, the number of malaria cases remains stable since week 36. However, the number of cases in week 39 is a little bit higher than the same week of last year.

South omo reported the highest malaria incidence rate with 93 cases per 100,000 populations in the week. The incidence rate has increased in the week in zone as compared to last week. South omo reported 66 cases per 100,000 populations in week 38. Sheka and Konta special woreda reported the second and third highest

cases with 68 and 47malaria cases per 100,000 populations in the week respectively.

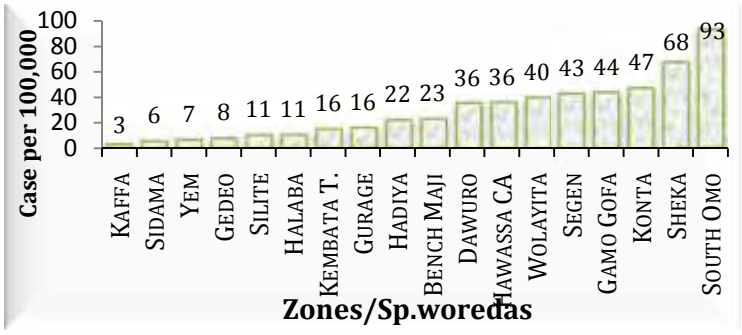

Fig.3: Malaria cases per 100,000 populations by zones/Sp.woredas in SNNPR, week 39, 2016

Among woredas, Dasenech woreda from South omo zone reported the highest malaria case in the week with 206 cases. The woreda reported 33 and 37 cases in week 37 and 38 respectively. Salamago and Burji woreda are among top three woredas in the week with 171 and 111 cases in the week respectively. (See fig 4).

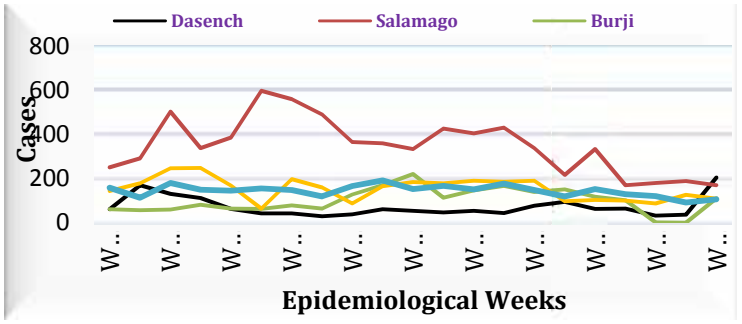

Fig.4: Trend of malaria cases in five highest reporting woreda in SNNPR, Week 39 in 2016.

In the last one month, Salamago reported the highest malaria case in the region with 713 cases. Yeki woreda and Arba Minch town reported the second and third highest malaria case with 504 and 449 cases.

S.NO.	WOREDAS	WK 36	WK 37	WK 38	WK 39	TOTAL
1	Salamago	171	181	190	171	713
2	Yeki	77	194	174	59	504
3	Arba Minch town	130	121	92	106	449
4	Uba Debretsahay	101	88	128	110	427
5	Hawassa city	90	100	112	80	382
6	Shone town	93	71	113	100	377
7	Arba Minch zuria	91	76	97	85	349
8	Dasench	65	33	37	206	341
9	kucha	70	92	105	73	340
10	Hamer	70	69	86	94	319

Table 37: Top 10 woredas with highest malaria case in last one month, SNNPR, week 39,2016.

2. Meningitis

In this week, 15 suspected meningitis cases with zero death were reported in the region. The cases are reported from Sodo Hospital (5), Adare Hospital (3), Hawassa referral Hospital (3), Bona Hospital (2), Dilla Hospital (1), and Kele Hospital (1). The number of meningitis cases increased by 11compared to week 38 (4 cases were reported in week 38).

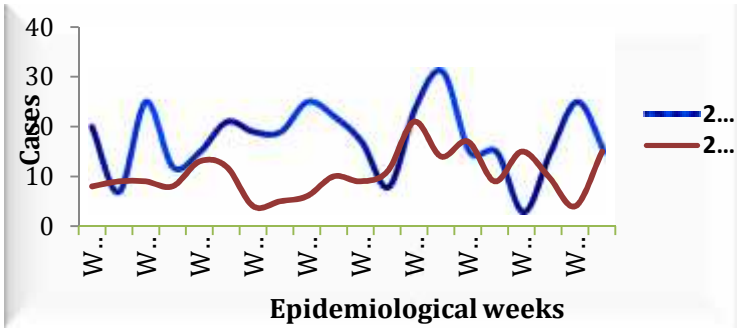

Fig.5: Trend of suspected meningitis cases over the last 19 weeks in SNNPR, week 39, 2016.

3. Dysentery

There was a total of 620 reported cases of dysentery with zero death in this week. Only one case was in patient cases. The number of dysentery cases increased by 102 as compared to the previous one week (518 cases were reported in week 38).

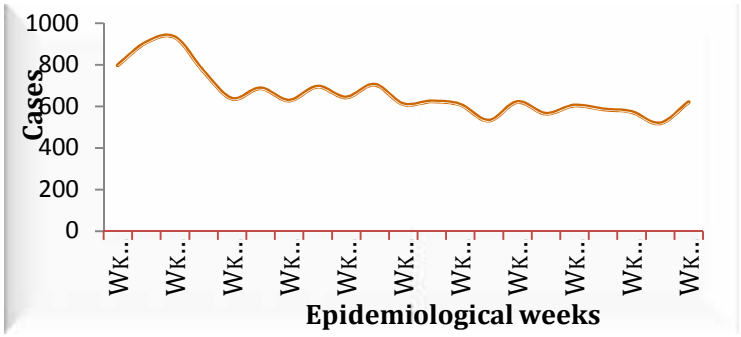

Fig. 6: Trend of dysentery cases for the last 20 weeks, SNNPR, week 39, 2016.

During the week, Yirgalem town reported the highest number with 94 dysentery cases followed by Amaro woreda and Hawassa city with 50 and 24 cases respectively in the region.

4. Severe Acute Malnutrition

A total of 681 severe acute malnutrition (SAM) cases were reported in the region. Of these 599 were outpatient and 82 were inpatient cases with four deaths during the week. Each death was reported from Dilla Hospital, Jinka Hospital, Hawassa referral Hospital, and Salamago woreda.

Generally, the number of SAM cases increased at the regional level by 68 when compared to week thirty eight (n= 613). As shown in figure 7, the outpatient SAM (OTP) case increased in the week by 73 compared to week 38. However, the number of inpatient SAM (SC) case has decreased by 5 in the week.

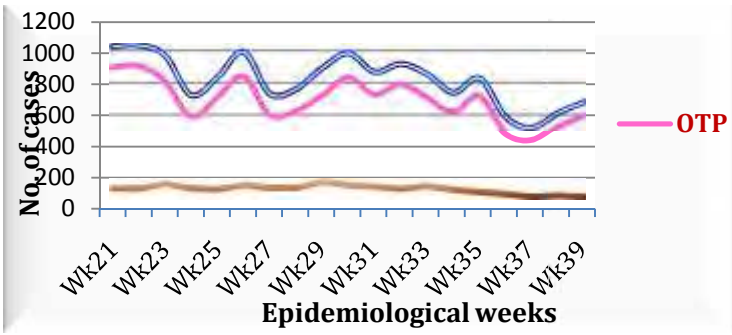

Fig.7: Trend of Severe Acute Malnutrition (SAM) cases over the last 19 weeks in SNNPR week 39, 2016.

Figure 8 depicts that Gedio zone reported the highest number of SAM cases (n= 139) followed by Sidama and Gamo gofa zone with 129 and 98 case in the week.

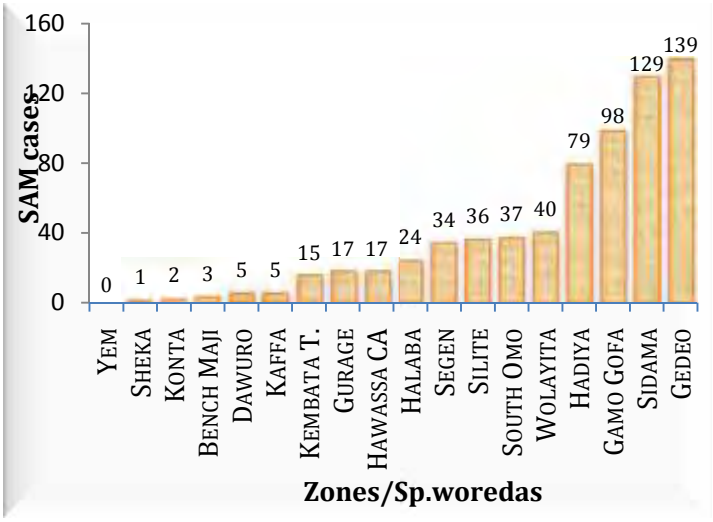

Fig. 8: Number malnutrition cases by zones/ Sp.woredas, SNNPR, week 39, 2016.

When disaggregated by woreda, Yirgachefe woreda, Wonago, and Kemba, are top threes for SAM cases during the week in the region with 36, 27, and 24 cases respectively.

5. Measles

In the last 39 weeks (9 month) in 2016, none measles febrile rash (NMFR) rate has been attained 1.6 per 100,000 populations at regional level while the target is 2 or more NMFR rate.

Eight zones/ special woredas namely Konta, Hawassa, South Omo, Kaffa, Silite, Basketo, Sidama and Guraghe have achieved 2 or above NMFR rate in the last 9 month. While Gamo gofa, Halaba, Sheka, Segen, Wolayita and Hadiya achieved far below the target (less than 1 NMFR rate) in the last 9 month.

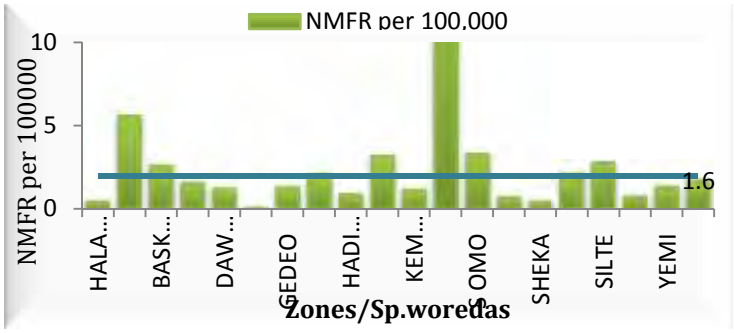

Fig. 9: None measles febrile rash rate per 100,000 population by zone/special woreda in SNNPR, week 39, 2016.

A total of 88 (58%) woredas have sent at least one suspected measles sample in the last 39 weeks (9 months) in the region while the target is 80 % of the woredas are expected to send at least one suspected measles case with blood specimen. As the figure 10 below illustrates, More than 80% of woredas in Gedio zone, Sidama zone, Guraghe zone and all special woredas have sent least one measles sample.

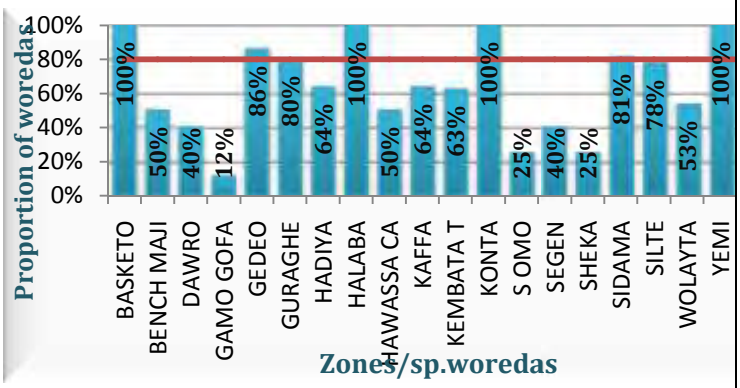

Fig. 10: Proportion of woredas reported at least one suspected measles case with blood specimen by zone/sp.woredas, week 39, 2016

Gamo gofa zone performs the least among other zones/special woredas in the region. Only 2(12%) among 17 woredas in the zone have sent at least one measles sample in last 9 months.

Considering the remaining three months ahead in 2016, improving active case searching is necessary in zones/special woredas where the measles surveillance is unsatisfactory.

6. AFP

During the week, one AFP case was reported in the region. The case was reported from Chena woreda, Kaffa zone.

7. AWD

Active AWD outbreak is ongoing in Wondo genet woreda, Hawssa town and Meskan woreda in the region during the week.

8. Anthrax

One anthrax case was reported from Aman Hospital, Benchi Maji zone.

9. Maternal Death

Zero maternal death was reported in the region in the week.

10. No case or death of NNT, yellow fever, AHI, SARS, Pandemic influenza, Viral Hemorrhagic Fever, Guinea worm, Smallpox, and Rabis reported in the region in this reporting period.

Preparedness

RHB in collaboration with save the children conducted second round PHEM basic training for 24 PHEM officers from selected Woredas and Zones of the Region in west part. The training is provided for five days from Oct. 03 to 07, 2016 at Butajira town. In total 88 PHEM officers has been trained recently in two rounds with the aim to strengthen the capacity of the PHEM system at Woreda and Zone level where there is a gap in implementing its activities.

Contact us:
Email: phemsnnpr@gmail.com
Tele: 0462120281

Your comments will have a significant role in improving our bulletin!

About this newsletter:

The PHEM bulletin is the weekly bulletin of the south Nations nationalities and People's Regional State Health Bureau, Public health emergency management core process. It is prepared and disseminated on a weekly basis.

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: Daniel Tamirat Dinku

Signature _____

Place: South Omo Zone Health Department, SNNPR

Date of Submission: June 26, 2017

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

Name of advisor: Mr.Abdulnaser Abagero

Signature: _____

Date _____