



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

Ethiopia Field Epidemiology Training Program [EFETP]

Compiled Body of Work in Field Epidemiology

BY

[DEGU BELACHEW]

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

June, 2017

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List of abbreviations

AFI	Acute Febrile Illness
AFR	African Region
AIDS	Acquired Immune-Deficiency Syndrome
ANC	Antenatal care
AR	Attack Rate
ART	Anti-retroviral treatment
AWD	Acute Watery Diarrhea
BCG	Bacille Calmette Guerin
BSc	Bachelor of Science
CBN	Community based nutrition
CDC	Center for Disease Control & prevention
CDR	Crude Birth Rate
CDS	Communicable Diseases Surveillance
CFR	Case Fatality Rate
CI	Confidence Interval
CTC	Cholera Treatment Center
DOT	Directly Observed Therapy
EFETP	Ethiopian Field Epidemiology Training Program
EPHA	Ethiopian Public Health Association
EPHI	Ethiopian Public Health Institution
EPI	Extended program on immunization
EPTB	Extra pulmonary Tuberculosis
ETB	Ethiopian Birr
HB	Health Bureau
HC	Health Center
HD	Health Department
HDA	Health Development Army
HEW	Health extension worker
HF	Health Facility
HIT	Health Information Technology

HIV	Human Immune-deficiency Virus
HMIS	Health Management Information System
HSDP	Health Sector Development Plan
IDSR	Integrated Disease Surveillance and Response
IP	Incidence Proportion
IRC	International Rescue Committee
IRS	Indoor Residual Spraying
ITN	Impregnated Treated Net
LAFP	Long Acting Family Planning
LLIN	Long lasting Insecticide treated net
M&E	Monitoring & Evaluation
MAM	Moderate Acute Malnutrition
MCH	Maternal and child health
MDR	Multiple Drug Therapy
MMWR	Morbidity and Mortality Weekly Report
MOH	Ministry of Health
NGO	Non-Governmental Organization
ODF	Open Defecation Free
OHT	One Health Tool
OPD	Outpatient department
OPV	Oral polio vaccine
OR	Odds Ratio
ORS	Oral Rehydration Syrup
OTP	Outpatient therapeutic program
P/Neg	Pulmonary Negative
PCV	Pneumococcal Conjugated Vaccine
PF	Plasmodium falciparum
PHEM	Public Health Emergency Management
PICT	provided initiated counseling and testing
PLWHIV	Peoples living with HIV
PMTCT	Prevention of Mother to Child Transmission

PNC	Postnatal care
PTB	Pulmonary tuberculosis
PV	Plasmodium vivax
RDT	Rapid Diagnostic Test
RHB	Regional Health Bureau
RRT	Rapid Response Team
SAFP	Short Acting Family Planning
SAM	Severe Acute Malnutrition
SC	Stabilizing Center
SD1	Shigella dysenteriae type 1
SIAS	Supplementary Immunization Activities
SNNPR	Southern, Nation, Nationalities and Peoples Region
TB	Tuberculosis
TFU	Therapeutic feeding unit
TSF	Therapeutic Supplementary feeding
TT	Tetanus Toxoid
UNAIDS	United Nation Acquired Immune Deficiency Syndrome
UNICEF	United Nation Children Fund
UNICEF	United Nation Children's Fund
VCHW	Volunteer Community Health Worker
VCT	Voluntary counseling and testing
WASH	Water, Sanitation & Hygiene
WHO	World Health Organization
ZHD	Zone Health Department

Summary

This document contains all outputs which are accomplished in residency periods in field epidemiology training program. This body of works is compiled as per the format provided by the program and submitted to graduate school of public health for partial fulfillment of Master Degree in Field Epidemiology. The document is organized by nine chapters consisting expected outputs produced through the two year in-service training process. Chapter one contains two outbreak investigation reports. The two studies conducted on Measles and Cholera outbreaks using case-control study design. Chapter two also contains report of surveillance data analysis which is conducted on four years aggregated dysentery surveillance data, collected by weekly case based surveillance reports in Southern Nations, Nationalities and Peoples (SNNP) region. Surveillance system evaluation report is also included in chapter three. The public health surveillance system evaluation has been conducted in Sodo zuria district health office, Wolayita zone. Chapter four addresses assessments of Humbo district health profile description. Similarly, chapter five contains scientific manuscript for peer reviewed journals. One manuscript is prepared on the acute watery diarrheal outbreak. In chapter six, two abstracts are presented which are written on Measles outbreak investigation and dysentery surveillance data analysis. Conducting disaster situation assessment and preparing narrative summary report is one of the outputs expected from the residents. I participated in human health and nutrition assessment in Hadya zone and the narrative report is prepared and included in chapter seven. Epidemiological research proposal entitled with ‘assessment of latrine utilization and associated risk factors among rural households in Dara district, Sidama zone’ is also dumped in chapter eight. The last chapter (chapter nine) contains one additional output which is public health emergency weekly bulletin prepared on week 42, 2016 PHEM report of Southern Nation, nationalities and peoples regional state.

CHAPTER I – OUTBREAK INVESTIGATIONS

1.1. Measles Outbreak Investigation, Tello Woreda, Kefa Zone, SNNPR, Ethiopia, 2016

Abstract

Background: Measles is respiratory disease caused by measles virus and spread through droplets of patients. Approximately 20 million people are affected by measles every year worldwide with the highest numbers in Africa. According to World Health Organization' report 14,100 confirmed cases have been reported from Ethiopia in 2014. According to national guideline on Measles, approximately 15% of vaccinated children at nine months of age fail to seroconvert, and are thus not protected after vaccination. In February 2016, Telo district reported increased number of persons with fever, and generalized maculopapular rash. We investigated to confirm the outbreak, identify risk factors and implement control measures.

Methods: We employed 1:2 unmatched case-control study designs. We collected data by interviewing using questionnaire. We interviewed parents behalf of patients & controls whose age was not appropriate for enquiring. We used case definition as per stated in national Measles guideline. We collected specimens and tested at regional laboratory. We analyzed the data using Epi-Info & ArcGIS.

Results: Three kebeles were affected. A total of 68 Measles cases, 30 (44%) male and 38 (56%) female identified. All patients were under 15 years and 58(85%) of them were under 5 years of age. Attack Rate was 1.3%, of this 2.5% was among less than one year old, 27 (40%) of patients were not vaccinated with measles. A measles vaccination dropout rate in affected kebeles was high (44, 13 & -23 of the three kebeles). Three Tested samples are all positive for measles (IgM). Travel history to affected areas (AOR 9.7; 95%CI: 1.7 – 55) and unvaccinated (AOR 4.4; 95%CI: 1.6 – 11.6) were statistically significantly associated risk factors for the infection and age group greater than five years was protective factor(AOR=0.18, 95%CI: 0.05 – 0.66).

Conclusion: This investigation confirmed an outbreak of measles and unvaccinated against measles and travel history to affected area were significant risk factors for contracting measles. We recommended supplementary immunization and strengthening the routine vaccination.

Keywords: Measles outbreak, Telo district, Kefa zone, Ethiopia

Introduction

Measles is highly contagious acute viral disease characterized by fever of $>39^{\circ}\text{C}$, coryza, cough, conjunctivitis, enanthema (Koplicspote) on the buccal and labial mucosa, and maculo-papular rash appearing on the body over a period of 3 days. The causative agent of the disease is measles virus, a member of the morbillivirus genus in the paramyxoviridae family. Measles virus is sensitive to ultraviolet light, heat & drying. The virus has short survival time, less than 2 hours in air or on objects and surfaces. Transmission is primarily person to person via droplet spread, direct contact with nasal or throat secretions of infected person and human beings are the only reservoir to the measles virus. The incubation period is approximately 10 to 12 days from exposure to the onset of fever and 7 to 18 days from exposure to the onset of rash. It can be transmitted one to two days before fever onset and four days before and after rash onset. About one-third of the cases are followed complication caused by disruption of epithelial surface and immunosuppression. The highest case fatality rate occurs in children under the age of five. The survivors may left with long life disabilities including blindness, deafness, or brain damage and have no specific treatment, but only supportive care and prevention. Infant born to mothers who have either had measles or been vaccinated are immune and protected until 5 to 9 months. Following natural infection and effective vaccination of measles is believed to be life-long immune. But, approximately 15% of children vaccinated at 9 month of age and 5% of those vaccinated at 12 month of age fail to seroconvert and are thus not protected after vaccination. As the result of this, susceptible children may accumulate over time and outbreaks may occur in well vaccinated communities. Thus, due to the high transmission efficiency of measles, outbreaks have been reported in population where only 3% to 7% of the individuals were susceptible. (1)

More than 20 million people are affected by measles every year worldwide. According to WHO, approximately 145,700 people died from Measles in 2013. (2)

The majority of this problem takes place in the poorest countries, particularly in sub-Sahara Africa, where a combination of factors contribute substantial to the high case fatality rate Lack of immunization service, vaccine failure, low herd immunity, maternal immunity, malnutrition, vitamin A deficiency, and recurrent draught are some risk factors for measles infection.(3)

The member states of the world health organization's African Region (AFR) have set goals for Measles elimination by 2020.To prevent large measles outbreaks and ultimately reach measles

elimination goals by 2020, vaccination strategies must be implemented to achieve and maintain uniformly high 2-dose MCV coverage to reach the 93% to 95% population immunity threshold that can provide herd immunity in a country. (4)

Recognizing the burden of measles infection and to achieve the AFR goals, remarkable prevention and control intervention have been undertaken in Ethiopia. Regardless of the quality of cold chain national vaccination coverage has reached 90.3% in 2015. (5)

Despite high vaccination coverage measles outbreak occurs in different parts of the country every year. According to the WHO member state report of 2015, 14,100 confirmed cases of measles has reported from Ethiopia in 2014. (6)

Southern nation nationalities and peoples region is one of the regions which are experiencing measles outbreaks. For instance, according to two years regional aggregated surveillance data analyzed by field epidemiology graduate, a total of 32,005 suspected measles cases and 43 deaths were reported from 2010 to 2011. (7) Kafa zone was highly affected area during the epidemic. A total of 2866 measles cases with 7 deaths have been reported from the zone, and the distribution of outbreak was covers wide areas, 7 of 11 districts were affected. (8)

On Feb 15/2016, measles outbreak has been occurred in Tello district and notified from Kefa zone to regional health bureau. The regional outbreak response team was prepared and deployed to the site to investigate the outbreak.

Objectives

2.1. General Objective: The objective of the investigation was to confirm the outbreak and identify possible risk factors for control and prevention measures of the outbreak in Tello district, 2016.

2.2. Specific Objectives:

- To verify the Measles outbreak in Tello district
- To determine the Risk factors for the outbreak
- To describe the outbreak in terms of place person and time.
- To recommend control and prevention measures

Methods and materials

3.1. Study setting and period: The investigation was conducted in Kefa zone which is one of the 19 zones of Southern nationals, nationalities and people's regional state. The capital city of the zone, Bonga town, is about 460 km far from Addis Ababa to the south west of Ethiopia and 550 km from regional town, Hawassa to the west. The zone has 10 districts and one city administration. The total population of the zone was 1,089,867 during investigation period.

The investigation was conducted on February 17 to 21/2016

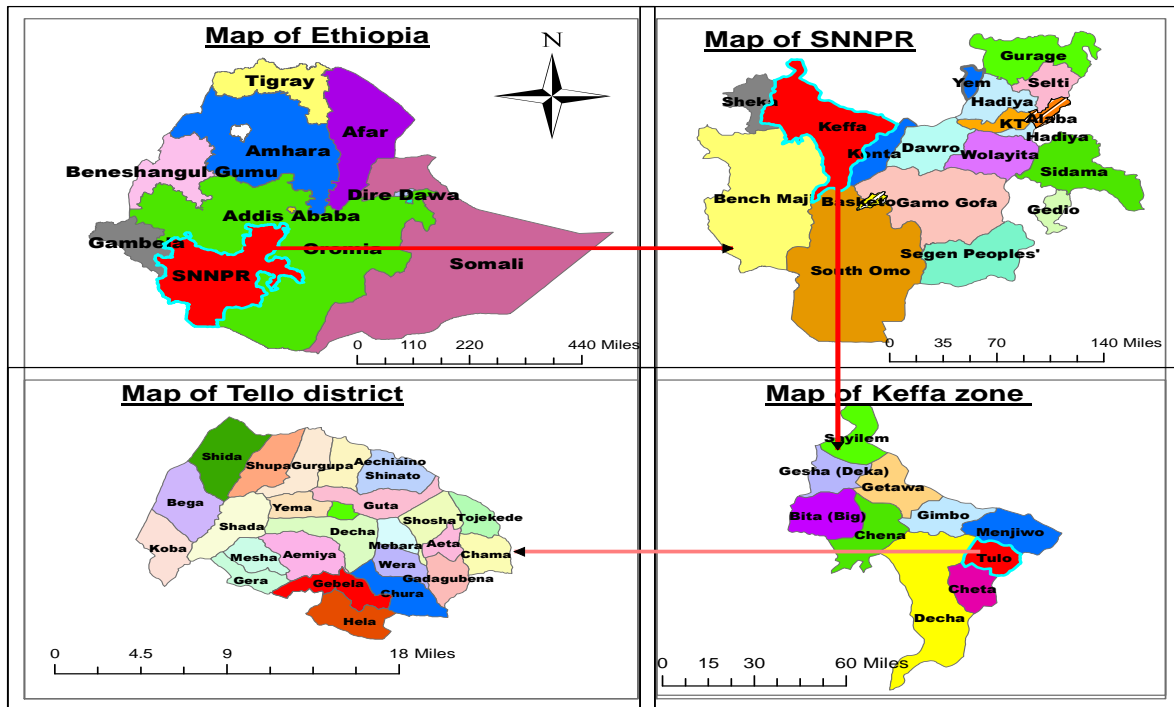


Figure 1.1-1: Area where Measles outbreak investigation conducted, Tello, Kafa, 2016

Tello district is one of the affected districts with measles outbreak in the zone by the year of 2016. The district is 45 km far from Zonal town, Bonga on the south east direction. The district administered with 25 rural kebeles with a total population of 78,565. In the district there were 4 health centers and 25 health posts. The distributions of health professional were 3 health officers, 2 Bsc nurse, 19 all type nurses, 8 Midwifery nurses and 3 laboratory technicians. The district is bordered on the north & northeast by Adiyo district, on the east-southeast by Konta special district, on southwest by Cheta district and on northwest by Decha district (Fig 1.1-2). According to district's agricultural office, agro-clemently, 95% of the district is highland.



Figure 1.1-2: Map of Keffa zone shows affected district [Telo] and neighboring zones, 2016

3.2. Study designs: Descriptive followed by case-control designs conducted. Descriptive study was conducted by reviewing health records and discussing with respective health staffs and community members. We assessed and reviewed immunization coverage, vaccine storage, vaccination schedule, monitoring chart, immunization cards & registrations and reports at health center and health post levels. Using line listed cases we described the distribution of disease by place, person and time. Unmatched case-control study was conducted by recruiting 35 cases (51% of total cases) and 70 controls to identify risk factors for the outbreak. Case-control design was chosen because it enables to explore a wide range of multiple exposures for a single outcome (case), easy to conduct in undefined population; it is quick & inexpensive and has few ethical problems.

3.3. Case definition:

Suspected case: Suspected measles case was defined as a person with fever, generalized maculopapular rash and at least one of the following; cough, coryza or conjunctivitis who was resides any of the three affected kebeles during outbreak period.

Confirmed case: A suspected measles case that is laboratory confirmed (IgM positive)

Epidemiologically linked case: A suspected case that does not have a serological confirmation but is linked (in place, person & time) to a laboratory confirmed case.

Controls: We defined controls as individuals that have similar age groups and residency with that of the cases except they had no outcome (measles infection) on the date of data collection.

3.4. Case finding: We found active cases that come to health center for seeking treatment and controls also found at their home from kebeles where cases have been come from.

3.5. Data collection: Data collected by interviewing using questionnaires. Training was given for five data collectors (who are health professionals) about the questionnaires and how to collect data from cases and controls. Data was collected by face to face interviewing of mother, father or other elderly behalf of cases and controls whose age was not appropriate for inquiring. We interviewed all active cases who came to health center seeking treatment during study period. 51% of total cases had been interviewed, no any case jumped or left to be interviewed with in a study period. 33 cases were occurred before study started.

3.6. Laboratory investigation: Three blood serum samples were collected and sent to regional laboratory center for confirmation.

3.7. Data analysis: analysis of the data was performed using Epi Info software, version 7. Measles specific attack rate (AR), crude and adjusted odds ratio (OR) with confidence interval (CI) 95% were calculated for exposures among cases and controls.

Results

4.1. Descriptive findings: A total of 68 measles cases were reported within one week, from Feb 14 to 21, 2016 from three kebeles, namely Hala, Chura & Gebela (fig 1.1-5). 38 (56%) and 30 (44%) of the cases were female and male respectively. All cases were under 15 years of age.

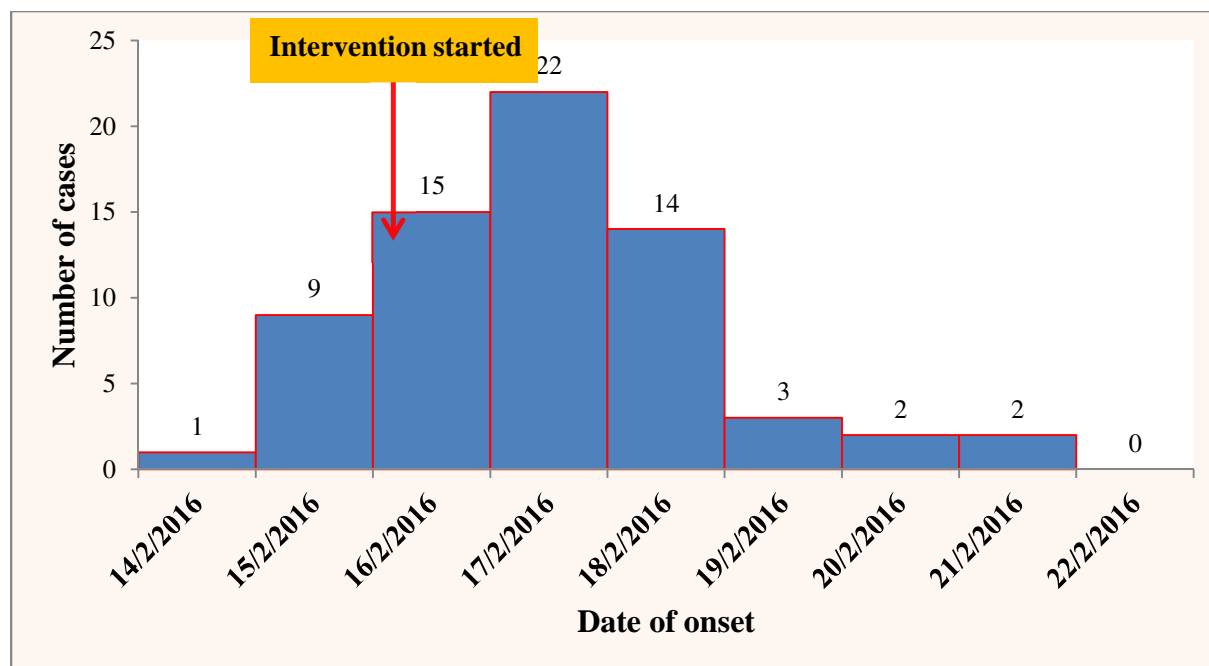


Figure 1.1-3: Measles cases by date of onset, Tello district, Kafa zone, Feb/2016

As indicated on the above Epi-curve, the incidence was peaks on 17/2/2016 that was one day after interventions started and then gradually declined.

The number of cases was higher in 1-4 years of age and lower in 5-14 age groups that were, 17% (< 1year of age), 68 % (1-4 years of age) and 15% (5-14 years of age). The crude attack rate among total risk populations was 1.3% in a week. But age specific attack rate was higher in age group less than one year (2.5%) followed 1-4 years of age groups (2.0%) and least was in the age group of 5-14 (0.4 %). In general 85% (N=58) cases were below 5 year of age. There was no any death occurred due to outbreak.

Table 1.1-1: Age specific measles cases and AR in 3 affected Kebeles, Tello district, 2016

Age group	Risk population	No of cases	%	Cumulative %	AR/100
<1 year	473	12	17	17	2.5
1-4 years	2314	46	68	85	2.0
5-14 years	2376	10	15	100.0	0.4
Total	5163	68	100	-	1.3

The smallest and largest age of cases was 2 months and 13 year respectively. The median age of cases was 2 years.

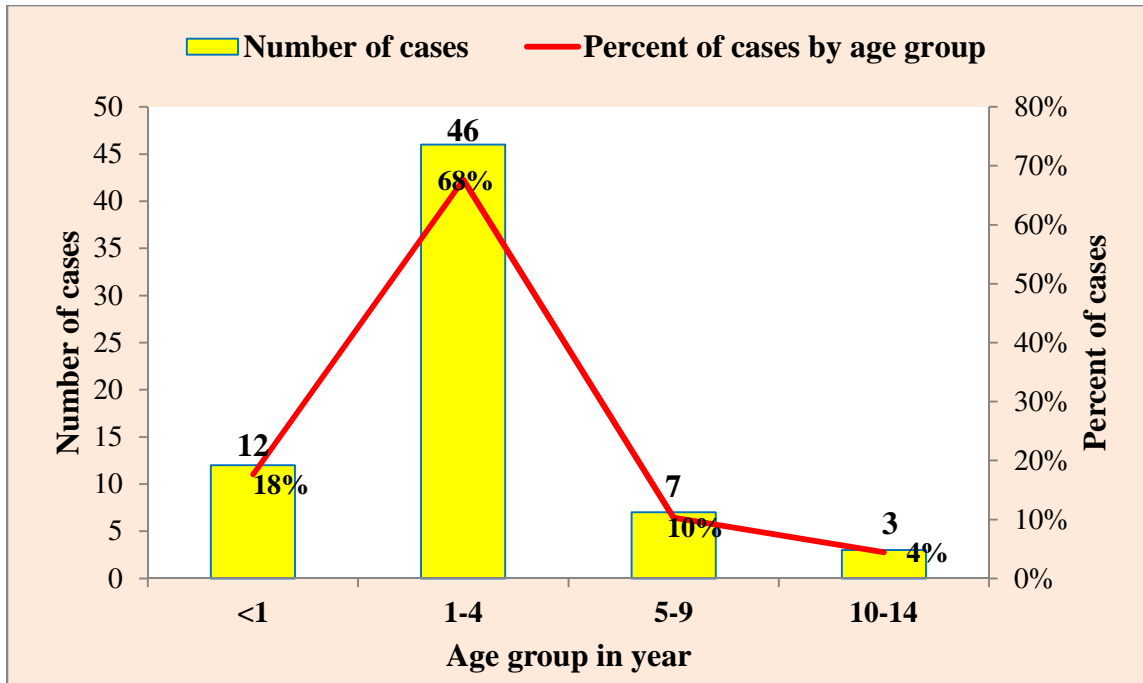


Figure 1.1-4: Measles cases by age group, Tello district, 2016

Among affected kebeles, more cases were occurred in Hala Kebele, 79% (N=54) and least cases were reported from Gebala, 6% (N=4).

By kebeles, higher attack rate was occurred in Hala Kebele (1.2%). The attack rate of Chura and Gebala were 0.2% and 0.1% respectively.

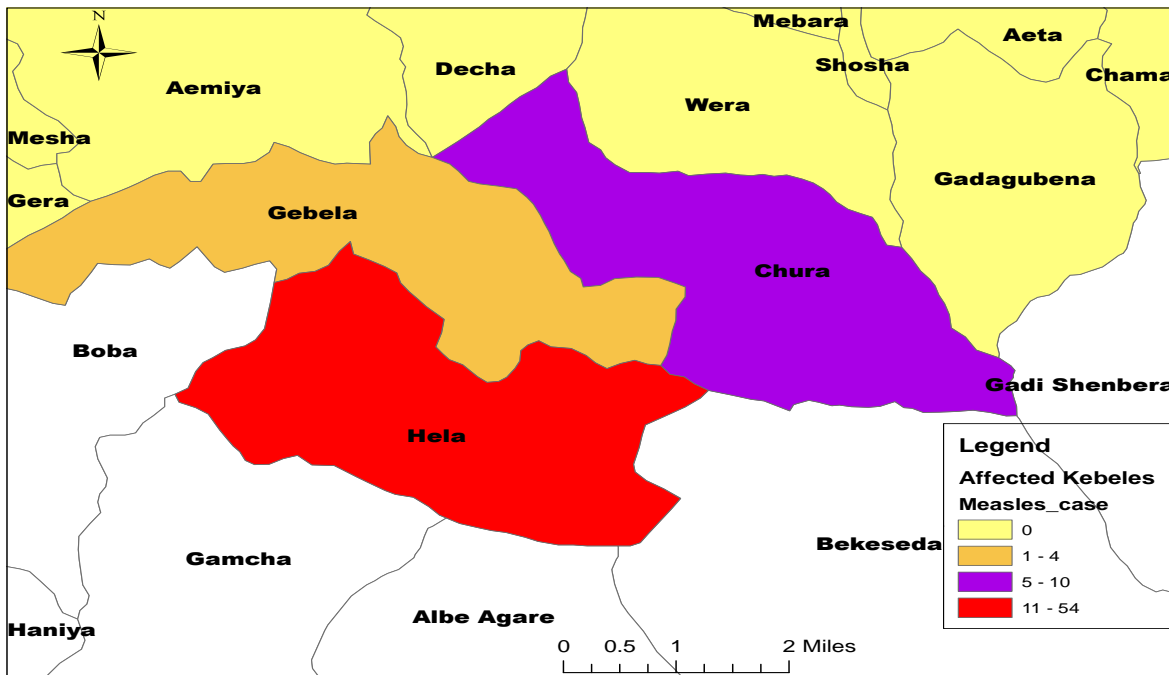


Figure 1.1-5: Spot map of Measles cases in 3 Kebels of Tello districts, Kafa zone, 2016

Among the total reported cases, 40% (N=27) of them were not vaccinated against measles. Through other observations and risk assessments, different health service gaps and challenges have been identified that might be predisposing factors for occurrence of the outbreak in the area. Higher Measles vaccination Dropout Rate (DOR) of the affected kebeles, unavailability of refrigerators in a health center, difficulty of topography to travel, far distance of vaccination sites from health facilities, far distance of health center from woreda town to bring vaccine might directly or indirectly be contributing for occurrence of outbreak.

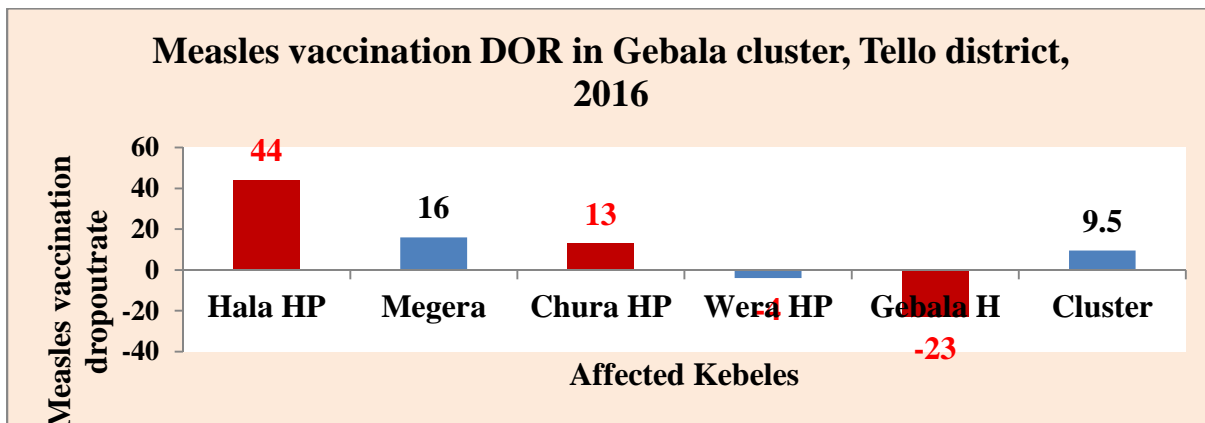


Figure 1.1-6: Measles vaccination dropout rate in Gebala cluster, Tello district, 2015/16

Table 1.1-2: Measles vaccination trend in Tello district, Kefa zone, 2016 EFY

Year(EFY)	Targeted children	Vaccinated	Coverage	Not vaccinated
2003	2263	1381	61%	882
2004	2329	2469	100%	0
2005	2398	2292	95.5%	106
2006	2468	2336	95%	132
2007	2540	2088	82%	452
2008 (7 month)	1462	1200	82%	262

In addition, we emphasized that the accumulation of susceptible individuals might be additional factor for outbreak. According to zone health department and woreda health office leaders, SIAs was not conducted for more than four years in the district, and then about 2817 individuals were accumulated being susceptible to measles during outbreak period. (Table 1.1-3)

Other observed risk factor of the outbreak was also epidemiological linkage with four adjacent kebeles, namely Bakesede, Albe-agare, Gamecha and Boba, which were affected by Measles outbreak before (Fig1.1-5). Tested samples are all positive for measles (IgM).

Table 1.1-3: Accumulated susceptible individuals for Measles, Tello Woreda, Kafa Zone, Feb. 2016

Year	Total population	Surviving infant (3.19%)	Routine Measles Vaccination coverage	No of children vaccinated (C*D)	No of children seroconverting (E*0.85)	No of children susceptible (C-F)	SIA coverage (%)	susceptible vaccinated on SIA (G*H)	susceptible immunized on SIA (I*0.95)	Remaining susceptible (G-J)	Accumulating susceptible
A	B	C	D	E	F	G	H	I	J	K	L
2003 EFY	70,947	2263	0.61	1381	1173	1090	0	0	0	1090	1090
2004 EFY	73,022	2329	1.06	2469	2099	231	0.92	212	202	29	1119
2005 EFY	75,158	2398	0.956	2292	1948	449	0	0	0	449	1568
2006 EFY	77,356	2468	0.946	2334	1984	483	0	0	0	483	2052
2007 EFY	79,619	2540	0.822	2088	1775	765	0	0	0	765	<u>2817</u>

*Source of data: Tello woreda's health office records, 2008 E.C.

4.2. Case-control study:

Unmatched study was conducted by recruiting 35 cases and 70 non-case/controls, of which 57% (N=60) and 43% (N=45) were females and males respectively.

On bivariate analysis for factors; odds of travel history to affected areas within 7-18 days before onset of symptoms 11.76 times [95%CI 2.38-58.14] more than who didn't travel, odds of contact history with someone else four days before rash onset was 4.89 times [95%CI: 1.36-17.6] more than persons didn't have contact history, and odds of unvaccinated was 4.2 times [95%CI: 1.80-9.91] more than vaccinated. Age group greater than 5 years of age was protective factor for the infection.

Table 1.1-4: Bivariate analysis for exposures of Measles infection, Tello district, 2016

Exposures		Cases (%)	Control (%)	COR (95%CI)	P-Value
Travel history to affected areas within 7-18 days before onset of disease	Yes	9 [25.71%]	2 [2.86%]	11.76 [2.38-58.14]	0.0003
	No	26 [74.29%]	68 [97.14%]		
Age group	>5	5[14%]	29[42%]	0.23[0.08-0.67]	0.005
	<5	30[86%]	41[58%]		
Contact history with other case four days before rash onset	Yes	8 [22.86%]	4 [5.71%]	4.89 [1.36-17.60]	0.009
	No	27 [77.14%]	66 [94.29%]		
Ever not vaccinated against Measles	Yes	24[68.57%]	24[34.29%]	4.20[1.80-9.91]	0.001
	No	11[31.43%]	46[65.71%]		

However, from a multivariate logistic regression analysis only three factors such as travel history to affected area and unvaccinated against measles were statistically significantly associated with infection, and age group greater than five years of age was protective factor. Contact history with other cases before four days of rash onset was not independent risk factor.

Table 1.1-5: Multivariate analysis for exposures of Measles outbreak, Tello, 2016

Risk factors	AOR	95%C.I.	P-Value
Travel history to affected areas within 7-18 days before onset of disease (Yes/No)	<u>9.7</u>	(<u>1.7</u> - <u>55</u>)	0.01
Age group (>5/<5)	<u>0.18</u>	(<u>0.05</u> - <u>0.7</u>)	0.009
Contact history with other cases four days before rash onset (Yes/No)	2.3	(0.5 - 10.5)	0.18
Ever not vaccinated against Measles (Yes/No)	<u>4.4</u>	(<u>1.6</u> - <u>11.6</u>)	0.003

5. Action taken

Nonselective vaccination of measles for children aged from 6 to 59 months (2067 children) has been given to prevent further transition of the disease. All targeted children were vaccinated during the campaign (100%). Supplementation of vitamin A and other supportive treatment was given to all admitted measles cases. Experts from zonal health department, district health offices and health facilities were deployed to the site and providing technical assistance. Health education was given to public at large at religious places, schools, markets and other population gathering areas. Health extension workers & other health personnel were going house to house for active cases searching and community awareness creation.

Discussion

The strategy for sustained reduction measles morbidity and mortality in national measles guideline indicates that > 90% routine vaccination coverage at nine months of age will be needed to prevent measles transmission among population. [1] Measles outbreaks are expected in communities where there is inappropriate vaccine handling or storages, high susceptible individuals and low vaccination coverage. (9)

Despite the global progress, some populations remain unprotected. An estimated 20 million children worldwide did not receive the first dose of vaccine in 2011. More than half of these children live in five countries: the Democratic Republic of the Congo (DRC) (0.8 million), Ethiopia (1 million), India (6.7 million), Nigeria (1.7 million) and Pakistan (0.9 million). (10) Likewise this study finding revealed that unvaccinated against measles was most likely associated with the infection.

Children vaccinated via routine vaccination might fail to seroconvert, and then unless they get second opportunity of vaccination, they may not be protected against measles. SIAs were not conducted for more than 4 years in the district. This left many young and older children (2817) susceptible for measles infection. In addition, the routine vaccination coverage of Measles in Tello districts during outbreak period was 82%, which is lower compared to national target, 90% (12). Measles vaccination dropout rate in affected Kebeles was also very high, that was, 44 in Hala, 13 in Chura and -23 in Gebala kebele. Serological study conducted in Addis Ababa city reveals that 21% of children with age of 9-23 months with vaccination history were fail to seroconversion of measles vaccine. (13) Other studies suggested that, with proportion of unvaccinated individuals as low as 4.3%, minor outbreaks are expected to occur with increasing

attack rate around this threshold. (14) Compared to study conducted in Borena zone, the result of this study revealed that age-specific attack rate of age less than 5 years of age had significantly higher than those aged 5 years and above.(15) Similarly, the attack rate of this outbreak was higher among children under five years of age. Other study conducted on herd immunity showed that as community immunity decreased, measles disease can transmit easily from affected areas to new susceptible communities. (16) The same way, the statistical evidence of this study reveals that most cases were having travel history to affected area.

Limitations of the study

Vaccination history was collected based on individual recall, thus there might be recall bias from the respondents. Contacts with asymptomatic cases are difficult to recognize those cases could perceive as they had no contact history with suspected or confirmed measles cases. More over short duration of investigation time was the main limitation to detect new cases and follow controls that might develop measles after one or two weeks.

Conclusion

The current outbreak occurred in the remote pocket of the district where there was none reassuring immunization services and such remote areas are usually difficult to reach with routine immunization services. The investigation revealed that unvaccinated and epidemiological linkage with areas affected by measles outbreak was statistically significantly associated risk factors for the occurrence of the outbreak.

Recommendation

District health office should give emphasis for hard to reach areas to strengthen routine vaccination and should provide secondary opportunity for vaccination through supplementary immunization or by routine vaccination program. The district health office should also provide refrigerator for health center.

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1.2. Investigation of Cholera Outbreak, Dara Woreda, Sidama Zone, SNNPR, Ethiopia, 2016

Summary

Introduction: Cholera is acute bacterial infection caused by ingestion of food or water containing vibrio cholera either O1 or O139 serogroups. Worldwide, 3 to 5 million cases and 100,000 to 120,000 deaths reported per year. The case fatality rate, if untreated may reach 30-50%. An intermittent common source of cholera outbreak was occurred in Dara district during the beginning of July to the end of August 2016. We conducted an investigation to confirm the outbreak, assess magnitude, identify risk factors and implement control measures of the outbreak in Dara district, Sidama zone, south Ethiopia, 2016.

Method: Unmatched case control study was conducted by recruiting 51 cases and 102 controls with 1 to 2 ratios. A case was a person aged 5 years or more with acute watery diarrhea with or without vomiting. We collected data by using structured questionnaires and we analyzed the data using excel, Epi Info version 7 and ArcGIS 10.1. Water samples from four different sources and nine stool samples from patients were collected and tested.

Result: A total of 220 cases with one death (CFR 0.45%) were reported. Overall attack rate was 0.23% from 18 affected kebeles. Most cases were occurred from people settled along Legedara River. Sixty six (30%) of cases were in the age group of 25-34 years and 37(56%) of them were females. But in overall, both sexes were equally affected by the disease. Multivariate logistic regression analysis indicated that eating food outside the home (OR: 2.73; 95%CI: 1.06 – 7.03), and travel history to affected area before 5 days (OR: 3.66; 95%CI: 1.56 - 8.59) were statistically associated risk factors for the outbreak. Nine tested stool samples were all positive for vibrio cholera O1, Ogawa serotype. Legedara River and one spring were positive for total & fecal coliforms.

Conclusion & recommendation: This investigation confirmed an outbreak of AWD caused by V. cholera serotype Ogawa and we identified eating outside the home and travel history to affected area as significant risk factors for contracting the disease. We recommended provision of safe water supply and improvement of sanitation and hygiene condition is required to prevent the disease in the future.

Introduction

Cholera is a diarrheal disease caused by a bacterial infection of the intestine. The bacterium is vibrio cholera, which can either be of type o1 or o139. Only about 20 percent of those infected develop cholera, and of these, between 10-20 % can develop severe watery diarrhea with vomiting. If people are not promptly and adequately treated, the loss of large amount of fluid and salt can lead to severe dehydration and death within hours. The case fatality rate (CFR) if untreated may reach 30-50% [1].

Cholera 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 [2].

Cholera is usually transmitted through faecally contaminated water, food and hands. Outbreaks can occur where water supply, sanitation, food safety and hygiene are inadequate. The greatest risk occurs in over-populated and refugee setting. Because the incubation period is very short (2 hours to 5 days) the number of cases can rise quickly. But adequate level of public sanitation, safe water supply and personal hygiene will inhibit its transmission [3].

Cholera is on the rise with an estimated 3 to 5 million cases and 100,000 to 120,000 deaths per year worldwide [4]. The world is now experiencing its seventh cholera pandemic. In this era, between 1970 to 2011 African countries reported 3,221,050 suspected cholera cases to the World Health Organization, representing 46% of all cases reported globally. In 2011, 58 countries reported a total of 589,854 cases and 7816 deaths to 'WHO' worldwide. Of these, Africa accounted for 86% of cases and 99% of deaths [5].

According to WHO outbreak news of 2017, more than 25 African countries had been affected since 2000. In recent time many African countries are affected by the disease, for example united republic of Tanzania had been reported 9,871 and 24,108 cases in 2015 and 2016 respectively. In 2015, Democratic Republic of Congo was highly affected, with a total of 38,410 cases reported to World Health Organization. But Ethiopia was not mentioned in that news [6].

In Ethiopian, like most other developing countries, cholera is a major public health concern. In 2006 and 2007, there were more than 110,000 cholera cases and 1200 related deaths. Continuing, according to WHO report on Cholera in 2009 there were 31,509 cases and 434 deaths in different region of the country [7].

According to SNNPR PHEM database, in 2007 a total of 17,398 cholera cases had been reported from different zones. More cases (7600 cases) were reported from Sidama zone, of this 2396 cases were occurred in Dara woreda of the zone.

On 9 July 2016, the Sidama zone health department was reported increasing number of cases of AWD in Dara woreda. Cases were first started in Wonago woreda of Gedeo zone and then became quickly spread to Dilla zuria woreda, Dilla town and Dara woreda of Sidama zone. The first case in Dara woreda was reported from Bedessa Kebele on 6 July 2016 and the frequency and distribution of the disease in the woreda was very fast and covers a wide area within a short period of time. As the result of this, Sidama zone health department requested the regional health bureau of Public Health Emergency management (PHEM) for assistance with investigation of an increased number of AWD cases. On July 16, 2016 a team from PHEM including field epidemiology residents deployed to the woreda. The aim of the investigation was to evaluate our hypothesis, to verify the outbreak, to identify risk factors and determine the causes for the increased number of cases in the woreda.

Objectives

General objective: The objective of the investigation was to verify the outbreak and assess the magnitude of the outcome by identifying risk factors associated with the infection and to suggest control measures in Dara district, Sidama zone, SNNPR, Ethiopia, 2016.

Specific objectives:

- To verify AWD outbreak in Dara woreda
- To assess the magnitude of the problem in the community
- To identify risk factors associated with the outbreak
- To suggest recommendations based on the findings

Methods and materials

Study period and setting: The investigation was conducted from July 16 to 31, 2016 in Dara woreda. Dara woreda is located in Sidama zone, Southern Nations, Nationalities and Peoples Regional state of Ethiopia. The woreda was organized by 36 administrative kebeles with a total population of 197,930 in 2016. The woreda is adjacent with Dila town, Gedeo zone and bordered with seven woredas, two from oromiya region, two from Gedeo zone and others from Sidama zone.

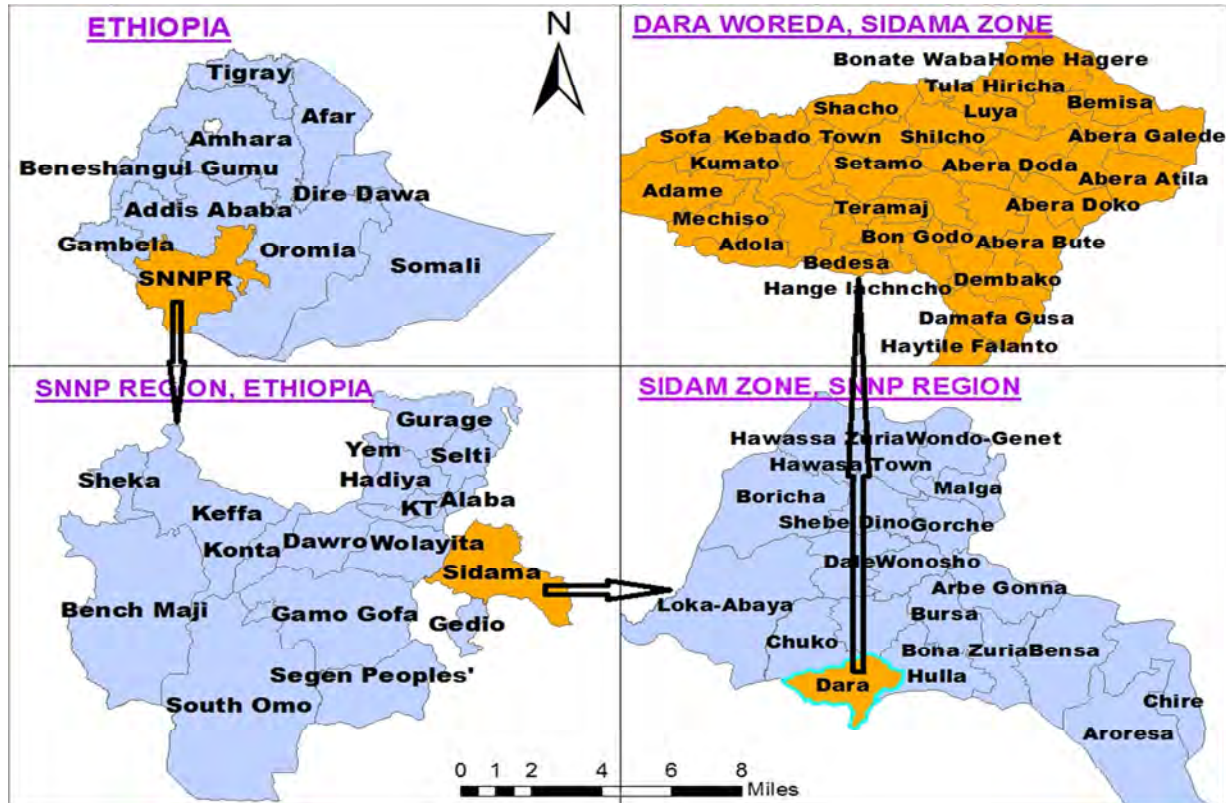


Figure 1.2-1: Location where AWD outbreak occurred, July 2016

Many residents in the woreda, who are in low economic level, are engaged in small scale trading and daily labor for their daily food requirement. According to Dara woreda administrator, approximately 10,000 peoples are move to Dilla town per day for their livelihood activities.

Study design: We conducted descriptive study followed by case control study. We used line list to describe the disease by place, time and person. Unmatched case-control study was also conducted by recruiting 51 cases 102 controls (1 to 2 ratios).

Study population: The study involved cases and controls. Controls were defined as a person aged 5 years or more without acute watery diarrhea and vomiting and who resides in or come from area affected by the outbreak.

Case definition:

Suspected case: was defined as any patient aged 5 years or more who had acute watery diarrhea, with or without vomiting and come from affected & nearby kebeles during data collection.

Confirmed case: a suspected case in which vibrio cholerae 01 has been isolated from his stool

Data collection: We collected data by interviewing all active cases came to CTC seeking treatment, and controls at their home using structured questionnaire. We collected sanitation, latrine utilization and safe water supply coverage by reviewing reports and records from woreda health and water & mineral energy offices. We assessed socioeconomic and types livelihood activity conducting in the district by discussing with woreda administrators. We obtained line listed cases from CTCs.

Environmental assessment: We assessed water sources, sanitation and hygiene conditions of the visited households and general environmental health conditions of the community.

Laboratory test: We collected stool specimens from a random sample of nineteen patients and water samples from four purposively selected water sources (River, unprotected spring, water reservoir and water treatment plant) and sent to the regional laboratory.

Data analysis: We described the outbreak by person, place and time. We calculated odds ratio with 95% confidence interval using Epi Info version 7. We calculated attack rate, case fatality rate and percentages from line listed cases using excel. We used ArcGIS 10.1 to show cases on spot map.

Ethical issues

Some patients were not willing full to respond for interview, so that informed consent and permission was sought from patients who admitted in CTC before the interviews.

Result

1.1. Descriptive epidemiology

Distribution of AWD by time

From July 6/2016 to august 24/2016, a total of 220 people with 1 death, case fatality rate (CFR) of 0.45%, were affected by cholera. The first case was occurred in Bedesa Kebele on 6/7/2016. The duration of outbreak was extended for more than a month and an intermittent common source outbreak was observed with multiple peaks (Fig 1.2-2).

The first peak was observed on 11th & 12th July 2016, and the other peaks were between 17th to 21th July. The sharp peak was occurred on July17/2016. There was a gradual decline in the

number of cases with irregular manner, thereafter, by the end of August; the outbreak was nearly its end.

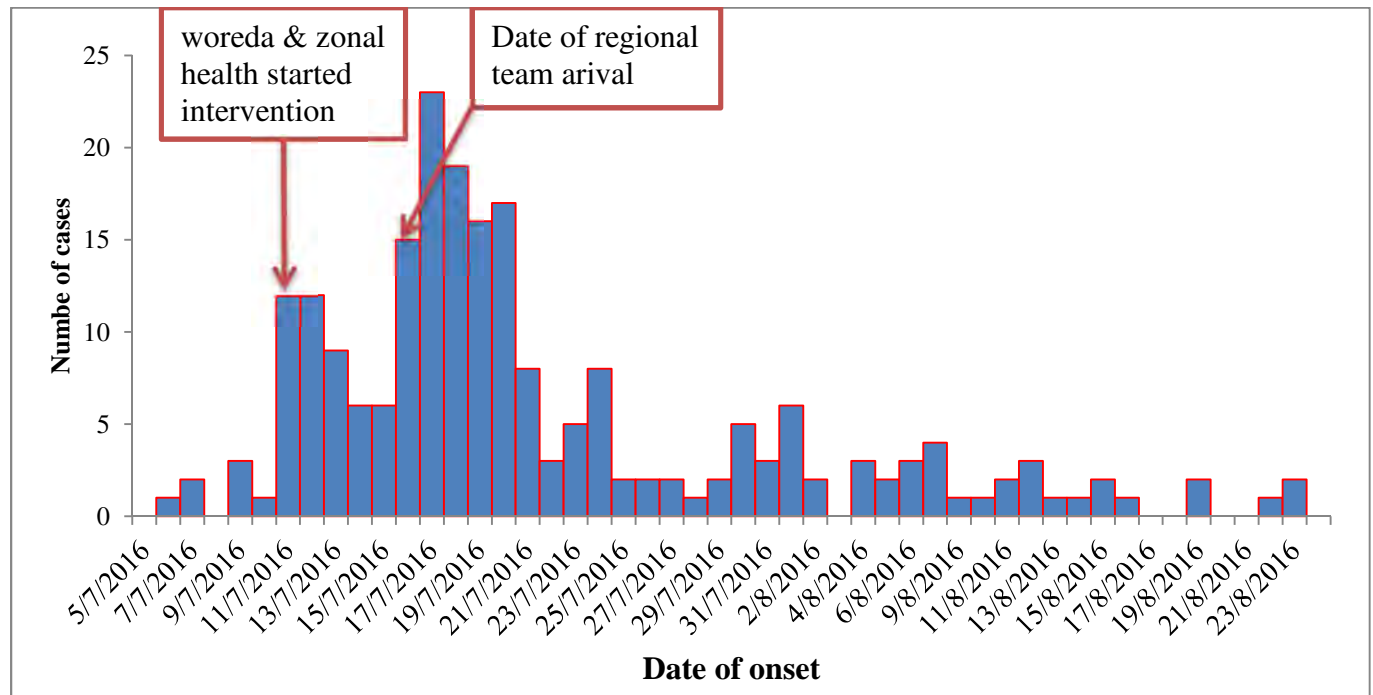


Figure 1.2-2: Epicure of Cholera by date of onset in Dara woreda, Sidama zone, 2016

Distribution by person

The index case was a 27 year old male, daily laborer; he developed diarrhea and vomiting on July 6/2016. He was go to Dila town daily to search work and he always eats his lunch from small scale food establishments and sometimes he goes to street vendors to get food with a low cost. After five days the number of cumulative cases increased to 12 in 3 kebeles. Between July 6 to August 24/2016 a total of 220 cases were reported from the woreda. Males and females were equally (50% to 50%) affected by the disease. The affected age ranges from 9 month to 76 years with a median age of 24 years. The highest proportion of cases, 66(30%) was in the age group of 25-34 years. In this age group 37(56%) were females. The second most affected age group was 15-24 years, 60(27%), among them 31(52%) were males. And the least affected age group was 65 & above years 4(2%).

Table 1.2-1: Distribution of Cholera cases by sex & age groups, Dara district, Sidama, 2016

Age group	Male		Female		Total	
	Cases	%	Cases	%	Cases	%
<5yrs	3	33%	6	67%	9	4%
5-14	28	64%	16	36%	44	20%
15-24	31	52%	29	48%	60	27%
25-34	29	44%	37	56%	66	30%
35-44	8	53%	7	47%	15	7%
45-54	6	50%	6	50%	12	5%
55-64	4	40%	6	60%	10	5%
>65	1	25%	3	75%	4	2%
Total	110	50%	110	50%	220	100%

Distribution by place

The first case was occurred in Bedessa Kebele and then a total of 18 Kebeles (50% of the woreda) were affected by the outbreak. Mechiso kebele was the most affected with 45(21%) of cases followed by Bedessa 36(16%) cases. The attack rate was also higher in Mechisho Kebele (1.03%). The overall attack rate for affected Kebeles was 0.23%.

Table 1.2-2: Cholera CFR and AR by kebele, Dara woreda, Sidama zone, 2016

Kebele	Population	No cases	Death	CFR	AR
Mechisho	4348	45	1	2.2%	1.03%
Badesa	5829	36	0	0%	0.62%
Korate	7145	26	0	0%	0.36%
Satte	5911	15	0	0%	0.25%
Teramaje	5869	14	0	0%	0.24%
Odolla	4904	14	0	0%	0.29%
Harru	4481	13	0	0%	0.29%
komato	6020	11	0	0%	0.18%
Hanigala	4,222	10	0	0%	0.24%
Banko mar.	6259	8	0	0%	0.13%
Galawacho	5688	7	0	0%	0.12%
Adame	3833	6	0	0%	0.16%
Bongodo	3,423	5	0	0%	0.15%
Aleme Koricha	6706	3	0	0%	0.04%
Safa	5632	3	0	0%	0.05%
Abera Butte	3,844	2	0	0%	0.05%
Setamo	6779	1	0	0%	0.01%
Abera Doda	5114	1	0	0%	0.02%
Total	96007	220	1	0.45%	0.23%

Most cases were mapped along the Legedara River, which runs between most affected kebeles and Dila town, Gedeo zone. The distribution of the cases was covered a wide areas with a scattered manner.

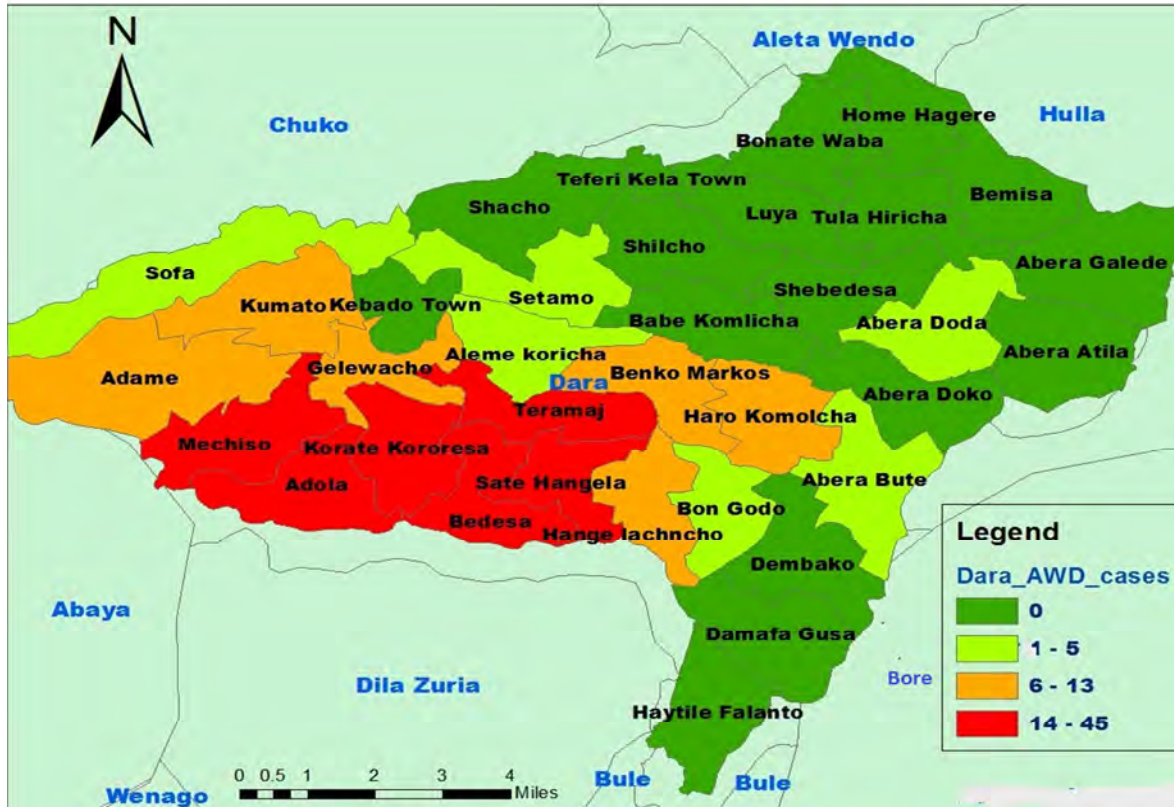


Figure 1.2-3: Spot map of Cholera cases in Dara district, Sidama zone, 2016

1.2. Case-control study

We recruited 153 participants of which 51 were cases and 102 were controls giving a case to control ratio of 1:2. The median age of both case-patients and controls was 25 year with a range of cases 2 to 74 and controls 5 to 65 years of age. 84(55%) of participants were males with 30 case & 54 controls, and 69(45%) of participants were also females with 21 case & 48 controls, were interviewed.

Analytic analysis has been conducted for selected risk factors for cases and controls. Eating outside of the home, travel history to affected areas before 5 days, using river water for drinking purpose and knowledge on cholera transmission were having association with the infection. Knowledge on transmission of cholera was protective to the infection.

Table 1.2-3: Bivariate and multivariate analysis for selected risk factors for Cholera outbreak, Dara, 2016

S.No	Risk factors		Case	Control	Bivariate		Multivariate	
					OR	95%CI	OR	95%CI
1	knowledge on cholera transmission	Yes	20	72	<u>0.26</u>	<u>0.13 - 0.54</u>	<u>0.2</u>	<u>0.06 - 0.46</u>
		No	31	30				
3	Unclean latrine	Yes	33	65	1.01	0.51-2.1		
		Not	18	37				
4	Travel history to affected area	Yes	23	22	<u>2.98</u>	<u>1.4 - 6.1</u>	<u>3.66</u>	<u>1.56 - 8.59</u>
		No	28	80				
5	Using river water for drinking purpose	Yes	18	20	<u>2.2</u>	<u>1.1 - 4.7</u>	<u>2.31</u>	0.79 - 5.46
		No	33	82				
6	Eating food outside the home	Yes	17	15	<u>2.9</u>	<u>1.3 - 6.4</u>	<u>2.73</u>	<u>1.06 - 7.03</u>
		No	34	87				
7	Contact with other cholera patient	Yes	5	14	0.68	0.23-2		
		No	46	88				
8	Participating in funeral ceremony from cholera death	Yes	2	3	1.3	0.2-8		
		No	49	98				
9	Unclean latrine	Yes	33	65	1.04	0.5-2.1		
		No	18	37				

From a multivariate logistic regression analysis knowledge on cholera transmission, travel history to affected area and eating food outside the home were statistically significantly association with the outbreak. Unlikely in bivariate analysis, using river water for drinking purpose had no association with contracting the disease and thus was not an independent risk factor for occurrence of cholera in the area.

Environmental and community investigation

Many of the questions require observing environmental status and sanitation & hygiene practice of the community. Though the sanitation coverage of the woreda was 88%, almost all visited households' latrine was not clean. There was observed human feces dumped on open field and at the bank of rivers. Safe water supply coverage of the woreda was also very low (47%), and nonfunctional of water scheme was 24%. Most people obtained their water from unprotected sources and/or buying from unknown source. Peoples living in three kebeles named Mechisho, Odola and Kumato were without having any safe water sources. Except Kumato, the two kebeles

are located along Legedara River, which was used for drinking and other domestic purposes of the residents. Moreover, residents believed that the river water is safe when they fetch it at night or morning. In the case of eating outside the home, 17(33%) cases ate food from small scale establishment and/or at street vendor in Dilla town.

1.3. Laboratory result

Stool samples tested from 19 patients were all positive to vibrio cholera with serogroup o1, serotype ogawa. And among tested water samples from four different water sources, samples collected from Legedara River and one unprotected spring were positive for total and fecal coliforms with very high grade of contamination.

Action taken

Treatment centers (CTC) were established at four sites in the woreda and all affected peoples had been treated with appropriate treatments. Infection control activities like disinfecting vehicles in which patient was transported, disinfecting patient's house and any place where vomitus and stool has dropped, bed and other articles which come in to contact with the patient both in the CTC and household level were disinfected with appropriate chlorine solutions. 38,000 sachets of Bishangary, 7,290 sachets of pure and 1500 bottles of water-guard chemicals had been distributed for 20,258 households (50% of total households of the woreda). Adequate staffs from zonal health department, woreda health office and health facilities were deployed to all kebeles in the woreda and they conducted intervention activities like active surveillance, mobilizing communities, monitoring & promoting hygienic conditions in small scale food & drinking establishments. Non-governmental organizations (IRC, UNICEF, Save the children) were also actively involved in intervention by providing supplies and technical support.

Discussion

The outbreak was occurred from June to mid of August which is the rainy season in the area. In such condition the spreading of disease increases with flooding and contamination of water [1]. As the result of this the duration of outbreak was prolonged for more than one and half months. 68% of cases were occurred within the first two weeks of the outbreak period, peaked during the beginning of July and then decline with gradual and irregular manner in effects of intervention.

The origin of the outbreak was from the neighboring zone of Gedeo, starting in Wonago woreda, spread to Dilla zuria woreda and Dila town and then spread to Dara woreda of Sidama zone. Most cases were reported from Mechiso, Badesa and Korate kebeles which are located along Legedara River and there was no any safe water source for domestic purpose other than this River. Residents were using the river water for drinking and other domestic purpose undoubtedly believing that the water is safe when they fetch it at night or morning. Such limited awareness or understanding on how to transmit cholera is a serious gap to cope the problem. The outbreak appeared to have spread to other kebeles with scattered cases. This happened due to the movement of many peoples from rural to town for the sake of searching daily labor and conducting small scale trading. Peoples may consume food and water what they get at work place. In our study, 33% of cases consume food outside home prior to showing sign and symptom of the disease. According to guideline of cholera outbreak (Oxfam, 2012), communities in which people are moving about a lot, gathering, dispersing etc can import and export cases to new areas very rapidly.

The most affected age group was 15-34 years accounted 126(57%) of all cases, among these 66(52%) of cases were females. But our data showed that overall males and females were affected with equal proportion. This is inconsistent with study conducted in Afar region suggested that 87.7% of cases were males [8]. In other study conducted in Central Africa Republic, women were more affected (52.5%) than men [9].

Gender disparity or differences with respect to roles, social norms, and personal behaviors vary by context and can lead to distinction in exposure to the cholera. Women often bear greater responsibility for preparing food, cleaning and household hygiene. In addition, they are more engaged in small scale roadside trading. Men are mobile and more likely to eat outside the home, making them more vulnerable to infection due to poor hygiene in food outlets [4].

The overall Case Fatality Rate (CFR) was 0.45% which was much less than the maximum recommended rate (1%) expected in proper treatment setting [3].

Comparing to other cholera outbreak occurred in Guji zone, Oromiya region in 2006, the CFR (1.1%) was greater than to this outbreak rate [10]. This showed that case management and treatment was appropriate and satisfactory in the CTC.

The case control study identified eating foods from outside the home and people who having travel history to affected areas were having a significant association with the infection. Those who developed cholera were 2.73 times as likely to have eaten food outside the home, including from street vender as compared to those who didn't develop the disease (AOR = 2.73, 95%CI:1.06-7.03). Similarly, the odds of developing cholera among people who having travel history to areas (AOR 3.66, 95%CI: 1.56–8.59) times higher than those who didn't travel.

The laboratory investigations on the stool specimen indicated the isolation of vibrio cholera O1 serotype ogawa as the causative organisms for the outbreak. In neighboring country, Kenya, an analysis of 31 stool samples positive for *Vibrio cholerae* O1 indicated that 30 were serotype Ogawa [11].

Laboratory test on the water sample from Legedara River was confirmed as the growth of many fecal and total coliform. The environmental survey supports our epidemiological findings and revealed that lack of safe drinking water, dumped human wastes at the bank of Legedara River, poor hygiene and sanitation conditions, movement of many peoples are known to facilitate the occurrence and spread of the disease.

Limitation of the study

According to Oxfam cholera outbreak guideline, about eighty percent of cholera patients may remain asymptomatic for the duration of the infection; then persons recruited as control might have an outcome despite the fact that they didn't have sign and symptom during the interview. Our data collection tool was also not including questions regarding to socioeconomic status of participants, since it can be a risk factor for the infection.

Conclusion

An intermittent common source Ogawaa serotype cholera outbreak was occurred in extended and with many peaks in Dara woreda. This outbreak resulted primarily from insufficient access to clean water and poor sanitation and hygiene conditions in the area. The spread of the infection to new area was also facilitated by high population movement to and from affected area, small and wide commercial activities and being a rainy season of the outbreak period. Most of cases were reported from areas located along river banks and densely populated with slummy conditions. Those age groups, who can move and engage in different livelihood activities, were highly affected. Though it took a bit of longer period of time, the outbreak was brought under control by coordinated and community based responses. The medical management was also generally appropriate. However, unless the basic deficiencies on safe water supply and sanitation are properly addressed, the outbreak will undoubtedly occur again in the area.

Recommendation

The current outbreak is controlled mainly by treating water at household levels with water chemicals. This intervention method is a temporary remedy, only for the sake of stopping the current spreading of the disease. Therefore, woreda, water and mineral energy sectors should work towards sustainable solutions for serious water problems existing in the woreda. The woreda health office should also work hard to gain actual improvement of sanitation and hygiene conditions. In addition, public latrines need to be availed alongside of the main road.

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CHAPTER II – SURVEILLANCE DATA ANALYSIS

Epidemiology of Dysentery in SNNPR, 2012 to 2015

Summary

Introduction: Dysentery is a diarrheal disease commonly caused by *Shigella dysenteriae* type 1(Sd1) and it can spread by fecal-oral route. Worldwide, approximately 140 million cases and 576,000 deaths reported annually. Dysentery is weekly reportable disease in Ethiopia so that we analyzed case data collected by IDSR reports to describe distribution and burden of the disease in SNNPR.

Rational: Even though dysentery is one of the weekly reportable diseases in Ethiopia, analyzing of yearly trend of the disease is not doing regularly. So that I analyzed dysentery surveillance and HMIS data collected within four consecutive years from SNNP region and the result might insight and provide a clue to give attention for the disease.

Methods: Cross-sectional data analysis was conducted. We analyzed four years (2012 to 2015) data collected by Integrated Diseases Surveillance and Response (IDSR) report and we used Health Management Information System (HMIS) database. We cleaned the data carefully and analyzed using Microsoft excels.

Result: From 2012 to 2015, a total of 176,824 patients of dysentery (175,238 outpatients & 1586 inpatients) with 13 deaths (death to case ratio of 7.5/100,000 population) were reported from the region. The annual incidence rate was nearly similar during each year (29, 25, 21 and 23 per 100,000 populations respectively). Patients were clustered to eastern and northeast zones. Incidence was peaked during March to May in each year. On the basis of HMIS report, an average of 25% of patients was aged less than 5 years and males were slightly more affected than females. But there was a big discrepancy of reported data between IDSR & HMIS.

Discussion: The analyzed data shows that the morbidity of the dysentery is significant in the region and a considerable burden existed among the youngest groups from zones with higher population density, and peaked during the spring months that may be related to increasing contamination of water.

Recommendation: MOH and health bureau should revise weekly reporting format and constitute personal variables. The concerned work process of the health bureau should solve the data discrepancy created between IDSR and HMIS reports. Finally, we recommend regional health bureau to improve sanitation and hygiene services to prevent diarrheal diseases occurrence in the region.

Introduction

Dysentery is a general term for a group of gastrointestinal disorders characterized by inflammation of the intestines, particularly the colon. Symptoms and sign of the disease are fever, abdominal cramps, rectal pain, and bloody stools. This is accompanied with inflammation of the lower intestinal tract, Patients of dysentery pass stool mixed with blood. Bloody stool is often feared as a sign of gastrointestinal bleeding. (1)

Dysentery can be caused commonly by either *Shigella* or *Entamoeba histolytica* species. Bacillary dysentery or which is also known as shigellosis, is caused by species of the genus *Shigella dysenteriae* type 1 (SD1), which is the most virulent species and the one most likely to cause epidemics with low amount of bacterial doses. Amebic dysentery, which is also called intestinal amebiasis and amebic colitis, is caused by a protozoon, *Entamoeba histolytica*. Both types of dysentery infect people of diverse age, sex, and ethnic backgrounds, although children are more susceptible. (2)

Dysentery is spread by fecal contamination of food and water, usually in impoverished areas with poor sanitation. It is one of the oldest known gastrointestinal disorders, as late as the eighteenth and nineteenth centuries, sailors and soldiers were more likely to die from the "bloody flux" than from injuries received in battle. It was not until 1897 that a bacillus (rod-shaped bacterium) was identified as the cause of one major type of dysentery. (3)

Epidemic dysentery is a major problem in a place where overcrowding and poor sanitation facilitate are exists. Epidemics are characterized by severe disease, high death rates, person to person spread, and multiple antibiotic resistances.

Worldwide, approximately 140 million people develop dysentery each year, and about 576,000 die. Most of these deaths occur in developing countries among children under age five. The death rate can be as high as 15 per cent, and health care services are severely stretched during epidemics. Even when correctly treated, about 5 per cent of people with dysentery can die during an epidemic. (4)

In sub-Saharan Africa, diarrheal diseases are a leading cause of death in children under age five. It is estimated that each child has five episodes of diarrhea per year and that 800,000 of those children will die from diarrhea and associated de-hydration. In near time, 2003, 51429 cases and 35 death was occurred with dysentery outbreak in Ethiopia (5)

Dysentery is a more difficult problem to control than other diarrheal diseases. It is different from “ordinary diarrhea” in that an epidemiologic surveillance and laboratory system is needed to detect and track epidemics and to monitor antibiotic resistance. (6) Ongoing analysis of surveillance data should also be performed at regular intervals to identify changes in disease reporting. (7)

In Ethiopia, more than 20 diseases included in surveillance system and reported in weekly basis. Dysentery is one of weekly reportable diseases, which is included due to its epidemic prone and public health importance in the country. (8) The case is identified using case definition and reported from health facilities by IDSR reporting format. In addition, the case data is coming in to RHB by HMIS report in monthly basis.

Rational

Ongoing 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. Regular weekly data analysis could identify outbreaks and initiates to take immediate action while analyzing of yearly cumulative surveillance data could also use to show trend and distribution of diseases over time.

However, analyzing of priority diseases surveillance data in yearly basis is one of the limitations in diseases surveillance system of the country. Due to this, the distribution and trend of dysentery over time in south region were not known before this. So I analyzed that the past four consecutive year’s surveillance data of SNNP region, and the result might insight and be a clue to give attention for the disease.

Objective

General objective

To describe the magnitude, distribution and yearly trend of dysentery disease in SNNP regional state based on the past four years (2012 to 2015) surveillance data.

Specific objectives

- To describe the distribution and burden of dysentery disease by place and person in SNNPR.
- To determine and compare temporal trend of the disease in the region
- To suggest important recommendations based on the analyzed data

Methodology

The descriptive epidemiology was conducted using four years' data reported by IDSR & HMIS. The data was obtained from regional Public Health Emergency Management (PHEM) and from monitoring and evaluation (M&E) report database. I analyzed dysentery case data by time and place using IDSR report. The data had triangulated and number of affected persons was highlighted only in the basis of total cases reported by HMIS. The data has cleaned carefully and finally analyzed using Microsoft excels, and the result has been presented using tabular, graphical, rate and narrative ways.

Result

By time

In the past four years (2012 to 2015), a total of 176,824 dysentery cases with 175,238 outpatients, 1586 inpatients with 13 deaths (death to case ratio 7.5/100,000 population) were reported from 16 zones and 3 special districts in southern nation, nationalities and peoples region. An average 44,206 of cases were reported annually in the region. Comparatively, higher prevalence rate of dysentery was reported in 2012 (0.29%), whereas comparatively least proportion were reported in 2014 (0.21%) of the total reported cases.

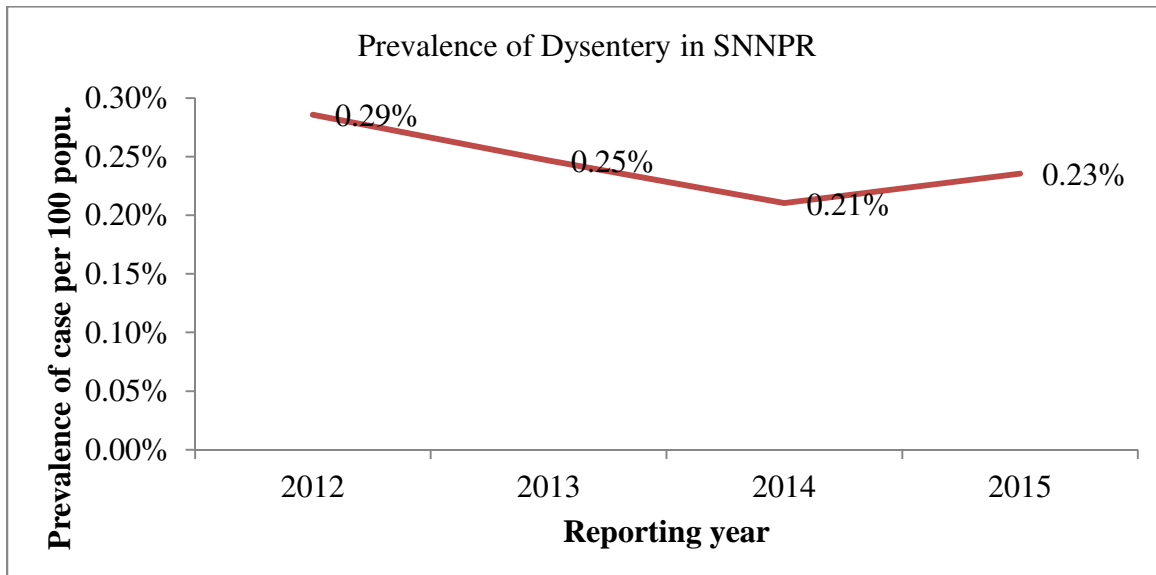


Figure 2-1: Seasonal trend of dysentery cases from 2012 to 2015, SNNPR

When we see yearly incidence rate of the disease, it was almost similar during each year, but death to case ratio was higher in 2014.

Table 2-1:-Incidence and death rates per year from dysentery, SNNPR, 2012 – 2015.

Year	Cases	population	IR/100,000 pop.	Death	Death to case ratio per 100,000 population
2012	49579	17353928	29	2	4.0
2013	44636	17857192	25	2	4.5
2014	39782	18375050	21	8	20.1
2015	42827	18276000	23	1	2.3
Grand Total	176824			13	7.5

The least number of outpatients and the largest number of inpatients were also reported in 2014. [Fig 2]

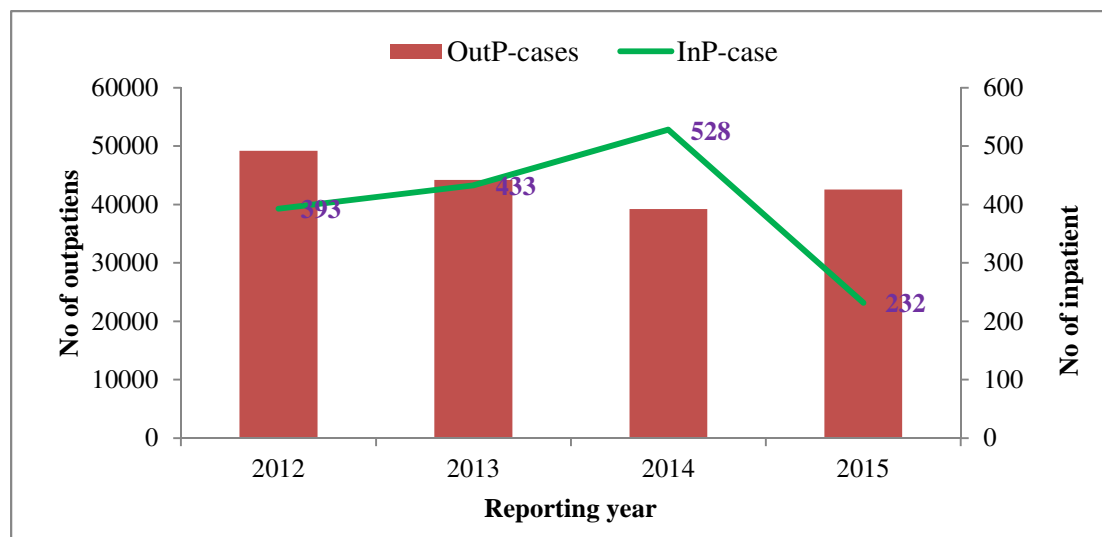


Figure 2-2: Outpatient & inpatient dysentery cases, SNNPR, during 2012 to 2015

Though the number of cases was fluctuated, more cases were reported during spring season (March to May). Comparatively, in 2012 and 2015 the cases were higher in this season. During the last month, the number of reported cases was increased in 2013 and decreased in 2014. At the end month of each year the number of cases was almost in equal extent.

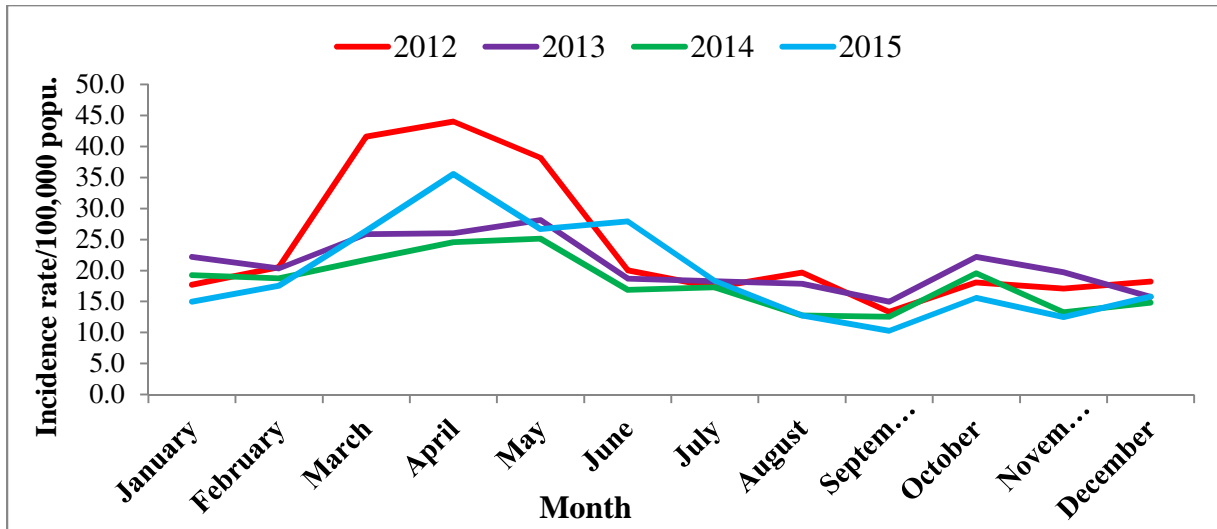


Figure 2-3: Reported Dysentery cases by month, SNNPR, during 2012 to 2015.

An average of 850 cases was reported per week. More cases were reported from week 10 to 22 during each year. During week 17 & 23, the number of cases was peaked in 2012 and 2015 respectively. Week 53 report was included only in 2015. (Fig2- 4)

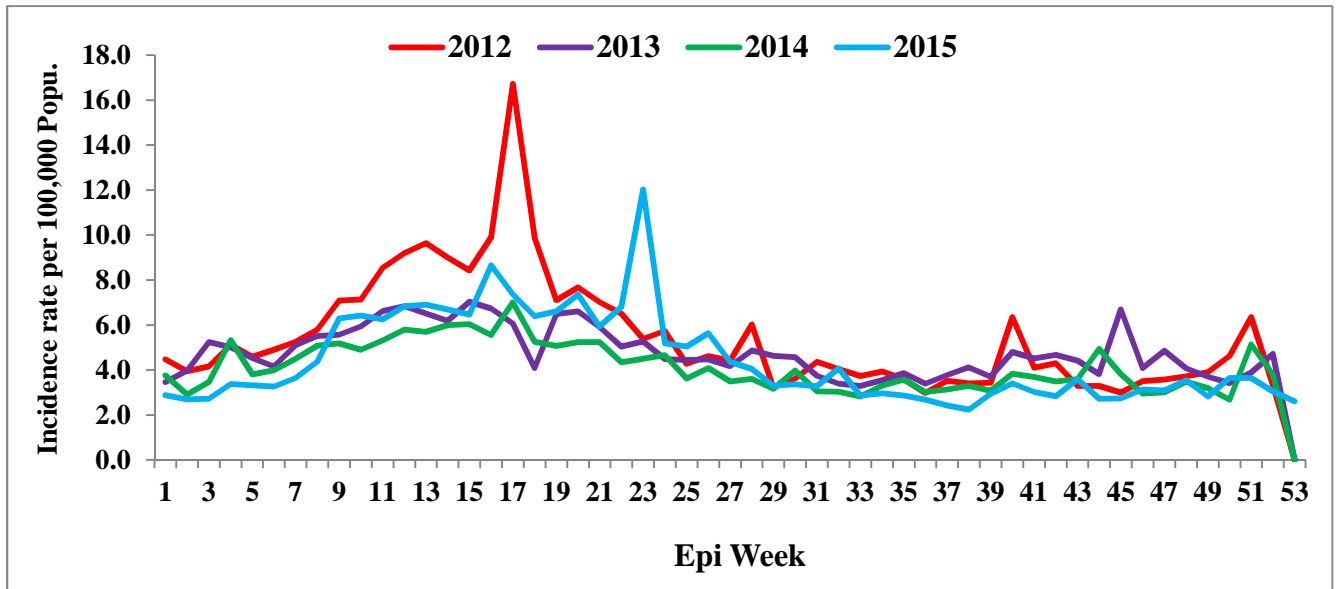


Figure 2-4: Reported Dysentery cases by Epi-weeks, SNNPR, during 2012 to 2015.

By place

As you would see in table 1, almost in all years the first and the second highest dysentery cases have been reported from Sidama and Gurage zones respectively.

Table 2-2: Temporal trend and proportion of dysentery cases by zone in SNNPR, 2012 to 2015

Zones	2012		2013		2014		2015		Total	
	Cases	%	Cases	%	Cases	%	Cases	%	Case	%
Sidama	10848	22%	9291	21%	10889	27%	12403	29%	43431	24.6%
Gurage	4622	9%	5356	12%	5226	13%	6393	15%	21597	12.2%
Hawassa Town	4982	10%	4881	11%	3481	9%	1610	4%	14954	8.5%
Silitie	3911	8%	3075	7%	2333	6%	3278	8%	12597	7.1%
Bench Maji	2679	5%	3101	7%	2487	6%	2859	7%	11126	6.3%
Gamo Gofa	2715	5%	2567	6%	2572	6%	2752	6%	10606	6.0%
Hadiya	3268	7%	2319	5%	2244	6%	2637	6%	10468	5.9%
Segen	2020	4%	2318	5%	1879	5%	1888	4%	8105	4.6%
Wolayita	2985	6%	2137	5%	1620	4%	1157	3%	7899	4.5%
South Omo	1674	3%	1870	4%	1565	4%	1682	4%	6791	3.8%
Dawuro	2488	5%	1658	4%	1364	3%	1047	2%	6557	3.7%
K/Tembaro	1817	4%	1785	4%	654	2%	918	2%	5174	2.9%
Gedeo	1349	3%	1270	3%	894	2%	1416	3%	4929	2.8%
Kefa	1542	3%	993	2%	1245	3%	915	2%	4695	2.7%
Halaba	1393	3%	844	2%	376	1%	1014	2%	3627	2.1%
Konta	384	1%	579	1%	405	1%	376	1%	1744	1.0%
Basketo	597	1%	256	1%	211	1%	271	1%	1335	0.8%
Yem	135	0%	245	1%	183	0%	177	0%	740	0.4%
Sheka	170	0%	91	0%	154	0%	34	0%	449	0.3%
Total	49579	100%	44636	100%	39782	100%	42827	100%	176824	100%

There was no dysentery outbreak has been reported from any zone in each year. The largest number of cases reported from Eastern and Northeast zones, from Sidama, Gurage, & Silte zones; in contrast the least number of dysentery cases reported from Northern & Northwest zones, Sheka & Kefa zones and Konta, Yem and Basketo special districts in each year.

To illustrate the geographic distribution of the disease in one year, nearest time (2015) was shows that many cases are clustered from Northeast and eastern zones of the region. (Fig 2-5)

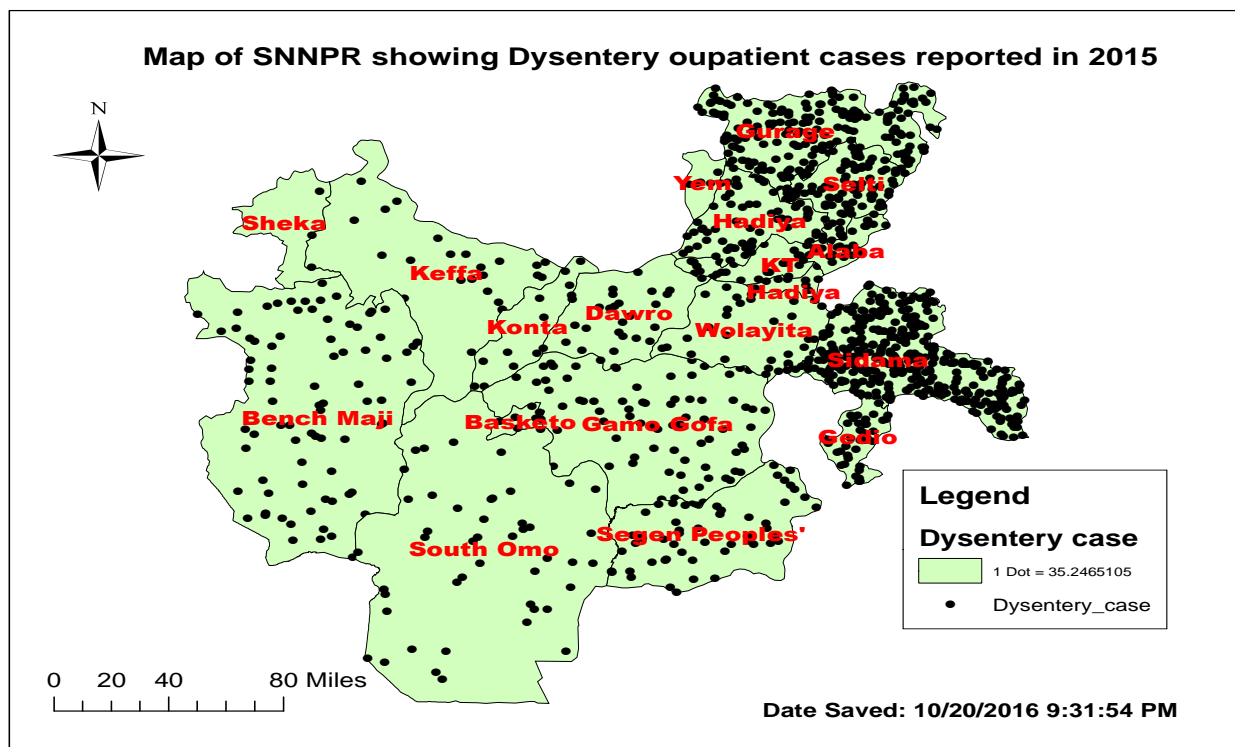


Figure 2-5: Distribution of dysentery cases by place in SNNPR, 2015

By person

The IDSR reporting format couldn't capture patterns of diseases in terms of person. So that I reviewed regional HMIS report to highlight which part of persons are affected by the disease. Though the source of data for IDSR and HMIS reports is the same, there was a big discrepancy of data reported by the two systems in each year.

Table 2-3: Dysentery case data reported by IDSR and HMIS from 2012 – 2015, SNNPR

Year	Cases				Death		
	IDSR	HMIS	Discrepancy	Discrepancy in %	IDSR	HMIS	Discrepancy
2012	49579	55499	5920	12%	2	60	58
2013	44636	152207	107571	241%	2	27	25
2014	39782	53171	13389	34%	8	37	29
2015	42827	60170	17343	40%	1	7	6
Sum	176824	321047	144223	82%	13	131	118

Although there was a discrepancy of data between IDSR & reports, I analyzed the four year HMIS report data and described patterns of dysentery by person in the region. As you would see in table 2, except in 2004 EFY, persons with age group less than 15 years were more affected than other age groups.

Table 2-4: Dysentery cases by age groups reported by HMIS, 2012 - 2015, SNNPR

Age groups	2012/2004		2013/2005		2014/2006		2015/2007	
	Cases	%	Cases	%	Cases	%	Cases	%
0-4 years	14916	26.88	26758	17.58	18682	35.14	20837	34.63
5-14 years	10557	19.02	90020	59.14	9158	17.22	9801	16.29
>=15 years	30026	54.10	35429	23.28	25331	47.64	29532	49.08
Total	55499	100.00	152207	100.00	53171	100.00	60170	100.00

Except in 2005 EFY, both sex were almost equally affected in each year, but in 2005 males were affected twice more than females. (fig 2-6)

Table 2-5: Dysentery cases by sex reported by HMIS, 2012 – 2015, SNNPR

Year	Male		Female		Total cases
	No of cases	%	No of cases	%	
2012/2004	27711	49.9%	27788	50.1%	55499
2013/2005	102653	67.4%	49554	32.6%	152207
2014/2006	27857	52.4%	25314	47.6%	53171
2015/2007	30612	50.9%	29558	49.1%	60170

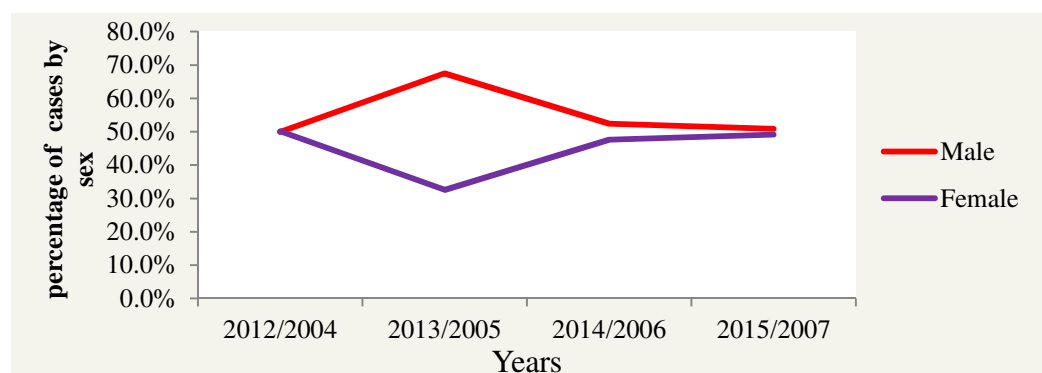


Figure 2-6: Comparison of dysentery cases by sex (by %) in SNNPR, 2004 – 2007 EFY.

Discussion

This surveillance data analysis confirmed that dysentery is significant health problem in the region and a considerable burden exists among the youngest groups and from zones with higher population density. The analyzed data indicates an average 44,206 of cases reported in the region annually. Unlikely other years, the least number of outpatient and highest number of inpatient cases were reported in 2014. On the basis of yearly adjusted population of the region, the annual prevalence of the disease was almost similar in each year.

The analyzed data has demonstrated that highest dysentery incidence was peaked during spring season (March to May). In this season the rainfall begins in the region, therefore there may be related to increased contamination of water supplies due to flooding. (8)

Regarding to place distribution of dysentery, largest number of cases was clustered in northeast and eastern zones and least cases also occurred in western zones of the region. The geographical variation of disease distribution indicates that largest number of cases was occurred in the place where population density is higher in the region. Similarly, study conducted in Jimma town indicated that more than 50% of dysentery cases were occurred in Jimma University where many people were living in crowded place. (9)

Indicative analysis conducted on aggregated HMIS report of the SNNP region revealed that males were more affected than females in 2013. This was consistent with finding of the study conducted on dysentery outbreak in Amhara region in 2015, 63% of cases were male. (10) Similarly other study conducted in Ruwanda incidence rates of dysentery in adult males was higher than females. (6) According to WHO African region, inadequate sanitation infrastructures, poor standard of personal hygiene, inadequate and unsafe water supply are some risk factors for diarrheal diseases. 'WHO' has identified the two interrelated diseases; dysentery and cholera are epidemic diarrhea in Africa. Though the respective diseases are unique, they are similar with several practical reasons; basically both are transmitted through fecal-oral routes.

Conclusion

The burden and distribution of dysentery in SNNPR is considerable and needs attention to prevent further health risks due to dysentery. This data analysis shows that the yearly burden of dysentery disease was peaked during the season when the rainfall begins in the region that contributed for increasing water contamination. In comparative analysis, the number of dysentery case reported through surveillance system is not consistent with reported through HMIS. This happened due to ignorance of dedicated persons reporting all cases, those treated and recorded in health center.

Limitation of the study

Analyzing of surveillance data was conducted using secondary data reported from zones and special districts, as the result of this we could not identify and describe surely what factor makes cases differ by place and time. In addition, PHEM weekly reporting format does not capture person variables, so that surveillance data couldn't show which part of people affected more.

Recommendation

Analysis of surveillance data begins with characterizing the pattern of disease by person, place, and time. But weekly reporting format does not capture personal variables, therefore MOH and health bureau should revise weekly reporting format and constitute person variables. The concerned work process of the health bureau should resolve data discrepancy created between IDSR and HMIS reports. Finally, we recommend regional health bureau should take in consideration in relation with the improvement of sanitation and hygiene services to decrease dysentery cases in the region.

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CHAPTER III – EVALUATION OF SURVEILLANCE SYSTEM

An Evaluation of Dysentery Surveillance System, Sodo Zuria Woreda, Wolayita Zone, SNNPR, Ethiopia, 2016

Summary

Introduction: Dysentery is dangerous types of diarrheal diseases, which is more severe and more likely to result in death than other forms of diarrhea. The disease is transmitted through fecal-oral route and commonly caused by *Shigella dysenteriae* type 1 [SD1] that can cause a large outbreak. Dysentery is one of the priority diseases for surveillance and response activities. Therefore we evaluated Sodo zuria woreda dysentery surveillance system to ensure whether the disease is monitored effectively and to determine the performance of public health surveillance at large.

Methods: A cross sectional descriptive study was employed. The evaluation was conducted in Zodo zuria woreda in Wolayita zone. A health office and nine health facilities (study units) was selected and from which a total of 24 stakeholders were participated in the evaluation. We collected data by face to face interview and reviewing reports & registers. We used a semi-structured questionnaires formulated from CDC guideline. We analyzed the data and described in terms of inter-related functions and attributes.

Result: Sodo zuria Woreda public health surveillance system is structurally compliance with standard and stakeholders were well aware on purpose, objectives and usefulness of the system. Dysentery case detection is performed using case definition and patients are recorded in standard registers, but all recorded cases are not reported by the surveillance system. Therefore, the system was not sensitive and representative for all cases detected in health facilities. Due to lack of training at health facility level, Lack of communication facilities and other resources creates the system is not well accepted by dedicated staffs. Completeness of reporting sites, report timelines, flexibility and stability of the surveillance system were fairly good.

Conclusion and recommendation: We concluded that Sodo zuria woreda public health surveillance system is structured as per standards. Lack of training, resource and communication facility led the system to be less acceptable among dedicated health staffs. Health centers reported inaccurate case data through the system, so that the system becomes less sensitive and

representative to existing cases. However sensitivity in terms of case definition, report timelines, simplicity of formats, stability and flexibility of the system were apparently good. We suggested that reporting all detected cases, training of staffs, provision of resource, restrict monitoring and constituting personal variables in reporting format should be done to improve surveillance system attributes.

Introduction

Dysentery is a diarrheal disease which is caused mainly by *Shigella dysenteriae* type 1 [SD1]. It is more severe and more likely to result in death than other forms of diarrhea. The disease is a global public health concern, especially in developing countries and low income regions. Dysentery is the most common cause of enteric infections and is easily transmitted by fecal-oral route via contaminated water, food, articles for daily use, and person to person contact. [1]

Mostly large scale outbreak is caused by SD1 with up to 30% of populations infected. The case fatality rate may approaches 20% among young and elderly persons with severe dehydration. Comparing to other acute watery diarrhea, the case fatality rate after treatment of dysentery cases is very high, 5%. SD1 is extremely virulent, only a few, 10-100 bacteria need to be swallowed to cause illness. An epidemic of dysentery should be suspected if there is a rapid increase in the daily or weekly number of cases of bloody diarrhea, or if increased deaths from bloody diarrhea are reported in a community. Its suspected case definition is diarrhea with visible blood in stool and confirmed case is a suspected case with stool culture positive for SD1. An estimated 140 million cases and 576,000 deaths occur annually due to *Shigella* infection in children under five years of age worldwide. The largest outbreak of dysentery caused by SD1 in Africa was reported in 2003 with a cumulative number of 487,297 cases. Of this, the majority [50%] were from 10 countries including Ethiopia. In this period, 51,429 cases and 35 deaths was reported in Ethiopia. [1, 2]

Because dysentery is included in weekly reportable diseases in Ethiopia, weekly data are collecting using IDSR standard reporting format. In SNNPR, a total of 42,827 dysentery cases were reported from 15 zones and 4 special woredas in 2015. The sources & risk factors for dysentery infection are almost similar with many diarrheal diseases. Lack of proper sanitation infrastructure, poor hygiene practice, contaminated water, poor handling of food, and overcrowding are essential risk factors for dysentery and other diarrheal diseases. But improving

of such conditions is feasible, effective and does not need massive resources. However, in recent time acute watery diarrhea outbreak was occurred in different part of the country and affected many peoples. Since the risk factors of dysentery are almost similar with AWD, it is not hard to expect the occurrence of dysentery outbreaks in such conditions.

Therefore periodic monitoring and evaluation of surveillance of diseases and other public health events is important to promptly detect and intervene if occurred. [3]

Surveillance is defined as the ongoing, systematic collection, analysis, and interpretation of data with prompt dissemination to those who need to know, for relevant action to be taken. [4]

The surveillance for public health is the application of surveillance activities on a health related events for use in public health action to reduce morbidity and mortality, and to improve health status of a community. [5]

Public health surveillance is an epidemiological tool helps to provide health information for action through well-established action oriented systems. System is a group of components that are connected and work together to be functional, if any one of components is poorly connected or disconnected, the system will not be effective or become dysfunctional. [6]







Likewise, diseases surveillance system is an organized set of ways constituting different essential elements such as population under surveillance, stakeholders and/or organizations, resources, and designed mechanisms that enable to promptly identify, communicate and intervene to any public health problems. Public health surveillance system should be evaluated periodically to ensure the effectiveness & efficiency of the system. Such an evaluation identifies elements of surveillance that should be enhanced to improve its attributes, assess how surveillance findings affect control efforts, and improve the quality of data and interpretations provided by surveillance. [7]

As far any type of evaluation, the intent is to use the findings to adjust the design, protocol or approaches for future surveillance activities. Simply the purpose of surveillance system evaluation is to make it better by identifying gaps in the system. [8]

The routine flow of surveillance data is usually from reporting sites to the next & up to the central level. In the context of Ethiopia, the surveillance data collected from health facilities is compiled in standard IDSR format, and then forward to the upper level. Though HMIS is not a surveillance system, diseases under surveillance are reported through HMIS within monthly

basis. Because of the reporting data source for the two systems is the same, it needs to be coordinated to detect health events effectively. The surveillance data is aggregated in each hierarchical level and send to upper level up to MOH. The aggregated data is analyzed and the feedback come back to each level and utilized for improvement purposes. Practical cycle of surveillance system and activities implementing in the system is depicted below.

Table 3-1: SURVEILLANCE PROCESSES AND TASKS BY LEVEL

<ul style="list-style-type: none"> • Receiving reports • Analyze & use data • communicate with 'WHO' 		<ul style="list-style-type: none"> • Prepare feedback and communicate with RHB & other stakeholders
↑		↓
<ul style="list-style-type: none"> • Receiving reports • Data aggregation • Data analyzing • Reporting to upper level 		<ul style="list-style-type: none"> • Receiving feedbacks • Utilizing feedbacks • Prepare feedback & send to lower level
↑		↓
<ul style="list-style-type: none"> • Receiving reports • Data aggregation • Data analyzing • Reporting to upper level 		<ul style="list-style-type: none"> • Receiving feedbacks • Utilizing feedbacks • Prepare feedback & send to lower level • Follow up & supporting
↑		↓
<ul style="list-style-type: none"> • Receiving reports • Data aggregation • Data analyzing • Reporting to upper level 		<ul style="list-style-type: none"> • Receiving feedbacks • Utilizing feedbacks • Prepare feedback & send to lower level • Make intervention & prevention
↑		↓
<ul style="list-style-type: none"> • Diagnosis & treatment • Case detection • Case registration • Reporting to upper level 		<ul style="list-style-type: none"> • Receiving feedbacks • Utilizing feedbacks • Make intervention & prevention
↑		↓
<ul style="list-style-type: none"> • Health problems/events • healthcare seeking 		<ul style="list-style-type: none"> • Improve community health • Develop healthy behavior

Because of scarce resources, surveillance could not be carried out for all diseases and conditions; it works only on diseases that are given priority. Based on different criteria, Ethiopia has selected 20 diseases to be included in to the routine surveillance. There are case-based and indicator-based surveillance systems applying in the country. Dysentery is one of those priority diseases and it is included in indicator based surveillance system. It is selected & included based on its significant public health importance, being prone to epidemic and having available & effective prevention measures for addressing its health risk. [9]

Rational

Disease surveillance system evaluation is used to ensure that problems of public health importance are being monitored efficiently and effectively. Poor surveillance system can be as bad as or worse than no system at all, because if we are looking for disease but our system doesn't work, then we might work with false data. Therefore the system needs to be evaluated periodically to assess how well the system operates to meet its purposes and objectives. The surveillance system evaluation has conducted in Sodo zuria woreda by assessing dysentery case data. Based on the excess number of reported cases in 2016 and taking into consideration of transport & time constraints, the woreda was selected purposively.

In recent time WASH related health problems such as AWD & Scabies were emerged in the country in general and in SNNPR in particular. Like AWD, there is a threat of dysentery outbreak occurrence, since risk factors and mode of transmission is similar with AWD. Therefore evaluation of dysentery surveillance system is important to assure whether the disease is monitored effectively or not and then the finding can infer how other case surveillance systems is conducting. Additionally, case data reported via HIMS and IDSR within the same period is showing a big discrepancy. For example according regional aggregated data, Sodo zuria district has reported only 22 dysentery cases by weekly IDSR reports from week 27/2015 to week 26/2016 (in 2008 EFY). But within the same period, 276 dysentery cases are reported by HIMS. So that it needs to be evaluated to answer why the discrepancy is occurring? Other reason why evaluation needed is also the district disease surveillance system has never been evaluated before.

Objectives

General objective: To determine the performance of public health surveillance system in Sodo zuria district, Wolayita zone by assessing dysentery surveillance and suggest recommendations based on gaps identified in 2017.

Specific objectives:

- To provide a comprehensive summary of how the surveillance system operate in the district
- To assess simplicity, acceptability, flexibility, sensitivity, timeliness, completeness, stability and representativeness of the diseases surveillance system of the district
- To assess the consistency of case data recorded in health facility registers with data reported by weekly IDSR and monthly HMIS in the same reporting period.
- To assess the resource allocated for surveillance activities
- To suggest recommendations based on findings

Methods & materials

- 1.1. **Study design:** A cross sectional descriptive study was employed to describe and assess the effectiveness and attributes of surveillance system. I followed the steps illustrated in “updated guidelines for the evaluation of surveillance system” formulated by CDC.
- 1.2. **Study setting and period:** The evaluation conducted in Zodo zuria district which is one of the 12 districts of Wolayita zone and located at near distance from/ surrounding to Sodo town (zonal town). The district is divided in to 30 administrative kebeles with a total population of 206,033. Seven governmental health centers, one NGO health center and 35 health posts were providing preventive and curative health services in the district. The field work was conducted from November 14 – 26, 2016.
- 1.3. **Study units:** A health office and all health facilities which are running diseases surveillance activities in the district were the study units. A district Health office, 3 health centers and 6 health posts, totally 10 study units was selected for the study. The selection of health facilities was made on a convenience basis taking into consideration of transport & time constraints. Selected studied health facilities were Wara-lasho, Amacho-Kodo and Delbo-Atwaro health centers and six health posts, two from three HC, Lasho & Waja HP from Waraza-Lasho HC, Amach & Bekilo-segno HP from Amacho-Kodo Hc and Delbo-Atwaro & Delbo-Wogen HP from Delbo-Atwaro HC were studied

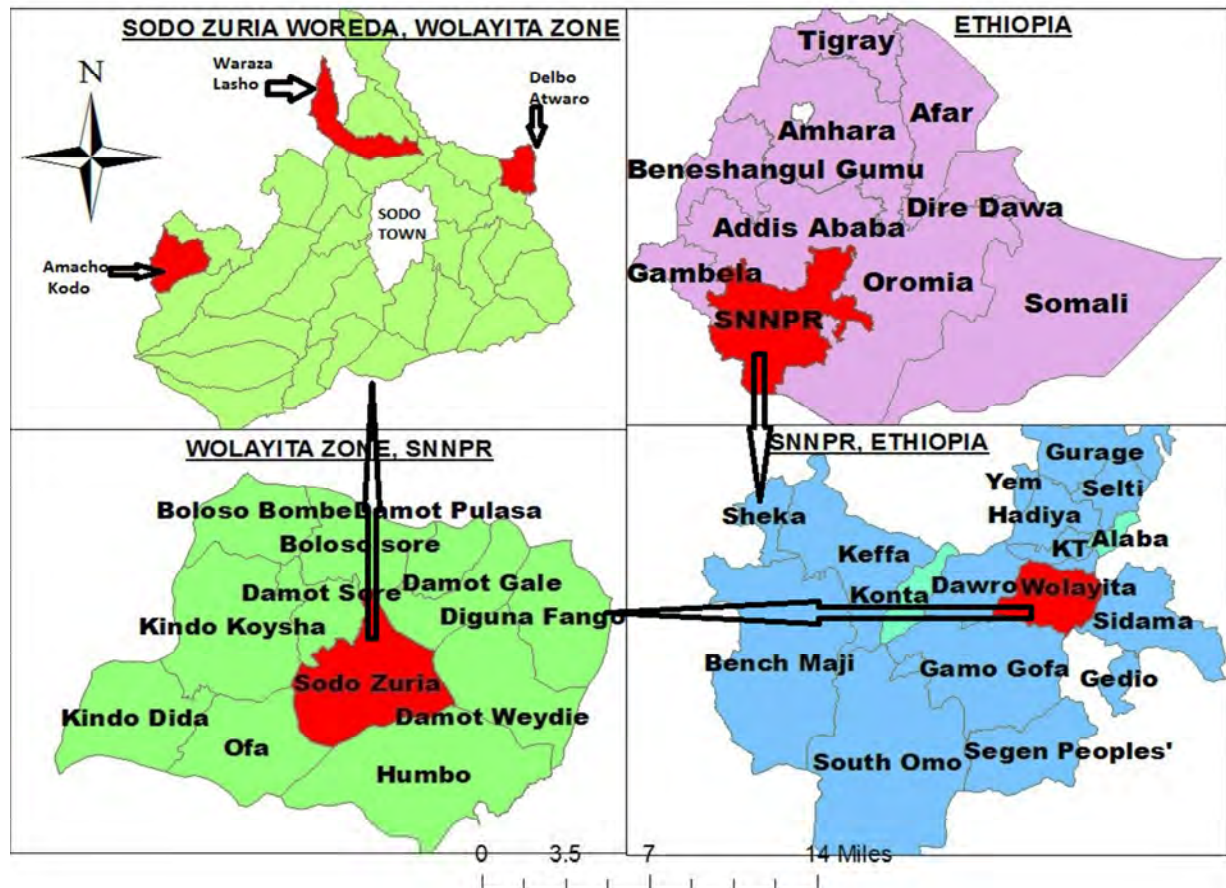


Figure 3-1: Maps showing areas in which surveillance system evaluation conducted, 2016

1.4. **Data collection:** Credible evidence gathered by using two methods such as face to face interviewing & discussing with stakeholders (health personnel) and reviewing copy of reports and recorded data in patient registers from each unit. Health personnel were selected purposively based on their respective roles and duties in surveillance activities. From a health office [n=3, leader, IDSR & HMIS focal], from three HCs [n=9, three from each], and from six HPs [n=12, two from each], totally 24 persons had interviewed regarding usefulness and relevant attributes of the surveillance system. At each sources of information, a structured questionnaire, formulated from CDC guideline was used.

1.5. **Data analysis and description:** The collected data had analyzed, described & concluded as per the tool used. The quality of surveillance system is described in terms of interrelated attributes of the system such as completeness, timeliness, simplicity, flexibility, sensitivity, stability and representativeness.

Results

Structure, Purposes and objective of surveillance:

The public health surveillance system of the woreda is structured by constituting community, health post, health center (including private HC) and woreda health office. All health personnel who are participated in evaluation were well aware on the objectives and purposes of disease surveillance and response system. They recalled that early detection and prompt action on health related event is the primary objective of surveillance.

Core function

Case detection and confirmation

Priority diseases case identification was conducting through the formal health system, private health system and community structures (using HDA). Specifically dysentery case was identified clinically using case definitions. As per PHEM guideline and in practical, lab confirmation was not performed for dysentery cases at health center level.

Case registration

All visited health center was used standardized registers to record data elements of cases under and above five ages of patients. In terms of quality of recorded information was encouraging from each visited health centers.

Reporting and communication

All visited health facilities were reported dysentery & other priority diseases including zero case in weekly basis. Health centers are also reporting dysentery and other diseases cases by two ways, via IDSR and HIMS in weekly & monthly basis respectively. Health posts send to HC every Monday morning, health centers also compile and send to woreda health office every Monday afternoon. Woreda health office sends compiled & aggregated report every Tuesday afternoon to zone health department. HMIS report also sends every 22th day of the month.

Except health office, all visited health facilities receive and send report from & to respective levels by phone call or paper on person. Woreda health office uses phone, e-IDSR & e-HMIS systems to upload data to zone health department in weekly and monthly basis. According to IDSR focal of each health center and woreda health office PHEM officer, most of the time

communication is takes place by phone calling to send and receive reports before paper report is reached on hand. The following figure shows the structural system and reporting units in the woreda and the evaluation was conducted in health units shaded by yellow.

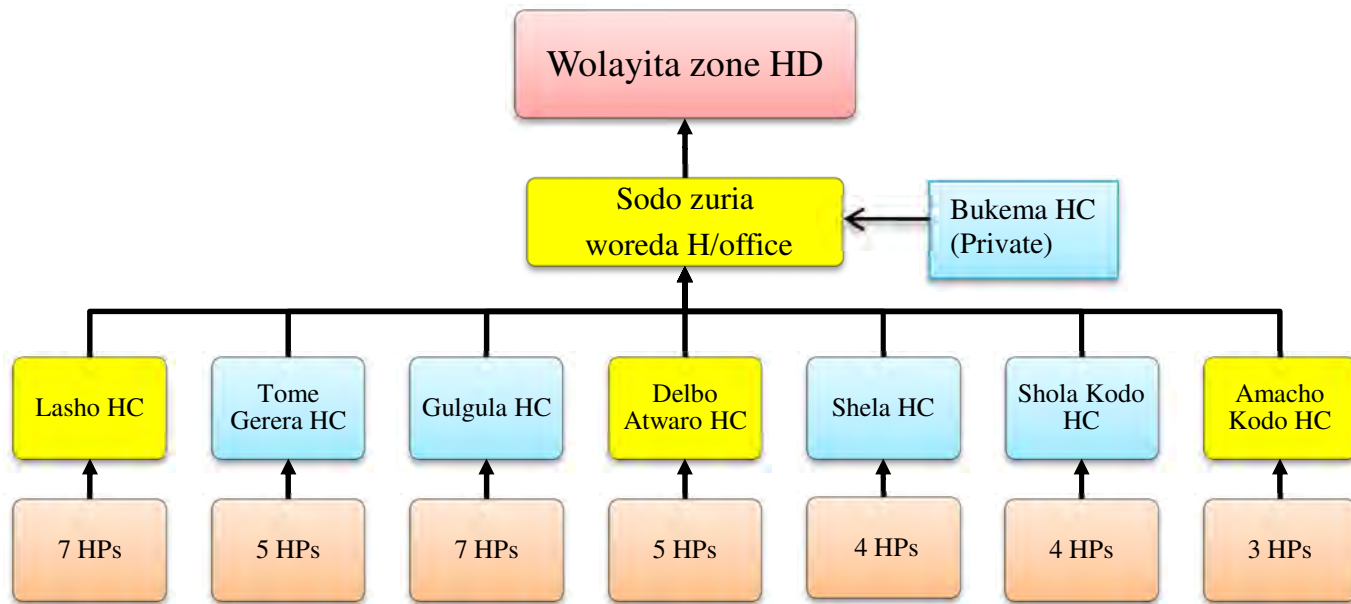


Figure 3-2: Structural system and reporting units in Sodo zuria woreda, Wolayita zone, SNNPR, 2016

Data analysis & interpretation

At woreda health level, PHEM data was analyzed quarterly, midyear and annually for the purpose of evaluating plan of action. The analyzed result was described only by place and time. At health center level only malaria case data was monitored and compared with the past data simply by observing the number of cases recorded in a reporting period. But other priority diseases surveillance data was not got attention and analyzing is not done in any time.

Epidemic response and preparedness

Woreda health office had a plan for epidemic preparedness and response and there was a little amount of budget (only 2000 EBr.) allocated for surveillance activities. Woreda health office and all visited health centers were established rapid response team. But no any evidence whether the team conduct meeting regularly. There was no any types of outbreak occurred in the woreda for the last one year.

Feedback

In visited health center there was supervisory book to put feedbacks by supervisors whoever go there. Comprehensive feedback points are written in the book. But a separately written feedback for surveillance activities or related issues was not provided by anyone for visited units.

Support functions of surveillance system

Standard and guidelines

During assessment period there was no shortage of reporting format in health facilities except in Delbo health post. Case definition for priority diseases was available in health facilities. At health post level case definition is translated in to Amharic. PHEM guideline was available in health office and health center levels. But there was no outbreak guideline & line list in all visited health facilities.

Training

At woreda level, PHEM officer had trained on PHEM basic training. But at health center level no anyone, neither IDSR focal nor other health staffs who involved in health surveillance and response system, were trained.

Supervision

Woreda health office and visited health centers were supervised and supervise the lower level of units. According to respective health staffs, the supportive supervision was comprehensive and there was assigned supervisor at each lower level. Woreda health office was supervised twice by upper level in 2008 EFY and woreda itself conducted comprehensive supervision on health facilities in quarter basis. Visited health centers were supervised by upper levels in average two times in 2008. There were assigned supervisors to each health post to work comprehensive activities with health extension workers and they were working two days per week at field.

Communication facilities

Communication between woreda health office and lower level structure was takes place by calling with private phone. Except e-IDSR system in woreda health office for uploading data to upper level, no any communication facility was available in any visited health units.

Resource and cost required to operate the system

At health center level there was no any material and financial resource allocated specifically for operating a public health surveillance system. But one person has delegated to collect and disseminate data/report. At health office level there was few amount of allocated budget (2000 EBr.) and only computer was in place for analyzing and storing of surveillance data.

Lack of resources like fixed phone, vehicles and computer for health centers were create obstacle to perform surveillance and response activities in the woreda.

In coastwise, PHEM officer and IDSR focal persons were incurred personal expenses when they call by their private phone for requesting and disseminating weekly report. Thus according to respective delegators, at HC & woreda health office levels, they are incurred an average of 10 Br and 25 EBr per week respectively. Then we estimated that Woreda health office PHEM officer would incurred 1300 EBR and health center IDSR focal person also will incurred 520 EBR per person per year. This happened due to lack of fixed phone and vehicles assigned for such intended activities.

Quality of surveillance system/attributes

Usefulness

All interviewed health staffs were agreed that the surveillance system is useful to detect unusual occurrence of health events in the community, to determine the trend of diseases, and to monitor and evaluate diseases prevention and control programs. Because of usefulness might be affected by other attributes of surveillance system, the acceptability and data quality of the woreda public health surveillance is contradicted with the health personnel agreement regarding to usefulness.

Completeness/data quality

According to “WHO” monitoring and evaluating Guide, completeness in surveillance can be evaluated in terms of completeness of reporting sites, completeness of case reporting and completeness of surveillance data. Regarding to reporting sites completeness, we reviewed half year (26 weeks) of report copies from each health centers and then all visited health facilities were reported in each week irrespective of timeliness of reporting time. At woreda level annual reporting site completeness was reviewed in e-IDSR database and it was 92% and a half year completeness of the woreda was 88%.

Completeness of case reporting was evaluated by comparing cases reported by IDSR & HIMS with the number of cases recorded in the patient register over the same period of time. As indicated in table 1 & 2, the surveillance system was completely not detected to report cases recorded in patient register. So that very poor data are coming to upper level through surveillance system.

Table 3-2:-Number of dysentery case reported by visited health center from week 1 - 26, 2016 (the 2nd midyear of 2008 EFY) in Sodo zuria woreda.

Visited health centers	No of cases recorded in patient register	No of cases reported by IDSR	No of cases reported by HMIS	Discrepancy of reported cases	Remarks
Lasho HC	35	0	33	33	Abstract register in HC
Delbo Atwaro HC	28	0	30	30	
Amacho Kodo HC	6	0	7	7	
Total	69	0	70	70	

Table 3-3: Number of dysentery cases reported by Sodo zuria woreda's IDSR & HMIS from week 1 - 26, 2016 (the 2nd midyear of 2008 EFY)

Reporting sites	No of cases reported by IDSR	No of cases reported by HMIS	Discrepancy of reported cases
Waraza Lasho HC	0	33	33
Tome Gerera HC	1	26	25
Gulgula HC	0	4	4
Delbo Atwaro HC	0	16	16
Shela HC	0	35	35
Shola Kodo HC	4	15	11
Amacho Kodo HC	0	7	7
Bukema HC	0	0	0
Total	5	136	131

The reason why cases that are recorded in patient register don't reported by surveillance system was the health staffs do not give attention to dysentery cases data to collect & report, they give more attention for only malaria cases.

In terms of completeness of surveillance data, it lacks personal variables

Timeliness

In priority diseases surveillance system, timeliness can be described by the amount of time taken between the onset of disease and the reporting of case to the respective upper level. During this

time interval the time required for identification of disease and intervention taken should also be considered. But in our evaluation of timeliness in Sodo zuria woreda surveillance system, it was impossible to measure how fast the system can identify the case and respond to the problem.

We evaluated only the timeliness of reporting of cases against standard developed by the country. As we reviewed e-IDSR report database, reporting timeliness of woreda health was 89% in 2016 and 87% biannually. All visited health centers were reported in all weeks of the year, however, it was difficult to know whether they reported on stated day in each week of the reviewed period.

Simplicity

The case definition of dysentery is very simple for all health care providers, thus a person with diarrhea with visible blood in stool is simple to identify cases and is agreed upon to be used by everyone within the country (PHEM guideline). Data collecting procedure and reporting format is very easy to understand and fill data by all health care providers; it takes 5-10 minutes to fill the data. But in terms of integration with other related system is found to be a gap in the system. Woreda health office and health centers do not integrate IDSR with HMIS to cross-check and disseminate all cases treated in health facility (Table 3-2 & 3-3). Due to lack of training, data analysis also not simple for staffs to analyze at health center level.

Acceptability

Individuals who assigned for IDSR focal in visited health centers were not as such interested on the weekly report receiving and sending activities, because

- If the report do not come by person on hand, they will call by their personal expense to collect reports from health posts
- Lack of fixed phone even for woreda PHEM work process
- Unavailability of vehicles for IDSR activities
- Lack of training on IDSR
- Lack of allocating resources for IDSR purposes like other programs

Inconsistent and not reporting existing cases by the system were also additional evidences regarding to unacceptability of the surveillance system by the visited health centers. Other than reporting, health staffs from visited facilities were willingly participating on the surveillance & response activities.

Flexibility

We assessed the flexibility of public health surveillance system in terms of adaptability of reporting format to the inclusion of additional diseases, capability of operating the system by different personnel, and integration with other systems. Therefore, reporting format consist a blank space for enabling to include additional diseases and anyone can operate surveillance system easily. But the system was not integrated with other system like with HMIS.

Sensitivity

Because of almost impossible to know the true number of cases in the population, it is usually not practical to obtain highly accurate estimates of sensitivity. Then we evaluated sensitivity of dysentery surveillance system in respect to consistency of reported data and definition of the case. Suspected dysentery case definition is sensitive to detect the true cases. But we assessed that reported dysentery cases by the surveillance system was not consistent with recorded in patient register and with reported cases by HMIS within the same reporting period. As shown in table 1 & 2, many dysentery cases were missed by IDSR reports in all weeks of studied period. So that it is impossible to conclude that dysentery surveillance system is sensitive in Sodo zuria woreda.

Stability

According to health staffs discussed during study period, surveillance and response activities don't affected if dedicated person leaves or not available. Sometimes communication system is interrupted due to lack of network or when e-IDSR system is not functional, even in this condition the surveillance & response system don't interrupted.

Representativeness

The reported cases of dysentery might not be representative of the cases that are occurring in the population since reporting practice of the visited health centers were not accurately reported all cases treated and recorded in patient register. But within a study period, all health facilities found in the woreda were reported on stated reporting period. However, the true frequency and distribution of dysentery in a population, and a health seeking-behavior of the population is unknown, it is impossible to measure representativeness accurately unless a population based study is conducted.

Discussion

The findings of this evaluation of disease surveillance system in Sodo zuria wored showed that the stakeholders or health staffs who are participating in disease surveillance and response activities were well aware on the objective and purposes of the system. As stated in guideline of communicable diseases surveillance and response system developed by 'WHO', a good knowledge of stakeholders on purposes and objectives of diseases surveillance is important to exert their concerted efforts to achieve stated objectives (10). The woreda health surveillance and response system is structured as per the PHEM guideline of the country. The surveillance activities are performing in comprehensive ways in the system starting from community level by initiating with women HDA. Among the core functions of disease surveillance system, case detection (specifically for dysentery) is performed by using standard case definition. But lab confirmation is not performed for dysentery cases in any visited health center. As per PHEM guideline dysentery case confirmation is done in hospital laboratory level (9). Case registration is another core function of the surveillance system and in all visited health centers standardized patient registers were available and registers were filled with relevant variables. Reporting is performed by using standard reporting formats. The communication mechanism regarding to disease surveillance and response activity is mostly conducted by calling mobile phone. However, calling expense does not compensated by government or other budget, dedicated persons are incurred on personal cost. At woreda level aggregated PHEM data is analyzed and described by only place and time but not done at health facility levels due to lack of training. In such condition unusual increment of health events or diseases in the community will not be detected as early as possible at lower level and will not be intervened immediately as necessary. Woreda health office does have rapid response team and preparedness plan with a few amount of budget and in all health center there is established RRT without preparedness plan. Comprehensive feedback is written in supervisory logbook for each visited health centers but specific feedback to disease surveillance activity was not given to any visited units. Unless an appropriate feedback for priority diseases, public health surveillance and response activities will not be improved and achieved as intended objectives.

There are also several gaps in the support functions that can create obstacle to the performance of the core functions. At health center level no training was given, lack of communication facilities

and resources allocated for operating surveillance and response activities and these gaps create low acceptability of the system among health staffs. But PHEM guideline, registers, formats and standard case definition were available in almost all visited health units.

The quality of public health surveillance system is usually described by the inter-related attributes of the system (11). Although all participated health staffs agreed up on the usefulness of the system, some of the relevant data quality components/attributes were not as expected good. Even though all health facilities are reported on stated reporting day in the study period, all dysentery cases that are registered in patient register are not collected and reported by weekly reporting system from each health center. This indicates that the surveillance system does not capture existing cases in the community and then it is not enough represent to all cases. On the other way, almost all cases that are treated and recorded in register are reported by monthly reporting system (HMIS). Irrespective of reporting period, health facilities reported the same case data by the two systems inconsistently. This also shows that the two reporting system are not integrated. The system was no acceptable by stakeholders due to lack of resources and budget for performing surveillance activities. On the other hand, reporting site completeness of the woreda was 92% in 2016, which was consistent with regional target (90%). Simplicity in terms of case definition & filling of reporting form, flexibility and stability of the surveillance system were apparently good.

Conclusion

Based on the findings of the evaluation, we concluded that Sodo zuria Woreda public health surveillance system is structurally compliance with country guideline and stakeholders were well aware on purpose, objectives and usefulness of the system. Lack of training and data analysis at health facility level, incomplete case reporting (inconsistent reported data) & incomplete surveillance data, lack of resources & communication facilities and poor integration of surveillance system with other related health information system are led to less acceptability, poor data capturing (insensitive to detect case data) of the system. As the result of these poor and less representative data are reported to upper level. But fortunately, timeliness of reporting, simplicity of format, dysentery case definition, flexibility and stability of the system was good.

Recommendation

Primarily, district health office should facilitate training on disease surveillance and related issues to be given for health staffs who are dedicated to diseases surveillance and response activities. Secondly, woreda health office should allocate resources like fixed phone, vehicle (motor bicycle), and budget for health facilities in order to improve diseases surveillance and response system attribute and activities. The health office should undertake restrict monitoring and support health facilities to solve and improve inconsistent data between patient registers, IDSR and HMIS reporting system. I strongly recommend health center staffs and/or persons who dedicated to diseases surveillance and response should report all detected and recorded cases in the health center. MOH and RHB should amend weekly reporting format in order to incorporate personal and other basic indicator variables. At the last, all concerned organizations should begin concerted effort to transform partial to full e-IDSR systems up to health facility levels.

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CHAPTER IV – HEALTH PROFILE DESCRIPTION REPORT

Health Profile Description of Humbo Woreda, Wolayita Zone, SNNPR, Ethiopia, 2016

Summary

Periodically compiling and analyzing health profile can help a community maintain a broad strategic view of its population's health status and identify factors that influence the community health.

This health profile description report gives an overview of health and health related issues in Humbo district, Wolaita zone, 2007 EFY's.

The whole area of Humbo district is prone to malaria and the characteristic weather condition of the district is also suitable to many risk factors of community health problems. However, health profile of the district was not assessed and described before this. By these and other reasons, the district has been selected and assessed about community health conditions.

The data has collected from health and related offices by reviewing documents and interviewing of leaders and experts, and collected data has analyzed by Ms excel. The health coverage of the district was 96% and most health services coverage also more than 85%. Although vaccination coverage was high, there were children who didn't fully immunize. The whole area of the district is malarias. From both outpatient and inpatient attendants, malaria is the leading cause of the cases. In contrast to the magnitude of malaria, IRS coverage of the district was very low, only 8 Kebeles were sprayed in 2007 EFY. Regarding to the documentation and quality of data, most data are not recorded and documented as well and was very difficult to retrieve the required information other than from HMIS report. The assessment findings are presented in narrative ways, percentages, and using graphs and tables.

Introduction

A community health profile is a comprehensive compilation of health and health related data, health indicators and health status of a community within specified geographic location and period of time. A community health profile is an integral component of the problem identification and prioritization cycle of the community health improvement process. A community health profile is made up of indicators of socio demographic characteristics, health status and quality of life, health risk factors, and health resources that are relevant for most communities; these indicators provide basic descriptive information that can inform priority setting and interpretation of data on specific health issues. (1)

Community health profile describes health determinants such as Economic growth, income distribution, geographical difference, education gender, food and nutrition behavior, lifestyle-related factors, environmental factors related to water and sanitation, waste management, and other livelihood conditions should be included. Community health may be influenced by different factors including physical and social environments, climatic variations, economic and educational status, accessibility of health service and facilities, living conditions and other factors are dominant to effects of community health. (2)

Therefore, periodically updating and compiling of health profile is also very imperative for identifying and prioritizing health and health related problems of the community at any level. It is basic for planning and undertaking appropriate public health interventions; and is used as a basis for operational public health researches. (3)

Rationale

The health profile description helps to describe the existing health service coverage, the developmental activities, social services, enables to identify the major health problems & prioritizing it, shows risk factors and indicates areas that should be given due attention to improve the health status of the community. Additionally, it indicates the fairness of distribution of health facility and resource in the community, helps to evaluate the performance of health service activities and provide evidence for decision making purposes.

Periodically compiled and analyzed health profile can help a community maintain a broad strategic view of its population's health status and factors that influence health in the community.

However, in our country in general and at district level in particular, the health profile is not well organized, it is usually incomplete and inaccessible to retrieve it when users want to use it. Therefore, assessment, description and compilation of health profile of regional, zonal or district level is necessary to evaluate and take interventions for unmet health issues.

Humbo district is found in Wolaita zone, SNNPR. Due to suitability of weather conditions, the district has taken as a hotspot area for malaria problem. The district health profile description was not conducted before. Due to these, I have been selected and conducted the health profile description of the district.

Objectives

General objective

To assess, describe and compile health and health related issues, health status, important health indicators and to identify health problems for priority setting in Humbo district in 2016.

Specific Objectives

- To compile community health and health related data
- To analyze and describe existing health status and issues
- To identify health gaps
- To suggest constructive recommendations based on findings

Methodology

Cross-sectional study has been conducted from January 12 to 27, 2016 in Humbo district, Wolayita zone. Health and health related data were collected from the district health, water & mineral, finance, education and agriculture offices. Checklist has been developed and used for collecting data from all relevant sectors/offices.

The data were collected by reviewing of records, reports, and interviewing and discussing with office heads & experts. In health office, most data have collected from aggregated HMIS report. Some data also has collected by phone contact with concerned persons.

Finally, the raw data was analyzed by Microsoft excel and ArcGIS. The findings have been compared with standard indicators, expected result and intended goals. Rates and percent of data are calculated by using Microsoft excels and information have presented by table, graph and charts.

Result

1.1. Demographic and Administrative set up:

Humbo district is one of the 12 districts of Wolayta zone in SNNP regional state. It found at 18 km away from zonal town (Sodo), 168 km from Hawassa and 395 km from Addis Ababa. The woreda has established in 1955 E.C, but no anyone who knows exactly how & why the name 'Humbo' had been given for the district. The district is surrounded by; on north Sodo zuria district, on North-east Damot Woide district, on southeast Loka-Abaya district [Sidama zone], on south Lake Abaya and Mirab Abaya district (Gamo Goffa zone), south-east Boreda district (Gamo Gofa zone), and on west ofa district.

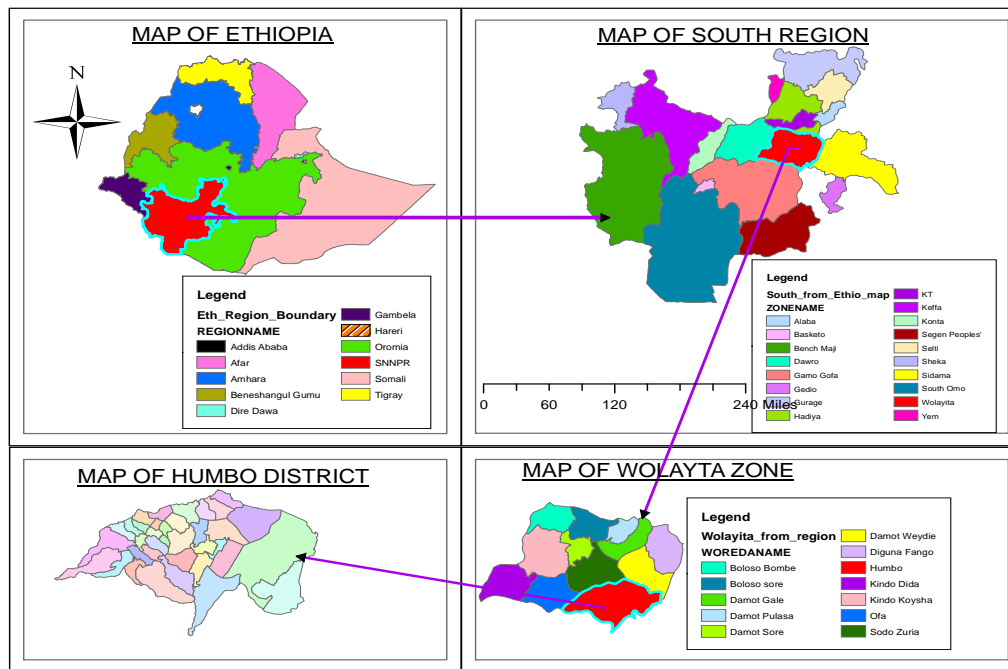


Figure 4-1: Maps showing area in which health profile description conducted, 2015

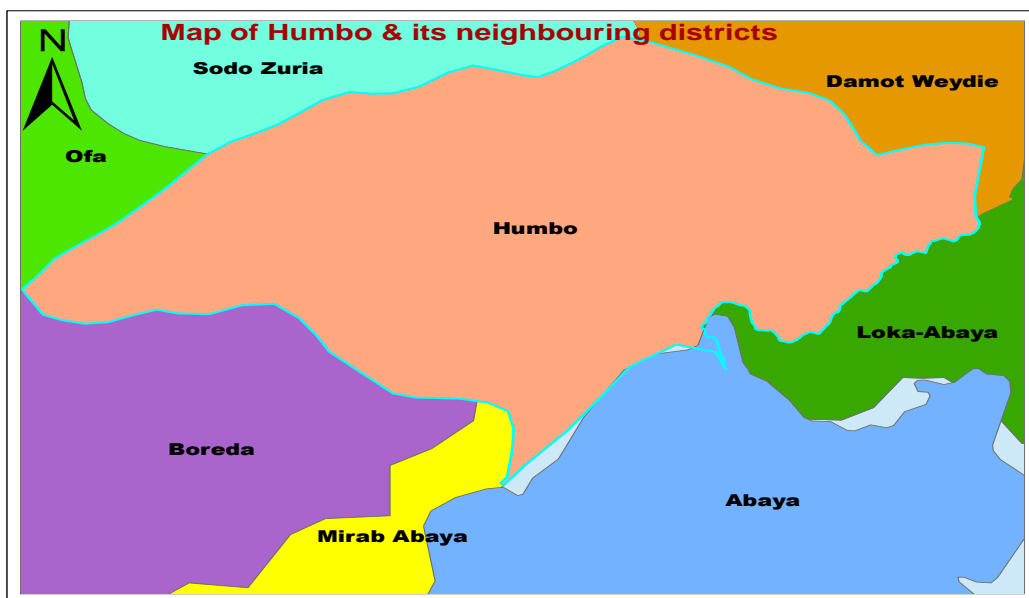


Figure 4-2: Map of Humbo district and its bordered areas

The district covers 866.5 square kilometers area. It is wider than other districts of the zone, covers 19.5% from zonal area (4453.2 Sq.km). This indicates that in one square km, 182 peoples are living in the district. The district is located at 2335m and 110m of higher and lower attitude respectively, and its average temperature is ranges from 21⁰c to 29⁰c. The mean annual rainfall of the district is ranges from 840 to1434mm. However, the district is characterized by hot weather condition.

The district was sub divided in to 41 administrative Kebeles (39 rural and 2 urban). According to population projection, in the year of 2015/2007 EFY, the total population of the district was 157,731. The sex ratio of the population is almost equal (one to one), 50.2 %(79,181) and 49.8% (78,550) female and male respectively. Based on the total live birth of the year, the crude Birth Rate of the district in 2007 EFY was 22 per 1000 peoples

Table 4-1: Population size of Humbo district by its Kebele in 2015

S.No	Name of Kebele	Population size by sex		
		Male	Female	Total
1	Abaya Gfata	2801	2916	5717
2	Abela Faracho	2277	2370	4647
3	Bukie Dongala	2155	2242	4397
4	Abela Kolshobo	1639	1705	3344
5	Abela Longena	1942	2021	3963
6	Abela Zegire	1675	1743	3418
7	Abela Sippa	523	545	1068
8	Abela Ajaja	904	941	1845
9	Abela Mreka	1701	1770	3471
10	Hobicha Bda	5988	6232	12220
11	Hobicha Bonigata	3989	4152	8141
12	Hobicha Digiso	2660	2768	5428
13	Hobicha Borkoshe	1764	1836	3600
14	Bola Wanche	1575	1640	3215
15	Serie Taworata	2167	2256	4423
16	Shochora Gola	1958	2037	3995
17	Koisha Gola	1407	1465	2872
18	Shochora Ossie	1480	1540	3020
19	Demba Koisha	1257	1308	2565
20	Koisha Wanigala	1411	1469	2880
21	Fango Gelchecha	1962	2043	4005
22	Fango Lome	2365	2462	4827
23	Galcha Kara	1753	1824	3577
24	Kodo Knko	1255	1307	2562
25	Shochora Abela	1450	1510	2960
26	Anika Wocha	1392	1448	2840
27	Shochora Ficho	887	924	1811
28	Ambe Shoya	1717	1788	3505
29	Gututo Larena	2036	2119	4155
30	Bossa Wanche	3043	3167	6210
31	Shochora Ogodama	1445	1503	2948
32	Koisha Ogodama	1276	1329	2605
33	Tebela 01	1925	2004	3929
34	Tebela 02	1924	2003	3929
35	Abela Shoya	1314	1368	2682
36	Ella Kabala	1997	2078	4075
37	Ampo Koisha	2598	2705	5303
38	Abaya Gurucho	1540	1603	3143
39	Abaya Chaocarie	2054	2137	4191
40	Abaya Bilatie	1540	1603	3143
41	Abaya Bosarie	835	870	1705
	Sum	78,550	79,181	157,731

Age distribution of the population has determined by regional conversion factor, so that 5032 (3.19%) of population was under one year of age, under five year 24622 (15.61%), women child bearing age 36751(23.3%), number of pregnant women were 5478 (3.46%). The five year age interval of population distribution is determined by One–Health–Tool (OHT) software and then the population pyramid is shown as the following. (4-3)

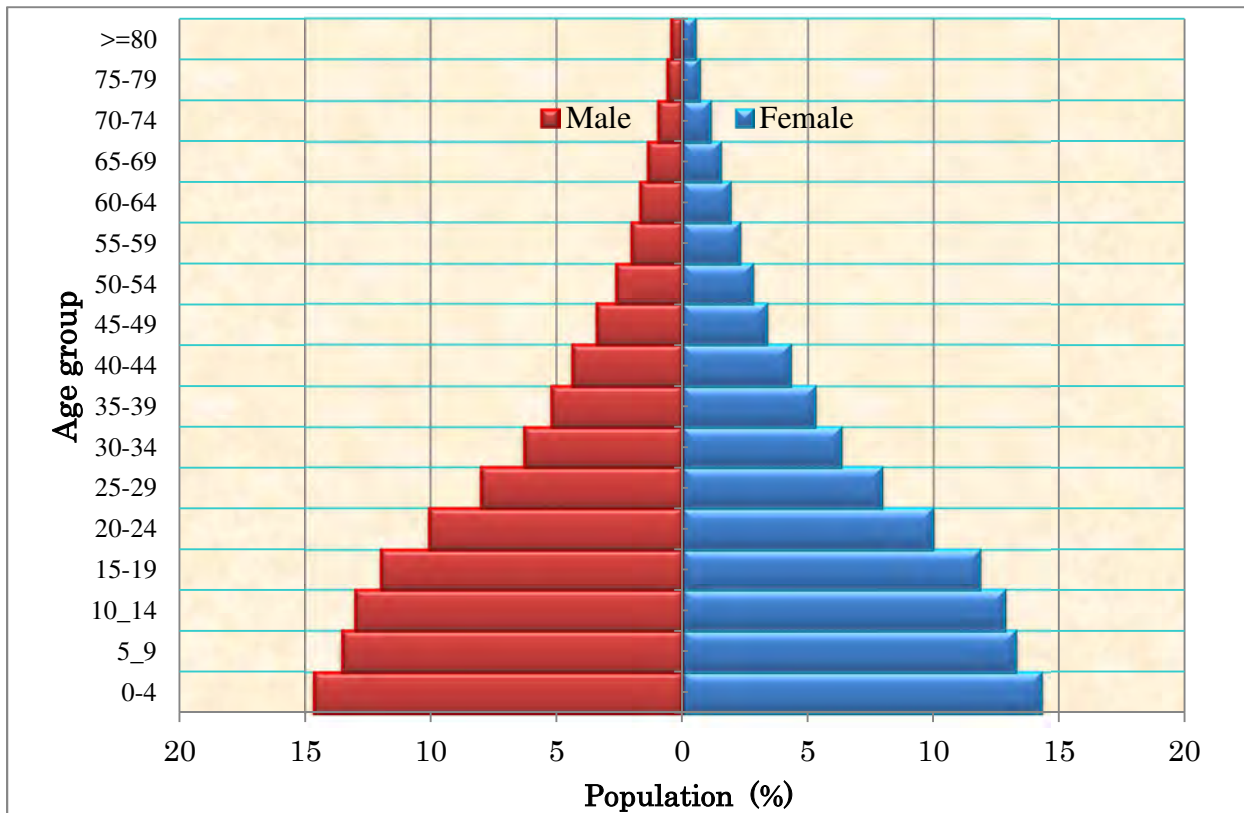


Figure 4-3: Population pyramid of Humbo district, Wolaita zone, 2015

In terms of religion and ethnicity, more than 95% of residents are Wolayta in ethnic group and 80% of them are protestant religion followers.

1.2. Economic situation

The main source of income of the populations is agricultural productions, thus according to district agriculture office, 93% of population is engaged in agriculture and then maize is stable food for most population. 1820 peoples are employed in governmental sectors. According to the district finance and economic office, there are 2831 unemployed populations in the district in 2014/15.

Budget and finance allocation

According to the district finance and economic office, the annual budget of the district in the year of 2014/15 (2007 EFY) was 68,526,990 ETB. Of these the amount budgeted for the district health sector was 6,234,638 ETB. The budget allocated in 2007 EFY for the health sector increased by 15.7% from the previous year, 2006 EFY (was 5,390,526 ETB). The allocation of health budget in 2008 EFY is shows that dramatically increased by more than 85% compared to the previous year budget. But as would you see in table 2, in relation to yearly total budget of the district, the proportion of budget allocated for health sector is decreased from year to year. Other than government, no additional budget has been allocated for the district health office, from donors or partners.

Table 4-2: Government budget allocated for Humbo district and its health sector from 2004-2008 EFY.

Year	District Budget	Health sector budget	Proportion of health budget (%), from district	Increment of health budget (%)
2004 E.C	36,798,167	5,059,413	13.7	
2005 E.C	43,291,961	5,633,239	13	11.34
2006 E.C	50,931,719	5,390,526	10.6	-4.3
2007 E.C	68,526,990	6,234,638	9.1	15.7
2008 E.C	101,996,834	11,545,102	11.3	85.2

Regarding to health care financing, two health center in 2000 E.C and four health centers also in 2003 E.C had started health care financing. So those by now all health centers are self-financed.

1.3. Health status & infrastructures in the district in 2014/15 (2007 EFY)

Health promotion, preventive and curative services are providing by 6 staffed health centers and 39 health posts. There are also 14 private clinics that are providing community health need services. All rural kebeles (39) have health post that is staffed with health extension workers.

Health centers mainly provide basic curative health care services but also support health extension program by acting as referral and technical assistance center for health extension workers. No any hospital exist in the district, however the district health coverage has reached 96%.

Utilization of health services

In the district, OPD attendance per capita and admission rate were 25.6% (37190) and 1.7% (635) respectively.

1.4. Human resource in health sector

Table 4-3: Number of health professionals and other staffs in 2015

S.No	Health professionals & others	In 2007 EFY		
		Male	Female	Total
1	Health officer	10	7	17
2	Nurse –BSC	11	8	19
3	Nurse – diploma	38	32	70
4	Laboratory technician/technology	10	6	16
5	Pharmacy technician/pharmacist	12	4	16
6	Midwifery	1	10	11
7	Environmental health professional	1	0	1
8	HIT-health information technology	3	1	4
9	Health extension worker	0	97	97
10	Other administrative staff	90	45	135
	Total	176	210	386

874 WHDA groups, 4290 one-to-five networks and 21588 members are organized and they are strengthening community ownership of health programs in the district.

Based on the existing health professionals and total population of the district, the ratio of health facility to population and health professional to population is almost equivalent to the standards, especially health post is more than to the required.

Table 4-4: Ratio of HF & health professionals to the population in 2015

S.No	Description	Ratio in 2007	Standard ratio
1	Health center to population	1 : 25,941	1 : 25,000
2	Health post to population	1 : 3,991	1 : 5,000
3	Health officer to population	1 : 9,278	
4	Nurses (BSc & diploma) to population	1 : 1,773	1 : 5000
5	Midwifery to population	1 : 14,339	
6	Health extension worker to population	1 : 1,626	1 : 2,500

Top 10 causes of morbidity, mortality & admission in the district, 2007 EFY

The leading cause of both OPD visit and admission rate of the district community was malaria. All age groups of the population were affected by malaria, Plasmodium falciparum is the leading parasite to cause malaria. From all cases of above five years of age, 27.6% and 44.2% were outpatient and inpatient cases of malaria respectively. Similarly from all cases, 30.9% and 77.97% of malaria cases of under-five years of age were outpatient and inpatient cases respectively.

Table 4-5: Top Ten Leading Causes of OPD Visit (mortality) in Humbo district, 2015

Sr No	>5 Years of age			0-4 years of age		
	Types causes	cases	%	Types causes	cases	%
1	Malaria	5030	27.6	Malaria	2177	30.9
2	Typhoid fever (AFI)	4037	22.18	Pneumonia	1535	21.79
3	Acute febrile illness (AFI)	1543	4.5	Diarrhea (non-bloody)	926	13.14
4	Trauma (injury, fracture)	1493	8.2	All respiratory diseases	718	10.19
5	All respiratory diseases	935	5.14	AFI	687	9.75
6	Skin diseases	791	4.35	Skin diseases	304	4.32
7	Pneumonia	623	3.42	Diarrhea with dehydration	121	1.72
8	Helmentiasis	463	2.54	Helmentiasis	98	1.39
9	Urinary tract infection	423	2.32	Otitis	76	1.08
10	Dyspensia	395	2.17	Trauma	62	0.88

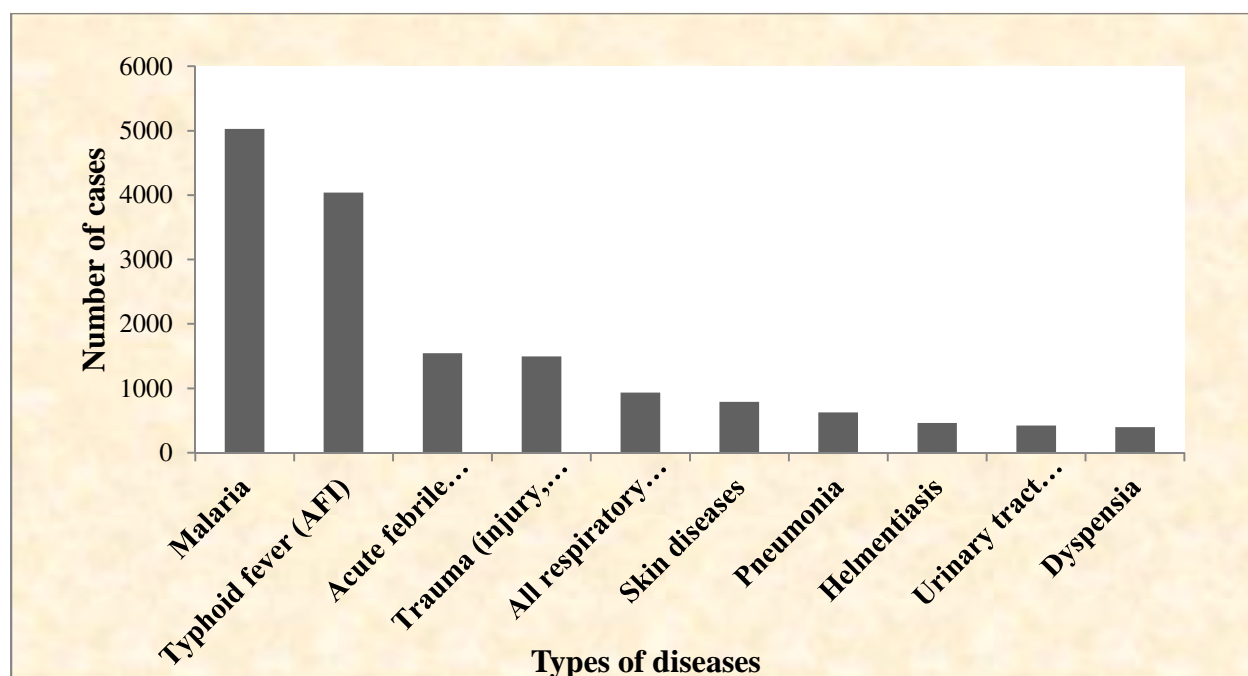


Figure 4-4: Top ten causes of morbidity of above five year of age in Humbo district, 2015

Table 4-6: Top Ten Leading Causes of admission in Humbo district, 2015

Sr	>5 Years of age			0-4 years of age		
No	Types causes	cases	%	Types causes	Cases	%
1	Malaria	278	44.2	Malaria	46	77.97
2	Typhoid fever (AFI)	168	26.7	Diarrhea with dehydration	6	10.17
3	Pneumonia	49	7.79	Pneumonia	5	8.47
4	Diarrhea (non-bloody)	44	7	Typhoid fever	2	3.39
5	Dyspnea	43	6.8			
6	Diarrhea with dehydration	16	2.54			
7	Acute bronchitis	7	1.11			
8	Trauma	5	0.79			
9	All respiratory diseases	5	0.79			
10	Helmentiasis	3	0.48			

Source: Humbo district HMIS report in 2007 EFY.

Top ten causes of deaths (mortality) in Humbo district, 2007 EFY

Birth and death rates are the main determinant of population size within a specified location and period of time. The birth and death data are used as evidence or accepted only if it is recorded in health facility registration. For the health sector of our country, no other means to acquire data of all birth and death occurred in a community within a year or any period of time unless it recorded health facility.

In addition, it is not common to go to health facility when the health condition of a person is reached to death. Even when a health care providers estimate a patient will die soon, they tell him/her to return back to his/her home. Due to this and other reasons, Humbo district health data revealed that only one person has died and recorded in HF within a year in the district.

2. Status of primary health care components

2.1. MCH service status in Humbo district in 2007 EFY

Child health

As would you see fig.5, infant vaccination coverage is high but there are children who completed their vaccination schedule without fully vaccinated. For example 657 children didn't uptake full Rota vaccine, and 513 children also didn't get BCG vaccine.

Maternal health

Maternal health service coverage was very encouraging, except delivery assisted by skilled personnel, most other services are covered more than 90% for eligible peoples.

In the district there were 5457 pregnant women and about 4433 (81.2%) mothers have got ANC services at least four visits. Delivery assisted by skilled personnel was 55.8% and postnatal coverage was 98.5%. But the numbers of mothers who have got PNC service are greater than that of mothers who have birth in a year; logically it is inconsistent and it may indicates that there were mothers attend delivery at their home and came to health facility seeking postnatal care service. About 422 (7.7%) mothers have attended birth supported by health extension workers. The PMTCT coverage was 5782 (106%), 5 are positive to HIV.

Table 4-7: Child vaccination service coverage in Humbo district, 2015

no	Type of vaccination		Eligible	Coverage		DOR
1	BCG		5457	4559	83.5%	
2	OPV	1	5032	5277	105%	
		3	5032	5119	102%	
3	Rota	1	5032	4773	94.8%	
		2	5032	4375	86.9%	8.3 (Rota1 to Rota2)
4	Penta	1	5032	5192	103%	
		3	5032	5168	102.7%	0.46 (Penta1 to 3)
5	PCV	1	5032	5208	103.5%	
		3	5032	5163	102.6%	
6	Measles		5032	5109	101.5%	1.6 (Penta1 to measles)
7	Fully immunized		5032	5072	100.8%	697 children didn't take Rota

Table 4-8: Maternal health service coverage in Humbo district, 2015

no	Description		Eligible	Coverage		DOR & Remarks
				Number	%	
1	ANC coverage	1 st round	5457	5233	95.8	
		4 th round	5457	4433	81.2	
2	PNC coverage		5457	5380	98.5	
3	Delivery coverage	in HC		3048	55.8	0.22, Delivery to ANC+4
		HEWs	5457	422	7.7	
4	Contraceptive prevalence		30395	18389	60.5	LAFP=24% SAFP=51.6%
5	PMTCT coverage		5457	5782	106	5 was +ve =0.86 per1000
6	TT2+ coverage for pregnant		5457	5201	95.3	
7	TT2+ coverage for no pregnant		30395	14711	48.4	

Source: Humbo district health office HMIS report in 2007 EFY

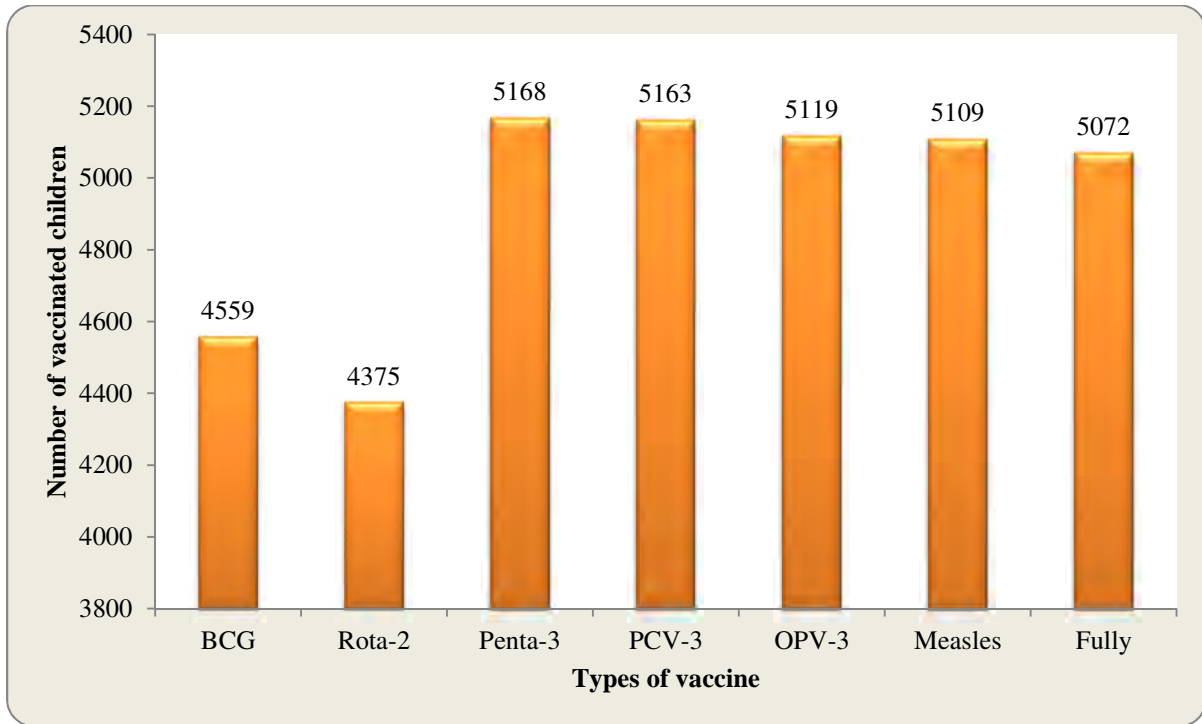


Figure 4-5: Child Vaccination service coverage in Humbo district, 2015

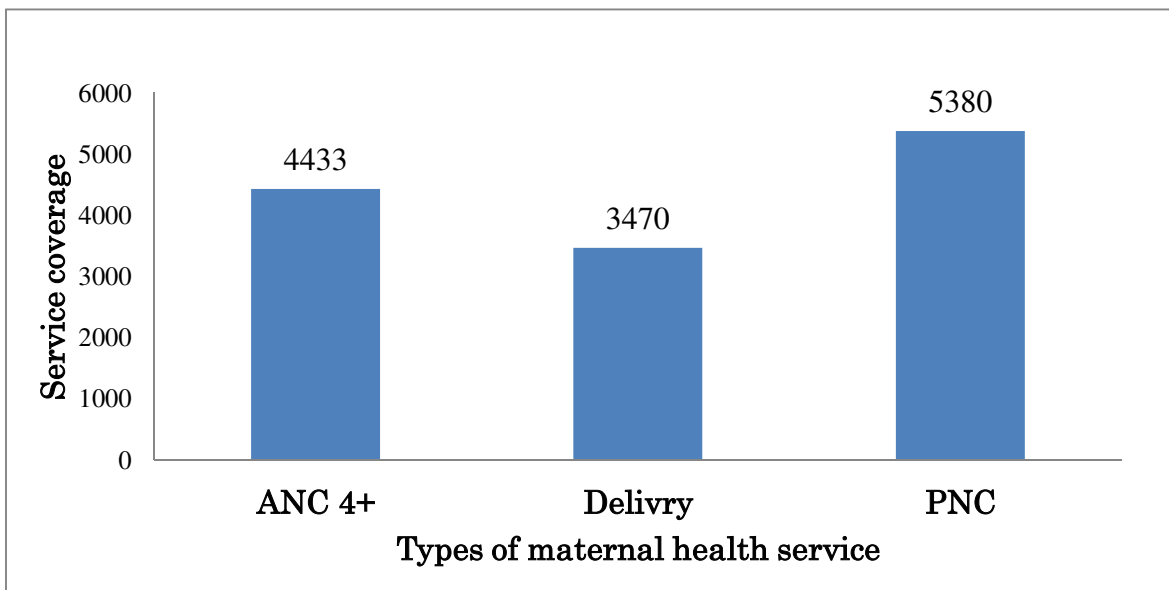


Figure 4-6: Maternal health service coverage in number in Humbo district, 2015

2.2. Environmental health status

Sanitation coverage of Humbo woreda was 100% in 2007 EFY, this means all households have own latrine. Access to safe water coverage of the district was 86.27%. Among 41 kebeles, 13 (32%) of them were fully accessed to safe water supply. However, 4 (10%) kebeles (11793 population) haven't any safe water supply system up to 2007 E.C.

Table 4-9: Environmental health status in Humbo district, 2015

no	Description	Number or (%)
1	Latrine coverage	100
2	Number of house hold having latrine	32190
3	Safe water supply coverage	86.27
4	Number of kebeles fully accessed to safe water supply	13
5	Number of kebels have not safe water supply at all	4
6	ODF kebeles	22

2.3. Health Education services, 2007 EFY

Skills-Based Health Education, also referred to as Life Skills-Based Education is used to acquire knowledge and to develop attitudes and skills which support the adoption of healthy behaviors.

Health education is used for as a tool to promote primary health components in the community. Unless and other wise users having relevant information about healthy behaviors, they will not act well to prevent their health from any risks.

In Humbo district, about 16,972 peoples have got health education about communicable & non-communicable diseases, sanitation, maternal and child health and others in 2007 EFY.

2.4. Prevention and control of diseases in Humbo district, 2015

Malaria prevention and control status

Areas up to 2000 meters above sea level are malaria epidemic and considered IRS & LLIN targeted area in Ethiopia.

According to the district agricultural office, Humbo district is found in the range of 110 to 2335 meter above sea level, only 30% of area is found above 2000 meter. So that it is identified as a hot spot area by the RHB.

Because of the favorable geographical and weather conditions of the whole area of the district, malaria is the leading cause of morbidity of all age groups of the people. Among 19,268 suspected and diagnosed peoples, 7122 (37%) of them are positive with malaria. About 80% of cases were caused by plasmodium falciparum parasite. As could be seen from fig 7, the pick was during the January and July.

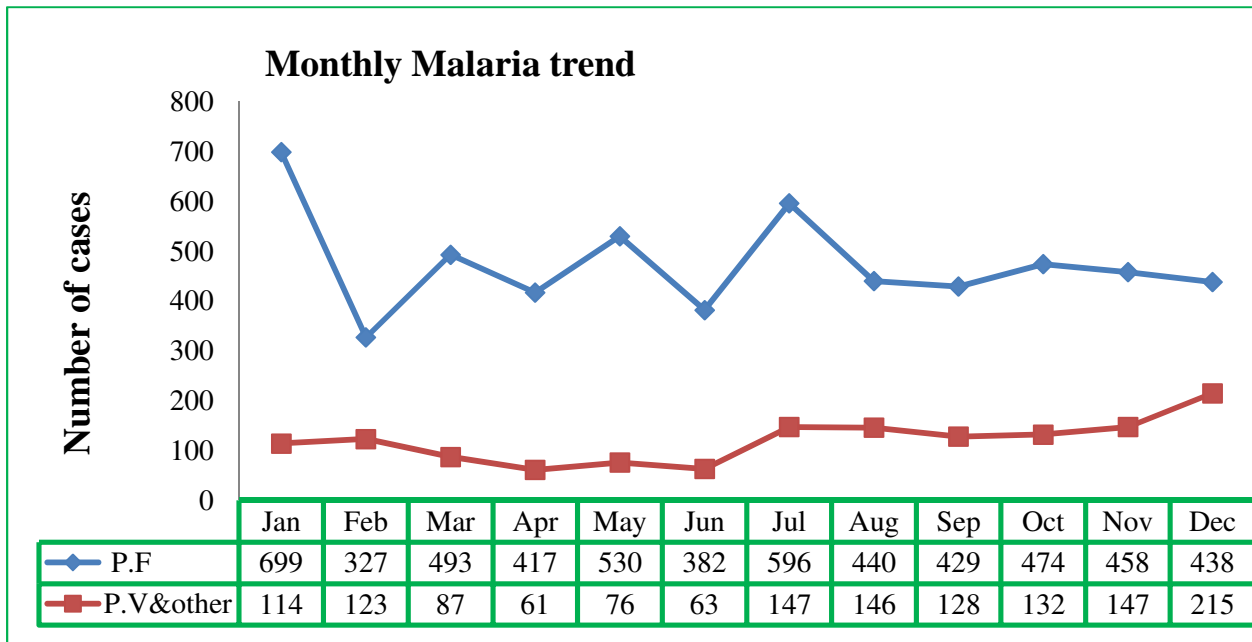


Figure 4-7: Monthly Malaria trend in Humbo district, 2015 (only confirmed)

As you would see in figure 8, in age group and sex wise, males were more affected than females with malaria, (53% males and 47% females) and ages groups greater than five year are more affected.

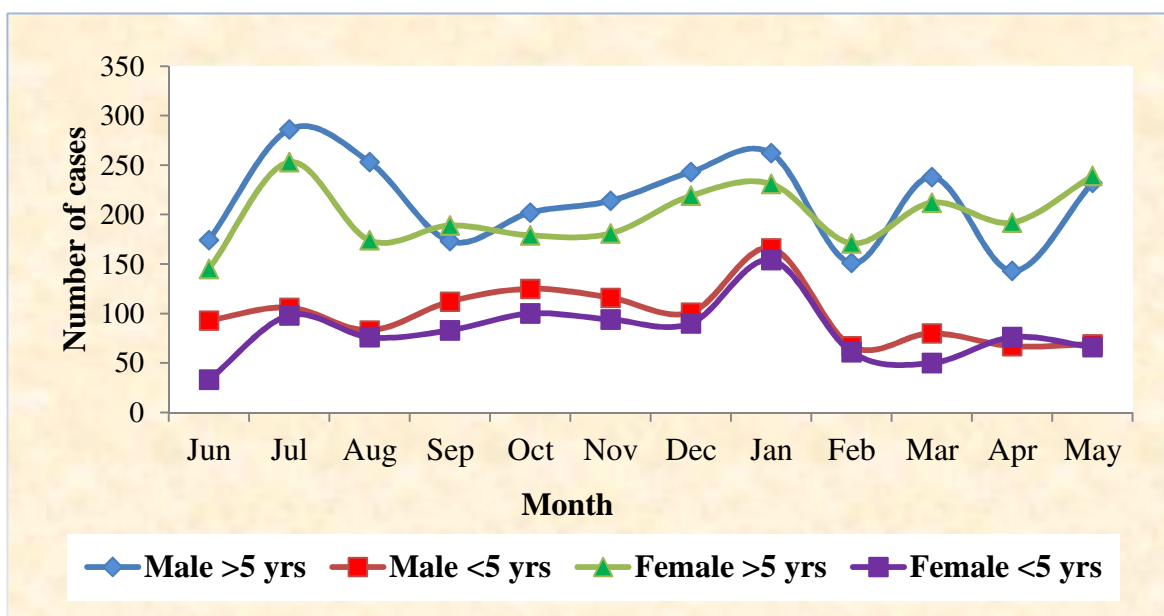


Figure 4-8: Patterns of malaria in sex and age group in Humbo district, 2015

Although there are some gaps, all intervention methods are undertaking to prevent and control malaria problem in the district. LLIN distribution coverage of the district is 100%. 18,800 LLIN has distributed to the community in 2007 EFY for replacement purpose. Even if the woreda is IRS targeted area, only 8 (19.5%) kebeles were sprayed with anti-mosquito chemical in the year. District health office has received 801 boxes of RDT and more than 621 boxes of Coartem from zone health department and distributed it to health facilities as required. However, according to district’s store personnel, most of the time essential drugs like Coartem, Quinine, and other drugs are getting shortage, since it is provided from upper sector according to the previous month/period report.

Prevention and control of TB/Leprosy in 2007 EFY

The prevention and control methods of tuberculosis is needs due attention to decrease the risk and consequences of the disease. Early detection and treatment of cases is undertaking at community and health facility level. The treatment of the disease takes long period of time and the outcome is evaluated at the end of one year treatment. As you would see in table 4-10, there were 121 PTB & EPTB cases enrolled in cohort for one year and evaluated their treatment outcome after a year (2007 EFY).

Table 4-10: Tuberculosis treatment outcome in Humbo district in 2015

Types of TB cases	Enrolled in cohort	Outcomes								
		Cured	Rx completed	Lost to follow up	failure	Not evaluated	Moved to MDR	Died	total	Not recorded
Bacteriologically confirmed PTB	67	60	7	-	-	-	-	-	67	-
Clinically diagnosed P/Neg PTB	39		34	-	-	-	-	3	37	2
Clinically diagnosed EPTB	15		8	-	-	-	-	5	13	2
Total	121	60	49	-	-	-	-	8	117	4

Source: 2007 E.C HMIS report of the district

Among patients who are enrolled for treatment, 4 of them no information recorded about their treatment outcome. The main indicators of the services are cure rate of the patient 60 (89.6%), treatment success rate 109 (90.1%) and death rate of all form of TB was (6.6%). Only 76 (62.8%) TB patients are screened for HIV. There was no any person infected by leprosy in the year.

In the year, 25 all form TB patients have given treatment (DOT) supported by community health workers (HEWs).

Prevention and control of HIV/AIDS in 2007 EFY

In Humbo district about 26,295 persons were tested for HIV in 2007 EFY, of them 16,022 (61%) by VCT and the rest 10,273 (39%) are tested by PICT service. Among them, 148 are positive for HIV. Based on HMIS report, females are more affected than males. All patients were on ART.

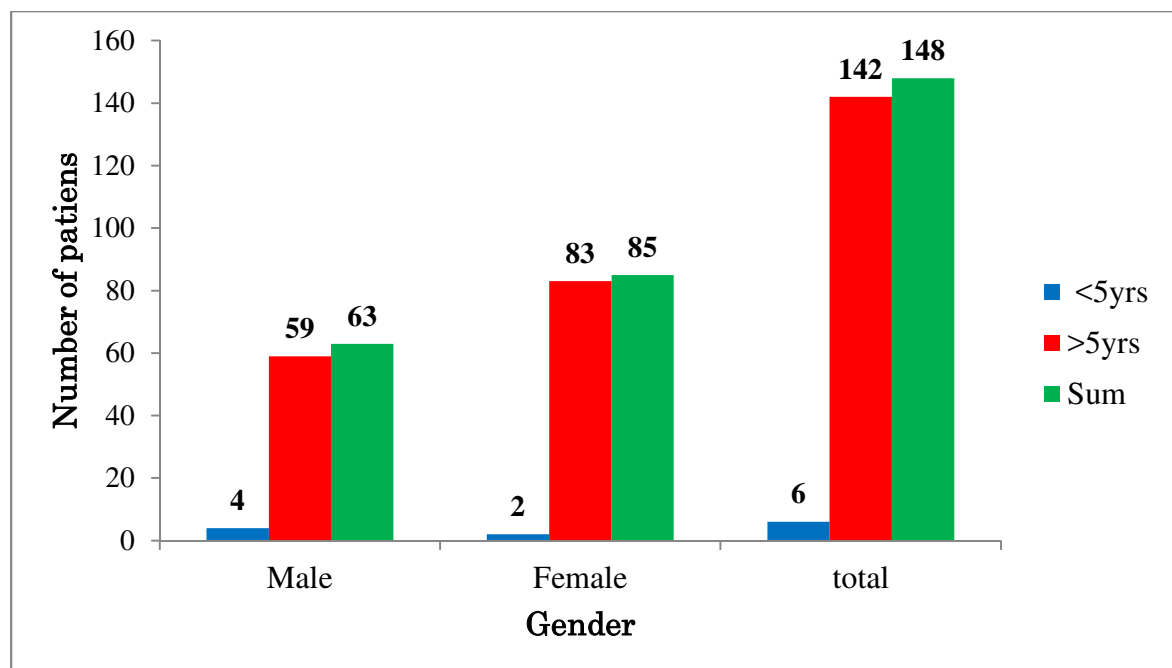


Figure 4-9: Number of people living with HIV & on ART in Humbo district, 2015

2.5. Nutrition intervention program

A nutritional problem was raised in country wide due to unusual variability of weather condition. In Humbo district different nutrition intervention programs like Outpatient Therapeutic Program, Therapeutic Feeding Unit, Therapeutic Supplementary Feeding and Community Based Nutrition were undertaking to reduce the effects of malnutrition.

Table 4-11: Nutrition programs and number of users in Humbo district, 2007 EFY

S.NO	Types of intervention program	No of sites	No of new user enrolled	Remarks
1	OTP	41	261	
2	TFU	6	7	
3	TSF	41	5898	Mothers & children
4	CBN	39	5692	Jan 2014 – 2015

2.6. Disaster status in the area

Flooding is inevitable in some areas of Humbo district during the main rainy season. Especially kebeles found at the costal of Abaya Sea are prone to flooding. But no data recorded about the affected peoples or properties in previous years.

2.7. Educational status

The general level of education has marked to decreases the spread of diseases, the acceptability of health practices and utilization of modern health services.

In the year 2007 EFY, there were 58 schools in the district with a total of 45007 students, 23727 (52.7%) and 21280 (47.3%) male and female respectively.

Table 4-12: School enrolment proportion by Sex in Humbo district, 2007 EFY

Grade	Sex		Total	Proportion	
	Male	Female		Male	Female
1-8	19902	18223	38125	52.2%	47.8%
9-10	3039	2347	5386	56.4%	43.6%
11-12	786	710	1496	52.5%	47.5%
1-12	23727	21280	45007	52.7%	47.3%

Different school health clubs like Eye health, Red-cross, Anti-malaria and other clubs are established in each school and they are working basic school health activities.

Major gaps identified

- Low coverage of IRS (19.5%)
- Many children (697) didn't get Rota vaccination
- Lack of safe water supply in four kebeles (11793 population)
- Poor documentation system

Discussion

Periodically updating of compiled health profile is very imperative for identifying and prioritizing health and health related problems of the community. (5) The district encompasses a geographic area of 686.5 square kilometers with a population density of 182 persons per square kilometer. Comparing to country density (82 people per square km), 100 more persons are living per square km. (6)

Humbo district health profile indicates that the general health coverage has reached 96%. Except health personnel assisted delivery, most health services coverage also more than 85%. But there were 657 children included in fully immunized without getting Rota vaccination. The district is characterized by hot weather condition and the whole area of the district is prone to malaria. Thus, malaria is the leading health problem of the community in the district. According to malaria guideline, areas up to 2000 meters above sea level are malaria epidemic and considered IRS & LLIN targeted area in Ethiopia. (7) But the coverage of IRS of the woreda was (19.5%), 2007 EFY. The proportion of households with access to improved sources of drinking water in the district was 86% which is higher compared to national coverage, 57% of year 2014. (8)

However, there were four kebeles with 11,793 population without safe water supply system at all, so this is a serious risk for water born and related health problems.

Conclusion: Based on our findings of district health profile assessment, I concluded that safe water supply, malaria prevention measures, children vaccination and TB cases follow up services need to be improved in the district.

Recommendation

The district health office should improve IRS coverage, should emphasis for unmet vaccinations, should follow and support health institutions to improve TB patient follow up and treatment. In addition district health office should improve documentation and data filling systems. District water, mineral and energy office should give immediate remedy for communities which are without safe water supply system.

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CHAPTER V – SCIENTIFIC MANUSCRIPT

Cholera Outbreak Investigation, Dara Woreda, Sidama Zone, SNNPR, Ethiopia, 2016

Abstract

Background: Cholera is acute bacterial infection caused by ingestion of food or water containing vibrio cholera either O1 or O139 serogroups. Worldwide, 3 to 5 million cases and 100,000 to 120,000 deaths reported per year. The case fatality rate, if untreated may reach 30-50%. An intermittent common source cholera outbreak was occurred in Dara district and we conducted an investigation to verify the outbreak, assess magnitude, identify risk factors and recommend control measures in Dara district, Sidama zone, South Ethiopia, 2016.

Method: Case control study was conducted by recruiting 51 cases and 102 controls. A case was a person aged 5 years or more with acute watery diarrhea with or without vomiting. We collected data by using questionnaires and we analyzed the data using excel, Epi Info version 7 and ArcGIS 10.1. Water samples from four different sources and nine stool samples from patients were collected and tested.

Result: A total of 220 cases with one death (CFR 0.45%) were reported. Overall attack rate was 23/10,000 population from 18 affected kebeles. Most cases were occurred from people settled along Legedara River. 126[57%] of cases were in the age group of 15-34 years. Male and female were equally affected by the disease. Multivariate analysis indicated that eating food outside the home [AOR: 2.73; 95%CI: 1.06 – 7.03], and travel history to affected area before 5 days [AOR: 3.66; 95%CI: 1.56 - 8.59] were statistically significantly associated risk factors for the outbreak. Tested stool samples were all positive for vibrio cholera O1, Ogawa serotype, Legedara River and one spring were positive for total & fecal coliforms.

Conclusion: This investigation confirmed an outbreak of cholera causing by V. cholera serotype Ogawa and we identified eating outside the home and travel history to affected area were significant risk factors for contracting the disease. We recommended provision of safe water supply and improvement of sanitation and hygiene condition is required to prevent the disease in the future.

Key word: Acute Watery Diarrhea Outbreak, Investigation, Dara, 2016.

Introduction

Cholera is a diarrheal disease caused by vibrio cholera, which can either be of type o1 or o139. Only about 20 percent of those infected develop acute watery diarrhea, and of these, between 10-20 % can develop severe watery diarrhea with vomiting within short incubation period, 2 hours to 5 days [1]. The case fatality rate (CFR) if untreated may reach 30-50% [2].

In the year of 2011, fifty eight countries reported a total of 589,854 cases and 7816 deaths to 'WHO' worldwide. Of these, Africa accounted for 86% of cases and 99% of deaths [3].

'WHO' report on cholera in 2009 revealed 31,509 cases and 434 deaths were occurred in different region of the Ethiopia [4].

According to the international study conducted on updated global burden of cholera in endemic countries of WHO region and published on 2015, among 40 listed African countries, Ethiopia is the first by morbidity (275,221 cases) and mortality (10,458 deaths) [5].

On 7 July 2016, Sidama zone health department was reported an outbreak of AWD in Dara woreda in Southern region of Ethiopia. The disease was first started in neighboring districts of Gedeo zone and then became quickly spread to Dara district and then covers a wide area within a short period of time. Cholera Outbreaks can occur where water supply, sanitation, food safety and hygiene are inadequate. [6]. The aim of the study was to identify risk factors associated with increased number of cases, to describe the epidemiology of the disease and to assist the intervention measures for the outbreak in the woreda.

Methods and materials

Study period and setting: We conducted the investigation from July 16 to 31, 2016 in Dara woreda. Dara woreda is located in Sidama zone, Southern Nations, Nationalities and Peoples of Ethiopia. The woreda was organized by 36 administrative kebeles with a total population of 197,930 (projected from 2007 census). The woreda is bordered with seven woredas, two from oromiya region, two from Gedeo zone and others from Sidama zone [Fig 5-1].

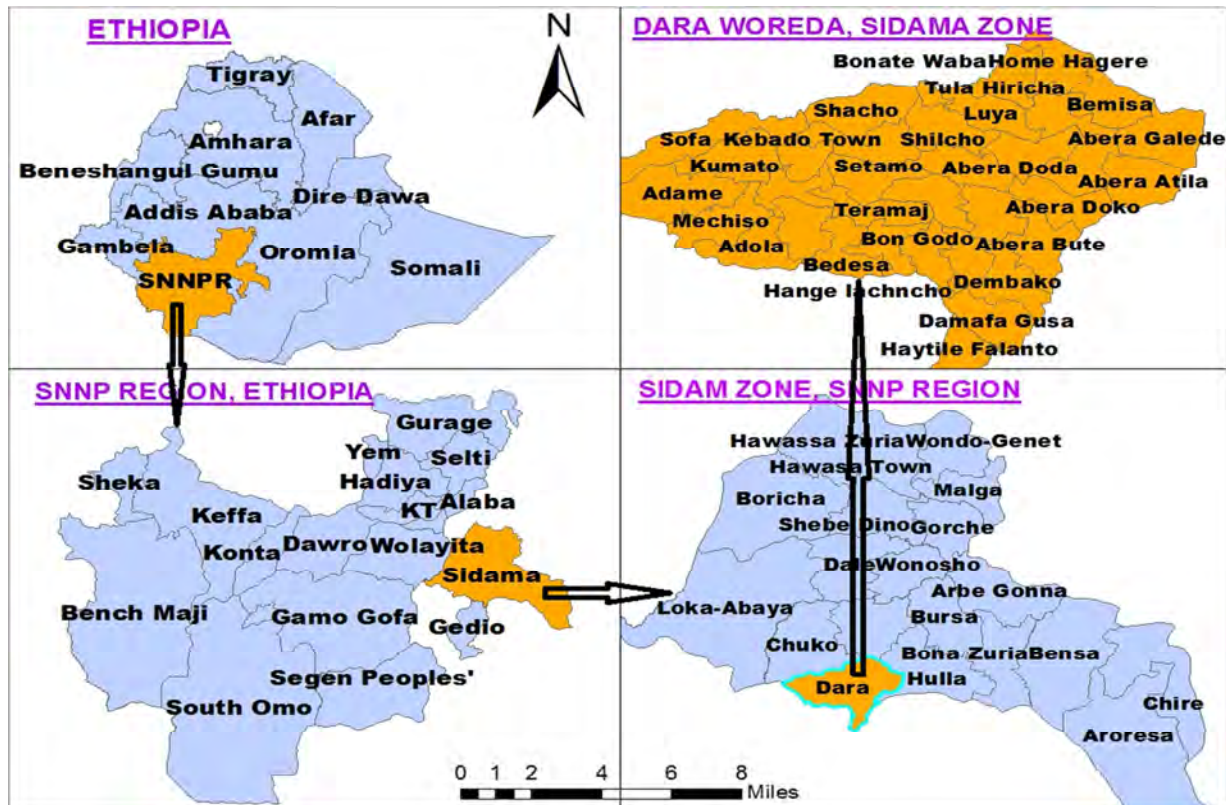


Figure 5-1: Location where AWD outbreak investigation has been conducted in 2016

Study design: We conducted descriptive study followed by case control study. We conducted unmatched case-control study by recruiting 51 cases 102 controls [1 to 2 ratios].

Case definition: We defined a probable case as any patient aged 5 years or more who had acute watery diarrhea, with or without vomiting. We compared each case-patient with a control selected from the next door neighbors without diarrhea and vomiting.

Data collection: We collected data by interviewing active cases at CTC and controls at their home using structured questionnaire. We collected sanitation, latrine utilization and safe water supply coverage by reviewing reports and records from woreda health and water & mineral energy offices. We collected socioeconomic and types livelihood activity conducting in the district by discussing with woreda administrators. We obtained line listed cases from CTCs.

Environmental assessment: We assessed water sources, sanitation and hygiene conditions of the visited households and general environmental health conditions of the community.

Laboratory test: We collected stool specimens from a random sample of nineteen patients and water samples from four water sources (River, unprotected spring, water reservoir and water treatment plant) and tested.

Data analysis: We described the outbreak by person, place and time. We calculated odds ratio and risk factors also analyzed by binary and multivariate regression model with 95% confidence interval using Epi Info version 7. We calculated attack rate, case fatality rate and percentages of line listed cases using excel. We used ArcGIS 10.1 to show cases on spot map.

Ethical issues

Some patients were not willing full to respond for interview, so that informed consent and permission was sought from patients who admitted in CTC before the interviews.

Result

1.1. Descriptive epidemiology

Distribution of AWD by time

The first case was occurred on 6/7/2016. Between July 6 to August 24/2016, a total of 220 people with 1 death, case fatality rate (CFR) of 0.45%, were affected by cholera. The duration of outbreak was extended for more than a month and an intermittent common source outbreak was observed with multiple peaks.

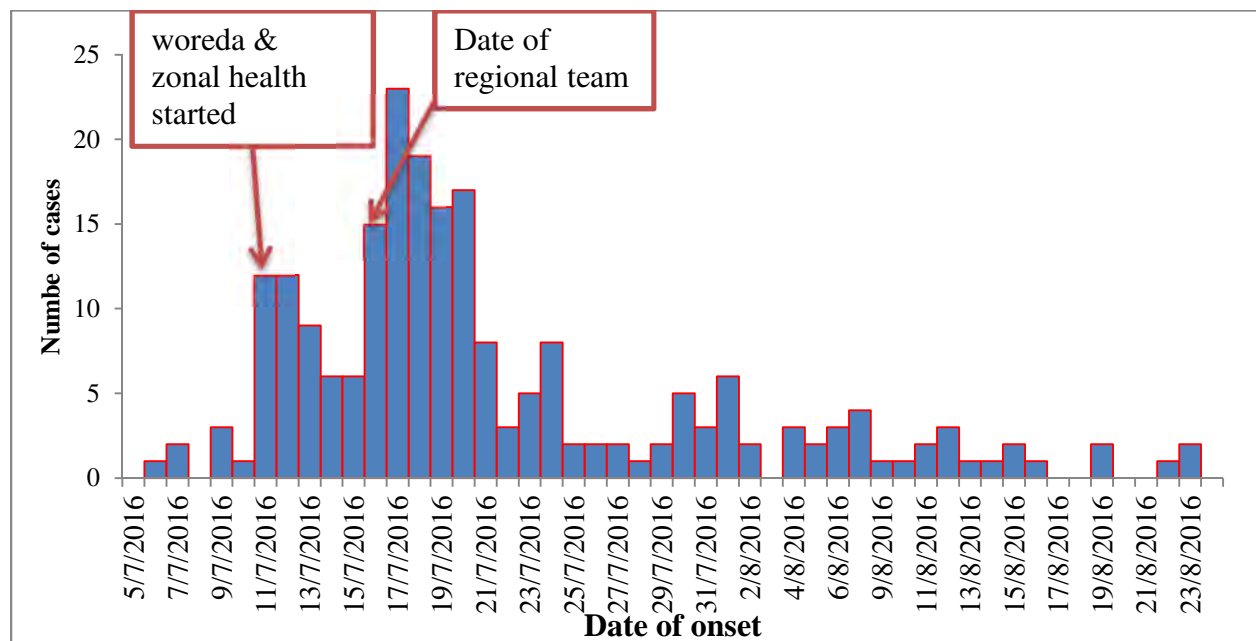


Figure 5-2: Epicure of AWD by date of onset in Dara woreda, Sidama zone, 2016

Distribution by person

The index case was a 27 year old male, daily laborer; he developed diarrhea and vomiting on July 6/2016. After five days the number of cumulative cases increased to 12 within 3 kebeles. Males and females were equally affected by the disease. The affected age ranges from 9 month to 76 years with a median of 24. Both sexes were more affected in the age group of 15 – 34 years, 126(57%) of all cases.

Table 5-1: Distribution of AWD cases by sex & age groups, Dara district, Sidama, 2016

Age group	Male		Female		Total	
	Cases	%	Cases	%	Cases	%
<5yrs	3	33%	6	67%	9	4%
5-14	28	64%	16	36%	44	20%
15-24	31	52%	29	48%	60	27%
25-34	29	44%	37	56%	66	30%
35-44	8	53%	7	47%	15	7%
45-54	6	50%	6	50%	12	5%
55-64	4	40%	6	60%	10	5%
>65	1	25%	3	75%	4	2%
Total	110	50%	110	50%	220	100%

Distribution by place

The first case was occurred in Bedessa Kebele and then a total of 18 Kebeles (50% of the woreda) were affected by the outbreak. Mechiso kebele was the most affected with 45(21%) of cases followed by Bedessa 36(16%) cases. The attack rate was also higher in Mechisho Kebele (1.03%). The overall attack rate for affected Kebeles was 0.23% with a total of 96,007 populations at risk.

Most cases were mapped along the Legedara River, which runs between most affected kebeles and Dila town, Gedeo zone. The distribution of the cases was covered a wide areas with a scattered manner.

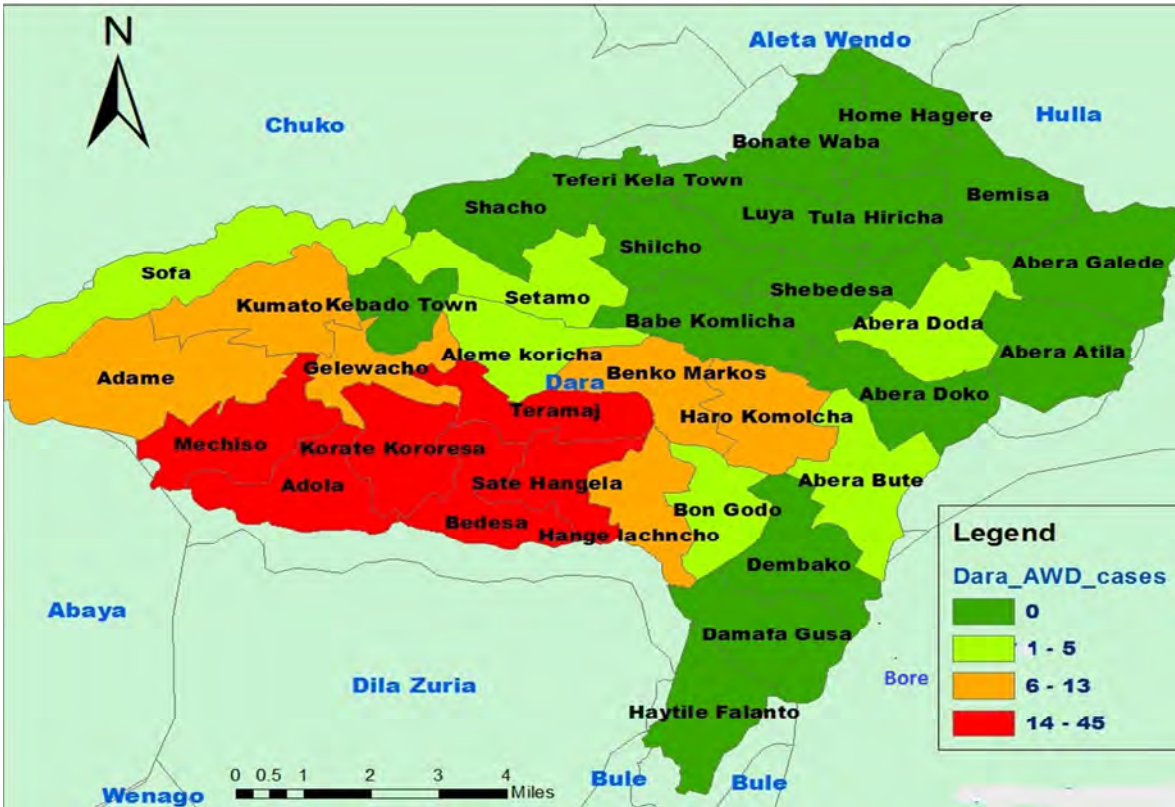


Figure 5-3: Geographic distribution of AWD cases in Dara district, Sidama zone, 2016.

1.2. Case-control study

The median age of both case-patients and controls was 25 year with a range of 2 to 74 years of age. 84 (55%) of participants were males with 30 case & 54 controls, and 69(45%) of participants were also females with 21 case & 48 controls.

Analytic analysis has been conducted for selected risk factors for cases and controls. Eating outside of the home, travel history to affected areas before 5 days, using river water for drinking purpose and knowledge on cholera transmission were having association with the infection. Knowledge on transmission of cholera was protective to the infection.

From a multivariate logistic regression analysis knowledge on cholera transmission, travel history to affected area and eating food outside the home were statistically significantly association with the outbreak. Unlikely in bivariate analysis, using river water for drinking purpose had no association with contracting the disease and thus was not an independent risk factor for occurrence of cholera in the area.

Table 5-2: Multivariate analysis for factors associated with AWD outbreak, Dara, 2016

S.No	Risk factors		Case	Control	Bivariate		Multivariate	
					OR	95%CI	OR	95%CI
1	knowledge on cholera transmission	Yes	20	72	<u>0.26</u>	<u>0.13 - 0.54</u>	<u>0.2</u>	<u>0.06 - 0.46</u>
		No	31	30				
3	Unclean latrine	Yes	33	65	1.01	0.51-2.1		
		Not	18	37				
4	Travel history to affected area	Yes	23	22	<u>2.98</u>	<u>1.4 - 6.1</u>	<u>3.66</u>	<u>1.56 - 8.59</u>
		No	28	80				
5	Using river water for drinking purpose	Yes	18	20	<u>2.2</u>	<u>1.1 - 4.7</u>	<u>2.31</u>	<u>0.79 - 5.46</u>
		No	33	82				
6	Eating food outside the home	Yes	17	15	<u>2.9</u>	<u>1.3 - 6.4</u>	<u>2.73</u>	<u>1.06 - 7.03</u>
		No	34	87				
7	Contact with other cholera patient	Yes	5	14	0.68	0.23-2		
		No	46	88				
8	Participating in funeral ceremony from cholera death	Yes	2	3	1.3	0.2-8		
		No	49	98				
9	Unclean latrine	Yes	33	65	1.04	0.5-2.1		
		No	18	37				

1.3. Environmental and community investigation

Many of the questions require observing environmental status and sanitation & hygiene practice of the community. Though the sanitation coverage of the woreda was 88%, almost all visited households' latrine was not clean. There was observed human feces dumped on open field and at the bank of rivers. Safe water supply coverage of the woreda was also very low [47%], and nonfunctional of water scheme was 24%. Most people obtained their water from unprotected sources and/or buying from unknown source. Peoples living in three kebele located along Legedara River were without having any safe water sources. Moreover, residents believed that the river water might be safe when they fetch it at night or morning. In the case of eating outside the home, 17[33%] cases ate food from small scale establishment and/or at street vendor in Dilla town. In the area, many residents who are in low economic level are engaged in small scale trading and daily labor for their daily food requirement. According to Dara wreda administrator, approximately 10,000 peoples are move to Dilla town per day for their livelihood activities.

1.4. Laboratory result

Stool samples tested from 19 patients were all positive to vibrio cholera with serogroup o1, serotype ogawa. And among tested water samples from four different water sources, samples collected from Legedara River and one unprotected spring were positive for total and fecal coliforms with very high grade of contamination.

Action taken

Treatment centers (CTC) were established at four sites in the woreda and all affected peoples had been treated with appropriate treatments. Infection control activities like disinfecting any place and articles which come in to contact with the patients' vomitus and stool were disinfecting with appropriate chlorine solutions. Water treatment chemicals had been distributed for 20,258 households (50% of total households of the woreda). Adequate staffs were deployed to all kebeles in the woreda and they undertake intervention activities. Non-governmental organizations (IRC, UNICEF, Save the Children) were also actively involved in intervention by providing supplies and technical support.

Discussion

Our study identified two inter-related risk factors having statistically significant association with the infection of cholera, which are odds of traveling to affected area and eating of food outside the home. In the first case, for the sake of daily labor and small scale trading purposes, many people from Dara district were moving to Dila town where the diseases had been already occurred. And the second associated risk factor might be happening whenever people go and wait for a day or more outside the home. There are also other contributing factors for the rapidly spreading of the disease and covering large areas in the district. Being the outbreak period was rainy season, in such condition the spreading of disease increases with flooding and contamination of water [1] Movement of many peoples from rural to town and back was also other factor for an outbreak covered a wide areas. According to guideline of cholera outbreak, Oxfam 2012, communities in which people are moving about a lot, gathering, dispersing etc can import and export cases to new areas very rapidly. In bivariate analysis, drinking of water from river source had association with contracting the disease. Similar study conducted in Ghana suggested that people who drunk from the river were 6.9 times more likely affected by cholera

than those didn't drink [7]. But in this outbreak drinking from river was not significantly associated. This study showed that overall males and females were affected with equal proportion. This is inconsistent with study conducted in Afar region suggested that 87.7% of cases were males [8]. In other study conducted in Central Africa Republic, women were more affected (52.5%) than men [9]. Gender disparity or differences regarding to exposure to cholera may be with respect to roles, social norms, and personal behaviors vary by context and can lead to distinction in exposure to the cholera. Women often bear greater responsibility for preparing food, cleaning and household hygiene. In addition, they are more engaged in small scale roadside trading. Men are mobile and more likely to eat outside the home, making them more vulnerable to infection due to poor hygiene in food outlets [4].

The overall Case Fatality Rate [CFR] was 0.45% which was much less than the maximum recommended rate (1%) expected in proper treatment setting [3]. In addition case fatality rate of this outbreak was much less comparing to outbreak occurred in Guji zone, Oromiya region in 2006, the CFR of 1.1% [10]. This showed that case management and treatment was appropriate and satisfactory in the CTC.

The laboratory investigations on the stool specimen indicated the isolation of vibrio cholera O1 serotype ogawa as the causative organisms for the outbreak. In neighboring country, Kenya, an analysis of 31 stool samples positive for *Vibrio cholerae* O1 indicated that 30 isolates were serotype Ogawa [11].

The environmental survey supports our epidemiological findings and revealed lack of safe drinking water, dumped human and other domestic wastes at the bank of River, poor hygiene and sanitation conditions.

Limitation of the study

According to Oxfam cholera outbreak guideline, about eighty percent of cholera patients may remain asymptomatic for the duration of the infection; then the controls might have an outcome despite the fact that they didn't have sign and symptom during the interview. Our data collection tool was also not including questions regarding to socioeconomic status of participants, since it can be a risk factor for the infection.

Conclusion and recommendation

An intermittent common source Ogawaa serotype cholera outbreak was occurred in extended and with many peaks in Dara woreda. This outbreak resulted primarily from insufficient access to clean water and poor sanitation and hygiene conditions in the area. The spread of the infection to new area was also facilitated by high population movement to and from affected area, small and wide commercial activities and being a rainy season of the outbreak period. Most of AWD cases were reported from areas located along river banks and densely populated with slummy conditions. Those age groups, who can move and engage in different livelihood activities, were highly affected. Though it took a bit of longer period of time, the outbreak was brought under control by coordinated and community based responses. The medical management was also generally appropriate. The basic deficiencies on safe water supply and sanitation need to be properly addressed to prevent the outbreak in the future.

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CHAPTER VI – ABSTRACTS FOR SCIENTIFIC PRESENTATION

I. Investigation of Measles Outbreak in Tello Woreda, Kefa Zone, SNNPR, Ethiopia, 2016

Abstract

Background: Measles is respiratory disease caused by measles virus & spread through droplets of patients. Approximately 20 million people are affected by measles every year worldwide with the highest numbers in Africa. According to World Health Organization' report, 14,100 confirmed cases have been reported from Ethiopia in 2014. According to national guideline on Measles, approximately 15% of vaccinated children at nine months of age fail to seroconvert, and are thus not protected after vaccination. In February 2016, Telo district reported an increased number of persons with fever, and generalized maculopapular rash. We investigated to confirm the outbreak, identify risk factors and implement control measures.

Methods: We employed 1: 2 unmatched case-control study designs. We used interview administered questionnaire. We used case definition as per stated in national Measles guideline. We collected specimens and tested at regional laboratory. We analyzed the data using Epi-Info.

Results: Results: Vaccination coverage of the district was 82%. A total of 68 Measles cases were identified in 3 kebeles. All patients were under 15 years and 58(85%) of them was under 5 years of age. Attack Rate was 0.5%, of this 2.5% was under one year of old, 27 (40%) of patients were not vaccinated with measles. A measles vaccination dropout rate in affected kebeles was high (44, 13 and -23 of 3 kebeles). Tested samples are all positive for measles (IgM). Travel history to affected areas (AOR 9.7; 95%CI: 1.7 – 55) and unvaccinated (AOR 4.4; 95%CI: 1.6 – 11.6) were statistically significantly associated risk factors for the infection and age group greater than five years was protective factor (AOR=0.18, 95%CI: 0.05 – 0.66).

Conclusion: This investigation confirmed an outbreak of measles and identified travel history to measles affected area and unvaccinated against measles as significant risk factors for contracting measles. We can reduce the risk through improved routine & supplementary vaccination .We recommend the district conduct supplementary immunization and strengthening the routine vaccination.

Keywords: Measles outbreak, Telo district, Kefa zone, Ethiopia

II. Dysentery Surveillance Data Analysis - SNNPR, Ethiopia, 2012 to 2015

Abstract

Background: Dysentery is a dangerous type of diarrhea caused by many species, mainly *Shigella dysenteriae* type1 (Sd1) is responsible for epidemic. An estimated 140 million cases and 576,000 deaths occurred annually in children under five years of age worldwide. It is one of the modifiable diseases in Ethiopia. We analyzed the data to describe the magnitude and distribution of the disease in southern region.

Methods: Cross-sectional data analysis was conducted. We analyzed four years data (2012 to 2015). We obtained the data from the regional Integrated Diseases Surveillance and Response (IDSR) weekly report and Health Management Information System (HMIS) data bases. We cleaned the data carefully and analyzed using Microsoft excels.

Results: Within the study period a total of 176,824 patients of dysentery (175,238 outpatients & 1586 inpatients) with 13 deaths (death to case ratio 7.5/100,000 population) were reported from the region. The annual incidence rate of the disease was nearly similar during each year (29, 25, 21 and 23 per 100,000 population respectively). Patients were clustered to eastern and northeast zones. Incidence was peaked during from March to May in each year. On average 25% of patients were aged less than 5 years and in 2012, males were twice more affected than females.

Conclusion: This surveillance data analysis confirmed dysentery is significant health problem in the region and a considerable burden exists among the youngest groups from zones with higher population density. The burden was peaked during March to May where highest scarcity of pure drinking water and flooding is observed in the region. We recommend attention need to be given to improving safety of water supply, sanitation and hygiene services in the region especially to areas where diarrheal disease is frequently observed.

Keywords: Dysentery, data analyze, SNNPR, Ethiopia

CHAPTER VII – NARRATIVE SUMMARY OF DISASTER SITUATION VISITED

Human Health and Nutrition Emergency Needs Assessment, Hadiya Zone, SNNPR, 2016

Summary

Introduction: The country has been conducting human health and nutrition emergency needs assessment twice a year following Meher and Belg seasons in coordinated with different sectors. Due to the effects of EL NINO happened in 2015-2016, the normal weather patterns was change and then drought, flood, erratic rainfall and land slid were occurred in different part of the country in 2016. Many people have affected with flood and land slide in the year. The populations in drought areas are also vulnerable because of their reliance on seasonal rain-fall for their livelihood and hence affecting them in short and long-term effects of the drought. In 2016, Beld assessment was conducted in selected zones of the south region by establishing teams. The main aims of the assessment were to assess the impact of weather condition (EI NINO) on health and nutrition, to evaluate and improve the preparedness and response plan, and to identify vulnerable groups in selected areas.

Methods: Two types of teams, food & non-food, was established. The team in which I included was deployed to Hadya zone and conducted the assessment in the zone in general and in three selected woredas namely Soro, Shasheg and East-badwach in particular. We collected data by interviewing, observing and discussion. The woreda was selected purposely considering being hotspot priority, increasing number of malnutrition cases reported from each woreda .

Result: Multi-sectoral coordination team has been established at zone and visited woredas and the team meets on weekly basis. Neither ongoing nor in the last three months, was no any outbreaks occurred in the zone. Compared to the same months of year 2007 E.C, the number of SAM cases was more increased than MAM cases. The number of malnutrition cases was irregular in each month due to inconsistency of nutritional screening activity per month. Unstable weather conditions and erratic rainfall were interrupting the agricultural activities and crops are damaged by flood and drought. April 2016 two districts, Shashego and East Badwacho, were affected by flood and more than 600 households and 25,500 populations were affected in both districts. In case of supplies there were no sufficient essential drugs and medical supplies to treat and control if any major public health importance diseases occurred.

Conclusion & recommendation: We concluded that due to the effect of EL NINO, crops are damaged and then food security deteriorated, farther more malnutrition cases will be increased in the next. There was shortage of essential emergency drugs. The team suggested that nutritional screening need to be strengthened, WASH status in the zone need to be improved to prevent diarrhea & other related diseases occurring due to changing weather conditions, and essential emergency drugs need to be availed.

Introduction

Natural and man-made disasters and public health emergencies are quite common in Ethiopia due to drought, flood, landslides, erratic rainfall, epidemics of communicable diseases etc. Among the natural disasters, drought is the most devastating one and recently affecting almost all of the country. Due to the effects of EL NINO happened in 2015-2016, the normal weather patterns was change and then drought, flood, erratic rainfall and land slid were occurred in different part of the country in 2016, “*EL NINO and health, Global overview-Jan 2016*”. [1] The populations in drought areas are vulnerable because of their reliance on seasonal rain-fall for their livelihood and hence affecting them in short and long-term effects of drought. The effect have been persisting in various forms including loss of livestock and agricultural related properties, severe acute and chronic malnutrition, and associated morbidities and mortalities due to measles, respiratory infections (mainly pneumonia) and diarrheal diseases.

The country has been conducting human health and nutrition emergency needs assessment twice a year following Meher and Belg seasons in coordinated with different sectors led by disaster risk management and food security sector.

This year, 2016, Belg assessment was conducted to identify areas where emergency assistance (health, nutrition, WaSH) might be needed for the upcoming 6 months period due to the effect of unusual weather conditions. To minimize the level of health risks and develop preparedness and response plan, hazards and vulnerable groups should be identified and mapped. Hot spot districts were purposely identified by respective regional health bureaus and zonal health departments.

The assessment was conducted in Hadyia zones of Southern nation nationalities and peoples Region. Three districts, [Soro, Shashego and East Badwach] were selected and visited during the assessment.

On the assessments both government and nongovernmental organizations [Ministry of Agriculture, Disaster Risk Management and Food Security Sector, Health Bureau, Ministry of Water and Energy, Education Bureau, and respective regional bureaus, WHO, UNICEF, OCHA, MSF, Plan International, IRC and etc.] have been participating. During the assessment possible human health and nutrition risks have been 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.

OBJECTIVES

- To evaluate the impact of weather condition (EI NINO) on health and nutrition of the year 2016 in the region.
- To assess the impact of a particular disaster, if any, and evaluate the extent to which the household can cope.
- To identify areas where Emergency response is needed due to acute problem (Health, Nutrition and WASH) and to estimate the size of the population in need including required supplies and duration of assistance.
- To assess undertaking responses for nutritional problems in priority one districts in the region
- To recommend and provide feedbacks for respective sectors based on findings

Methodology

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

Study setting: The assessment was conducted in Hadyia zone which is found in Southern nation nationalities and people regional state. Hadya is one of the 15 zones and 4 special districts of SNNPR. The zone is divided into 10 districts with a total population of 1,573,841 (802,658 females) as of June 2016. According to respective zonal sector departments' record, the zone has 100% of health service, 98% of latrine coverage. The zone bordered by 9 zones including orromia (Map 1). Specifically, rapid Belg assessment has been conducted in three districts (Soro, Shashego & East Badwacho) of the zone.

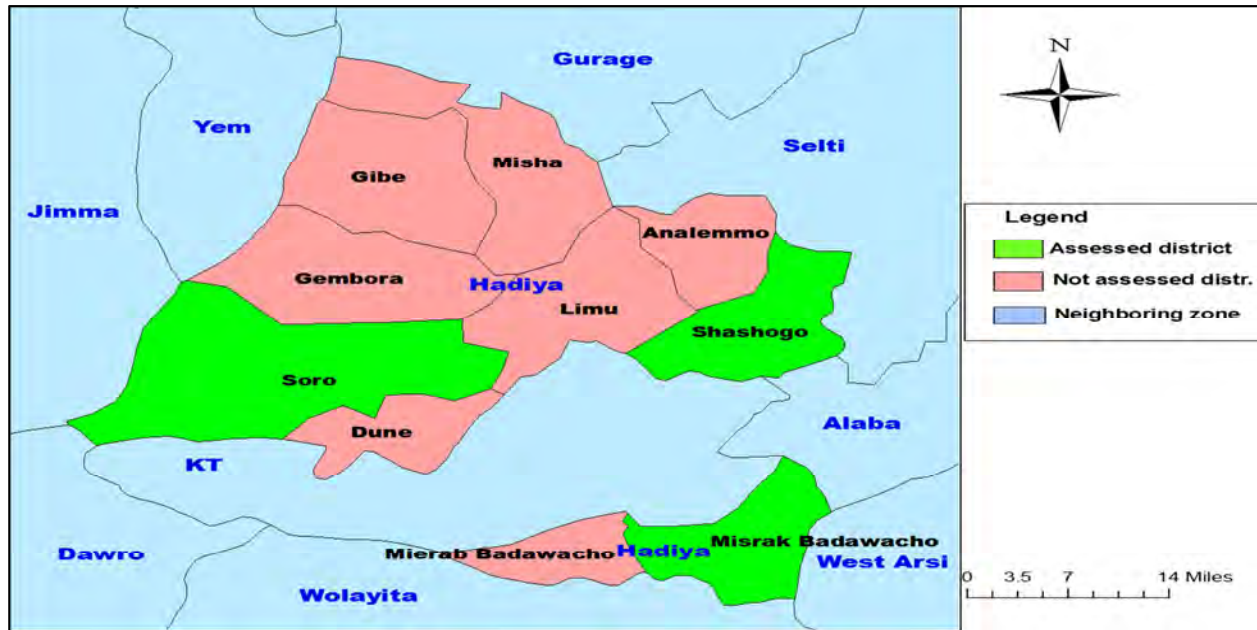


Figure 7-1: Map of Hadiya zone and its neighboring zones, SNNP region.

Selection of Assessment area: districts were selected purposely considering critical criteria such being hotspot priority one, increasing number of malnutrition cases, malaria trends and flood.

Assessment period: Belg assessment was conducted from June 7 to 15/2008 E.C

Data collection process: Two teams (food & nonfood team) were organized to assess the health situation of the three districts. The teams oriented on the data collection tools and briefed on the Belg assessment at regional levels before deployment to their respective field sites. The health and nutrition data from the selected zone & woredas were collected using the prepared check lists. Reviewing of documents, observations and discussions with concerned experts of the woreda health office and health facilities were conducted to acquire relevant data. General information was obtained from Zonal and Woreda Administrations. The collected numerical data was entered and analyzed using Microsoft Excel.

Source of Data: Both primary and secondary data were collected from zonal health departments and district health offices. Reports, registers or documents and field observation were the source of data.

Assessment findings

1. Zonal level

1.1. Coordination:

Zonal Multi-sectoral coordination was existed & functional. The committee consists of all expected governmental and nongovernmental sectors and led by zonal administrator having head of health department as secretary. According to zone vice administrator, the committee meets weekly and discuss about any emergency events, especially decreasing of food security and unexpected increasing of malnutrition cases were emphasized agenda.

1.2. Outbreak:

There was no ongoing outbreak but the data indicated that Malaria cases were sharply increased in February and March. As the result of unusual weather condition, zone health department officers anticipate malnutrition, malaria & AWD will be public health risks in the next upcoming time.

1.3. Public health Emergency Management:

At the zonal level there is public health and nutrition emergency preparedness and response plan with allocated budget. However, no any staff who trained neither on PHEM basic level, RRT nor emergency nutrition management training during assessment period.

1.4. Stock:

During assessment period, except therapeutic supplies there were no sufficient essential drugs and medical supplies to treat and control if any diseases of major public health emergencies such as, meningitis, measles, malaria and AWD will happened.

1.5. Nutrition, diseases and disaster conditions

Nutrition: Unusual weather condition in general and erratic nature of seasonal rainfall in particular affects the public health condition and agricultural production in the zone. The short term effect unstable weather conditions and erratic rainfall were interrupting agricultural activities and damaging of crops by flood and drought. Due to failure of belg harvest, deteriorated food security situation has been reported in most woredas of Hadya zone. The delay in 2016 belg rain and heavy rain induced flooding in April to May have been aggravating food insecurity situation in the zone. Planting of belg crops is completed lately in May and thus crop harvest is expected to delay until the end of July or beginning of August 2016. Normally, belg harvest had been completed in June in

the zone. To this effect, further deterioration in food security situation is expected in the coming months in woredas of Hadiya zone. Thus, to respond & manage expected nutritional problems, screening for children and pregnant & lactating women is conducted monthly by CHD program in the zone. 306 OTP and 23 SC are established to manage the MAM and SAM cases. As indicated from the following chart (Fig 2 & 3), the comparative prevalence of new SAM & MAM cases in the same consecutive six months (Oct – Mar) of 2007 and 2008 EFY was analyzed. Then number of SAM cases was more increased than MAM cases in 2008 E.C compared to the same months of year 2007 E.C.

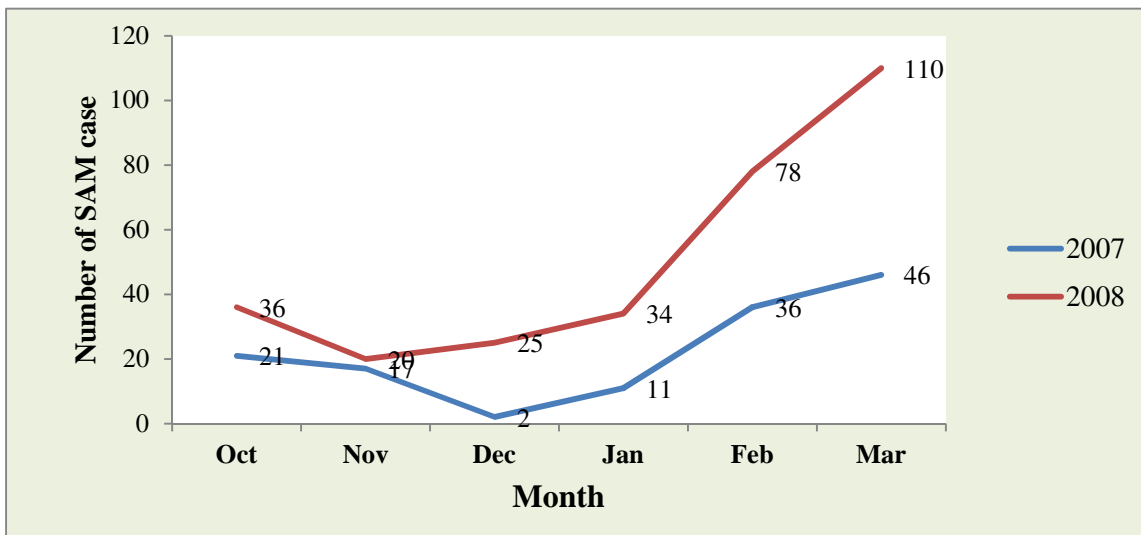


Figure 7-2: Comparison of 6 months' SAM cases in Hadiya zone, 2007 & 2008 E.C

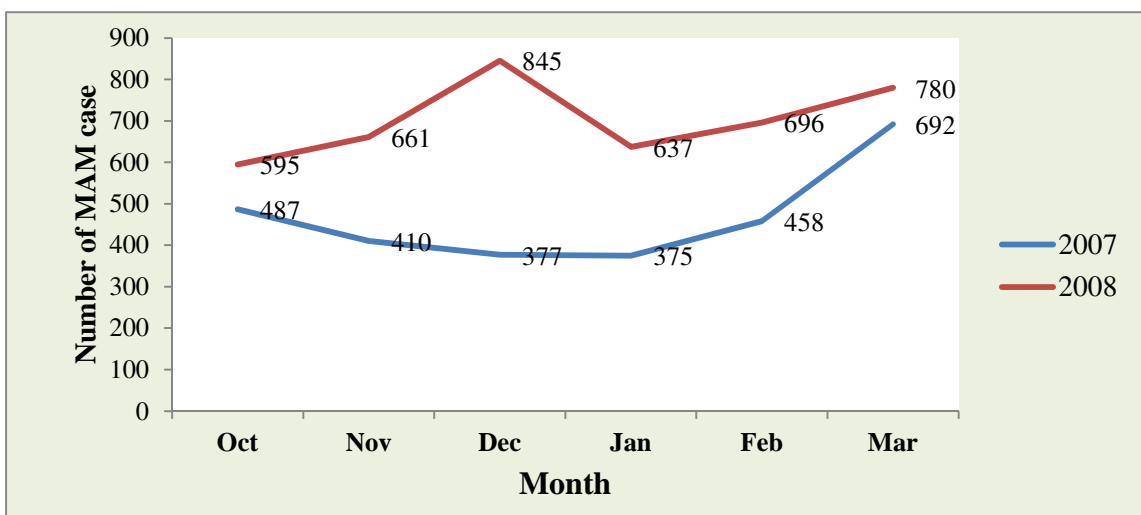


Figure 7-3: Comparison of 6 months MAM cases in Hadiya zone, 2007 & 2008 E.C,

Diseases: Although there was no any disease has occurred as an outbreak or an unusual pattern of disease during the assessment period, an epidemic of malaria and acute watery diarrheal disease were health threat due to the unstable weather condition and occurrence of flood in most districts.

Flood: In April 2016 two districts, Shashego and East Badwacho, were affected by flood and more than 600 households and 25,500 populations were affected in both districts.

2. District level

Rapid Belg season assessment was conducted in three districts, Soro, Shashego and East Badwacho in the zone.

2.1 Coordination: Multi-sectoral PHEM coordination forum was established in all assessed three woredas. The forum meets on weekly bases in soro woreda and on monthly bases in East Badwacho and shashego woredas to review emergency responses, to identify gaps and prepare response plan. The forum includes representation of all relevant government offices and NGOs operating in the district. Except Soro, other two districts have allocated budget for response plan.

2.2. Cause of morbidity: According to the HMIS report of assessed woredas, the top 5 causes of morbidity in the year of 2008 EFY are indicated in the following table.

Table 7-1: Top 5 causes of morbidity for < 5 years of age in 3 districts, Hadiya zone, 2008

Soro	East Badwacho	Shashego
pneumonia	pneumonia	Pneumonia
typhoid fever	malaria	Diarrhea
AFI	Diarrhea(non-bloody)	Malaria other than P.falsifurem
Malaria with P.F	Acute upper respiratory infection	Acute respiratory infection (AFI)
Malaria without P.F	AFI	Malaria with p. falcifurem

Table 7-2: Top 5 causes of morbidity for >5 years of age in 3 districts, Hadiya zone, 2008

Soro	East Badwacho	Shashego
Typhoid	Malaria	AFI
AFI	pneumonia	Malaria other than p.facilfarem
Pneumonia	typhoid fever	Malaria with p. falsiparem
malaria	AFI	Trauma
Helminthiasis	trauma (injury, fracture)	Pneumonia

2.3. Diseases & disaster:

Disease: According to respective woreda health offices, there was no any outbreak reported in the previous three months and there is no ongoing epidemic currently. However, there was sharply increase in malaria cases from February 2008 on ward in Soro district (before 3 month), but from other two districts the cases were slightly decreased compared to same successive months of last year.

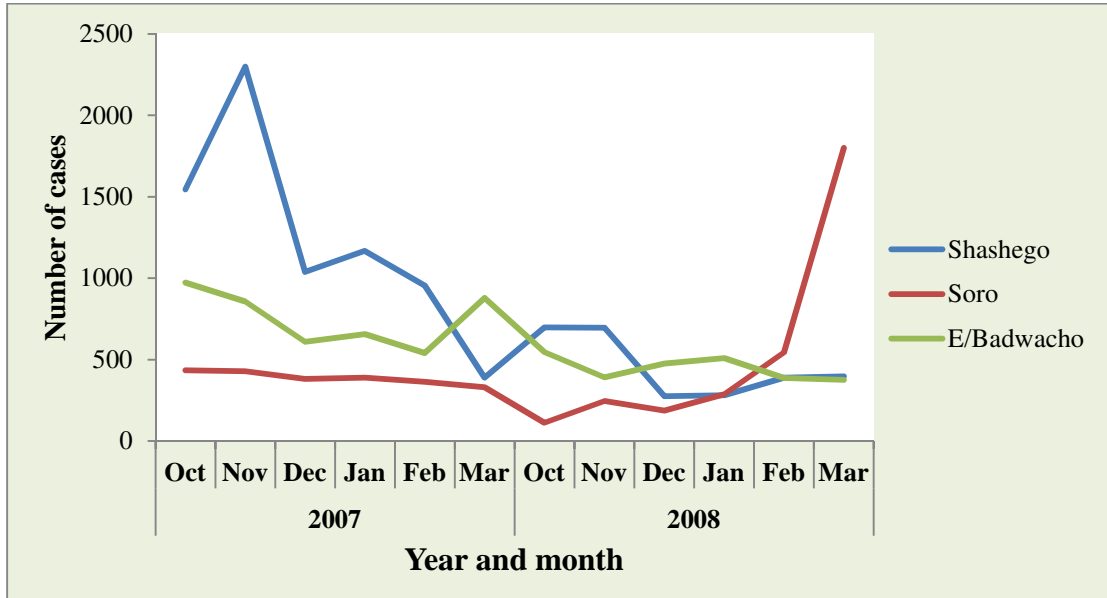


Figure 7-4: Malaria prevalence comparative trend in 2007 & 2008 EFY with the same six months in 3 districts, Hadiya zone.

As indicated above figure, the cases reported in March from Soro woreda was far higher compared to same month last year and then even if no any disease outbreak occurred within the last three months, the recorded data shows that malaria outbreak was occurred in Soro district from February to forward months. Due to an increasing trend therefore, adequate responses have been made in terms of chemical spray, ITNs distribution and environmental management in all mentioned woredas.

In general, considering the existing risk factors in assessed districts, there was a threat and anticipated public health risks like outbreak of malaria and diarrheal diseases. The following risk factors for epidemic were identified from each respective district health offices.

Table 7-3: Identified risk factors for public health epidemics to occur in 3 districts, Hadiya zone, 2008/EFY

Diseases	Risk factors	Districts		
		Soro	East badwacho	Shashego
Malaria	Unstable weather condition	√	√	√
	presence of malaria epidemic areas	31 kebeles	10 kebeles	36 kebeles
	presence of many population at risk	119,752	41,741	129,338
	Low coverage of IRS	53%	28%	30%
	Low coverage of ITNS	77%	72%	No data
	presence of breeding sites	√	√	√
	Presence of interrupted flood	0	√	√
AWD	Low coverage of safe water supply	42%	39.5%	38.7%
	Low coverage of latrine	87%	73%	92%
	unknown latrine utilization	√	√	√
	Presence of areas affected by flood	0	5 kebeles	22 kebeles
	Presence of people using unprotected water source	24,642	18,220	38,486

Disaster/Flood: unusual and heavy rain occurred from March to April, 2016 (2008 E.C) was affects two districts by flood, (Shashego & east Badwacho).

Especially in Shashego district the effect of heavy rain was worsen. According to the head of district health office, 22 kebeles was affected by flood and more than 16,500 people were displaced from their residence, 2752 homes are damaged, many domestic animals are died, huge crops and properties are lost due to heavy flood. People who reside on the bank of Guder River and around Boyo pond (small lake found in the district) suffers from frequent floods in each year due to low gradient/steep and narrow way of river, flat area around the river, common flooding from highland area and flatness of the pond are the reason why flood affects the area yearly. Whenever the rain falls at the highland area and even the flood is low, Guder River and Boyo pond overflows to the surrounding area. The coping mechanism of residents is leaving their home and evacuates themselves to relative or to their second home which is built at the hill side.



Figure 7-5: Photo of affected areas (Golicho Boyo Kebele) by flood in Shashego district, Hadiya zone, April/2008 E.C

Though the year 2008 flood was heavier and devastator than previous years, no any evacuating activity undertaken by the government sector or others for affected people. The event was considered as a common phenomenon. But food items, clothes and other immediate need was provided by government and red-cross association.

In east Badwacho district also 5 rural kebeles were affected and in which more than 11,000 people were affected by the flood that occurred on period stated above. But in this condition people who affected by the flood were evacuated and protected in temporary tents until the flood is stopped and recovered to the normal condition. In both district no any human death and disease outbreak were happened due to unexpected flooding.

2.4. Nutrition: As described in the initial phase of this report, 2015-2016 EL NIÑO effect is played a big role on the failure of crop production and then deteriorated food security situation has been reported in most woredas of Hadya zone. Due to food insecurity and other problems, all three assessed districts are identified as priority one woreda and many peoples were supported by the therapeutic feeding program in each district. Many SC and OTP facilities are established to run therapeutic feeding program. But people who affected by malnutrition could not be decreased as such. As indicated on the following chart, the incidence of SAM cases are increased in 2008 E.C compared to the same six consecutive months of last year in all assessed districts.

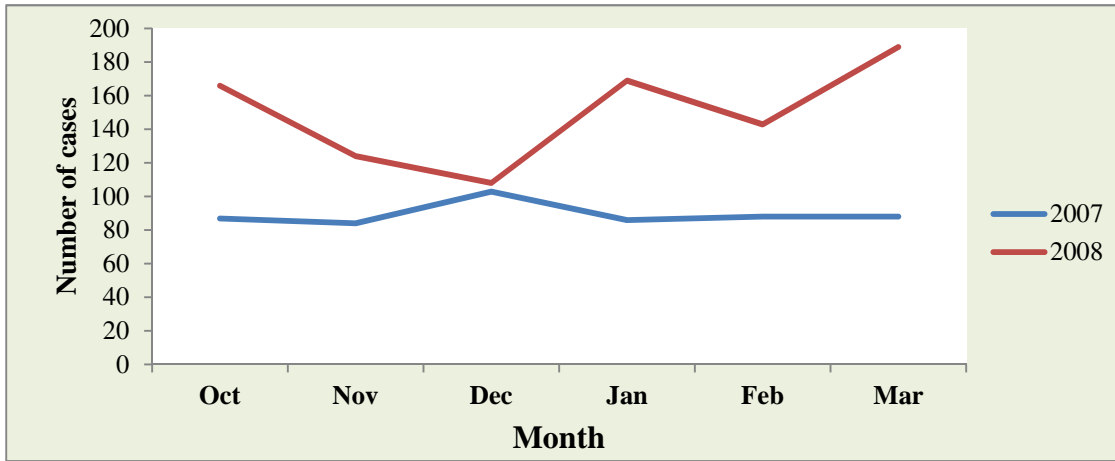


Figure 7-6: Comparison of SAM cases reported in 2007 & 2008 E.C in Soro district, Hadyia zone

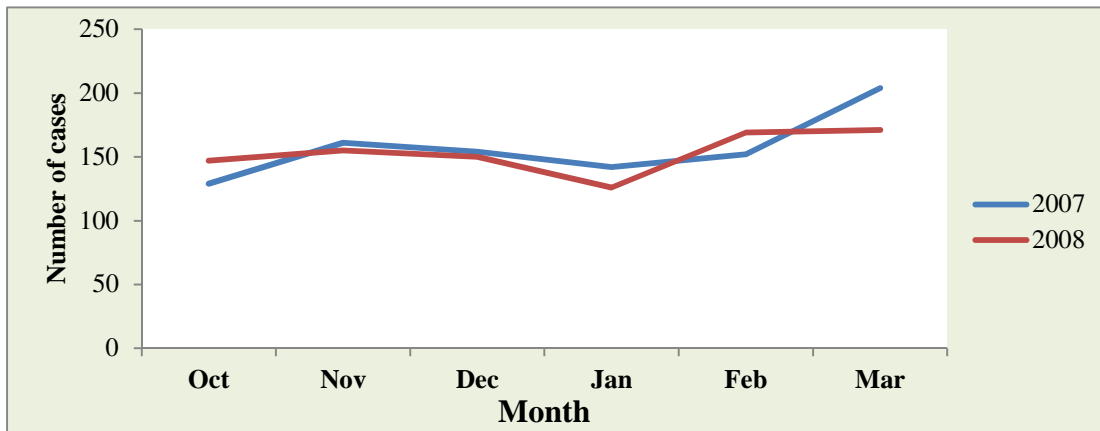


Figure 7-7: Comparison of SAM cases reported in 2007 & 2008 E.C in Shashego district, Hadyia zone

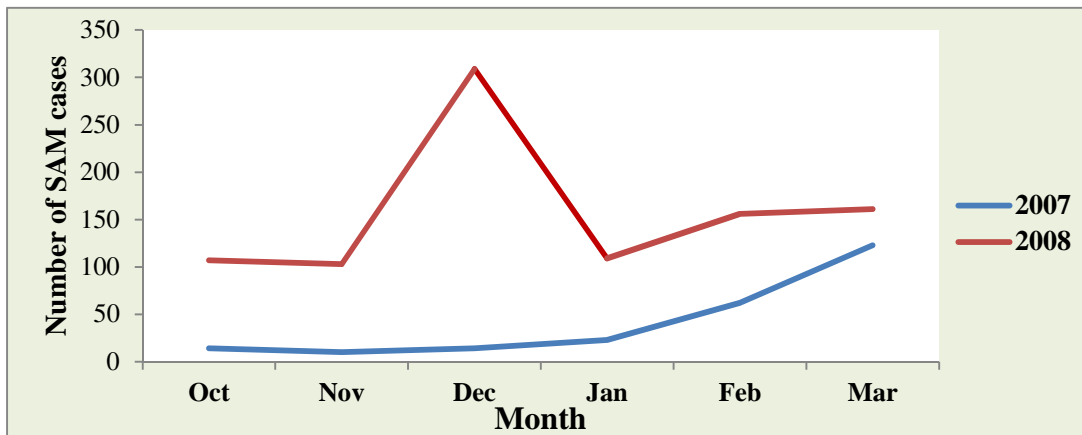
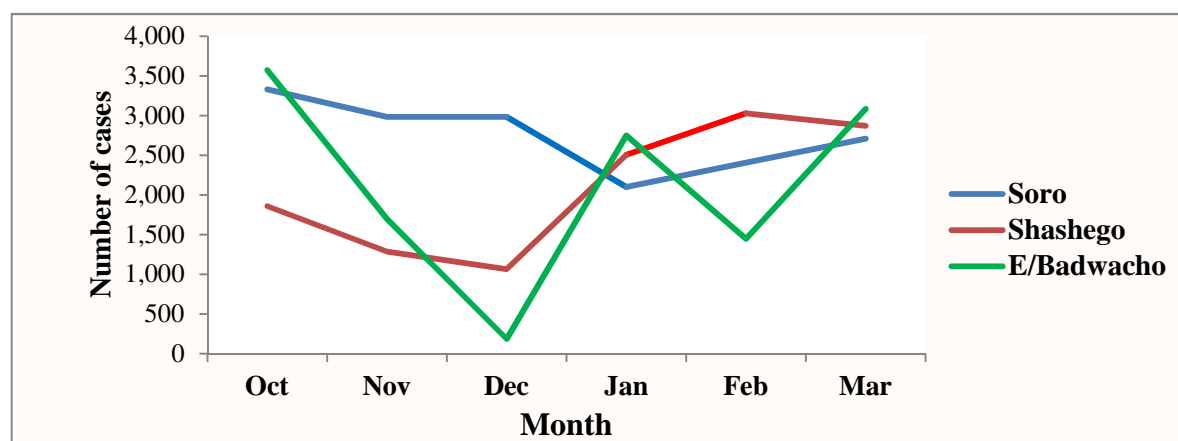


Figure 7-8: SAM cases reported in 2007 & 2008 E.C in E/Badwacho district, Hadyia zone

As shown the above charts, except in Shashego, in other two districts the total SAM case of admission rate in each six month was more increased in 2008 E.C compared to the same months of the last year. Especially, in December the cases were sharply peaked.

The moderate acute malnutrition (MAM) cases were very significantly higher and the trend was not regular over the consecutive six months in all assessed districts. Especially in East Badwacho district the trend was very irregular, in October the number of MAM case was very high and sharply decreased in November & December, and then in January the cases were highly increased. The reason for irregularity was not the matter of cases, but it was inconsistency of nutritional screening activity per month. Due to unavailability of data, we could not compare the trend with previous year.



Fig

ure 7-9: Trend of MAM cases over six months in 3 districts, Hadiya zone, 2008

Stock: In terms of emergency drug & supply availability for preparedness in the assessed woredas for short period in need, except in E/badwacho district, there were no sufficient drugs and supplies during assessment time.

Table 7-4: Emergency drugs & supplies in three districts, Hadiya zone, 2008 E.C

Types of drug & supply	Soro district	Shashego	E/badwacho
Ringer Lactate for AWD cases	No	No	Yes
ORS for AWD cases	No	No	Yes
Doxycycline to treat AWD cases	No	No	No
Syringes, gloves for AWD management	Yes	Yes	Yes
CTC kit for AWD cases	No	No	No
Amoxil susp for Measles	No	No	Yes
Tetracycline ointment for measles case	No	Yes	Yes
Vitamin A for measles case	No	Yes	Yes
Coartem for malaria	No	Yes	Yes
RDT for malaria	Yes	Yes	Yes
RDT (Pastorex) for Menengitis	No	No	No

In general, this report highlights affected districts where health actions are needed urgently to increase preparedness capacity and scale up response in forward periods. The assessment findings reveals that both at zonal and district level, number of malnutrition cases are increasing and it seems to continue in the next periods.

Major gaps identified

- Low coverage of IRS in all districts
- Low coverage of latrine which is a very risk factor for AWD epidemics
- Low safe water supply coverage
- Unavailability of sufficient drugs and medical supplies for emergency preparedness
- Increasing of malnutrition cases (SAM & MAM) while support of food is providing
- Absence of trained staffs neither on PHEM basic level, RRT nor emergency nutrition management at zonal level

Recommendation:

- Hadiya zone in general and visited districts in particular should make endeavor to improve hygiene and sanitation status to prevent different types of diarrheal diseases.
- As the result of variability of weather conditions, malaria will be a major toll for public health in the zone. So that districts and the zone at large should give attention and implement controlling measures like IRS, improving ITS coverage & utilization and environmental management.
- To minimize farther impacts of EL NIÑO, at the zone and district levels the preparedness and response measures should be enhanced and In line with the plan for preparedness and response, put in place adequate operational capacities, including human resources, supplies (e.g. replacement of insecticide-treated bed-nets, essential drugs and medical supplies, etc.)
- To give sustainable solution for recurrent flood in Shashego district, zonal and regional responsible sectors should deal with the remedy.

Reference

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CHAPTER VIII – PROPOSAL FOR EPIDEMIOLOGIC RESEARCH PROJECT

Latrine Utilization and Associated Factors in Rural communities of Dara District, Sidama Zone, SNNPR, Ethiopia, 2017

Name of investigator	DEGU BELACHEW ABERA
Name of advisors	Prof. Fikre Enqusilassie & Mr Yeshitila Mogessie
Full title of research	Assessment of latrine utilization among residents in Dara woreda, Sidama zone, SNNPR, Ethiopia, 2017
Duration	May to July, 2017
Study area	Dra woreda, Sidama zone, SNNPR, Ethiopia
Total cost	58,800 EBR
Address of investigator	Tel: +251-913331250
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Summary

Introduction: Safe disposal of human excreta and proper hygienic practice is important to prevent more than 80% of fecal related diseases. A safe toilet accompanied by hand washing with soap, provides an effective barrier to transmission of diseases. Improved sanitation can contribute to an approximate one-third reduction in diarrhea, and washing hand with soap alone can also reduce diarrheal diseases by 47%. Actually, application of proper hygienic behavior, especially in rural community is affected by many factors and not yet accomplished as well in developing countries including Ethiopia.

Statement of the problem: Many diarrheal diseases such as cholera, typhoid fever, hepatitis and other related diseases are caused by poor sanitation conditions, poor utilization and improper hygienic behaviors of the community. Though latrine coverage is extensively improving, Dara woreda is recurrently affecting by diarrheal diseases. Totally not using existing latrine, poorly use of latrine, poor hygienic practice, might be contributing to the occurrence of diarrheal disease in the woreda.

Justification: Dara woreda is implemented extensive sanitation activities through health extension program. But proper use of latrine and hygienic behavior of rural community is not well due attention and then how many people are properly using their latrine is not clearly known and no any study conducted regarding to this issue in the woreda. The findings will be indicate latrine utilization status and associated factors influencing peoples on the use of their latrine.

Objective: This project is aimed to determine the latrine utilization status and associated factors among rural community of Dara district, Sidama zone, SNNPR, in 2017.

Method: Household based cross-sectional study will be employed on households owned latrine in the woreda. Sample is determined by single population proportion formula. Stratified two-stage sampling method will be used. The woreda is naturally stratified by 3 climatic zones then, within each climatic zone one sample of kebele will be selected randomly. The total sample size will be proportionally allocated for each selected kebeles and households will be selected by systematic random sampling system using list of households recorded by health extension workers. Structured questionnaire will be used to collect data and the data will be analyzed by Epi Info version 7. Ethical clearance and letter of permission will be obtained from respective sectors and verbal informed consent will obtain from each respondent prior to interview.

Estimated cost: The project will be cost an estimation of 58,800 EBR.

Introduction

Not having a proper toilet, people may defecate in the open field or rudimentary pit latrine, which leaks its content to the environment and contaminate water, food or hands. One gram of faeces carries up to 1 million bacteria and a minute amounts contaminate hands, foods, and water, and spread the diseases. Diarrhea is one of the three most common killers of young children globally, along with Pneumonia and malaria. Around 860 children die every day from diarrheal diseases caused by dirty water and poor sanitation. Most of this death [58%] could be prevented by clean water, sanitation and good hygiene including hand washing with soap [1].

Diarrheal diseases are one of the most common causes of death in low income countries, contributing to 15% of an estimated 8.8 million death in children under the age of five globally. Diarrhea can be caused by bacteria, virus, or protozoa organisms most of which are found in water or food contaminated by faecal material. WHO, estimates that 88% of cases of diarrhea can be attributed to unimproved water and sanitation. The primary source of contamination of water, food, and hands by fecal material is open defecation or poor sanitation and hygiene practices. Improved sanitation can contribute to an approximate one-third reduction in diarrhea, and washing hand with soap alone can also reduce the risk of diarrheal diseases by 47% [2].

The global MDG target for sanitation has been missed by almost 700 million people. Globally 68% (82% of the urban and 51% of the rural) had achieved. However, seven out of ten people without improved sanitation facilities, and nine out of ten people still practicing open defecation living in rural area. In general in 2015, 2.4 billion people lack improved sanitation facilities [3].

Morbidity and mortality with diarrheal diseases is higher in Sub-Saharan and south Asian countries due to inaccessible to safe water and sanitation [Update and MDG assessment; 2015]

Similarly, Ethiopia's main health problem are said to be communicable diseases caused by poor sanitation & hygiene. As the result of this, Ethiopia has made a great strides increasing sanitation coverage since 1990. Much of the progress in access to sanitation has actually taken place since 2004 when the health extension program was introduced [4].

However, according to Joint Monitoring Program [JMP] data of 2013 report, improved sanitation in Ethiopian stands at 21% and unimproved system was 34% [5].

According to Ethiopian DHS 2016 indicator report, 32% of households have no toilet facility at all. They are almost exclusively rural, accounting for 39% of rural households [6].

Statement of the problem

Many diarrheal diseases such as cholera, typhoid fever, hepatitis and other related diseases are caused by poor sanitation conditions and improper hygienic behaviors of the community. Particularly childhood diarrhea is a leading cause of morbidity and mortality in children under five years of age, accounts for one in nine children deaths worldwide, making diarrhea the second leading cause of death among children under the age of five, (CDC-WASH report of 2015). High prevalence of intestinal parasites among the population, especially, worm burden in children is the direct results of faecal contamination of food, water and hands.

The latrine (improved latrine) coverage of Dara woreda was 88% in 2016, but latrine utilization of the community was not known. Sanitation and hygiene activities are extensively implemented by health extension programs and resulting of this 54% of kebeles of the woreda was graduated being they are free from open defecation in 2016. However, the woreda is recurrently affecting by diarrheal diseases. Compared to other adjacent woredas, Dara woreda was highly affected by acute watery diarrheal disease in 2009. Similarly, in 2016, 50% of kebeles were affected by AWD outbreaks. This indicates that there are hidden risk factors or gaps contributing to the recurrent occurrence of diarrheal disease while sanitation coverage is improving in the woreda. In general, the existence and higher coverage of latrine alone doesn't guarantee to prevent sanitation related diseases.

Totally not using a latrine, poorly use of latrine, poor hygienic practice, might be contributing to the occurrence of diarrheal disease in the woreda. Therefore, it is necessary to carry out this study so as to determine latrine utilization status and related sanitation & hygiene gaps.

Justification of the study

The diseases burden caused by poor water, sanitation and hygiene is significant. Poor sanitation practice and unhygienic behavior is mostly responsible for diseases which are transmitted via the fecal-oral route. In Ethiopian, after the introduction of health extension program a strong momentum building behind improved hygiene and sanitation and then significant number of households have gained access to self-constructed basic latrine. Likewise, Dara woreda has implemented extensive sanitation activities through health extension program. But the software part of sanitation is not well due attention and then how many people are properly using their latrine is not clearly known and no any study conducted regarding to this issue in the woreda.

This study will, therefore, help to find out the status of latrine utilization of the community and then the findings will be used as a base to develop effective strategies to improve proper utilization and prevent diarrheal diseases in the future.

Literature review

Although mortality rate among children under five year of age have declined globally, the African region shows the smallest reduction in mortality rate in 2003. The under-five mortality rate in this region [African] is seven times higher than that in the European region [7]

Diarrheal diseases are a common cause of morbidity and the leading cause of death among children under five, accounting for 19% of mortality in this age group. Most diarrhea is caused by Bacteria, virus, and protozoa in human feces spread from the stool of one person to the mouth of another. Hands can act as a vector for transmission of faecal pathogens, either via direct person-to-person transmission or by contaminating food that later consumed. Hand washing after defecation and before handling food is therefore a biologically plausible mechanism for interrupting pathogen transmission. Hand washing with soap could reduce the risk of diarrhea by up to 47% [8].

At this point, proper utilization of latrine such as proper construction and handling of latrine, allows use it, proper disposing of child faeces and hand washing after defecation might be affected by household characteristics and socioeconomic factors. Study conducted in Ghana about household characteristics, the utilization of improved toilet facility by household type was influenced by wealth, income and the number of people forming the household. Though it is not described well about the reason, this study showed those married couple family households headed by male were 72% more likely to use open defecation as compared to female headed family [9].

Similar study conducted in Arba Minch zuria showed that 30% of children had experienced diarrhea before two weeks of the study period due to poor hand washing practice of the mothers. The study revealed that maternal diarrheal morbidity found to be significant predictors of diarrheal prevalence [10].

The utilization of latrine can be assessed by interviewing users and observing proxy indicators such as presence of muddy soil, hot runs to the latrine, presence of odor, availability of hand

washing facility with water & soap or other detergents near to the latrine can be used as assure people are properly using their latrine. Different studies suggested that lack of proper utilization of toilet is a big problem rather than absence of toilet totally. Cross-sectional survey conducted in North West Ethiopia in 2013, 24% of households' was not having any sign of use on their latrine. In addition, only 8% of households disposed their children faece in to latrine [11].

Similar study conducted on the issue in Tigray region, 21% of households did not use their latrine at all due to preferring to defecate on open field [12].

Other similar study conducted in rural community of Aneded district, north-west Ethiopia, the level of latrine utilization was 63%. [13]

Objective

General objective: To determine the latrine utilization and associated factors in rural communities of Dara district, Sidama zone, SNNPR, in 2017

Specific objectives

- To assess latrine utilization in rural communities of the woreda
- To identify factors associated with poor utilization of latrine among households
- To suggest constructive actions for improving proper utilization of latrine

Method and materials

Study setting and period

The study will be conducted in Dara woreda, Sidama zone, south Ethiopia. Dara district is located at 310Km south of Addis Ababa and 86Km south of Hawassa town, capital city of southern region. The woreda was organized by 37 administrative kebeles (33 rural & 4 town) with a total population of 193,274 (Male 94,704 & female 98,570) and a total household was 39,444. Among them 35,127 households in rural and 4,317 households are found in town). Weather condition of the woreda is classified in to woyna-dega (17 kebeles) Dega (11 Kebeles), and Kola (5 kebeles). The woreda is bordered with four woredas including one from Oromia region, one from Gedeo zone and others from Sidama zone. In 2016, health, sanitation and safe water supply coverage were 90%, 88% and 47% respectively, but latrine utilization was not known. The study will be conducted from July to September, 2017.

Study design

A household based cross-sectional study will be employed in the woreda.

Target population: All households with latrine facility in rural community of Dara woreda.

Study population: All households with latrine facility in the selected rural kebeles of the woreda.

Study units: All selected sample of households.

Respondents: Among family members, mothers will be given priority because mostly in most areas the role of hygiene and sanitation activities left for them. If mother is not available, father will be intervened. In other case, if parents will not be convenient, other family member will be interviewed.

Inclusion criteria: all households with functional latrine facility at the time of data collection

Exclusion criteria: Among family members whose age less than 18 years will be excluded from interviewing

Sample size determination

The sample size is determined by single population proportion formula [$n = Z^2 \alpha/2 p(1-p)/d^2$], with marginal error (d) 5%, a standard Z square of 1.96 corresponding to 95% confidence interval ($Z\alpha/2$), design effect of 2 to provide correction for the loss of sampling efficiency resulting from the use of stage sampling, and 10% for non-response rate. Proportion (P) of latrine utilization of 63% which is taken from finding of similar study conducted in Aneded-district, North-west Ethiopia, 2014. Therefore, $n = [1.96]^2 [0.63*0.37]/ [0.05]^2 = 358$
Accordingly, the required sample size is $(358*2) + (358*10\%) = 788$ households

Sampling method and procedures

Stratified two-stage method will be used. The woreda is naturally stratified by three climatic zones. Assuming that latrine utilization varies with climatic zone, we will draw random samples at two stages. At first stage a sample of kebele will be selected randomly within each zone (strata). Total sample of households will be allocated for each selected kebele proportionally and will be selected by systematic random sampling technique using list of households recorded by health extension workers.

Variables

Dependent variable: Latrine utilization

Independent variables: include socio-demographic factors like age, sex, marital status; socioeconomic factors like occupation, level of education, family income, latrine condition; environmental factors like distance of latrine from the home, type of soil, availability of water and behavioral factors like, cultural taboos of beliefs, religions.

Operational definition

- Pit latrine – is a prepared pit that have superstructure which has been designed for defecation purpose
- Status of latrine – condition of latrine during data collection, whether it is clean, unclean, needs repairing or required to construct new one.
- Improved latrine – a pit latrine consists at least main components like pit cover (slab), pit hole cover, supper structure including door, and hand washing facility with water and detergent (at least ash).
- Proper utilization of latrine: when all family members always defecate and dispose child's waste in the latrine, wash their hands after toilet, and when they handle the latrine in clean condition.
- Functional latrine – a latrine is providing full service for users during data collection
- Level of latrine utilization – status of family members regarding to proper use of latrine and latrine handling conditions
- Clean latrine – a latrine without fecal matters and related wastes on the slab and around the latrine.
- Hand washing practice – hand washing using soap or other detergent during critical time such as after visiting latrine, after cleaning children, before food preparation & consumption and before feeding of children
- Open defecation – when there is observable fecal matter in open field/compound

Data collection

Structured questionnaire will be used to collect data by face to face interview and environmental observation. The questionnaire will be prepared in English and then translated to Amharic version to make clear understanding for data collectors and supervisors. Nine data collectors and three supervisors (health professionals) will be employed. During data collection, if home is closed, one additional chance of visiting will be given.

Data quality control

Training will be given to data collectors and supervisors. Data collection tool (questionnaire) will be tested on 5% of respondents, they may not be in the study area, before actual data collection process is begin. Questionnaire will be translated in to Amharic.

Data processing and analysis

The collected data will be checked for error and cleaned. Data entry forms will be created in Epi Info version seven and the data will be transferred or entered on to computer files that can be read and manipulated. Coding also assigned for separate data or answers to be readable by computer. The data will be described by frequency, percentage, graphs, mean and standard deviation. If anyone family members do not properly use latrine and/or child's feces does not properly disposed in to the latrine, latrine utilization will not be considered good. Level/status of latrine utilization will be described by proportion.

Ethical consideration

Ethical clearance will be obtained from ethical review committee of Addis Ababa University, school of public health. Letter of permission will also obtained from South region health bureau, Sidama zone health department and from Dara woreda health office. Verbal informed consent will obtained from each respondent prior to interview and their confidentiality & privacy will be assured and maintained by using code.

Expected outcomes: Level of proper utilization of latrine in the community will be clearly identified.

Work plan for Epidemiologic project

Table 8-1: Tentative work plan for Epidemiologic project implementation, 2017

S.N	Activity	July, 2017	Aug, 2017	Sep, 2017
1	Submitting proposal and receiving comments			
2	Finalizing & resubmitting proposal			
3	Preparing data collection tools/questionnaires			
4	Training of data collectors & supervisors			
5	pretest			
6	Data collection			
7	Data cleaning, entry and analysis			
8	Report writing			
9	Submitting draft report for comments			
10	Submitting final report & communicate findings			

Estimated cost for Epidemiologic project

Table 8-2: Budget proposal for Epidemiologic project, 2017

S.N ₀	Activity	Estimated cost (EBR)
1	Printing questionnaire & other documents	2,000
2	Photocopy	1,500
3	Training of 9 data collectors and 3 supervisors for two days (12*2*200Br)	4,800
4	Per diem for data collectors, supervisors & investigator for 10 days (13*10*200)	26,000
5	Transport for data collectors	2,000
6	Vehicle rent for 10 days	20,000
7	Miscellaneous cost	2,500
	Total	58,800

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CHAPTER IX – OTHER ADDITIONAL OUTPUTS

1. Public Health Emergency Management Weekly Bulletin, Week 42, 2016

HIGHLIGHT OF THE WEEK

- ✓ Regional PHEM report completeness is improved in this week.
- ✓ Occurrence of unknown disease in prisoners was reported from Benchi Maji zone.
- ✓ Occurrence of Scabies outbreak is reported from East badwacho district, Hadiya zone.
- ✓ Malaria case is increased comparing to last

WEEKLY PHEM REPORT COMPLETENESS

In the 42th epidemiological week of 2016, the RHB collected weekly PHEM report from 15 (100%) zones and 4 (100%) special woredas. Out of expected 4,628 governmental health facilities in the region, 4,421 health facilities submitted PHEM report in the week. 96 % of PHEM report completeness has been attained at the regional level in this week while the regional target is 90% and above. This was the first highest achievement of the region in this year.

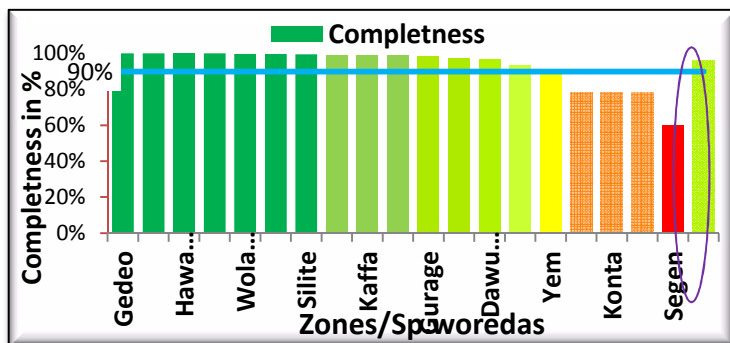


Fig.1: PHEM report completeness by zones/special woredas in SNNPR, Week 42, 2016

As indicated above figure (Green bar), seven zones namely Gedio, Halaba, Hawassa town, Sheka, Wolayita, K/Tembaro and Silite zones have reported 100% while

Yem (89%), Basketo, Konta & South omo (78%) and Segen (60%) zones reported below the target of report completeness in the week.

In general, the improvement of report completeness is attaining as the result of PHEM basic training provided for lower level PHEM officers. But the number of health facilities expected and reported is varying from week to week, this seems unlikely realistic. So that regional PHEM core process needs to monitor and amend it.

STATUS OF PRIORITY DISEASES IN THE WEEK

1. Malaria

In this week, a total of 32,920 suspected malaria cases were examined by RDT/microscopy and 4,639 cases were reported as confirmed malaria. Of which P.f cases were 2,570 (55 %) and P.v cases were 2,069 (45%). In general, a total of 4,794 confirmed and clinical cases of malaria were reported in the region. Of these cases, 4,768 (99 %) were outpatients and 26 (1%) were inpatients. The number of malaria cases during the week increased by 204 compared to the previous week (a total of 4,590 malaria cases were reported in week 41). One death is reported from Wolayita zone. Even though total number of reported malaria cases was slightly decreased from week 27 to week 36, the number of cases is showing up and down from week 39 to week 42. In addition, as it is depicted in figure two below reported cases in four consecutive weeks is slightly greater than the same week of last year.

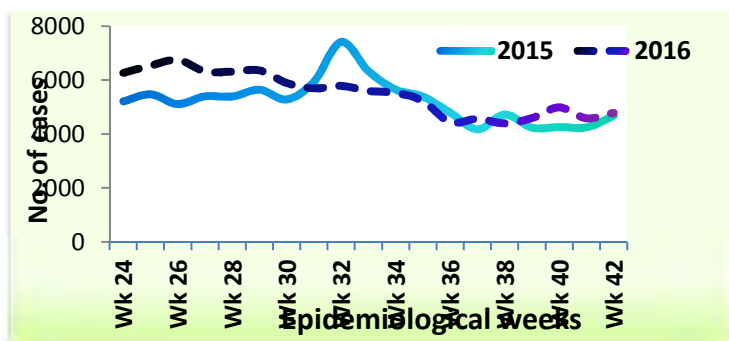


Fig.2: Trend of Malaria cases over the last 19 weeks in SNNPR, 2016

The highest malaria incidence rate is observed in Basketo special woreda with 88 cases per 100,000 populations in week 42. As compared to the last week, malaria incidence rate is increased by 21 cases per 100,000 populations in Basketo special district whereas decreased by 23 cases per 100,000 populations in South omo zone. Konta special district and South Omo reported the second and third highest rate with 70 and 63 malaria cases per 100,000 populations in the week respectively.

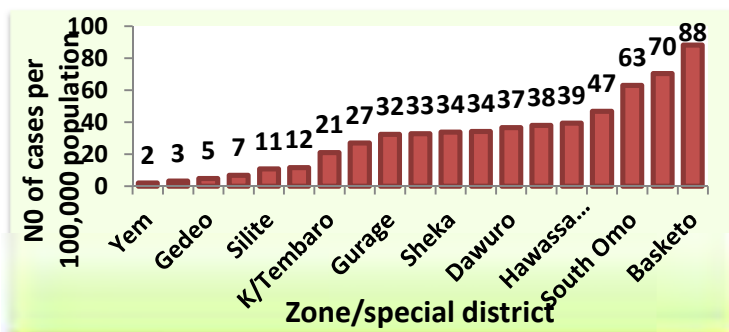


Fig.3: Malaria cases per 100,000 populations by zones/Sp.woredas, week 42 in SNNPR, 2016

Among woredas, Salamago reported the highest malaria case in the week with 172 cases. The number of cases appears fluctuating and decreasing sharply in the last two weeks in the woreda. The second and third highest malaria cases reported from Kucha and Uba debrestahay woredas with 151 and 136 cases in the week respectively. In 42th week, number of reported malaria cases was sharply decreased in Dasenech woreda because of an intensive interventions have done to down the cases that was sharply increasing in week 40.

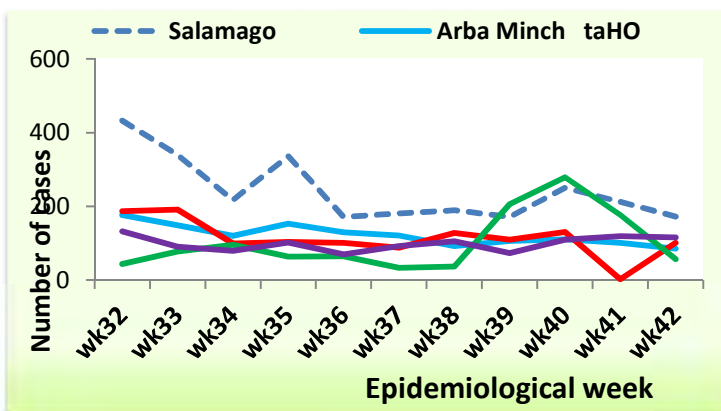


Fig.4: Trend of malaria cases over the last 11 weeks in five highest reporting woredas in SNNPR, 2016

2. Meningitis

In this week, 14 suspected meningitis cases were reported in the region. The highest number of cases is reported from Dilla Hospital and Hawassa referral hospitals with 5 & 4 cases respectively. As depicted in figure 5, the number of suspected cases highly fluctuated oppositely between last and this year in the same weeks but in week 42, number of reported cases was exactly the same in both years.

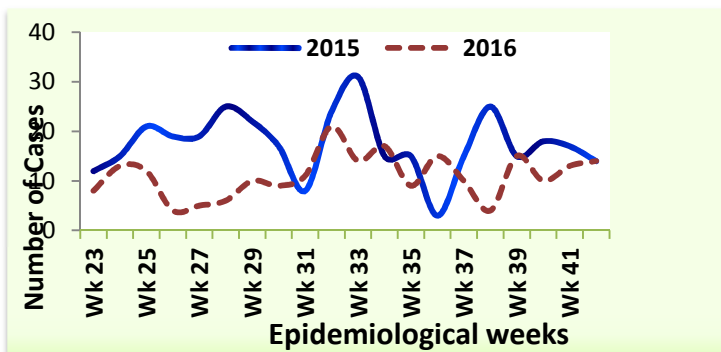


Fig.5: Trend of suspected meningitis cases over the last 20 weeks, 2016 in SNNPR

3. Dysentery

There was a total of 500 reported cases of dysentery with zero death in this week. 2 cases were inpatient cases. The number of dysentery cases decreased by 63 as compared to the previous one week (563 cases were reported in week 41). Generally, Dysentery cases are decreased gradually from week to week.

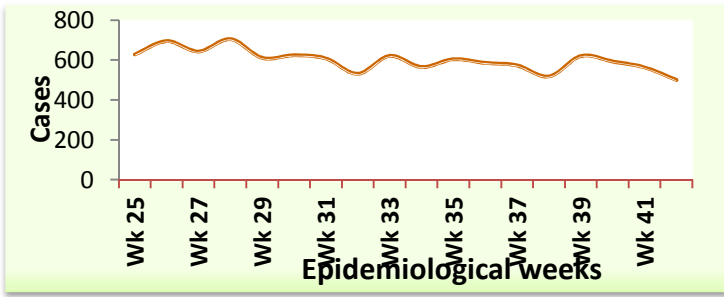


Fig. 6: Trend of dysentery cases for the last 18 weeks, week 42, 2016 SNNPR

During the week, Enemor ener, Melga, Basketo & Arbegona woredas were reported the highest number with 21,20,20,& 19 cases respectively.

4. Severe Acute Malnutrition

A total of 757 malnutrition cases were reported in the region. Of these 623 were outpatient and 134 were inpatient cases reported during the week. Since week 39, the number of cases is slightly increasing compared to the last year in the same week. In addition, 70 cases increased in this week comparing to last week.

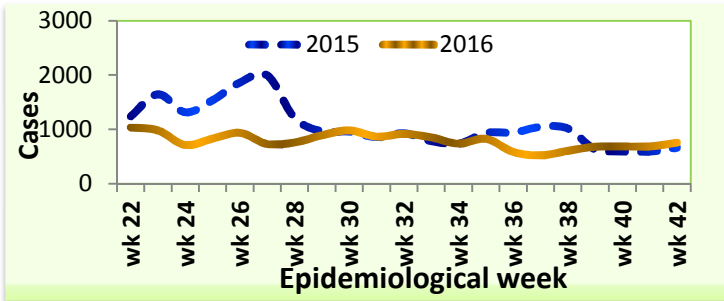


Fig.7: Trend of Malnutrition cases over the last 21 weeks,2016, SNNPR.

In this week, both outpatient (OTP) and inpatient (SC) cases increased by 41 and 29 respectively compared to week 41. As shown figure 8, OTP & SC cases are increased since week 38, SC cases slightly more increased than OTP cases in week 42 comparing to previous week.

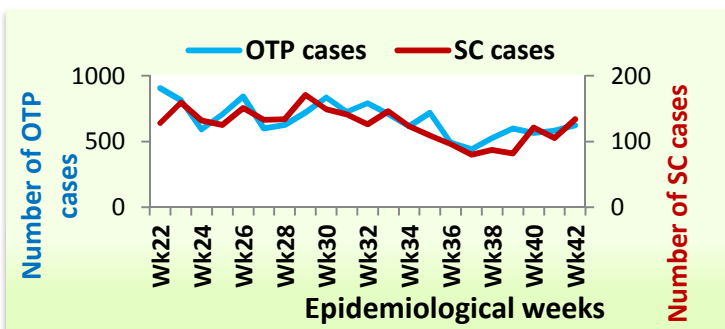


Fig.8: Trend of OTP & SC cases over the last 21 weeks, 2016 in SNNPR

Figure 9 depicts that Sidama zone reported the highest number of malnutrition cases (n= 145) followed by Hadiya and Gedio zone with 102 and 98 case in the week.

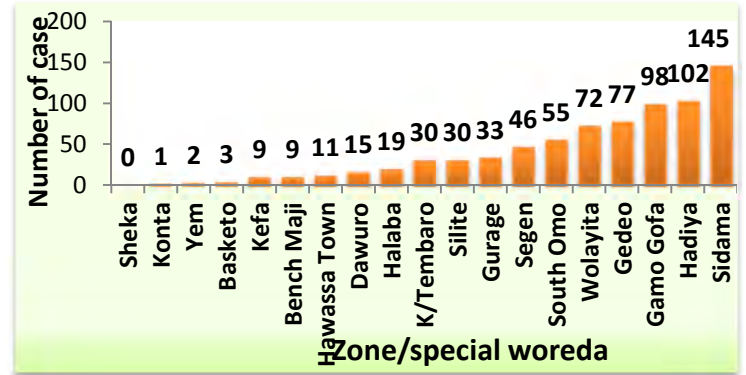


Fig. 9: Number malnutrition cases by zones/ Sp.woredas, week 34, 2016, SNNPR.

When disaggregated by woreda, Yirgachefe, Alle, Soro, Dara and Bonke woredas reported the highest cases during the week in the region with 24, 22, 22, 21, & 21 cases respectively.

5. Measles

During the week, 2 measles case was reported from Damot gale & Konta s/woreda.

6. **AFP:** During the week, one AFP case was reported from Malle woreda, South omo zone.

7. AWD

In the week 25 AWD cases were reported from Wondo genet woreda and Hawassa town with 15 and 10 cases respectively.

8. **Maternal death:** No maternal death reported in the week.

9. **Rabies:** One Rabies case has reported from Jinka Hospital, South omo zone.

10. No case or death of Guinea worm, yellow fever, NNT, AHI, SARS, Pandemic influenza, Viral Hemorrhagic Fever, Smallpox and anthrax reported in the region in this reporting period

Annex 1: 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.

Degu Belachew

Signature_____

Place: Addis Ababa University, Ethiopia

Date of submission:_____

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

Name of advisor: Professor Fikre Enquesselassie

Signature_____

Date_____

Questionnaires for Case - control study on Measles outbreak

Case status = Case _____ Control _____ ID ___ date of Data collection ___/___/___

Region _____ Zone _____ Woreda _____ Kebele _____ Got _____ Phone _____

Respondent status; 1.case/control 2.Mother 3.Father 4.other

I. Socio-demographic Characteristics

S. No	Questions	Alternatives			
1.1	Sex	1.Male 2.Female			
1.2	Age	years _____ Months _____			
1.3	Occupation	Case/control	Mother	Father	other
		1. Farmer 2. House wife 3. Student 4. Unemployed 5. Daily laborer 6. Merchant 7. Gov't 8. Other (specify) _____	1.Farmer 2.House wif 3.Student 4.Unemployed 5.Daily labore 6.Merchant 7.Gov't 8. Other (specify) _____	1.Farmer 2.House wif 3.Student 4.Unemployed 5.Daily labore 6.Merchant 7.Gov't 8. Other (specify) _____	1.Farmer 2.House wif 3.Student 4.Unemployed 5.Daily labore 6.Merchant 7.Gov't 8. Other (specify) _____
1.4	Education level	1. Unable to read and write 2. Read and write 3. Elementary 4. Secondary 5. Above secondary	1. Unable to read and write 2. Read and write 3. Elementary 4. Secondary 5. Above secondary	1. Unable to read and write 2. Read and write 3. Elementary 4. Secondary 5. Above secondary	1. Unable to read and write 2. Read and write 3. Elementary 4. Secondary 5. Above secondary
1.5	Marital status	1.Single 2.Married 3.Divorced 4.Widowed 5.Separated	1.Single 2.Married 3.Divorced 4.Widowed 5.Separated	1.Single 2.Married 3.Divorced 4.Widowed 5.Separated	1.Single 2.Married 3.Divorced 4.Widowed 5.Separated
1.6	Family size	_____			
1.7	Is there any sick person with rash, fever, running nose/conJectivities (illness)	1. Yes 2. No			
1.8	If yes, number of sick person	_____			

II. Clinical History of Diseases :(for case only)

2.1	What was the symptom?	1.fever 3.cough, 5. conjunctivitis (red eyes) 7. Ear discharge 8. Pneumonia 10. Laringo tracheal infection 12.Other _____	2.Rash 4.coryza (runny nose), 6.Diarrhea 9.Blidness 11.Vomitting
2.2	Date of rash on set	___ / ___ / ___	
2.3	Did you visit health facility	1 Yes 2 no	
2.4	If yes to question number 2.3 mention the place	_____	
2.5	Date seen at health facility	___ / ___ / ___	
2.6	Home Visit by HEW	1 yes 2 no	
2.7	Date visited by HEW	___ / ___ / ___	
2.8	Did you (he/she) take treatment?	1. Yes 2. No	
2.9	If yes, treatment taken	1.ORS 3.Vitamin A 5. TTC ointment 7.Others given _____	2.Antibiotics 4.Supplementary food 6.Anti pyretics
2.10	Did you recovered after the treatment?	1.cure 3. deteriorated/disabled	2. partially 4.death
2.11	How long does it take you to get to a health post?	<input type="checkbox"/> Less than 10 minutes <input type="checkbox"/> 31 minutes – 1 hour <input type="checkbox"/> More than 2 hours	<input type="checkbox"/> 10-30 minutes <input type="checkbox"/> More than 1 hour <input type="checkbox"/> Don't know
2.12	How long does it take you to get to a health centre?	<input type="checkbox"/> Less than 10 minutes <input type="checkbox"/> 31 minutes – 1 hour <input type="checkbox"/> More than 2 hours	<input type="checkbox"/> 10-30 minutes <input type="checkbox"/> More than 1 hour <input type="checkbox"/> Don't know
2.13	Was (NAME) admitted to a health facility?	1. Yes If Yes date admitted: ___/___/___ 2. No	

III. Risk factor

3.1	Did you ever vaccinated for measles?	1.Yes 2.No 3.Unknow 4.Not applicable
3.2	If yes last vaccination date	1.patient recall _____ dd/mm/yy 2. vaccination card _____ dd/mm/yy
3.3	Number of vaccine doses received	1. Zero dose 2. One dose 3. two dose 4.three and above
3.4	Can I see Immunization card/certificate?	1 .yes 2 no if no go to question 3.5
3.5	Why does (NAME) not have an immunization card or certificate?	<input type="checkbox"/> Never went to get vaccinated <input type="checkbox"/> Got vaccinated but was never given the card <input type="checkbox"/> Lost the card <input type="checkbox"/> Other _____
3.6	Did you have any travel history 7-18 days to areas with active measles cases before onset of symptoms?	1.Yes 2.No If Yes where _____
3.7	Do you have any travel history four days before and after rash onset	1.Yes 2.No If yes where _____
3.8	Do you have any contact history with someone else four days before and after rash onset	1.yes 2.No If yes with whom _____
3.9	Did you ever have measles infection?	1.Yes 2.No 3. I Don't know
3.10	Do you know modes of transmission for measles?	1.Yes 2.No 3. If yes specify _____
3.11	What is the common age for a child to be vaccinated with measles vaccine?	1.three month 2.six month 3. nine month 4. don't know
3.12	Nutritional status of the cases, measure MUAC for under five children ,pregnant mother and Lactating mother	1.Normal 2.Moderate 3.Severely malnourished 4.not applicable
3.13	Had received vitamin A supplementation within 6 months for your child?	1.yes 2.No
3.14	Had received deworming within 6 months for your child?	1.yes 2.No
3.15	How many months did you feed only breast for your child	1 two month 2 three month 3 four month 4 six month 5 other-----
3.16	Number of rooms your house have	_____
3.17	Dose each room has window	1.Yes 2.No
3.18	How often you open the windows	1. Every day 2. Some times
3.19	Number of persons per sleeping rooms	_____
3.20	Where did you go first when you get ill?	1.Health Facility 2.Traditional Healers 3. Holy Water 4. Stayed at home 5.Other :(Specify) _____
3.21	How do you think measles can be cured?	1.Using modern medicine 2.Using traditional Medicine 3.Holy water 4.By feeding nutritious foods 5. Keeping the sick person indoor 6.Other(Specify) _____

Annex1.1-2: Questionnaire for Acute Watery Diarrhea Outbreak Investigation.

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	Ethnicity	1.Oromo 2.Gedeo 3.Tigre 4. Sidama 4.Gurage 5.Amhara 6.Wolayita 8.Other(Specify)_____	
1.5	Age	_____ Year (s) _____ Month(s)	
1.6	Sex	1.Male 2.Female	
1.7	Occupation	1.Farmer 2.Merchant 3.Student 4. House wife 5.Unemployed 6. Pastoralist 7. Gov't Employee 8.Private Employee 9. Daily Laborer 10. Not applicable 11.Other_____	
1.8	What is your religious	1. Orthodox 2. Protestant 3. Muslim 4.Catholic 5. other_____	
1.9	What is your marital status?	1. Single 2. Married 3.Widowed 4.Divorced 5. NA	
1.10	Level of Education	1.Illiterate 2.Read and writing only 3.Elementary school(1-8) 4.Secondary School(9-12) 5.Tertiary School(college+)	
1.11	How many family members residing with you?	_____	
2. Knowledge of AWD			
2.1	Do you know acute watery diarrheal disease?	1.Yes 2.No	
2.2	How do you think acute watery diarrheas transmit from person to persons (none proving)?	1.Contaminated food 2.Contaminated water 3.Contact with patient 4.Other(specify) _____	
2.3	What are you doing when you face acute watery diarrhea (none proving)?	1. Go to health facility 2.Seek traditional healer 3.Use ORS 4.Use holy water 5. 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 know 2.No	If 2 or 3 skip to Q2.7
2.6	How do you prevent AWD (none proving)??	1.Using toilet 2.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 m 2. 10-30 m 3. 30 m – 1 hr 4. >1 hr 5. >2 hr	
3. Past History of AWD			

No.	Question	Coding Classification	Go To
5.5	Where did you participate in funeral ceremony of AWD death	_____	
5.6	Did you attend other public ceremonies /events(wedding, 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	What kind of drink did you served at the ceremonies/ event? (if water mention sources)	_____	
6. WASH			
6.1	Where do you defecate?	1. Toilet 2. open field	
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.Ventilated 4.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 toilet 2.Before food 3.After cleansing child 4.Before preparing food 5.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 water 2.Spring 3.Hand dug well 4.Deep well 5.Pond 6.River 7. Lake 8. Bottled water 9.Other(specify) _____	Local mane _____
6.9	What is the water source for your house hold for washing utensils?	1.Pipe water 2.Spring 3.Hand dug well 4.Deep well 5.Pond 6.River 7.Lake 8.Other(specify) _____	
6.10	What is the water source for your house hold for cooking food?	1.Pipe water 2.Spring 3.Hand dug well 4.Deep well 5.Pond 6.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 cane 2.Bucket 3.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 cane 2.Bucket 3.Ensira(Gan) 4.Rotto 5. Other(specify) _____	
6.14	How was the water accessed from the storage container?	1.Pour 2.Dip with cup 3.Other(specify)_____	
6.15	Does the container have cover/lid (observe)?	1.Yes 2.No	
6.16	Do you clean your water containers regularly?	1.Yes 2.No	If No skip to Q6.19

No.	Question	Coding Classification	Go To
6.17	What materials do you use to wash your water containers?	1.Soap 2.Only water 3.Ash 4.Other(specify) _	
6.18	How often do you wash your water containers?	1.Every day 2.Every other day 3.Once per week 4.Other(specify) _____	
6.19	Do you think the water you are using is safe?	1.Yes 2.No	
6.20	Could you purify the water?	1.Yes 2.No	
6.21	What methods of water purification do you use (none proving)?	1.Boiling 2.Filtration 3.Sedimentation 4.Water chemicals 5.Other(specify)_____	
6.22	For what purposes do you purify water (none proving)?	1.For drinking 2.For cooking 3.For washing hand 4.For cleaning food utensils 5.Other(specify) _____	
6.23	Is there water purification chemical available in your community?	1.Yes 2.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.Yes 2.No	
7.3	In the past 7 days of your symptoms onset what kind of uncooked food did you eat?	1. Raw meat 4. 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 7 days of your symptoms onset?	1.Enjer with wot 2.Roasted meat 3.Other(specify) _____	
7.5	Do you re-heat cooked food if not eaten immediately?	1.Yes 2.No	
7.6	Where do you keep the cooked food?	1.Room temperature 2.Refrigerator 3.Other(specify) _____	
7.7	What are you doing with the leftover foods (none proving)?	1.Reheat and eat 2.For domestic animals 3.Giving for beggars 4.Street children 5.Dump in waste substance 6.Other(specify) _____	
7.8	Is there fish supply in your village?	1.Yes 2.No	
7.9	Do you eat raw fish?	1.Yes 2.No	
7.10	Did you eat food from other house in the past 7 days of your symptoms	1.Yes 2.No	

Annex 3: Surveillance system evaluation checklists

A. Woreda level checklist

Region _____ Respondents _____, _____, _____
 Zone _____ Tel. (Only one) _____
 Woreda/town _____ Date _____
 Total population of the Woreda in 2008 _____ No of Health center _____ No of health post _____

A. General

1. What are the objectives of surveillance? _____
2. Does dysentery included in surveillance system? Yes/No
3. What are the strengths of your surveillance system? _____
4. What are the weaknesses of your surveillance system? _____

B. Case detection

1. Do you have dysentery case definition? Yes / No/I don't know
2. If Q1 is yes, it is posted? Yes/No
3. Is it easy to understand all professionals and enable to identify the disease? Yes/No

C. Reporting and documentation

1. Do you have weekly reporting format? Yes/No
2. How much easy to fill reporting format? Very easy somewhat difficult very difficult
3. Does reporting format designed to fill person, time and place variables? Yes/ No, if No, which missed? _____
4. Does dysentery included in weekly reporting format? Yes/No
5. Is there a national PHEM manual for surveillance? Yes/No
6. When you send weekly report to higher level? _____
7. When you receive weekly report from lower level? _____
8. When do you expected to send surveillance data to next level? _____
9. When are you expected to receive weekly report from HCs/HPs? _____
10. What are the reporting facilities for the surveillance system? _____

Table 1: Number of dysentery cases reported from HF from Jan to June, 2008 EFY

Reporting site	No of cases Reported by IDSR	No of cases reported by HMIS	Discrepancy	Remarks

11. Which communication method does you using to send data?
 - By person on hand E-mail EIDSR
 - Wired phone calling Mobile phone calling
 - Radio Fax Other-----
12. Did you have address of Zonal PHEM officers? Yes No
13. How frequently are you communicating with the Zonal/woreda PHEM officers on emergencies and other daily activities Daily Weekly Every 2 week Monthly Quarterly Every 6 month Others-----
14. Does budget allocated for surveillance activities? Yes No, If yes, amount _____
15. What type & amount of cost you incurred per week for surveillance activities? (in your pocket) _____ / _____
16. What are the purposes and uses of sending dysentery case report in weekly basis? _____
17. If you faced any problems on communicating and reporting, list them-----
18. Mention the alternative solutions that you take to tackle the problems you above? -----

C. Data analysis and training assessment

1. Had you trained on disease surveillance? Yes/ No
2. Had you trained on data analyzing? Yes/ No
3. Do you analyze disease surveillance data? Yes No
4. Is Q4 is Yes, what methods are used to analyze data? _____
5. If Q4 is yes, for what purpose do you analyze the data? _____
6. When do you analyze the data? _____
7. If Q4 is no, why not analyze? _____
8. Do you have computer assigned for surveillance activities? Yes/No
9. Did you have computer skill on Ms word Ms excel MS power point
10. Did you have denominators for data analysis? Total population male female U5
11. Frequency of your data analysis _____
12. Do you communicate the results of your analysis to the bodies? Yes /No, if yes for whom _____

D. Epidemic response and preparedness

1. What is dysentery case threshold? _____
2. What was the maximum number of cases reported in 2008? _____

3. What is your strategy to know whether an outbreak is happened or not in your district?

4. Was dysentery outbreak in your district in previous year? Yes/ No
5. If Q4 is yes, how did you know the occurrence of outbreak?

6. If your answer for Q4 is yes, what did you do?
 Reported to zone Reported to administrative leaders investigated Other-----
7. Did you have plan for epidemic response and preparedness? Yes/ No
8. Did you establish Rapid response team? Yes No
9. Did you have case management protocol for epidemic prone diseases? Yes No
10. Was there a budget for epidemic response? Yes No
11. Within what time is the reports received & send after detection of the diseases?

D. Supervision and Feedback

1. Were you supervised by higher level (regional, zonal) officers in 2008 EFY? Yes /No
2. If answer for Q1 is yes, how many times? -----
3. Had you received feedback from higher level supervisors? Yes /No
4. Do you supervise the lower level for disease surveillance purpose? Yes/No
5. If Q4 is yes, frequency of supervision undertaken in 2008 EFY _____
6. What was the challenge faced you during supervision? _____

E. Surveillance Attribute

1. Completeness

- 1.1. Do all sites report on expected time? Yes/No
- 1.2. Is all surveillance data completed? Yes/No, see table 1.

2. Timeliness

- 2.1. Is the surveillance data come on time? Yes/No
- 2.2. Are you send surveillance data on time? Yes/No
- 2.3. percent of HFs reported on time in 2008, HC _____, HP _____ Other _____

3. Usefulness

- 3.1. Does the surveillance system help? Yes/No
- 3.2. If Q3.1 is yes, mention advantages _____
- 3.1. Did the suspected outbreaks were detected early by the surveillance system? Yes/No
- 3.2. Did the response initiated in a timely manner? Yes/No
- 3.3. Did you identify health problems easily using existing surveillance system? Yes/No

4. **Simplicity of the system**

- 4.1. The surveillance system allows all levels of professionals to fill data? Yes/No
- 4.2. Does the surveillance system help to record and report data on time? Yes/No
- 4.3. How long it takes to fill the format? a, <5 minute b-10-15 minutes c- >15 minutes
- 4.4. Is the case definition easy to understand? Yes/No

5. **Flexibility:**

- 5.1. Can the current reporting formats be used for other newly occurring health event (disease) without much difficulty? Yes/ No
- 5.2. Do you think that any change in the existing procedure of case detection and reporting formats will be difficult to implement? Yes /No
- 5.3. Is the system easy to add new variables? Yes /No

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

- 6.1. Are the reporting site / data collectors trained/ supervised regularly? Yes/No
- 6.2. Did reported format filled correctly? See reported copy of format _____
- 6.3. Percent of reports which are complete (that is with no blank or unknown responses) from the total reports _____ (see table)

7. **Acceptability:**

- 7.1. Were all health workers using the standard case definition to identify cases? Yes/ No
- 7.2. Were your health facilities sending your report using the current and appropriate surveillance reporting format? Yes/ No (if yes observe the documents)
- 7.3. Did you believe the surveillance is important for public health intervention? Yes/No
- 7.4. Did you accept the influenza surveillance system? Yes/No

8. **Representativeness:**

- 8.1. Was the surveillance system enabled to follow the health and health related events in the whole community? Yes/No
- 8.2. Is surveillance system used to follow some part of population? Yes/No, if yes, which one _____

9. **Stability:**

- 9.1. Was any new restructuring affected the procedures and activities of the surveillance of these diseases? Yes/ No
- 9.2. Was there lack of resources that interrupt the surveillance system? Yes / No if yes what was it and how do you solve it? _____
- 9.3. Was there any time /condition in which the surveillance is not fully operating? Yes/ No
If the answer yes for Q #3 When/what is the condition that talks the system not to function properly? -----

B. Health center level checklist

Region _____ Respondents _____, _____, _____
Zone _____ Tele. (Only one) _____
Woreda/town _____ Date _____
Health C. (cluster) _____ Total population of the catchment in 2008 _____
No of Health post _____

A. General

1. What are the objectives of surveillance? _____
2. Does dysentery included in surveillance system? Yes/No
3. What are the strengths of your surveillance system? _____
4. What are the weaknesses of your surveillance system? _____

B. Case detection

1. Do you have dysentery case definition? Yes / No/I don't know
2. If Q1 is yes, it is posted? Yes/No
3. Is it easy to understand all professionals and identify the disease? Yes/No

C. Reporting and documentation

1. Do you have weekly reporting format? Yes/No
2. How much easy to fill reporting format? Very easy somewhat difficult very difficult
3. Does reporting format designed to fill person, time and place variables? Yes/ No, if No, which missed? _____
4. Does dysentery included in weekly reporting format? Yes/No
5. Is there other register/logbook for dysentery in your HC? Yes No
6. Is there a national PHEM manual for surveillance at this site? Yes/No
7. Can the current reporting formats be used for other diseases? Yes/No
8. Do you report dysentery cases to upper level? Yes/No, if yes, have you copy of reports for each time? Yes/No, observe it _____
9. How often you (frequency) report the cases? _____
10. When do you expected to send surveillance data to next level? _____
11. How many cases did you report to higher level in 2008 EFY
12. How do you send the data to the next level? _____
13. Do you receive reports from lower level/HP? Yes/No

C. Data analysis and training assessment

- 13. Had you trained on disease surveillance? Yes/ No
- 14. Had you trained on data analyzing? Yes/ No
- 15. Do you analyze any priority disease data? Yes No
- 16. Is Q4 is Yes, what methods are used to analyze data? _____
- 17. If Q4 is yes, for what purpose do you analyze the data? _____
- 18. When do you analyze the data? _____
- 19. If Q4 is no, why not analyze? _____
- 20. Do you have computer assigned for surveillance activities? Yes/No
- 21. Did you have computer skill on Ms word Ms excel MS power point
- 22. Did you have denominators for data analysis? Total population male female U5
- 23. Frequency of your data analysis _____
- 24. Do you communicate the results of your analysis to the bodies? Yes /No, if yes for whom _____

D. Epidemic response and preparedness

- 1. What is dysentery case threshold? _____
- 2. What was the maximum number of cases reported in 2008? _____
- 3. What is your strategy to know whether an outbreak is happened or not in your catchment? _____
- 4. Was dysentery outbreak in your catchment in previous year? Yes/ No
- 5. If Q4 is yes, how did you know the occurrence of outbreak?
- 6. If your answer for Q4 is yes, what did you do?
 - Reported to the woreda PHEM Reported to administrative leaders investigated
 - Cases referred to health center/hospital Other-----
- 7. Did you have plan for epidemic response and preparedness? Yes/ No
- 8. Did you establish Rapid response team? Yes No Not Applicable
- 9. Did you have case management protocol for epidemic prone diseases? Yes No
- 10. Was there a budget for epidemic response? Yes No
- 11. Within what time is the reports send after detection of the diseases? _____

D. Supervision and Feedback

- 7. Were you supervised by higher level (regional, zonal or woreda) officers in 2008 EFY? Yes /No
- 8. If answer for Q1 is yes, how many times? -----
- 9. Had you received feedback from higher level supervisors in 2008 EFY? Yes /No
- 10. Do you supervise the lower level for disease surveillance purpose? Yes/No
- 11. If Q4 is yes, frequency of supervision undertaken in 2008 EFY _____
- 12. What was the challenge faced you during supervision? _____

E. Surveillance Attribute

10. Completeness

- 1.1. Are all sites reported at expected time? Yes/No
- 1.2. Is all surveillance data completed? Yes/No, see table 1.

11. Timeliness

- 2.1. Is the surveillance data come on time? Yes/No
- 2.2. Are you send surveillance data on time? Yes/No
- 2.3. percent of HPs reported on time in 2008_____

12. Usefulness

- 3.1. Does the surveillance system help? Yes/No
- 3.2. If Q3.1 is yes, mention advantages_____
- 3.1. Did the suspected outbreaks were detected early by the surveillance system? Yes/No
- 3.2. Did the response initiated in a timely manner? Yes/No
- 3.3. Did you identify health problems easily using existing surveillance system? Yes/No

13. Simplicity of the system

- 4.1. The surveillance system allows all levels of professionals to fill data? Yes/No
- 4.2. Does the surveillance system help to record and report data on time? Yes/No
- 4.3. How long it takes to fill the format? a, <5 minute b-10-15 minutes c- >15 minutes
- 4.4. Is the case definition easy to understand? Yes/No

14. Flexibility:

- 5.1. Can the current reporting formats be used for other newly occurring health event (disease) without much difficulty? Yes/ No
- 5.2. Do you think that any change in the existing procedure of case detection and reporting formats will be difficult to implement? Yes /No
- 5.3. Is the system easy to add new variables? Yes /No

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

- 6.1. Are the reporting site / data collectors trained/ supervised regularly? Yes/No
- 6.2. Did reported format filled correctly? See reported copy of format _____

16. Acceptability:

- 7.1. Were all health workers using the standard case definition to identify cases? Yes/ No
- 7.2. Were your health facilities sending your report using the current and appropriate surveillance reporting format? Yes/ No (if yes observe the documents)
- 7.3. Did you believe the surveillance is important for public health intervention? Yes/No

7.4. Did you accept the influenza surveillance system? Yes/No

17. Representativeness:

8.1. Was the surveillance system enabled to follow the health and health related events in the whole community? Yes/No

8.2. Is surveillance system used to follow some part of population? Yes/No, if yes, which one _____

18. Stability:

9.1. Was any new restructuring affected the procedures and activities of the surveillance of these diseases? Yes/ No

9.2. Was there lack of resources that interrupt the surveillance system? Yes / No if yes what was it and how do you solve it? _____

9.3. Was there any time /condition in which the surveillance is not fully operating? Yes/ No
If the answer yes for Q #3 When/what is the condition that talks the system not to function properly? -----

C. Health post level checklist

Region _____	Respondent _____
Zone _____	Tele. _____
Woreda _____	Date _____
Health C. (cluster) _____	Name of health Post _____
Health post _____	Total population of the catchment in 2008 _____

A. General overview

1. Do you conduct dysentery surveillance? Yes/No. if yes, how and how often _____
2. What are the objectives of dysentery surveillance? _____
3. What are the strengths of your surveillance system? _____
4. What are the weaknesses of your surveillance system? _____
5. Do you believe the surveillance is important for health intervention? Yes/No
6. Does the surveillance system conducting in a reliable and consistent manner over time? Yes/No

B. Communication and reporting assessment

1. What kind of common communication facility do you have? E-mail Phone Radio other
2. Which communication method does you using to send data?
 By person on hand Wired phone calling Mobile phone calling Radio Fax
 Other-----

3. Did you have address of woreda or H.C PHEM officers? Yes /No
4. How frequently are you communicating with the woreda or H.C PHEM officers on emergencies and other daily activities?
 Daily Weekly Every 2 week Quarterly Every 6 month Yearly
 Others-----
5. When you are commonly send weekly report to the woreda or H.C PHEM unit?
 Monday Sunday Tuesday Wednesday Thursday Friday
 Saturday I don't know
6. What type & amount of cost you incurred per week for surveillance activities?
_____ / _____
7. What are the purposes and uses of sending dysentery case report in weekly basis?

8. If you faced any problems on communicating and reporting, list them-----
9. Mention the alternative solutions that you take to tackle the problems you above? -----

C. Assessment of availability of Surveillance Documentation, Registers, Forms & recorded data

1. Was there national manual for surveillance? Yes No Not Applicable
2. Did you have standard case definition for dysentery? Yes/ No
3. Was the case definition posted? Yes No, and is it easy to understand Yes/No
4. Does dysentery included in weekly reporting format? Yes No
5. How much easy to fill reporting format? very easy somewhat difficult very difficult
6. Does reporting format designed to fill person, time and place variables? Yes/ No
7. Can the current reporting formats be used for other diseases? Yes/No
8. Had you line list format for reporting cases during outbreaks? Yes No
9. Was there a clinical register/logbook for dysentery in your health post? Yes No
10. Did you face shortage of surveillance reporting and recording formats? Yes/ No
11. Fill the following table with total reported dysentery cases in the 2nd half year, 2008 EFY

Total reported dysentery cases in _____ HP, 2008

Month	No of suspected & reported case	Complete report	Incomplete report (has missing variables)
January			
February			
March			
April			
May			
June			
Total			

D. Data analysis and training assessment

1. Had you trained on disease surveillance? Yes/ No
2. Had you trained on data analyzing? Yes/ No
3. Do you analyze any priority disease data? Yes No
4. Is Q4 is Yes, what methods are used to analyze data? _____
5. If Q3 is yes, for what purpose do you analyze the data? _____
When do you analyze the data? _____

E. Outbreak investigation and case confirmation assessment

1. What is the threshold of malaria case in your Kebele? _____
 2. What was the maximum number of cases reported in 2008? _____
 3. What is your strategy to know whether an outbreak is happened or not in your kebele?

 4. Was dysentery outbreak in your Kebele in 2008 EFY? Yes/ No
 5. If Q4 is yes, how did you know the occurrence of outbreak?

 6. If your answer for Q4 is yes, what did you do? Reported to the woreda PHEM
 Reported to administrative leaders We investigated
 Cases referred to health center/hospital Other-----
 7. Who was responsible to investigate an outbreak? _____
 8. What type of resources needed for dysentery surveillance activities?

 9. What types of resources that have got shortage to conduct surveillance in a year?

 10. What are challenges you are facing to prevent dysentery in your kebele?

- b) List the alternatives that you take to tackle the challenges. -----

F. Supervision and feedback

1. Were you supervised by higher level officers in terms of disease surveillance in 2008 EFY?
 Yes No If yes, by whom? _____
2. If answer for Q1 is yes how many times in 2008 EFY? -----
3. Had you received feedback from supervisors in 2008 EFY? Yes No

If answer for Q 3 is yes how many feedbacks did you received in 2008 EFY? -----

Annex 4: Health profile data collection tool (checklist)

1. Historical Aspects of the area (if available)

- How and why the name given Humbo 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							
3							
4							
5							

- **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	Wolaita		
2	Hadiya		
3	Guragie		
4	Oromo		
5	Siltie		
6	Amhara		
7	Sidam		
8	Gamo		
9	Tigrie		
10	Others		

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										

* _____

A. 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, morbidity and admission 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						
3						
4						
5						
6						
7						
8						
9						
10						

10.4.2 Top ten causes of admissions in 2007 E.C

Sr. no	Adult			pediatric		
	Types causes	In No	%	Types causes	In No	%
1						
2						
3						
4						
5						
6						
7						
8						
9						
10						

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						
3						
4						
5						
6						
7						
8						
9						
10						

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	1 st round		
		4 th 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 health 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 Malarious Kebeles	
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											
2											
3											

*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									
2									
3									

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

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 _____

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

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

13. What are common zoonotic diseases in the district?

- 1. _____
- 2. _____
- 3. _____
- 4. _____

Annex 5: Rapid Belg assessment checklists

Rapid Belg assessment - Health Sector, Region /Zonal checklist

Interviewer name _____		Institution: _____				
Interview Date: (dd) _____ / (mm) _____ / 2016		Region: _____ Zone: _____				
Main contact at this location:	Name: _____	Position: _____	Tel: _____			
1. COORDINATION						
A. Is there a functional multi-sectoral coordination forum for the health sector?			Yes <input type="checkbox"/>	No <input type="checkbox"/>		
B. Are all relevant government, NGOs and UN agencies represented?			Yes <input type="checkbox"/>	No <input type="checkbox"/>		
C. Frequency of regular meeting? (Weekly, Every 2 weeks, monthly.....) _____						
2. Outbreak?						
Was there any outbreak in the last 3 months? If yes, specify the type of disease			Yes <input type="checkbox"/>	No <input type="checkbox"/>		
Type of outbreak _____	Number of cases _____	Deaths _____	(specify the time period) _____			
Type of outbreak _____	Number of cases _____	Deaths _____	(specify the time period) _____			
Type of outbreak _____	Number of cases _____	Deaths _____	(specify the time period) _____			
Type of outbreak _____	Number of cases _____	Deaths _____	(specify the time period) _____			
Type of outbreak _____	Number of cases _____	Deaths _____	(specify the time period) _____			
Is there any ongoing outbreak of any disease? YES _____ NO _____						
If yes, specify the type of disease						
Type of outbreak _____	Number of cases _____	Deaths _____	(specify the time period) _____			
Type of outbreak _____	Number of cases _____	Deaths _____	(specify the time period) _____			
Type of outbreak _____	Number of cases _____	Deaths _____	(specify the time period) _____			
Type of outbreak _____	Number of cases _____	Deaths _____	(specify the time period) _____			
3. Mention anticipated epidemics _____, _____, _____						
If yes please indicate Zone/Woreda at risk and risk population per anticipated risk: <i>(Use the back side)</i>						
4. Public Health emergency Management						
A. Is there a Public Health and Nutrition Emergency Preparedness and Response plan?			Yes <input type="checkbox"/>	No <input type="checkbox"/>		
If yes, is the plan budgeted/ funded?			Yes <input type="checkbox"/>	No <input type="checkbox"/>		
B. Is there a trained staff on PHEM basic level (Regional/Zonal/Woreda/HFs)			Yes <input type="checkbox"/>	No <input type="checkbox"/>		
If yes specify number of trained personnel per level: Region: Female _____ Male _____ Zone: Female _____ Male _____ Woreda: Female _____ Male _____						
C. Is there a Regional/zonal trained Rapid Response team (RRT)?			Yes <input type="checkbox"/>	No <input type="checkbox"/>		
D. Is there a trained staff on Emergency nutrition management at all level? yes --- No - --- If yes specify the no. : Total ___ Male : ___ Female :- ___						
E.	Drugs and medical supplies		Total requirement	Available	Gap	
	i. Meningitis vaccine					
	ii. Drugs:	Coartem				
		Artesunate (rectal)				
		Artesunate (Inj)				
Artemether IM						

		Quinine (PO)			
		Quinine (IV)			
		Chloroquine			
		Ceftriaxione			
		Oily CAF			
		Doxycycline			
		Ringer lactate			
		ORS			
		Vit A.			
	iii. Nutrition: Therapeutic supplies and antibiotics	F100			
		F75			
		RUTF			
		Resomal			
		Routine antibiotics at SC/OTP (the list can be annexed)			
	iv.Lab supplies	RDT (Malaria)			
		Pastorex (Meningitis)			
		LP set			
TI bottle					
CTC Kit (AWD)					
Medical Supplies	Gloves,				
	Syringe				
	PPE				
Drugs and supplies for Emergency RH	Individual Clean Delivery Kits				

Section IV: Nutrition – SAM & MAM Management in the Region /Zone October 2015 to March 2016

SAM Management

4.1 Facilities with SAM management in the Region /Zone

Month	Total Number of Health centers/hospitals	Total Number of Health posts	Number of SC.	% of health centers/hospitals with a SC.	Number of OTP.	% of health posts with an OTP	Total Number of OTP/SC reported	% of OTP/SC who have reported
Oct								
Nov								
Dec								
Jan								
Feb								
Mar								

4.2 Admission and performance of the therapeutic feeding program for SAM management

Month	Total SAM Cases		% of SAM children cured	% of SAM children defaulted	% of SAM children died	% of SAM children non-respondent	% of SAM children other
	2007 E.C.	2008 E.C.					
Oct							
Nov							
Dec							
Jan							
Feb							
March							

4.3. Availability of therapeutic supplies

	Yes	No	If Yes, How much
Is there sufficient supplies for 3 months of :			
RUTF			
F100			
F75			
2 nd line drugs			

MAM Management

4.6. TSFP program in the Region /Zone

	Yes	No	If Yes, How much is available
Is this a priority 1 woreda?			
Was there a TSFP distribution last month?			
Are 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 (2 nd generation) TSFP woreda?			
Has the Woreda been supported by an NGO in the last 3 months?			

4.7 MAM admission

Month	Priority 1 woreda Y/N		Total MAM Cases		Total Number of Food Distribution point in the woreda
	2007 E.C.	2008 E.C.	2007 E.C.	2008 E.C.	
Oct					
Nov					
Dec					
Jan					
Feb					
March					

Screening

4.8. When was the last screening conducted in the Region /Zone? _____

4.9. What screening modality is used in the Region /Zone? EOS _____, CHD _____, Routine _____, vitamin A and de-worming coverage from Oct 2015– March, 2016

Vitamin A _____ De-worming _____

4.10. Screening performance for children in the Region /Zone

Month	Target Children 6-59 months	# of screened children	Screening Coverage (%)	# of Children with no odema and MUAC <11 cm			# of children with no oedema and MUAC 11 to 11.9CM	% Proxy GAM for children	% Proxy SAM for children
				#SAM					
				MUAC <11 cm	odema	Total			
Oct									
Nov									
Dec									
Jan									
Feb									
March									

4.11. Screening performance for Pregnant and lactating Women (PLW) in the Region /Zone

Month	Target PLW	# of screened PLW	Screening Coverage (%)	# of PLW MUAC below 23.0 cm*	% Proxy GAM for PLW
Oct					
Nov					
Dec					
Jan					
Feb					
March					

* Below 21.0 cm in Tigray

4.12 Any other observations you made or any risks of emergency nutrition?

4.13 What were the major challenges in your emergency nutrition response experience?

Flood

- Was there flood disaster in the last 6 months in the **Region /Zone**? Yes No
- If yes, How many weredas affected _____, population affected _____
- Human Death due to flooding _____ yes or no
- If yes how many in number _____
- Are there displaced people due to flooding? Yes or No
- If Yes , how many _____
- was there outbreak in the flood affected area Yes No

If yes , Type of outbreak _____ Number of cases _____ Deaths _____ (specify the time period) _____
Type of outbreak _____ Number of cases _____ Deaths _____ (specify the time period) _____
Type of outbreak _____ Number of cases _____ Deaths _____ (specify the time period) _____
Type of outbreak _____ Number of cases _____ Deaths _____ (specify the time period) _____
Type of outbreak _____ Number of cases _____ Deaths _____ (specify the time period) _____

Any comment

Summary: Requirements/Needs/ 2016

Region/Zone	Type of Health and nutrition Emergency	Total estimated Beneficiaries ¹	Required finance

Region	Zone	Woreda at Risk	Type of Risk	At risk Population

Rapid Belg 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 (<i>if any</i>):	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 <input type="checkbox"/> No <input type="checkbox"/>																		
Within the last six month Deworming given to to children 2-5years Yes <input type="checkbox"/> No <input type="checkbox"/>																		
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 <input type="checkbox"/> No <input type="checkbox"/>																		
ORS (to treat AWD cases): Yes <input type="checkbox"/> No <input type="checkbox"/>																		
Doxycycline (to treat AWD cases): Yes <input type="checkbox"/> No <input type="checkbox"/>																		
Consumables : Syringes, Gloves (for AWD management): Yes <input type="checkbox"/> No <input type="checkbox"/>																		
Amoxil susp (measles) Yes <input type="checkbox"/> No <input type="checkbox"/>																		
Tetracycline ointment (measl es) Yes <input type="checkbox"/> No <input type="checkbox"/>																		
Vit A (measles) Yes <input type="checkbox"/> No <input type="checkbox"/>																		
Coartem for Malaria Yes <input type="checkbox"/> No <input type="checkbox"/>																		

Lab supply: RDT for Malaria	Yes <input type="checkbox"/> No <input type="checkbox"/>	
Lab supply: RDT (pastorex) for Meningitis	Yes <input type="checkbox"/> No <input type="checkbox"/>	
LP set	Yes <input type="checkbox"/> No <input type="checkbox"/>	
Number of CTC kit available: (for AWD)	Yes <input type="checkbox"/> No <input type="checkbox"/>	
Are there emergency reproductive health kits in health facilities to provide Basic Emergency Obstetric and New Born Care?	Yes <input type="checkbox"/> No <input type="checkbox"/>	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 <input type="checkbox"/> No <input type="checkbox"/>	If No, list the missing medicines and supplies ____
Are there emergency medicines and supplies to support care of rape survivors?	Yes <input type="checkbox"/> No <input type="checkbox"/>	
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

Items	Yes	No
Is there sufficient supplies for 3 months of :		
RUTF		
F100		
F75		
2 nd 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

Items	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 (2 nd 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 children with no oedema and MUAC 11 to 11.9CM	% Proxy GAM for children	% Proxy SAM for children
				#SAM					
				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					

4.12 Any other observations you made or any risks of emergency nutrition?

4.13 What were the major challenges in your emergency nutrition response experience?

Flood

- Was there flood disaster in the last 6 months in the **Region /Zone**? Yes No
- If yes, How many weredas affected _____, population affected _____
- Human Death due to flooding _____ yes or no
- If yes how many in number _____
- Are there displaced people due to flooding? Yes or No
- If Yes , how many _____ PLW__ Children <2 yrs (_____) (<6months, _ 6-23 months)
- was there outbreak in the flood affected area Yes No

If yes , Type of outbreak _____ Number of cases _____ Deaths _____ (specify the time period) _____
Type of outbreak _____ Number of cases _____ Deaths _____ (specify the time period) _____
Type of outbreak _____ Number of cases _____ Deaths _____ (specify the time period) _____
Type of outbreak _____ Number of cases _____ Deaths _____ (specify the time period) _____
Type of outbreak _____ Number of cases _____ Deaths _____ (specify the time period) _____

Any comment

Annex 6: Structured questionnaire for assessment of latrine utilization

Introduction

Hello, my name is _____, I am a member of AAU research team. Thank you for giving your time to speak with me. We are conducting an assessment how peoples utilize their latrine and what factors may affect them to use latrine properly in your kebele. Our goal is to figure out the utilization status of the community and dig out factors that hinder people to use their latrine and then the findings will be important for concerned bodies to take remedial actions for the identified gaps. Your house is selected randomly and then I will ask you some questions regarding your latrine and how you are using. Questions are simple and what you are clearly known in your daily activities. Please feel free to speak what you want to say, nothing will come to you about what you said. In addition your name or anything that could identify you will not be recorded in any official reports or presentations.

Description

Date of interview _____

Name of interviewer _____ Signature _____

Name of supervisor _____ Signature _____

Date of supervision conducted _____

Description for questionnaire

001: ID No _____

002: Kebele _____

003: Village/Got _____

004: house number _____

005: Respondent available during first visit _____

006: Respondent available during second visit _____

Part one: Socio-demographic characteristics

code	Questions & observation	Alternative response & coding category	Skip
101	Respondent/interviewee	Father-----1 Mother-----2 Other-----99	
102	Respondent's sex	Male-----1 Female-----2	
103	What is your age?	-----years	
104	What is your ethnicity?	Sidama-----1 Gedeo-----2 Orom-----3 Amhara-----4 Other-----99	
105	What is your religion?	Catholic-----1 Cristiana-----2 Muslim-----3 Other-----99	
106	Family size	Less than one year-----1 1-5 year of age-----2 Over 5 year of age-----3	
107	What is your occupation?	Farmer-----1 Government employee-----2 Merchant-----3 Daily labor-----4 Other-----/-----99	
108	What is your level of education?	Literate-----1 Illiterate-----2	
109	Your family members' level of education (write the number)	Illiterate-----1 Able to read & write-----2 Primary level-----3 Secondary & above-----4	
110	How long are you live in this kebele?	-----	

Part two: Latrine situation

code	Questions & observation	Alternative response & coding category	Skip
201	Is your latrine	New-----1 Old-----2	
202	How long your latrine is served?	Less than a year-----1 About two years-----2	

		Three or more years-----3	
203	How long the latrine far from the home?	Less than 10 meters-----1 About 10-15 meters-----2 About 15-20 meters-----3 More than 20 meters-----4	
204	Is the road suitable to walk easily to the latrine even at night?	Yes (observe)-----1 Not-----2	
205	Is your latrine constructed properly? (observe)	Is there super structure? Yes-----1 No-----2 Is there proper door? Yes-----1 No-----2 Is slab sealed? Yes-----1 No-----2 Is there cover hole? Yes-----1 No-----2 Is there hand washing facility? Yes-----1 No-----2 Is the latrine clean?(presence of face & urine around the hole) Yes-----1 No-----2	
206	Is there any water source near to your latrine? If yes,	Yes-----1 No-----2 Upper gradient to the latrine-----1 Lower gradient to the latrine-----2	

Part three: Utilization status

Code	Questions & observation	Alternative response & coding category	Skip
301	Are all your family members always using latrine?	Yes-----1 No-----2	
302	If not, who are not commonly using the latrine?	Children (<5 year of age)-----1 Old persons-----2 No anyone-----3 Other-----99	
303	Where do defecate who don't commonly use latrine?	Open field-----1 In compound-----2 In popo-----3 Other-----99	
304	Where do you dispose children's feces?	In latrine-----1 In anywhere-----2 Other-----99	
305	If you dispose children's feces in anywhere, why?	Since children's feces is not harmful-----1 Other-----99	
306	When is the difficult time to use latrine?	At night-----1 During traveling-----2 When anyone sick-----3	

		During rainy season-----4 No any difficult time-----5 Other-----99	
307	Do you wash your hands always immediately after defecation?	Yes-----1 Not-----2	If not, to 401
308	Where do you wash your hands after toilet?	Near to the latrine-----1 In the house -----2	
309	Are you using detergent when you wash your hands after toilet?	Yes-----1 No-----2	

Part four: Factors affecting latrine utilization

Code	Questions & observation	Alternative response & coding category	Skip
401	If you are using latrine not always and not properly, what is the reason?	Feces used for fertilization-----1 No problem occurred till now-----2 Due to bad smelling-----3 Fear of insect biting in the latrine-----4 Not to be comfortable to use freely-----5 Fear of collapsing-----6 Cultural beliefs-----7 Unavailable of latrine at roadside-----8 Other-----99	