

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

Field Epidemiology Training Program (FETP)

COMPILED BODY OF WORK IN EPIDEMIOLOGY

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Ethiopia Field Epidemiology Training Program (EFETP)

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Submitted to the School of Graduate of Addis Ababa University in partial fulfillment for the Degree of Master of Public Health in Field epidemiology

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May, 2016

Addis Ababa

Addis Ababa University

School of Graduate studies

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Acknowledgement

From the very beginning, I am very glad and thankful to Yusuf Nina who encouraged me to join the Ethiopia Field Epidemiology Training Program (EFETP) and invaluable contribution was continued throughout my stay in the university.

My special thanks and appreciation goes to my mentor Professor Alemayehu Woerku for his exhaustive work on my body of work, for the intellectual and constructive comments he made. I would like to heartedly express my deep thanks and appreciation to Mrs. Alefech Adisu initially for her committed and intellectual comments on my body of work

I would like to express my deep gratitude and appreciation to Mr. Weisa Ahmed and Kutbi oudo for their unreserved guidance and sincere cooperation during the field visit to each household without whom the case-control study of measles outbreak. My deep thanks go to my field supervisor Mr. Yohannis Gebrehawariya for the administrative arrangements he made in every of my field visits. My deep gratitude and sincere appreciation go to: peoples who generously participated in the study of measles and Scabies outbreak. I appreciate the Coordinators and Resident Advisors of the EFETP who made it possible my stay to come to its end. Many thanks go to the staff of Public Health Emergency Management (PHEM) of Tigray Regional Health Bureau and Afar Region Health Bureau for their help in all practical matters of the study both at the resident area and field engagements.

My grateful thank is granted to Centers for Disease Control and Prevention (CDC) and Ethiopian Public Health Association (EPHA) for financing the program which I engaged in and its contribution in the smooth running and achievements towards an improved career. Many thanks forwarded to all zonal, district health offices, health facilities and all other sector offices of which I have participated during the various field

activities. Finally I am also very thankful to Addis Ababa University School of Public Health and Tigray Regional Health Bureau for their technical and materials support.

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List of Abbreviations

AAU	Addis Ababa University
AFI	Acute Febrile Illness
ANC	Anti Natal Care
A.O.R	Adjusted Odds Ratio
ART	Anti- Retroviral-Therapy
AWD	Acute Watery Diarrhea
BSs	Bachelor of Science
CI	Confidence Interval
CFR	Case Fatality Rate
CSA	Central Statistics Agency
CBN	Community Based Nutrition
CDC	Center of disease Control and Prevention
EFELTP	Ethiopian Field Epidemiology & Laboratory Training Program
EPHA	Ethiopian Public Health Association

EPI	Expand Program of Immunization
ENS	Environmental Science
EWS	Early Warning System
HMIS	Health Management Information System
HC	Health Center
HCT	HIV Counseling and Testing
HEW	Health Extension workers
HF	Health Facility
HH	House Hold
HIV	Human Immune deficiency Virus
HP	Health Post
MD	Maternal Death
MDSR	Maternal Deaths Surveillance and Response
OD	Odds Ratio
RDT	Rapid Diagnostic test

Executive summary

The Ethiopia Field Epidemiology Training Program is a two years' service program in field epidemiology adapted from United States Center for Disease Control and Prevention (CDC) epidemic intelligence service (EIS) program. The program is designed to assist the ministry of health in building or strengthen health system by recruiting and promising health workers and building their competence through on the job mentorship and training. The program has two main components a class room - teaching component (25%) and practical attachment or field placement component (75%).

June 17, 2016, the Gela'lo District Health Office announced to the Afar Regional Health Bureau Public Health Emergency Management (PHEM) department. There were 79 suspected measles cases and 1 deaths occurred in two kebele (Debel and kodie) of the district. The region deployed a team of investigators on February 26, 2016, to undertake possible investigations and intervention measures. The team provided rapid response and control during the outbreaks.

We interviewed 30 cases; a 1.25% case fatality rate from 27th February, 2016 to 15th March 2016. Seventy three of the patients (93.3%) were from Kodie kebele (attack rate of 15.2 per 1000 population) and seven of the patients (8.75%) were from Debel Kebele (attack rate 0.18 per 1000 population).

Ethiopia is one of the six countries that contribute to about 50% of the maternal deaths Worldwide. The others being India, Nigeria, Pakistan, Afghanistan and the Democratic Republic of Congo (Lancet, April 2010).

We conducted retrospective cross-sectional study of maternal death audit in Tigray region to describe the data in term of time, place, and person and the causes of maternal deaths were described by percent.

The number of maternal deaths in three years was 286. In 2013 G.C, 45.5% of deaths were occurred and 72.64% were direct obstetrics. The timing of deaths relation to pregnancy in postpartum was 212(76.89%). Most of the deaths were due to hemorrhage followed by sepsis which were 171(50.94%) and 24(8.49%) respectively. From all maternal deaths, 72(25.09%) were from central zone, 78(27.53%) were from North West zone and 58(20.21%) were from Southern zone, 36(12.53%) were Eastern zone, 31(10.8%) were from western zone, 11(3.83%) were from Mekelle special zone. Thus, the number of deaths were high in north western zone; followed by western zone even though Central zone signify 25.5% of deaths occurred. Because, the population of central zone were much higher compared to them and the deaths were lower in eastern zone compared to all five zones.

Because, measuring maternal mortality is difficult and complex, reliable estimates of the dimensions of the problem are not generally available and assessing progress towards the goal of reducing maternal mortality is difficult. In particular, it tells us nothing about the faces behind the numbers, the individual stories of suffering and distress and the real underlying reasons why particular women died. We conducted MDSR Evaluation to evaluate the performance of the existing surveillance system of maternal deaths of the North Western Zone, Tigray region, April, 2016.

In 16(80) % of health facilities there were national manuals for MDSR. But in 4(10%) of the health facilities which had not national manual for MDSR which were health posts in rural area. Only the regional health bureau used a computerized system to monitor district completeness and timeliness reporting, but there was no cross checking how many health facilities reported at the ground level.

There was shortage of reporting format in the last six months in all visited health facilities and health offices except one health center. In one of the district offices they use their own hand written paper to receive reports. Overall completeness of reporting of the visited sites was 83.3%, completeness of reporting was high in Atsegede Tsimbila district (98.9%) followed by Medebay zana (69%).

Timeliness of reporting from health post to health center then to district of maternal death is difficult to evaluate because date of receipt was not recorded in all health facilities.

Finally, we concluded that supportive supervision on quarterly basis is a good trend in Tigray region but specific surveillance system evaluation and feedback is not practiced at regular basis. Laboratory participation in surveillance is very limited and quality assurance system is not practiced in health facilities by the regional health research laboratory. Data utilization is very low at the lower level of the reporting unit. No refunding mechanism for personal telephone expenditures. Reporting entities are almost governmental health facilities, only limited number of private health sectors have participated in reporting of the diseases under surveillance.

We conducted Health profile Description report to assess health and health related issues about health status of the Aysata District, Afar Region, in April, 2015.

Different instruments like checklists and structured questionnaire were used as tools for data collection from various governmental organizations such as district health office, health facilities, education sector, finance office, agriculture sector, district water resource office, district electric power authority and district political administration office.

The district has two health centers and nine health posts; with ratio of 1: 30,295 health center to population ratio and 1: 6,732 health post to population ratio. Health center coverage was above 100 % and health post 98.8%; with the ratio of 1:39,525, 1:3,040 and 1:3,953 health officer, nurse, HEW to population respectively.

No X-ray technicians and environmental health experts were found in the district. From the total district health professional (manpower) females account 38.7%. About 350 community health agents were working

in the district on health promotion and disease prevention activities. The overall health worker to population ratio was 1.02. No diagnostic laboratories were available in the district.

The overall health worker ratio per 1000 population was 1.02. This result is far less than the standard set by the World Health Organization of 2.3 per 1000 population. Malaria was the top causes of morbidity in 2015, 68.6%, outbreak was occurred in 2015; lack of ITNs coverage and problem of environmental sanitation may contributed to its existence.

Females experience higher incidence of HIV/AIDS; 3/10000 population which is 1.8 times higher than males. This may be attributed to the biological vulnerable nature of females and//or more of those were engaged as commercial sex workers. But, there was encouraging screening program which diagnosed significant amount of peoples in its system. The overall 0.54% prevalence of HIV in Aysata district is less than the EDHS 2011 finding (1.5%).

Participatory humanitarian needs assessments help to understand the actual emergency situations at the grassroots level. The Government of Ethiopia has been conducting two Disaster Risk Management and Food Security Sector led by multi-agency emergency needs assessments following the Meher/Karma and Belg/Sugum rainy seasons every year in selected hotspot woredas nationwide.

Health/nutrition emergency needs assessment was anticipated to identify, analyze and evaluate public health risk factors resulted from the outcomes of 2015 Sugum season in Afar Regional State based on six hotspot woredas, (two woredas from zone four and four woredas from Zone two). It is known to be affected with recurrent drought. Moreover, access to food and nutrition, water supply and sanitation, financial income, and health services is very low. The major health risks in the region are Malaria, Diarrhea, pneumonia & other AURTI².

The 2015 multi-agency *Belg/Sugum* emergency needs assessment commenced on June 23rd with briefing at the regional level and completed after six days on July 10th. Woreda level briefings were discussed with higher officials, heads and experts of line offices including administration, Health, pastoral and agro-pastoral office, Water Resources office, Women and Children offices. For the health part, targeted data sources were Woreda Health Offices records, Woreda officials, experts, community members and NGOs implementing in the areas.

Multi-sector Public Health Emergency Management (PHEM) coordination forums in most of the assessed woredas were either nonexistent or nonfunctional and Public Health Emergency (PHE) preparedness and response plan were not available in 4(66.7% of visited) woredas. These gaps should be highly considered by the woredas themselves and by the region.

The common top five morbidity causes for children under five years of age and the top 5 causes of morbidity above 5 years had a slight variation in all assessed woredas but the magnitude of these disease were different.

The region and woredas should allocate budget for coordination and preparedness and Strengthen communication system/ use of all possible means.

Those woredas which had high number of cases and low supplies should be prioritized and Avail emergency drugs and supplies in ample amount. The woredas should conduct measles SIA in their district and neighboring districts with suspected measles cases and strengthen routine EPI.

Chapter I: Outbreak Investigation

1.1. Measles outbreak in Gela'lo District, Afar Region, Ethiopia, March, 2016

Abstract

Introduction

Measles is a highly contagious human disease caused by RNA virus, which belongs to genus Morbillivirus which grows in the cells that line the back of the throat and lungs. It is transmitted through droplet nuclei or direct contact with infected person's respiratory secretions which is a most contagious, with one case can infect twenty other individuals.

This study was to investigate the measles suspected outbreak of Gela'lo District of the Afar region, February 2016 to March 15, 2016 to confirm the existence of the outbreak by identifying the causative agent of the outbreak; by describing the data in terms of place, person and time.

Methods and Materials

We define: a suspected measles case based on World Health Organization (WHO) case definition, as any person with fever, maculopapular generalized rash and cough, and either coryza, or conjunctivitis or any person in whom a clinician suspects measles.

From February 26, 2016 to March 15, 2016; we conducted retrospective unmatched case-control study design. We compared measles case patients with two control subjects recruited from the closest household. We designed a structured questionnaire in English and translated to the local language Afaric.

Data was exported into Epi-info 7 (version 7.1.5.00). Analysis was done using the software Epi-info 7 (version 7.1.5.00)

Result

We identified 79 suspected cases and 1 deaths in 2 kebeles of the district. We interviewed 30 cases; a 1.25% case fatality rate from 27th February, 2016 to 15th March, 2016. Seventy three of the patients (93.3%) were from Kodie kebele (attack rate of 15.2 per 1000 population) and seven of the patients (8.7%) were from Debel Kebele (attack rate 0.18 per 1000 population).

We determined that prior vaccination (odds ratio (OR) = 4.7, 95% confidence interval (CI): 1.87 - 12.2), P - *Value* (0.0009) were highly associated with the disease.

Conclusion

Majority of the cases were under 5 years old. From those 80 measles suspected cases, 23.33% of them had signs and symptoms of malnutrition. This was due to El Ni - ño global impact which aggravated the drought in the pastoralist regions like Afar region in Ethiopia

The occurrence of this outbreak in under 5 years' cases may be due to the accumulation of susceptible under 5 years' children which was not vaccinated due to low or nil coverage of measles vaccination.

1.1.1. Introduction

Based on the EDHS 2011, the Afar Regional State has a total population of 1,602,995, consisting of 892,998 men and 709,997 women. Urban inhabitants number 213,519 or 13.32% of the population. A further 1,474,755 or 92% were pastoralists and 128,239 or 8% were agro-pastoralist.

With an estimated area of 72,052.78 square kilometers, this region has an estimated density of 22.2 people per square kilometer⁹.

For the entire region 247,255 households were counted, which results in an average for the Region of 5.6 persons to a household, with urban households having on average 4 and rural households 6 people. Ethnic groups include Afar (90.03%), Amhara (5.22%), and Argobbaa (1.55%) Tigray (1.15%), Oromo (0.61%), Belaya (0.59%), and Hadiya (0.18%). 95.3% of the population is Muslim and 4.7% is Christian (3.9% Orthodox Christian, 0.7% P'ent'ay, and 0.1% Catholics)².

Measles is a highly contagious human disease caused by RNA virus, which belongs to genus Morbillivirus which grows in the cells that line the back of the throat and lungs. It is transmitted through droplet nuclei or direct contact with infected person's respiratory secretions which is a most contagious, with one case can infecting twenty other individuals. It is characterized by symptoms like fever, cough, runny nose, conjunctivitis and a generalized maculopapular rash. The rash occurs 14 days after exposure to the virus (within a range of 7 to 18 days) and lasts for 5 to 6 days, and then fades on average. Yet the only reservoir of measles virus is human beings; it can be transmitted by an infected person from four days prior to the onset of the rash to four days after the rash erupts. For people exposed to measles who have not been vaccinated almost 90% develop measles⁴.

Measles can be associated with complications such as diarrhea, pneumonia, encephalitis, croup, and otitis media and at last death due to viral replication or bacterial super infection. It can also cause miscarriage and premature birth in pregnant women. Increased disease severity and deaths due to complications are more common among poorly nourished young children especially those with vitamin A deficiency and human immunodeficiency virus (HIV) or other immune suppressing diseases, and adults greater than 20 years old (10 - 15)⁴.

Worldwide, 280,744 measles cases were reported in 2013 and 171,178 measles cases were reported from Africa region. In Ethiopia, 5253 measles cases were reported in 2013. Measles specific morbidity and mortality among under 5 years old children were decreased from 5% to 2% globally, from 6% to 2% in low income country, from 8% to 1% in African region, from 5% to 2% in Ethiopia. More than 95% deaths occurred in low income countries with weak health infrastructures. Large outbreaks occurred in several African countries during 2008, including the Democratic Republic of the Congo (12,461 reported cases), Ethiopia (4,470), Niger (1,317), and Nigeria (9,960). From mid-2009 through December 2010 there was a widespread measles outbreak affecting 28 Sub-Saharan Africa countries that resulted in over 200,000 reported measles cases and more than 1,400 deaths⁸.

Ethiopia introduced measles vaccination as part of the Expanded Program on Immunization (EPI) in 1980; one dose of measles vaccine was recommended at 9 months of age⁴.

Supplementary Immunization Activities (SIA) was started in 2002; targeting children 6 months to 14 years old and follow up SIAs have been conducted every year targeting different geographic areas since 2005. The government of Ethiopia launched a meningitis A phase III and measles integrated campaign, launched on October, 2015 in Afar, Amhara, Diredawa, Harari, oromiya (East Hararge and West Hararge), and Tigray.it

had completed successfully preliminary administrative data in regions where campaign was completed revealed a total of 725,469 children vaccinated for measles⁴.

In Afar Region measles is the major public health concern of all vaccine preventable diseases. In 2015, all zones of the region (five zones) and 34 of the 34 districts reported measles with 1213 suspected cases and 80 deaths. From those 60% of the cases and 73% of the deaths occurred in under 5 years' children¹.

On February 20, 2016, the Gela'lo District Health Office announced to the Afar Regional Health Bureau Public Health Emergency Management (PHEM) department 79 suspected measles cases and 1 deaths occurred in two kebele (Debel and kodie) of the district. The region deployed a team of investigators on February 26, 2016, to undertake possible investigations and intervention measures⁵.

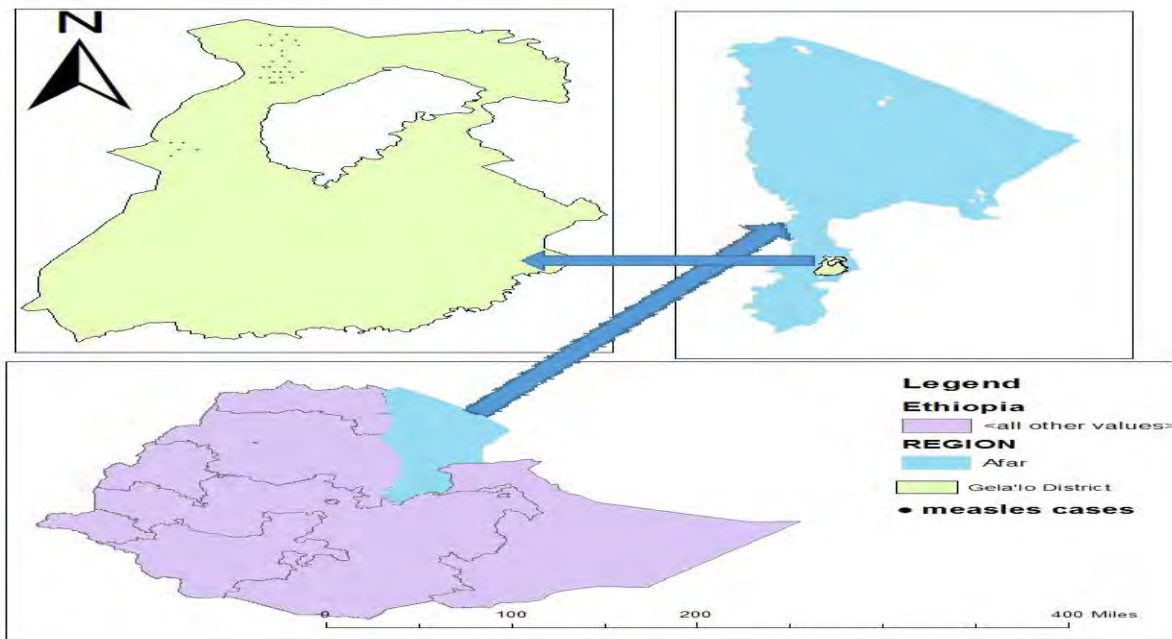


Figure 1. Geographic description of Measles cases Gela'lo District, Afar r region, Ethiopia

1.1.2. Objectives

General objective

- To investigate the measles suspected outbreak of Gela'lo District of the Afar region, February 26, 2016 to March 15, 2016

Specific objectives:

- To confirm the existence of the outbreak
- To identify the causative agent of the outbreak
- To describe the data in terms of place, person and time
- To identify potential risk factors
- Based on our finding to take possible intervention measures to control the outbreak and prevent occurrence of further cases

1.1.3. Methods and Materials

We define: a suspected measles case based on World Health Organization (WHO) case definition, as any person with fever, maculopapular generalized rash and cough, and either coryza, or conjunctivitis or any person in whom a clinician suspects measles. A confirmed case-patient was defined as a patient who tested positive for measles specific IgM. An epidemiologically linked case-patient was defined as a patient without laboratory testing that met the measles case definition and either had contact with a laboratory confirmed case or lived in the same or adjacent district of a laboratory - confirmed case with in the period of the outbreak¹¹.

Blood sample was taken from five suspected measles cases and sent to the national reference laboratory (Ethiopian Health and Nutrition Research Institute (EHNRI)) for laboratory confirmation³.

Study design: Case - control study

From February 26, 2016 - March 15, 2016; we conducted retrospective unmatched case-control. We compared measles case patients with two control subjects recruited from the closest household. We designed a structured questionnaire in English and translated to the local language Afaric. We made house-to-house investigations to identify measles case-patients and administer the questionnaire. Dependent variables like, demographic characteristics, knowledge, clinical features, risk factors for measles transmission, and complication and mortality information were collected for both case-patients and controls in the questionnaire.

Enrollment of cases and controls

A. Cases: those that had fever, conjunctivitis, running nose and maculopapular rash based on WHO case definition and any patient that were either laboratory confirmed or epidemiologically linked to the laboratory confirmed cases were selected.

B. Controls: controls are selected from the same kebele. Two controls were selected per each case and recruited from the closest household with voluntary participation.

Sample Size and Sampling Procedure

Source Population: our source population in this study was Gela'lo District total population.

Target Population and Study Population: our target population and target population in this study were Kodei and Debel kebeles' total population.

Sampling Unit: our sampling unit in this study were the household which the suspected measles case and

Study Unit: our Study Unit were those cases which had signs and symptoms of measles based on our case definition in Kodei and Debel kebeles. We studied two Controls per each case selected from the closest household with voluntary participation.

Sampling frame: we used line list of suspected measles cases in Gela'lo District.

Sampling technique: All the households which suspected measles cases available were included in the study. We used simple random sampling method to select the measles case if more than 1 cases in a household. We selected two Controls per each case from the closest household with voluntary participation.

Exclusion criteria: those cases which were in the remote area and difficult to reach were excluded from the study. Those households which controls were selected that were not close to the suspected measles cases were excluded.

Sample size: we used to estimate the total sample size:

- we allowed ± 0.05 and we used 95% confidence interval
- ratio of controls/cases = 2:1

But, we found 30 suspected measles cases and we took 60 controls from closest household.

Data collection procedure

We received permission to investigate Measles outbreak from the Afar Regional Health Baeuro, District Health Office. Our team were prepared to field visit by developing questionnaires and equipped with necessary materials (supportive treatment gotten from the Afar region health, Gela'lo District Health Office) and additional health professional also deployed from mobile health team.

We reviewed records, including case based reports and line lists from Kodei health center and Debel health center, Gela'lo district, and the Regional Health Bureau. Although reports from local health officials indicated that the outbreak had started on January 20, 2016, we reviewed records for the previous six months to evaluate for endemic measles or other previous outbreaks.

We conducted an active case investigation from February 26, 2016 to March 15, 2016 in the affected district using line lists and questionnaires by house to house visit. We worked with community leaders, the public administration committee and health extension workers to identify additional patients with possible measles and refer them for supportive treatment.

After the initial investigation we identified additional patients associated with the outbreak by reviewing case reports and line lists from the Afar Regional Health Bureau. We followed up suspected measles cases by interviewing the patient and close contacts.

We conducted a key informant interview with community leaders and health professionals in the district to determine the El Nino seasonal effect that aggravate the drought, crop failures that could have contributed to malnutrition in the area. We obtained oral consent from all study subjects.

We assessed measles vaccination rates in the district from 2014 to 2015 by reviewing Expanded Program on Immunization (EPI) records from the Afar Region and the Gela'lo district.

Data was exported into Epi-Info 7 (version 7.1.5.00). If records were found out of range; it was rechecked with the corresponding questionnaire, accordingly correction methods was taken. Analysis was done using the software Epi – info 7 (version 7.1.5.00).

Data Analysis

Descriptive statistics and Odds ratios with 95% confidence intervals were calculated to compare risk factors among cases and controls. Age Specific Attack Rates were calculated by taking population of the district from Gela'lo District Health Office based on EDHS 2011 and the conversion factor for each age group was taken from the 2007 population and housing census.

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

In our study, being case and control were dependent variables to describe or measure the problems. The independent variables were vaccination status, knowledge of measles transmission, educational status of respondent, number of people living in 1 room, recent contact history with suspected measles cases, travel history prior to 4 days or 4 days after onset of rash to other village, annual income and number of windows or doors in a room.

Operational definition

We categorized educational status of respondent by their highest level of education which they completed. If the respondent completed primary school and above, we had categorized the respondent as literate.

If more than 6 people living in 1 room, we consider as high risk of diseases transmission. We categorized the level of income as low income if less than 12000/year, 12000 to 20000/year as medium income, and more than 20000 as high income.

If the parents or guardian of the case answered “through the air and close contact” for the question of measles transmission they knew the way of transmission.

1.1.4. Result

We identified 79 suspected cases and 1 deaths in 2 kebeles of the district. We interviewed 30 cases; a 1.25% case fatality rate from 27, February to 2016, March 2016. Sixty three of the patients (78.7%) were from Kodie kebele (attack rate of 15.2 per 1000 population) and seven of the patients (11.3%) were from Debel Kebele (attack rate 0.18 per 1000 population). There were 5 laboratory confirmed and 74 epidemiologically

linked cases. Five out of the five, the blood tests performed were positive for measles specific IgM antibodies and 98.33% had suspected measles case symptoms.

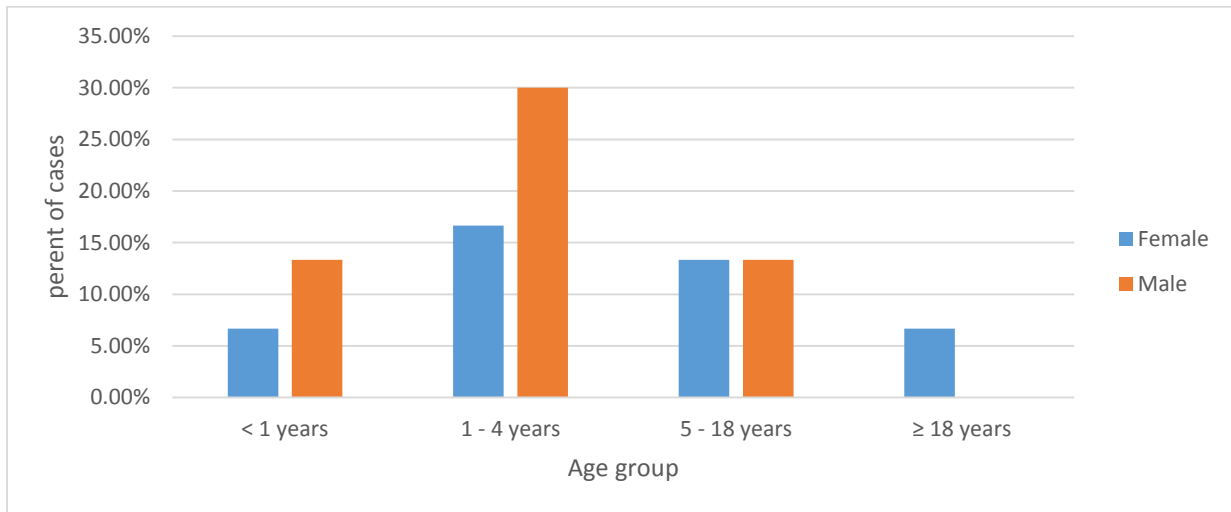


Figure 2. Sex and age distribution of measles cases, Gela'lo District, Afar region, Ethiopia, 2016

The epidemic curve showed a propagated pattern (Fig.1.1.4. 3). The index case developed a rash and it was seen on 20th, January 2016 in Kodie Kebele. After 10 days 1 case developed rash and the case had a contact history with the index case. The peak numbers of measles patients were on 20th April, 2016. The measles outbreak subsided two months after our intervention started, and passive surveillance for 1 months

following the outbreak did not reveal any additional measles patients in the affected district.

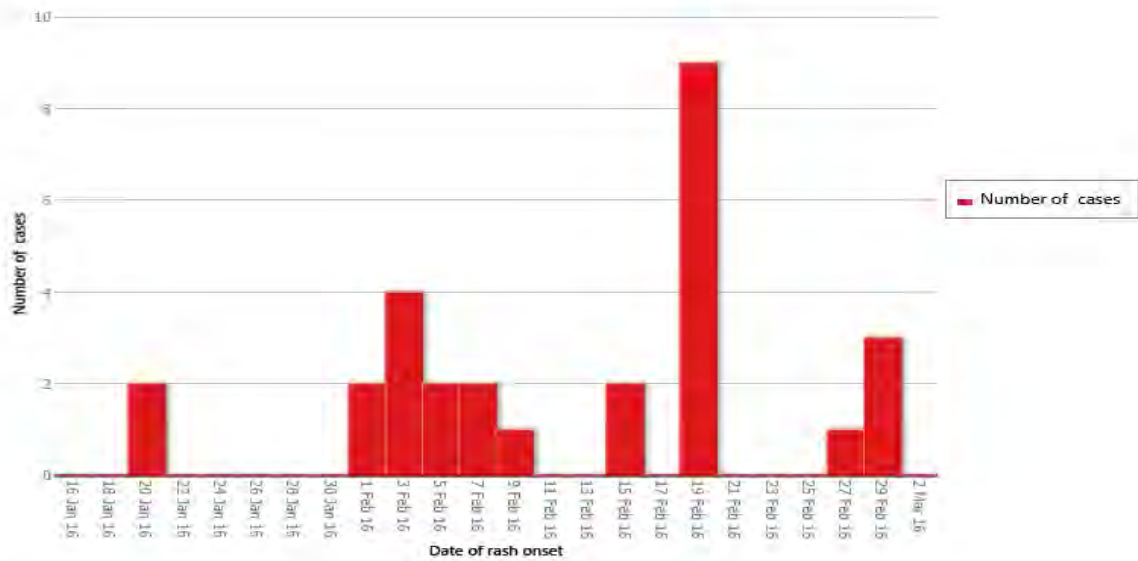


Figure 3. Number of measles cases by date of rash onset, Gela'lo District, Afar Region, Ethiopia, 2016

Levels of vaccination coverage

Forty five percent of the total measles cases were unvaccinated. Coverage rates of the first dose of measles containing vaccine (MCV1) for children less than one year in the Afar Region increased from 70% in 2015 to 85% in 2016. The MCV1 coverage in 2016 for the Gela'lo District was 82%.

Table 1. Vaccination history of measles case-patients by age and sex, Gela'lo District, Afar Region, Ethiopia, 2016

Vaccination status	Unvaccinated		Unvaccinated Total	Vaccinated		Vaccinated Total	Grand Total
	Female	Male		Female	Male		
Age group	Female	Male	Total	Female	Male	Total	
< 1 year	6.67%	13.33%	20.00%	10.00%	6.67%	16.67%	36.67%
1 - 4 years	6.67%	20.00%	26.67%	0.00%	3.33%	3.33%	30.00%
5 - 18 years	10.00%	6.67%	16.67%	3.33%	6.67%	10.00%	26.67%
> 18 years	3.33%	0.00%	3.33%	3.33%	0.00%	3.33%	6.67%
Grand Total	26.67%	40.00%	66.67%	16.67%	16.67%	33.33%	100.00%

Case - control study

We recruited 30 measles cases (median age 6 years) and 60 controls (median age 6.7 years) for the case-control study. We determined that prior vaccination (odds ratio (OR) = 4.7, 95% confidence interval (CI): 1.87 - 12.2), *P* - Value (0.0009) were highly associated with the disease.

Knowledge of measles transmission of the caretaker of pediatric patients (OR= 0.49, 95% CI: 0.12 - 1.96), *p* - value (0.3), after adjusting for study difference, we find (MLH OR = 0.49, 95% CI: Case 0.1 – 1.8 and Controls 0.08 – 2.11, *p* - value = 0.3) that larger than the relative OR in either of the sex strata, suggesting that sex is indeed a confounder. Knowledge of measles transmission had no association to the disease.

Living in a room with more than six people (OR = 13, 95% CI: 3.9 - 42.4) and *p* - value (0.000001) were have positive associated with the disease. Recent contact with suspected measles patients (active measles cases) (OR = 3.87%, CI: 0.8 - 18.4), and *p* - value (0.07) were not associated with the disease.

Level of income (OR = 13, CI: 29 – 140.96), and *p* - value (0.000000972) were have positive associated with the disease. Educational status and marital status were not significant factors associated with disease

contraction (Table 2). After unconditional logistic regression analysis done in Table 3; only vaccination status had protective to the disease (AOR = 0.214, 95% CI (0.084 – 0.548), and P – value = 0.001.

Table 2. Crude analysis of measles cases and controls with regard different variables, Gela'lo District, Afar Region, Ethiopia, 2016

Variable	Case	Control	Total	Odds CI*		P – Value
				Ratio	Lower Upper	
Vaccinated	20(66.67%)	18(30%)	38(42.2%)			
Unvaccinated	10(33.34%)	42(70%)	52(57.8)	4.667	1.825 11.93	0.0009
Total	30(100%)	60(100%)	90(100%)			
Knows measles transmission	3(11.1%)	11(18.33%)	14(15.5%)			
Don't know measles Transmission	27(89.9%)	49(81.67%)	76(84.5%)	0.494	0.127 1.926	0.303
Total	30(100%)	60(100%)	90(100%)			
Living in 1 room more than 6 people	15(50%)	10(16.67%)	25(27.78%)			
Living in 1 room less than 6 people	15(50%)	50(83.33%)	65(72.22%)	5	1.86 13.4	0.00087
Total	30(100%)	60(100%)	90(100%)			
Recent contact history with measles cases	28(93.34%)	34(56.67%)	62(68.9%)	10.7	2.33 49.08	0.00039

No recent contact history							
with measles cases	2(6.66%)	26(43.33%)	28(31.1%)				
Total	30(100%)	60(100%)	90(100%)				
Have travel History	1(3.34%)	4(6.67%)	5(5.55%)				
Have no travel History	29(96.66%)	56(93.33%)	85(94.45%)	0.48	0.051	4.52	0.51
Total	30(100%)	60(100%)	90(100%)				
Mother Illiterate	4(13.34%)	5(8.34%)	9(10%)				
Mother Literate	26(86.66%)	55(91.66%)	81(90%)	1.69	0.41	6.82	0.456
Total	30(100%)	60(100%)	90(100%)				
Low income	15(50%)	2(3.34%)	17(18.89%)				
Medium and high income	15(50%)	58(96.66%)	73(81.11%)	29	5.96	140.92	0.000009
Total	30(100%)	60(100%)	90(100%)				
Single	1(33.34%)	6(10%)	7(7.78%)				
Married	29(66.66%)	54(90%)	83(92.22%)	0.31	0.035	2.72	0.265
Total	30(100%)	60(100%)	90(100%)				

CI* = confidence interval

Table 3. Independent factors associated with measles infection, Gela'lo district, Afar Region, Ethiopia, 2016

Characteristics	Case	Control	Total	A.O.R	95% CI**	
				*	Lower	Upper
Vaccinated	20(66.67%)	18(30%)	38(42.2%)	0.214		
Not vaccinated	10(33.34%)	42(70%)	52(57.8)	1.368	0.084	0.548
Total	30(100%)	60(100%)	90(100%)			
Know measles transmission	3(11.1%)	11(18.33%)	14(15.5%)	0.022		
Don't know measles transmission	27(89.9%)	49(81.67%)	76(84.5%)	0.214	0.006	0.548
Total	30(100%)	60(100%)	90(100%)			
Living in 1 room more than 6 people	15(50%)	10(16.67%)	25(27.78%)	0.184	2.77	43.64
Living in 1 room less than 6 people	15(50%)	50(83.33%)	65(72.22%)	11		
Total	30(100%)	60(100%)	90(100%)			
Contact history with measles suspected cases	28(93.34%)	34(56.67%)	62(68.9%)	10.7		
No contact history with measles suspected cases	2(6.66%)	26(43.33%)	28(31.1%)	10.7	2.33	48.08
Total	30(100%)	60(100%)	90(100%)			

AOR** = Adjusted odds ratio, CI = confidence interval

Complications

There were 1 death identified among the 80 patients with measles (case fatality rate 1.25 %). All patients who came from the kodei and Debel Kebeles, and 66.7 % were less than 5 years. The patients who died

had Fever, running nose, conjunctivitis, rash and severe malnutrition, according to a local health provider. We determined complications among patients enrolled in the case-control study of the 30 case-patients, 60% developed diarrhea, 75.8% developed pneumonia, 43.3% had ear infection, 10% had convulsions, 6.67% had change in vision, and 6.67% had blindness.

Prevention and control actions taken

Vaccination of measles was given for defaulters aged 6 to 59 months; cases were managed by distributing supportive treatments (Antibiotics, tetracycline ointment, oral rehydrating salt, Vitamin A, and anti-pyretics). We delivered intensive health education campaign with community leaders and health professionals at social gathering areas like school. In addition to this we, discussed with community leaders, health professionals and administrative office of the district how to create awareness among the community, two Nurses and two health extension workers made daily house to house visit to search additional cases, trace defaulters of vaccination and to see patient progress. After intervention activities were initiated the number of cases began to decline rapidly.

Limitations of the study

The sample size of 30 case - patients for the case - control study was small. Many of the other case - patients could not be interviewed, because they were more than 2 measles cases from each household. Nonetheless, it is possible that some of the patients in our investigation had a febrile illness with rash caused by a disease other than measles. We didn't measure the Body Mass Index (BMI) of patients because of lack of transport facility and unable to carry the measuring materials. An apparatus of Global Positioning System (GPS) was not available during the field visit, thus exact place of residence of cases was not indicated.

1.1.5. Discussion

Afar region has made steady progress with measles vaccination programs among children < 5 years since it started EPI. Gela'lo District also has made from 90.6% to 90.9% from 2015 to 2016 G.C⁵. But, based on our findings 66.67% of suspected measles cases were not vaccinated. The occurrence of this outbreak in under 5 years' cases may be due to the accumulation of susceptible under 5 years' children which was not vaccinated due to low coverage of measles vaccination. In the crude analysis, we found that prior vaccination was the most protective of disease transmission and Prior vaccination rate was higher among controls (80.8%) than cases (19.2%).

Majority of the cases were under 5 years old. From those 80 measles suspected cases, 23.33% of them had signs and symptoms of Malnutrition. This was due to El Ni - no global impact which aggravated the drought in the pastoralist regions like Afar region in Ethiopia⁶

The death and cases that develop complications are in 1–4 years age group. The most common complication was pneumonia followed by diarrhea. Because, measles virus has high virulence to the respiratory system in adults. These complications demonstrate the severity of measles in adults⁷.

Living in a room with more than six people and low level of income were associated with higher rates of disease. In the rural area, it is common to have large household size composed of extended family, and in our study this finding is a risk factor.

1.1.6. Conclusion

We have confirmed a measles outbreak with high case fatality rate primarily under 5 years in Gela'lo District. Living in a room with more than six people and low level of income were associated with higher rates of disease.

Forty five (45%) of the total 80 measles cases had no history of vaccination in Gela'lo District. So, measles was once labeled a childhood disease with its complications that become a public health concern of the Gela'lo District.

The death and cases that develop complications are in 1- 4 years age group. The most common complication was pneumonia followed by diarrhea.

Educational status and sex were independent risk factors for disease contraction.

1.1.7. Recommendation

To successfully eliminate measles by the target date of 2020, it will be necessary to strengthen measles surveillance and outbreak preparedness programs in The Gela'lo District and in The Afar Region. In light of recent age shifts of measles to more adults in the Afar Region, measles control strategies in the Region may need to include protocols that identify, manage, and immunize pediatric under 5 years children.

District health office should increase routine immunization coverage (> 90%) in the target age group to stop transmission of measles and to achieve the targeted goal set by WHO for African region Elimination of measles by 2020.

The Gela'lo District should establish restriction measures for visitors from surrounding communities and movement of cases to the community during outbreak period.

The Gela'lo District health office should deliver health education to the community to create awareness regarding measles mode of transmission and control mechanisms.

1.1.8. References

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1.2. Scabies Outbreak in Enderta District, Southern Zone, Tigray Region, Ethiopia, 2016

Abstract

Introduction

Scabies is a skin disease which is caused by the human itch mite, *sarcoptes scabiei var. hominis*. Scabies transmitted through prolonged skin-to- skin contact with a person with conventional scabies. Crusted scabies (formerly called Norwegian scabies) is a more severe form of scabies in which a person is infested with a large number of mites and is more highly contagious. Indirect transmission may occur through contact with objects contaminated by a person with crusted scabies but it is rare if the person has conventional scabies.

We conducted unmatched case – control study to investigate the Scabies suspected outbreak of Enderta District of the Tigray region, April, 2016

Methods and Materials

Confirmed case: is an individual who has skin scraping with identified mites, mite eggs or mite feces.
Probable case: is an individual with clinical symptoms of scabies (persistent pruritic rash). Contact case: is anyone with a close skin-to-skin contact with a case.

All the households which suspected scabies cases available were included in the study. We used Simple random sampling method to select the suspected scabies case if more than 1 cases in a household. We selected two Controls per each case from the closest household with voluntary participation.

Result

We identified 1,438 suspected scabies cases and 0 deaths in 3 kebeles of the district. We interviewed 48 cases. One thousand one hundred forty six (79.7%) were from Kedamay weyane (incidence rate of 20.8 per 1000 population), 201 (11.3%) were from Felege selam (incidence rate 9% per 1000 population).

From 48 suspected Scabies cases, 57.45% have no water access and 91.45% have no Soap for personal hygiene. The mean of frequency of body wash of the suspected scabies cases were 1.5 and 60% of the cases occurred in under 5 to 18 years children and 93.2% of them had rash.

Knowledge of Scabies transmission of the caretaker of pediatric patients (OR = 6.22, 95% CI: 2.87 - 13.45), *p* - value (1×10^{-6}) were positively association to the disease. Living in a room with more than six people (OR = 8.54, 95% CI: 3.87 - 18.8) and *p* - value (1×10^{-8}) were positively associated with the disease. Recent contact with Scabies patients (OR = 5.12, 95% CI: 1.12 - 15.56), and *p* - value (0.0018) were positively associated with the disease.

Conclusion

The occurrence of this outbreak due to poor personal hygiene. Based on our finding, 60% of the cases were between 5 to 18 years old and the mean of frequency of body wash of the suspected scabies cases were 1.5 per week. In crude analysis we found contact to scabies cases, sharing clothes, living in 1 room more than 6 peoples were the most possible factors. District health office should be work with collaboration with schools since most of the scabies Cases were school age group to create awareness, to distribute treatments and to implement control mechanism. Establish water supplies and distribution with collaboration of District water office to areas which have water shortage.

1.2.1. Introduction

Scabies is a skin disease which is caused by the human itch mite, *sarcoptes scabiei var. hominis*. Scabies transmitted through prolonged skin-to- skin contact with a person with conventional scabies. Crusted scabies (formerly called Norwegian scabies) is a more severe form of scabies in which a person is infested with a large number of mites and is more highly contagious. Indirect transmission may occur through contact with objects contaminated by a person with crusted scabies but it is rare if the person has conventional scabies³.

Scabies is one of the commonest dermatological conditions, accounting for substantial proportion of skin disease in developing countries. Globally, it affects more than 130 million at any time. Rates for scabies occurrence vary in the recent literature from 0.35 to 46%. In the developed world, outbreaks in the health institution and vulnerable community contribute to significant economic cost in national health services. In our resource poor tropical settings, the sheer burden of scabies infestation, as well as their complication, imposes a major cost in health care systems. In 2010, it was estimated that the direct effects scabies infestation on the skin alone led to more than 1.5 million YLDS (years lived with disability) and the indirect effects of complications on renal and cardiovascular function are for greater¹.

Based on Tigray Region Health Bureau, Public Health Emergency report of six months; Scabies was the major public health concern. In 2016, 4 Districts of the region reported scabies with 8016 suspected cases and 0 deaths⁵.

On January 20, 2016, the Enderta District Health Office announced to the Tigray Regional Health Bureau Public Health Emergency Management (PHEM) department 1438 suspected Scabies cases and 0 deaths

occurred in 3 kebele (Felegeselam, Kedamay weyane and Didiba) of the district. The region deployed a team of investigators on January 26, 2016, to undertake possible investigations and intervention measures⁵.

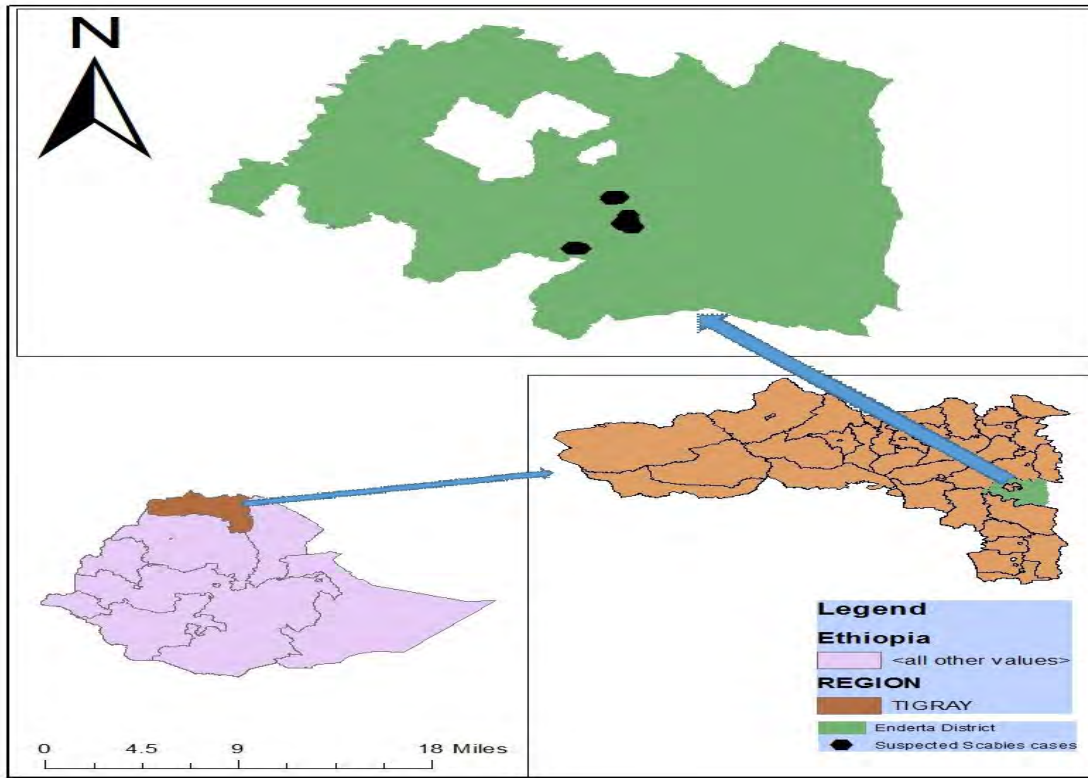


Figure 4. Geographic description of Scabies cases in Kedamay Weyane, Felegeselam and Didiba Kebeles, Enderta District, Tigray Region, Ethiopia, 2016

1.2.2. Objectives

General objective

- To investigate the Scabies suspected outbreak of Enderta District of the Tigray region, April, 2016

Specific objectives

- To confirm the existence of the outbreak
- To identify the causative agent of the outbreak
- To describe the data in terms of place, person and time
- To identify potential risk factors of disease transmission
- Based on our finding to take possible intervention measures to control the outbreak and prevent occurrence of further cases

1.2.3. Methods and materials

Case definition

Confirmed case: is an individual who has skin scraping with identified mites, mite eggs or mite feces.

Probable case: is an individual with clinical symptoms of scabies (persistent pruritic rash). Contact case: is anyone with a close skin-to-skin contact with a case⁴.

Study design: Descriptive study and Case - control study

The team described the six months Scabies data by place, person, and time. From February 1 to 15, 2016; we conducted retrospective unmatched case-control. The team of investigators were prepared to the field visit by developing questionnaires and equipped with necessary materials (supportive treatment gotten from the Tigray Region Health Bureau, Enderta District Health Office). We designed a structured questionnaire in English.

We compared Scabies case with two control subjects recruited from the closest household. We made house-to-house investigations to identify Scabies case and administer the questionnaire. Independent variables

like, demographic characteristics, knowledge, clinical features, risk factors for scabies transmission, and complication and mortality information were collected for both case and controls in the questionnaire.

Enrollment of cases and controls

A. Cases: those that have clinical sign symptom of measles based on WHO case definition that were either laboratory confirmed or epidemiologically linked to the laboratory confirmed cases.

B. Controls: controls are selected from the same kebele. Two controls were selected per each case and recruited from the closest household with voluntary participation.

Sample Size and Sampling Procedure

Source population: our source population in this study was Enderta District total population

Target Population and Study Population: our target population and target population in this study were felegeslam, Kedamay Weyane and Emba kebeles' total population.

Sampling Unit: our sampling unit in this study were the household which the suspected measles case and controls selected.

Study Unit: our study unit were those cases which had signs and symptoms of Scabies based on our case definition in Felegeslam, Kedamay Weyane and Emba kebeles. We studied two Controls per each case selected from the closest household with voluntary participation.

Sampling frame: we used line list of suspected scabies cases in Emderta District.

Sampling technique: we used systemic random sampling technique. All the households which suspected scabies cases available were included in the study. We used probability sampling method to select the suspected scabies case if more than 1 cases in a household. We selected two Controls per each case from the closest household with voluntary participation.

Exclusion criteria: those cases which were in the remote area and difficult to reach were excluded from the study. Those households which controls were selected that were not close to the suspected measles cases were excluded.

Sample size: we used to estimate the total sample size:

- we allowed ± 0.05 and we used 95% confidence interval
- ratio of sample size controls/cases = 2:1
- odds ratio = 2

We used Epi Info StatCalc and we got Total sample size = 144 (48 cases and 96 controls).

Data collection procedure

We received permission to investigate Scabies outbreak from the Tigray Regional Health Baeuro and Enderta District Health Office. Our team were prepared to field visit by developing questionnaires and equipped with necessary materials (supportive treatment gotten from the Tigray region health, Enderta District Health Office).

We reviewed records, including case based reports and line lists from Tigray region health baeuro and Enderta District. We conducted an active case investigation from February 1 to 15, 2016 in the affected district using line lists and questionnaires by house to house visit. We worked with health extension workers

to identify additional patients with possible scabies and refer them for supportive treatment. Although reports from local health officials indicated that the outbreak had started on October 2015, we reviewed records for the previous six months to evaluate for endemic scabies or other previous outbreaks.

After the initial investigation we identified additional patients associated with the outbreak by reviewing case reports and line lists from the Enderta District. We followed up suspected cases with interviews of the patient and close contacts. We received permission for the investigation from the Tigray Regional Health Baeuro, Enderta District Health Office, and obtained oral consent from all study subjects.

We reviewed records, including case based reports and line lists from Felegeselam health center and Didiba health center, Kedamay Weyane Health Center.

We conducted a key informant interview with community leaders, agriculture experts, and health professionals in the district to determine the possible factors.

Data was entered into Epi-Info 7. If records were found out of range; it was rechecked with the corresponding questionnaire, accordingly correction methods was taken. Analysis was done using the software Epi – info 7, (version 7.1.5.00).

Data Analysis

Descriptive statistics and Odds ratios with 95% confidence intervals were calculated to compare risk factors among cases and controls. Age Specific Attack rates were calculated by taking population of the district from Enderta District Health Office based on EDHS 2011 and the conversion factor for each age group was taken from the 2007 population and housing census.

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

In our study, being case and control were dependent variables to describe or measure the problems. The independent variables knowledge of Scabies transmission, educational status of respondent, number of people living in 1 room, recent contact history with suspected measles cases, travel history to other Scabies epidemic area, annual income and number of windows or doors in a room.

Operational definition

We categorized educational status of respondent by their highest level of education which they completed. If the respondent completed primary school and above, we had categorized the respondent as literate.

Scabies is highly contagious skin disease transmit by direct contact, using or sharing clothes. So, we consider as high risk of diseases transmission if more than 4 people living in 1 room.

Based on CSA 2007, we categorized the level of income as low income if less than 12000/year, 12000 to 20000/year as medium income, and more than 20000 as high income².

If the parents or guardian of the case answered “sharing close and skin contact” for the question of Scabies transmission they knew the way of transmission.

1.2.4. Result

We identified 1,438 suspected scabies cases and 0 deaths in 3 kebeles of the district. One thousand one hundred forty six (79.7%) were from Kedamay weyane (incidence rate of 20.8 per 1000 population), 201 (11.3%) were from Felege selam (incidence rate 9% per 1000 population).

From 48 suspected Scabies cases, 57.45% have no water access and 91.45% have no Soap for personal hygiene. The mean of frequency of body wash of the suspected scabies cases were 1.5 and 60% of the cases occurred in under 5 to 18 years children and 93.2% of them had Rash.

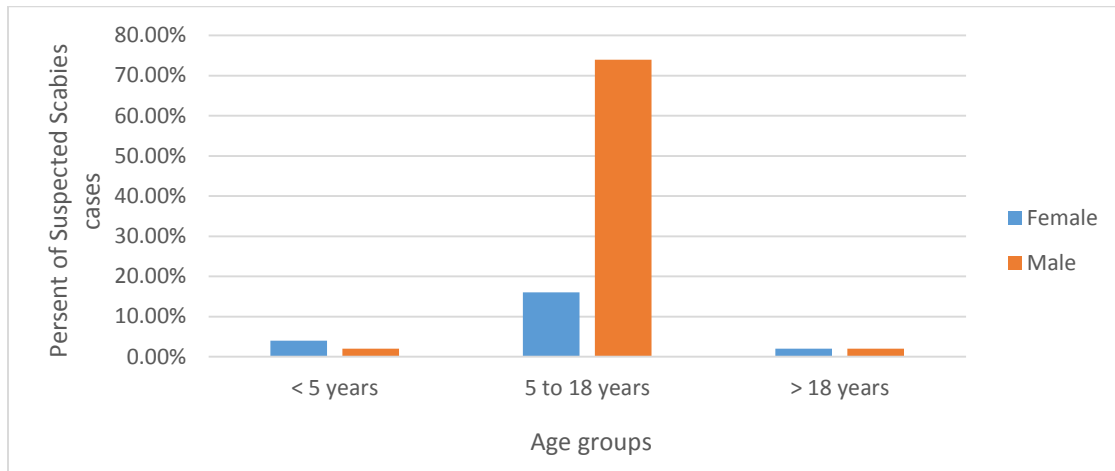


Figure 5. Sex and age distribution of suspected Scabies cases, Enderta District, Tigray Region, Ethiopia, 2016

The epidemic curve showed a propagated pattern from 6th, January 2016 to 31th, January 2016 (Figure 6). Three index case was developed a rash and it was seen on 12th, December 2015 in Kedamay Weyane Kebele. After 18 days 1 case developed rash and the case had a contact history with the index cases. The peak numbers of Scabies patients were on 21th January, 2016. The Scabies outbreak subsided 1 months after our intervention started.

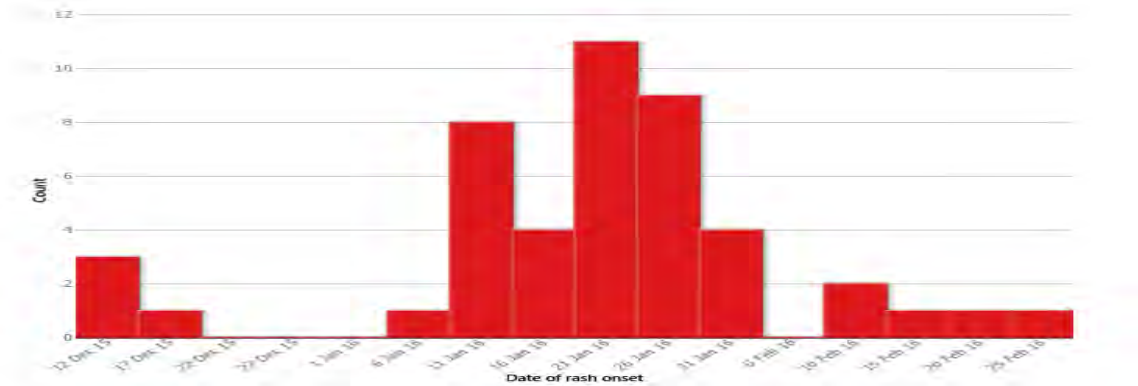


Figure 6. Number of Suspected Scabies cases by date of rash onset, Enderta District, Tigray Region, Ethiopia, 2016

Case - control study

We recruited 48 suspected Scabies cases (median age 10 years) and 96 controls (median age 10 years) for the case-control study.

Knowledge of Scabies transmission of the caretaker of pediatric patients (OR= 6.22, 95% CI: 2.87 – 13.45), *p* - value (1×10^{-6}) were positively association to the disease. Living in a room with more than 4 people (OR = 8.54, 95% CI: 3.87 - 18.8) and *p* - value (1×10^{-8}) was positively associated with the disease. Recent contact with Scabies patients (OR = 5.12, 95% CI: 1.12 - 15.56), and *p* - value (0.0018) were associated with the disease.

Respondent/ care taker illiteracy (OR = 5.57, CI: 1.59 – 19.46), and *p* - value (0.003) were positively associated with the disease. Knowledge of Scabies prevention (OR = 3.46, 95% CI: 1.15 – 10.39) and *p* - value (0.02) were positively associated with the disease.

Sharing of clothes (OR = 1.48, 95% CI: 0.63 – 3.5) and p – value (0.036) were positively association with the disease. Level of income and marital status were not significant factors associated with disease contraction. After unconditional logistic regression analysis done (Table 4) all independent factors were positively association to the disease.

Table 4. Crude analysis of Scabies cases and controls and independent risk factors with regard different variables, Enderta District, Tigray Region, Ethiopia, 2016

Variable	Case	Control	Total	OR*	AOR*	95% CI**		P – Value
						Lower	Upper	
Don't know scabies transmission	35	29	64	6.22	6.182	2.86	13.46	0.000001
know Scabies transmission	13	67	80		0.968			
Living in 1 room more than 6 people	73	13	86	8.54	8.54	3.87	18.8	0.00000001
Living in 1 room less than 6 people	23	35	58		0.214			
Recent contact history with Scabies cases	43	65	108	5.12	5.10	1.59	15.58	0.0018
No recent contact history with Scabies cases	4	31	35		1.02			
Respondent Illiterate	45	70	115	5.57	5.57			0.003
Respondent Literate	3	26	29		10.7	1.6	19.5	
don't know scabies prevention	9	6	15	3.46	3.44	1.15	10.41	

know Scabies prevention	39	90	129					0.004
Sharing closes	38	71	109					
not sharing closes	9	25	34	1.48	0.63	3.5		0.036

OR* = Odds Ratio, AOR ** = Adjusted Odds Ratio, CI** = Confidence Interval

Complications

There were no death identified among the 1138 patients with Scabies. We determined complications among patients enrolled in the case-control study of the 48 case-patients, 2.33 % had Secondary infection and 74.47% did not treated.

Prevention and control actions taken

Cases were managed by distributing supportive treatments (5% Permethrin cream, 25% benzyl benzoate lotion, 10% Sulfur ointment, 10% Crotamiton cream, 1% lindane lotion). We delivered intensive health education campaign with community leaders and health professionals at social gathering areas like school. We discussed with community leaders, health professionals and administrative office of the district how to create awareness among the community, 1 Nurses and 2 health extension workers made daily house to house visit to search additional cases, trace other cases and to see disease progress. After intervention activities were initiated the number of cases began to decline rapidly.

Limitations of the study

Some of the patients in our investigation had a skin infection with rash caused by a disease other than scabies. An apparatus of Global Positioning System (GPS) was not available during the field visit, thus exact place of residence of cases was not indicated.

1.2.5. Discussion

The occurrence of this outbreak due to poor personal hygiene. Based on our finding, 60% of the cases were between 5 to 18 years old and the mean of frequency of body wash of the suspected scabies cases were 1.5 per week. In crude analysis we found contact to scabies cases, sharing clothes, living in 1 room more than 4 peoples were the most possible factors.

Knowledge of Scabies transmission and protection mechanisms play the major role in controlling the scabies outbreak. In our findings, it also indicate the high association of with the disease.

Even though there were no death in Enderta District due to scabies, but 2.33% had complication due to scabies. This is because of the majority (74.47%) were not treated.

1.2.6. Conclusion

We have confirmed a Scabies outbreak with high case fatality rate primarily between 5 to 18 years especially in rural area. Poor personal hygiene, living or sleeping in 1 room more than 4 people, sharing of clothes, and contact with Scabies patient are the main way of transmission for scabies.

Almost all of the cases were in school age group children from 5 to 18 years and the possible interventions to control the scabies outbreak and protect future scabies outbreak should be at school.

1.2.7. Recommendations

District health office should be work with collaboration with schools since most of the scabies Cases were school age group to create awareness, to distribute treatments and to implement control mechanism.

Establish water supplies and distribution with collaboration of district water office to areas which have water shortage.

Improve early case detection. Deliver health education to the community to create awareness regarding Scabies mode of transmission and control mechanisms.

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Chapter II. Surveillance Data Analysis Report

2.1. Surveillance Data Analysis of Maternal Death in Tigray Region, Ethiopia, from 2013 to 2015

Abstract

Introduction

Pregnancy is a normal healthy state. Most of the deaths are preventable. The International health and development community had called for action to address this problem. The Millennium Declaration in 2000; goal 5 had had called for 75 % reduction in maternal mortality ratio, from 1990 to 2015.

We conducted this study to describe the data in term of time, place, and person. The causes of maternal deaths were described.

Methods and materials

We conducted retrospective study of maternal death audit in Tigray region. The source of population were; any women aged 15 - 49 years who were pregnant. Any women aged 15 - 49 years, who died while she was pregnant or within 42 days of the termination of pregnancy were counted. Any women less than age 15 years who died while she was pregnant were included. Those women who died in study period but were not pregnant, were excluded. The data were analyzed by Epi info 7.

Result

The number of maternal deaths in three years were 286. Forty five percent of it occurred in 2013. thus, 207 (72.64%) were direct obstetrics and these deaths were preventable. The timing of deaths relation to

pregnancy in postpartum were 220(76.89%). So, most of the deaths were due to hemorrhage followed by sepsis which were 145(50.94%) and 24(8.49%) respectively.

Conclusion

Most of the deaths occurred in those three years were preventable deaths and the health facilities and the community able to lower the number of avoidable maternal death.

2.1.1. Introduction

Pregnancy is a normal healthy state. Yet this normal, life affirming process carries with it serious risks of death and disability. Most maternal deaths are preventable, even where resources are limited, provided that preventive measures are taken and adequate care is available. The International health and development community has repeatedly called for action to address this problem and governments have formally committed themselves to doing so, notably at the International Conference on Population and Development (Cairo 1994), and the Fourth World Conference on Women (Beijing 1995) as well as their follow up conferences and more recently the Millennium Declaration in 2000 and goal 5 call for 75 % reduction in maternal mortality ratio between 1990 to 2015. Improvement in Maternal Health is enshrined as one of the essential prerequisites for development and for poverty reduction⁷.

According to the report on “Global, regional, and national level and trends in maternal mortality between 1990 to 2015” released by the UN Maternal Mortality Estimation Inter- Agencies Group published 13 November 2015, the number of maternal deaths has reduced globally from 385 deaths/100,000 live birth to 216 deaths/ 100,000 live birth in 2015. The regional MMRs for 2015 ranged from 12/100,000 LB for high income regions to 547 for sub- Saharan Africa. (Lancet, November, 2015 report)⁷.

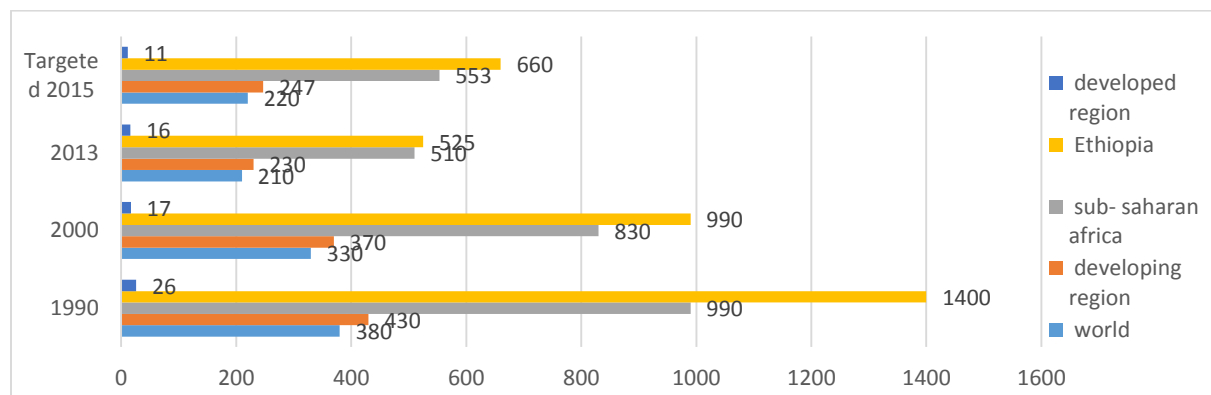


Figure 7. MMR, 1990, 2000, and 2013 (maternal death/100,000 live birth, women aged 15 - 49 years, estimate by WHO, UNICEF, UNFPA, the World Bank and the United Nations population division)

Ethiopia is one of the six countries that contribute to about 50% of the maternal deaths Worldwide; the others being India, Nigeria, Pakistan, Afghanistan and the Democratic Republic of Congo. The MMR of Ethiopia decreased from 1250/100,000 LB in 1990 to 353/100,000 LB in 2015⁸.

However it is worth noting that DHS 2011 shows a higher MMR estimate (676/100,000 LB) and there are also other global estimates with different figures highlighting the challenges in estimating maternal Deaths, especially in areas where civil registration is weak⁶.

Maternal death: is defined as the death of woman while pregnant or within 42 days of the termination of pregnancy irrespective of the duration and site of the pregnancy, from any cause, related to or aggravated by the pregnancy, labor or its management but not from accidental or incidental cause⁴.

Direct obstetrics deaths: are maternal deaths resulting from complications of the pregnancy, labor, or postpartum or interventions omission or incorrect treatment. Indirect obstetrics deaths: are maternal deaths

resulting from previously existing disease or newly developed medical conditions that were aggravated by the physiologic change of pregnancy⁴.

Maternal Death Surveillance and Report (MDSR): has been defined as “a component of the health information system, which permits the identification, the notification, the quantification, and the determination of causes and availability of maternal death for a defined time period and geographic location, with the goal of orienting the measures necessary for its preventions⁴.

Antepartum: occurring before parturition, or childbirth, with reference to the mother. Intrapartum: occurring during labor or child birth, with reference to the mother. Postpartum: occurring before parturition, or childbirth, with reference to the mother³.

Literature Review

In the survey on Health facility-based maternal death audit in Tigray, Ethiopia, from December 2005 G.C. and May 2006 G.C.; A total of 34 maternal deaths were identified in five public hospitals in Tigray over a period of two years, of which 12 (35.2%) were reported to have been avoidable]. The leading causes of death were infection, hemorrhage and hypertensive disorders. Avoidable factors were mainly related to hospital service or medical factors such as lack of Blood for transfusion, delay in transfusion, and inappropriate treatment. Lack of transportation and delayed care-seeking also contributed to avoidable maternal deaths. The quality of medical records was very poor. Nearly 73.5% of maternal deaths were of rural residents and 20.5% of those who died were under the age of 18, which shows that young girls and rural residents carry significant maternal death risk⁵.

2.1.2. Objectives

General objective

- To assess situation of maternal death in Tigray region from 2013 to 2015

Specific objective

- To describe the data in term of time, place, and person
- To determine the cause of maternal deaths
- To review the trend of maternal mortality ratio
- To improve use of information on maternal death surveillance and response

2.1.3. Methods and materials

Study area and period: This study were conducted in Tigray regional health bureau from 2013 to 2015

Study design: We conducted retrospective study of maternal death audit in Tigray region by reviewing secondary data.

Source population: The source of population were any women aged 15 - 49 years who were pregnant.

Study population/unit: Any women aged 15-49 years who died while she was pregnant or within 42 days of the termination of pregnancy irrespective of the duration and site of the pregnancy, from any cause, related to or aggravated by the pregnancy, labor or its management.

Inclusion criterion: any woman less than aged 15 years who died while she was pregnant or within 42 days of the termination of pregnancy irrespective of the duration and site of the pregnancy, from any cause, related to or aggravated by the pregnancy, labor or its management were included.

Exclusion criterion: those women who died in study period but were not pregnant, were excluded. Women that develop those conditions unrelated to pregnancy (i.e. not during Pregnancy or 42 days after termination of pregnancy) are not eligible.

Type of data: secondary data of maternal deaths from 2013 to 2015

Data collection procedure and management

The data were collected from Tigray regional health bureau MCH department, HMIS department, or MDSR.

Variables: The independent variables: age, place of death (at home, at health post, at health center, at hospital, on transit), marital status, date of death, and final diagnosis described by place, person, and time and the result displayed by using tables, graphs, or charts. The dependent variable is maternal death and described by maternal mortality ratio.

2.1.4. Result

We identified a total of 286 maternal deaths about 45.5% were occurred in 2013 G.C. and 28.7% were occurred in 2014 G.C. and 25.8 were occurred in 2015 G.C. The median age was 30 years (Ranges from 25 years to 35 years) and the median gestational age was 37 weeks (Ranges from 37 weeks to 43 weeks).

As depicted in Figure 8. From those maternal deaths, 72(25.09%) were from central zone, 78(27.53%) were from North West zone and 58(20.21%) were from Southern zone, 36(12.53%) were Eastern zone, 31(10.8%) were from western zone, 11(3.83%) were from Mekelle special zone.

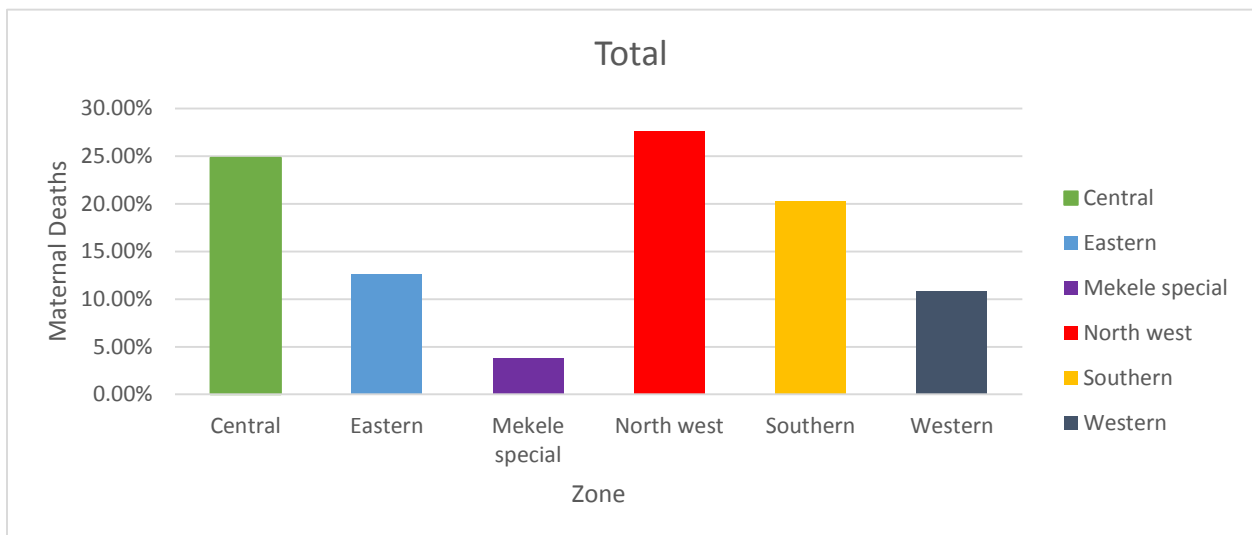


Figure 8. Maternal death in Tigray region stratified by zone, 2013 to 2015

As it is depicted in Figure 9, Out of the 286 maternal deaths 141(49.5%) were delivered home, 60(21.2%) were delivered at hospitals. Thirty (10.4%) delivered on transit, 27(9.43%) not registered 20(7%) delivered in health centers and the rest 5(2.36%) in health posts.

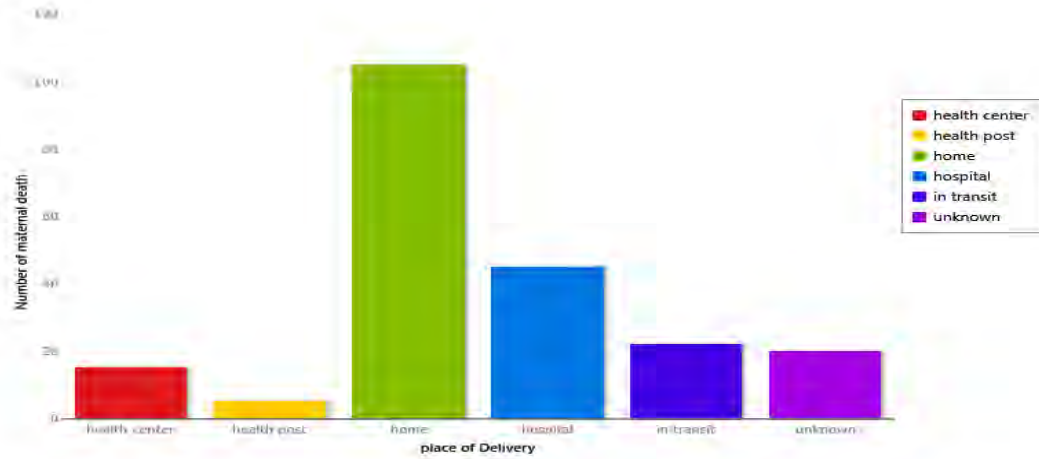


Figure 9. Place of delivery of deceased mother in Tigray region, 2013 to 2015

Out of the 286 maternal deaths, 140 (48.95%) died in their homes, 65(22.73%) were died in hospital. 25(8.74%) were died on transit, 23(8.04%) were died in health center .The death place of the 28(9.79%) mothers were unknown.

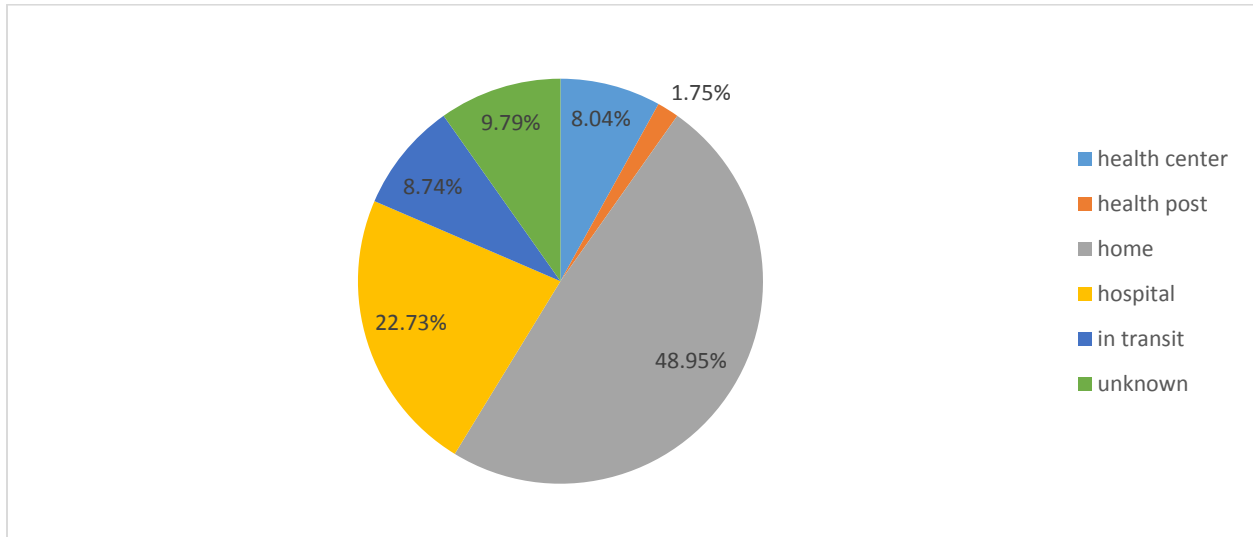


Figure 10. Place of death of deceased mother in Tigray region, 2013 to 2015

Out of 286 maternal deaths in 2013 to 2015; 245(85.8%) were rural residents, 41(14.2%) were urban residents.

The majority of deaths were in full term which were 216(75.6%), 61(21.53%) were pre- term, 5(1.9%) were post tern, and 6(0.96%) were < 12 weeks.

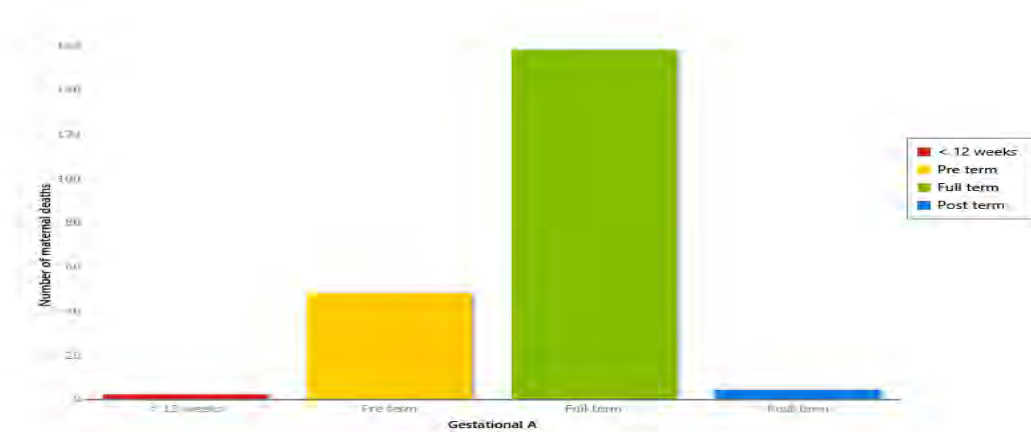


Figure 11. Gestational age of deceased mothers in Tigray region, 2013 to 2015

Table 6. Mean of Gestational age and Age at death of deceased mothers in Tigray region, 2013 to 2015

Gestational Age											
	Obs	Total	Mean	Var	Std Dev	Min	25%	Median	75%	Max	Mode
Gestational Age	212	7635	36.0142	33.4737	5.7856	8	37	37	39	43	37
Age at Death											
	Obs	Total	Mean	Var	Std Dev	Min	25%	Median	75%	Max	Mode
Age at Death	212	6274	29.5943	46.0621	6.7869	16	25	30	35	49	30

The timing of death relation to pregnancy of 286 maternal death were 219(76.89%) in postpartum, 50(17.5%) were in antepartum 16(5.49%) were in intrapartum, and 1(0.49%) were unknown.

The major causes of maternal death of 286 maternal death, 208(72.64%) were direct obstetrics. 78(27.36%) were indirect obstetrics.

Out of those 286 maternal deaths 150(52.61%) Were hemorrhage, 23(8 %) were sepsis, 20(7 %) were HDP, 11(4 %) were retained placenta, 6(2 %) were anemia, 3(1 %) were unsafe abortion and 49(17 %) were others diseases.

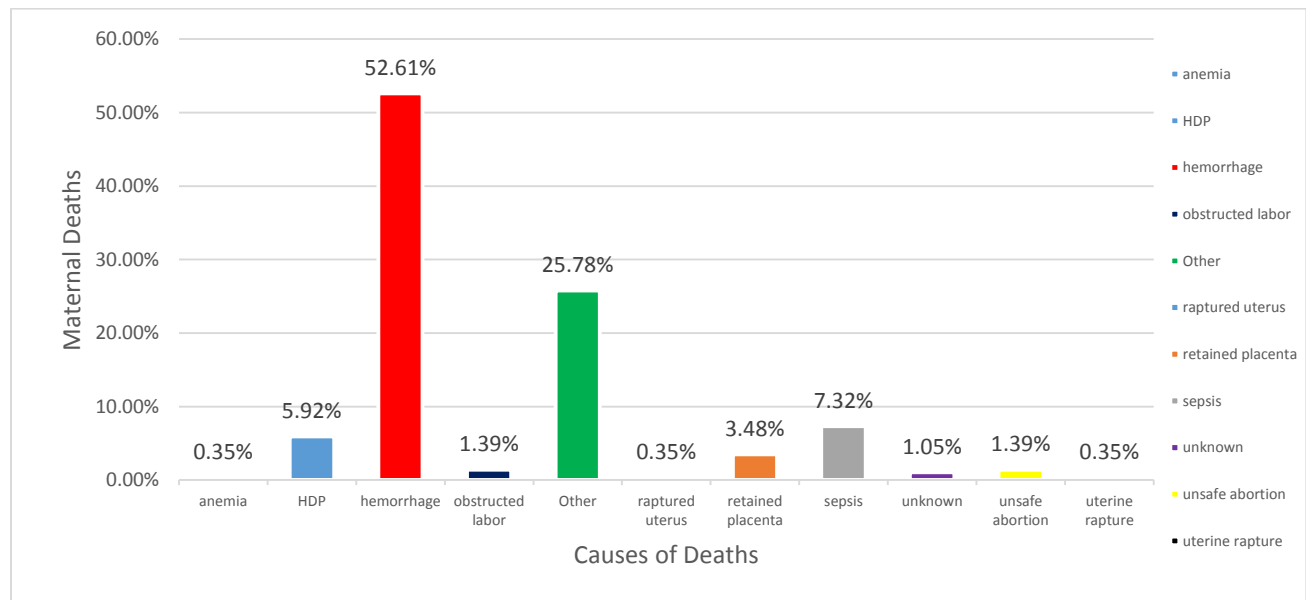


Figure 12. Causes of maternal deaths in Tigray region, 2013 to 2015.

Table 7. Marital status of deceased mothers in Tigray region, 2013 E.C to 2015 E.C.

Marital Status	Frequency	Percent	Cumulative frequency
Divorced	4	1.42 %	1.42%
Married	267	93.40 %	94.82%
Not married	15	5.19 %	100%
TOTAL	286	100.00 %	

The maternal mortality ratio (MMR) were 77/100,000 LB in 2013, 48/100,000 LB in 2014 and 43/100,000 LB in 2015.

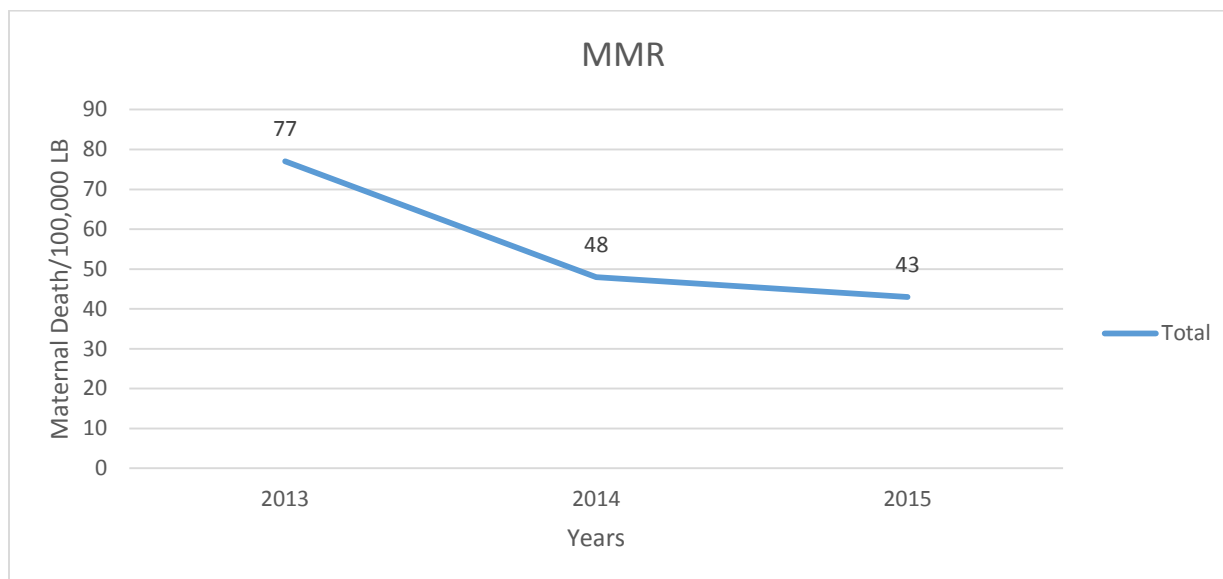


Figure 13. Maternal mortality ratio of Tigray from 2013 to 2015

2.1.5. Discussion

The maternal deaths identified in Three years were many and the majority were occurred in 2013 and it decreased in 2014 by 22.6 %. thus, the deaths were preventable deaths which were 208 (72.64%) direct obstetrics and the median gestational age was 37 weeks (Ranges from 37 weeks to 43 weeks) and the timing of deaths relation to pregnancy in postpartum were 220(76.89). So, most of the deaths were due to hemorrhage followed by sepsis which were 150(52.62%) and 21(7.38%) respectively.

In the survey on Health facility-based maternal death audit in Tigray, Ethiopia, from December 2005 G.C. and May 2006 G.C.; A total of 34 maternal deaths were identified in five public hospitals in Tigray over a period of two years, of which 12 (35.2%) were reported to have been avoidable]. The leading causes of death were infection, hemorrhage and hypertensive disorders.⁵

In our study, those maternal deaths occurred in three years, the number of deaths were high in north western zone; followed by western zone even though Central zone signify 25.5% of deaths occurred. Thus, the population of central zone were much higher compared to them and the deaths were lower in eastern zone compared to all five zones.

The deaths were much higher in rural residents which were 85.8 % and it may due to low health service coverage and inaccessibility, transportation problem.

From those maternal deaths occurred in t years; half of them were delivered home, this signifies higher number when compared to the survey on Health facility-based maternal death audit in Tigray, Ethiopia, from December 2005 G.C. and May 2006 G.C. were 47 %⁵.

In our study most of the death were avoidable and deaths in health facility were also higher which 32.5 %. This may due to low health service quality and low package provision.

2.1.6. Recommendation

Most of death occurred in those three years were preventable deaths and it is possible to lower the number of avoidable maternal death

Those zones which have high number of maternal deaths should be take consideration on the cause of maternal deaths and preventability. They should thoroughly work in awareness creation of mothers and community as a whole that every pregnant mothers should have follow up in health facility and to deliver there.

Since most of the deaths were preventable in our study, Health facilities should increase their quality of health service and packages provision to pregnant mothers to decrease possible factors.

2.1.7. References

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Chapter III: Evaluation of Surveillance System

3.1. Maternal Deaths Surveillance and Responses Evaluation in North - West Zone, Tigray Region, Ethiopia, April, 2016

Abstract

Introduction

Public health surveillance is an ongoing, systemic collection, analysis, interpretation and dissemination of health data for the planning, implementation and evaluation of public health programs. Disease surveillance is essential for early detection of outbreaks, epidemics and pandemics in order to initiate timely response. It is essential to evaluate or monitor progress of ongoing interventions targeted for disease reduction¹.

A well-functioning disease surveillance system is critical to measures the burden of a disease (health-related event), identification of populations at high risk. Establishing surveillance systems should regularly reviewed on the basis of explicit criteria of usefulness, cost and quality; systems should be modified as a result of such review. Attribute of quality includes: (I) sensitivity, (II) specificity, (III) representativeness, (IV), timeliness, (V) simplicity, (VI) flexibility, and (VII) accessibility².

Because, measuring maternal mortality is difficult and complex, reliable estimates of the dimensions of the problem are not generally available and assessing progress towards the goal of reducing maternal mortality is difficult. In particular, it tells us nothing about the faces behind the numbers, the individual stories of suffering and distress and the real underlying reasons why particular women

died. The objective of this study were to evaluate the performance of the existing surveillance system of maternal deaths of the North Western Zone, Tigray region, April, 2016.

Methods and Materials

This surveillance system evaluation was conducted in 4 districts of North West Zone of Tigray Region which has a total of 8 districts (one town and 7 woreda). North West zone have a total population of 835,853 based on the 2007 population projection. There are 1 hospitals (zonal), 21 health centers and 52 health posts.

Based on our secondary data analysis of maternal death in Tigray region from 2013 to 2015; those maternal deaths occurred in 3 years were high in north western zone; followed by western zone even though Central zone signify 25.5% of deaths occurred. Thus, the population of central zone were much higher compared to them and the deaths were lower in eastern zone compared to all five zones.

Result

In most of the health facilities and districts standard case definitions of the selected disease were available. Maternal death is defined as the death of woman while pregnant or within 42 days of the termination of pregnancy irrespective of the duration and site of the pregnancy, from any cause, related to or aggravated by the pregnancy, labor or its management but not from accidental or incidental cause.

In 16 of the 20 health facilities (80%) there were national manuals for MDSR. But in 4(10%) of the health facilities which had not national manual for MDSR were health posts in rural area.

Conclusion

There was a surveillance focal person in all the visited sites but the focal persons had work overload and lack of capacity to do data analysis regularly. There was a poor practice of interpretation and utilization of MDSR data at facility and district level, simply compile data from the next lower level and submitted to region without further analysis. Thus the collected data has a limited usefulness. The flow of data from lower level (health post) to higher level (regional and national) is very great, however; reported deaths were underestimated due to the trend of reporting only from governmental health facilities and very few higher private and NGO clinics, poor health seeking behavior of the population (0.97%), which is much more less than the WHO standard (2.5) this means based on the WHO standard everyone is expected to visit health facility 2.5 times per year.

3.1.1. Introduction

Public health surveillance is an ongoing, systemic collection, analysis, interpretation and dissemination of health data for the planning, implementation and evaluation of public health programs. Disease surveillance is essential for early detection of outbreaks, epidemics and pandemics in order to initiate timely response. It is essential to evaluate or monitor progress of ongoing interventions targeted for disease reduction¹.

A well-functioning disease surveillance system is critical to measures the burden of a disease (health-related event), identification of populations at high risk. Establishing surveillance systems should regularly reviewed on the basis of explicit criteria of usefulness, cost and quality; systems should be modified as a result of such review. Attribute of quality includes: (I) sensitivity, (II) specificity, (III) representativeness, (IV), timeliness, (V) simplicity, (VI) flexibility, and (VII) accessibility².

To date, evaluation of surveillance system has been limited in scope and content. In most developing countries, surveillance systems are often weak even though the burden of communicable disease remains major public health concern³.

Surveillance system evaluation answers questions like what are the successes and deficiencies of the surveillance system. Is the surveillance system meeting its public health objective? How does surveillance both support and benefit stakeholders? What measures could improve performance and productivity of the surveillance system and the program(s) that it supports? ³

Maternal Death Surveillance and Response (MDSR) is now promoted as a means of availing such actionable information locally and in real time making maternal deaths visible events that beg for

response. By reviewing the death it helps to sensitize communities and health workers in facilities to the fact that women need not die and encourages discussion and thought about prevention. It provides information about why the woman died and suggests ways that deaths like hers can be prevented in the future. It also connects actions to results⁴.

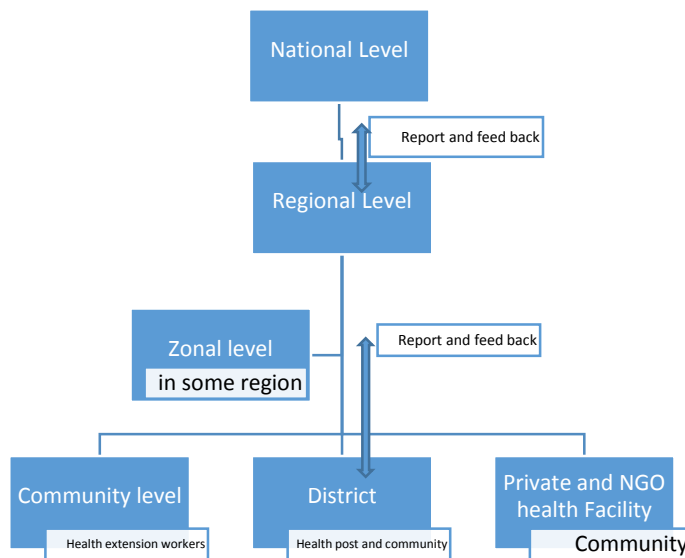


Figure 14. Diagram illustrating the formal and informal flow of surveillance data and information throughout the health system

Rationale of the study

Because, measuring maternal mortality is difficult and complex, reliable estimates of the dimensions of the problem are not generally available and assessing progress towards the goal of reducing maternal mortality is difficult. In particular, it tells us nothing about the faces behind the numbers, the individual stories of suffering and distress and the real underlying reasons why particular women died.

In order to stop the deaths, the right kind of information is needed upon which to base Actions. To help tackle these challenges, a variety of methods for reviewing and analyzing deaths and producing actionable information have been implemented throughout the world.

Based on our secondary data analysis of maternal death in Tigray region from 2013 to 2015; those maternal deaths occurred in 3 years were high in north western zone; followed by western zone even though Central zone signify 25.5% of deaths occurred. Thus, the population of central zone were much higher compared to them and the deaths were lower in eastern zone compared to all five zones.

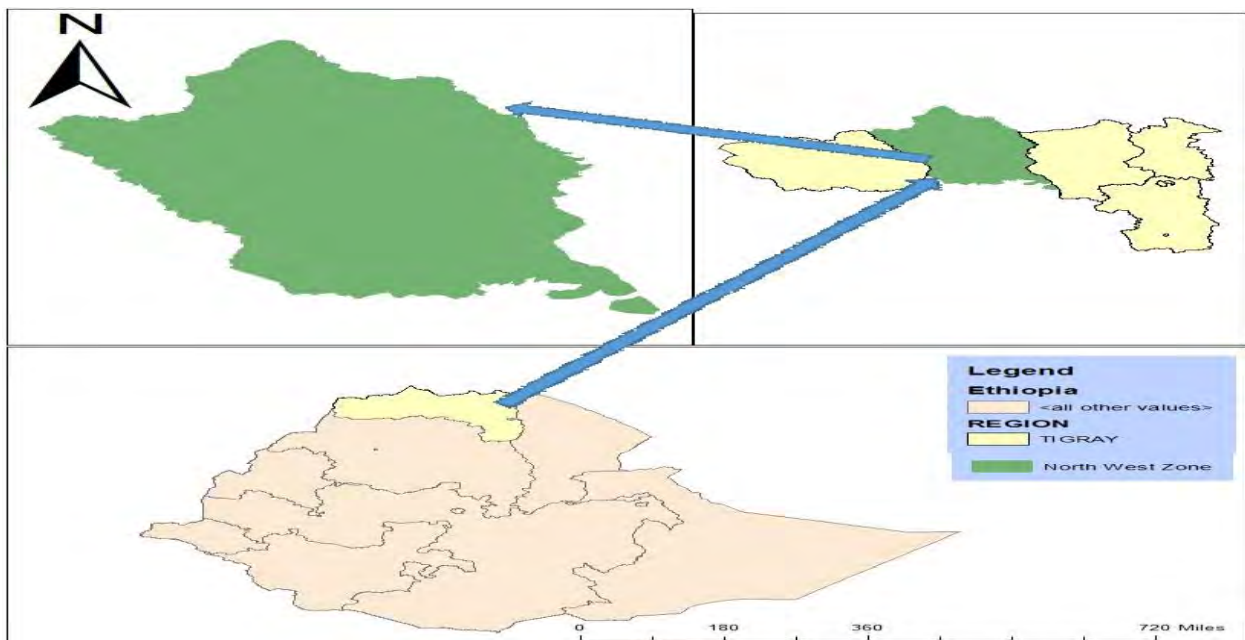


Figure 15. Geographic description of North West zone, Tigray region, Ethiopia

5.1.1. Objectives

General objective

- To evaluate the performance of the existing surveillance system of maternal deaths of the North Western Zone, Tigray region, April, 2016.

Specific objectives

- To investigate the implementation of Maternal deaths surveillance activities such as notifying, reporting, registration, confirmation, and response
- To assess supportive activities of maternal death surveillance system such as supervision, staff training, information feedback, equipment and financial support
- To describe constraints and challenges faced in the process of implementing the surveillance system

3.1.2. Methods and Materials

Study Area: This surveillance system evaluation was conducted in 4 districts of North West Zone of Tigray Region which has a total of 8 districts (one town and 7 woreda). North West zone have a total population of 835,853 based on the 2007 population projection. There are 1 hospitals (zonal), 21 health centers and 52 health posts.

Study period: The field work was carried out from April 10 to 30, 2016

Study population: All health facilities and health offices of the western zone of Tigray region.

Study unit: The surveillance system evaluation included a total of twelve study units; eight governmental health facilities (one Hospital, four health centers and three health posts), two district health offices of the Western Zone of Tigray Region, the Regional Health Bureau and the Regional Research Laboratory.

Data collection methods: Selection of the study area was made based on some background information of gaps of reporting such as low timeliness and completeness of reporting to the higher level. So, we used purposive method. Selection of health facilities was made on a convenience basis taking into consideration time, transport constraints and MDSR were selected based on the public health importance of the study area. Two weekly (malaria and typhoid fever). Data were collected using the tools of WHO/AFRO and updated CDC questionnaires which are designed for the assessment of national communicable disease surveillance system and Ethiopia Maternal Death Surveillance technical Guideline.

Data were collected using both face to face interviews and certain observations monitored by the principal investigator as a complementary measure.

Performance of the core activities of surveillance system of the district which includes case definitions, case detection, registration, reporting, data analysis, interpretation, dissemination and epidemic preparedness and response were assessed

- ❖ Supportive activities of the surveillance system in regard to supervision, staff training, information feedback, equipment (communication materials) and financial support were assessed.
- ❖ Status of system attributes (sensitivity, positive predictive value, Timeliness, completeness, simplicity, data quality, flexibility, usefulness, and acceptability) were evaluated

In addition, flow charts of the surveillance system, graphs, tables, maps of the selected diseases, availability of surveillance guidelines, standard case definition, etc. were checked.

Records of registration book, feedback reports of surveillance, weekly and immediately reports of surveillance in the past three months, and line lists of outbreak investigation were reviewed. Focal persons of PHEM at regional, district and at health facility levels, health professionals, and stakeholders of districts at various levels were interviewed to get the important data of the existing surveillance system of the study area.

Definitions: The usefulness of a surveillance system is measured by whether it leads to prevention and controls or a better understanding of adverse health event. The measure is qualitative, in terms of the subjective views of those using the system. Or, quantitative in terms of the impact of surveillance data in policies, interventions, or the occurrence of a health event.

The cost of a system includes indirect as well as direct costs, and should be measured in relation to benefit obtained. All element of the system should be included in the cost: data collection, analysis and dissemination.

The sensitivity of the surveillance system is its ability to detect health event (completeness of reporting). Its specificity is inversely proportional to the number of false positive it reports. Report of a disease does not meet the case definition are false positive.

3.1.3. Result

Core activities

A. Case definition of Maternal deaths

In most of the health facilities and districts standard case definitions of the selected disease are available. Maternal death is defined as the death of woman while pregnant or within 42 days of the termination of pregnancy irrespective of the duration and site of the pregnancy, from any cause, related to or aggravated by the pregnancy, labor or its management but not from accidental or incidental cause.

B. Availability of surveillance manual

In 16(80) % of health facilities there were national manuals for MDSR. But in 4(10%) of the health facilities which had not national manual for MDSR which were health posts in rural area.

C. Case detection, Registration and confirmation

The cases definition of maternal deaths available in 15/20 of the visited health facilities. The case definitions of maternal deaths were easily understandable by the health care providers of the facilities. As the MCH focal persons and health extension workers informed us, community case definitions of maternal deaths were used during health education and meetings with communities. Clinical registers were available in all

of the visited health facilities; but they used one registry for all the priority diseases which makes difficult to collect the data easily for all the diseases.

In all assessed districts, the HEW establish a link with all possible sources of information for identifying deceased women of reproductive age working with Health Development Army members, religious leaders/institutes, community leaders and administrative leaders. This task force get the information from persons who primarily attended the women during illness, persons who attended the women in labor and delivery (if at home), persons who were present at the side of the woman at the time of death, husband (who is likely to have additional details on the woman's experiences during pregnancy).

But, 11/20 health facilities' head of the any ward told us if there were a suspected maternal death occurs, they are not responsible for notifying these to the head of the health facility/the medical director.

All the assessed health facilities had referral sheets, medical records, attending health workers (OPD, maternity, OR) but shortage of log books (OR, maternity, OPD, anesthesia).

From assessed Districts, 78 % had an assigned professional from the HC which were trained on how to fill the VA tool and no data collectors for both facility and community who had a language barrier in the local language.

D. Reporting

Complete, timely, and accurate reporting is the foundation of a country's surveillance system. Completeness and timeliness are key indicators of reporting performance. These are defined as the proportion of expected reports received (completeness), and the proportion of expected reports received on

time (timeliness). Reports were considered late if they had not been received by the established deadline (due to the second day (Tuesday) of the following week at regional level, Monday from facility to district level). Only the regional health bureau used a computerized system to monitor district completeness and timeliness reporting, but there was no cross checking how many health facilities reported at the ground level.

There was shortage of reporting format in the last six months in all visited health facilities and health offices except one health center. In one of the district office they use their own hand written paper to receive reports. Overall completeness of reporting of the visited sites was 83.3%, completeness of reporting was high in Atsegede Tsimbila district (98.9%) followed by Medebay zana (69%).

Supportive Activities

A. Feedback and supervision

Regional health bureau conducted supportive supervision to health facilities on quarterly basis, but never practiced surveillance supervision specifically. Feedback from districts to health facilities was better than that from region to districts. All districts supervised at least once all health centers and health posts in the previous six months. But feedback to communities related to maternal deaths that had occurred in the community is almost nonexistent. All the visited sites interviewed and reported that they did receive one or more feedback during the preceding six months.

B. Materials and resource Available for MDSR

Resources for data management, communication, and other logistics were all available at the regional level. Computers are not available in all districts and all the visited facilities. All facilities and one district use

personal mobile for communication especially for surveillance data reporting. Twenty four hour electric power is existent in all the visited sites .There was no a radio call system in any of the remote areas of the visited districts; which impacted the timeliness of reports of MDSR.

C. Training

Fifty percent of the assessed health offices, health facilities, responded that staffs working on surveillance units got short term training of two to five days by the regional health bureau in collaboration with WHO. But in health post level HEWs did not take any kind of surveillance training. At the health facilities, only the focal persons assigned for surveillance were trained, but the health care providers did not get orientation.

System Attributes

1. Accessibility

In general, health workers expressed that they are satisfied with their work related to MDSR. The aspect with the lowest overall satisfaction level was education and training opportunities, no perdiem for field visit and no refunding for personal mobile phone and transport expenses and 76% of the interviewed surveillance focal persons were satisfied with what they were doing on surveillance.

2. Usefulness of MDSR Data

Collecting MDSR data through case based is very important but not sufficient by itself to improve the public health problems through preventing and controlling the avoidable maternal deaths. Data must be analyzed, interpreted, and used for taking action accordingly.

In each the visited sites there was responsible person for data analysis but data was not analyzed regularly in most of the visited facilities and districts except in regional health bureau. The main reasons they reported for not analyzing data were lack of technical skills and had limited time for the surveillance system, due to work overload

The MDSR data which we assessed determines the medical or pathophysiologic cause of death as specifically as possible and categorize it as a direct obstetric, indirect obstetric or non -maternal death. The mechanisms for establishing the medical cause of death depended on whether the woman was hospitalized or not.

In some cases, a woman who dies outside the facility may have had antenatal care or been hospitalized prior to her death. Medical records may be helpful but are sometimes unavailable in these situations. If the woman was dead on arrival at the facility or died soon after arrival, her case reviewed by that facility maternal death committee whenever possible. All maternal deaths occurring in facilities or in transit also be notified through community based channels (by the local HEW to the HC) and a verbal autopsy conducted .

3. Representativeness

The overall health seeking behavior of the region was 0.97%. Very little amount of the private health sectors (only 11 private higher clinics and hospitals and 6 NGO clinics) reported to regional level. In case of North Western zone, no private health sector had been reporting the priority disease to the respective health office.

There were gaps in cross check data from facility and community on same maternal death Sample of WRA deaths to ensure they are correctly identified as not maternal

4. Stability

After the introduction of the BPR, the system is well established and structured but lack of budget line and experienced staff turnover affects the stability of the system.

5. Positive Predictive Value

We used the positivity rate of maternal death whether the death were actual maternal deaths in the health service. 97.3% of the assessed health facility agreed that the death which reported under MDSR were actual maternal deaths.

6. Sensitivity

Based on our study, 98% of the assessed District strongly agreed that the system picks most of the maternal deaths in the facility and the community.

3.1.4. Discussion

There was a surveillance focal person in all the visited sites but the focal persons had work overload and lack of capacity to do data analysis regularly. There was a poor practice of interpretation and utilization of MDSR data at facility and district level, simply compile data from the next lower level and submitted to region without further analysis. Thus the collected data has a limited usefulness. The flow of data from lower level (health post) to higher level (regional and national) is very great, however; reported deaths were underestimated due to the trend of reporting only from governmental health facilities and very few higher private and NGO clinics, poor health seeking behavior of the population (0.97%), which is much more less

than the WHO standard (2.5) this means based on the WHO standard everyone is expected to visit health facility 2.5 times per year.

The health seeking behavior of the visited site is expected to be less than the regional average as most the populations are rural dwellers. Lack of reagents and materials such as RDT, Widal reagent, blood film slides, test tubes, electricity, computer, internet access and reporting format, this will affect the system attributes and this pose a problem to timely and appropriate interventions to be taken and preparation of future plan.

Laboratory experience of quality assurance program and participation in the surveillance system is found to be low. If the quality assurance is not performed it is difficult to measure the reliability and validity of test results delivered by the laboratory personnel. In addition to this reagent is not procured by the laboratory staff of the health facilities but by pharmacist this affects both the quality of reagents procured and may not give priority for the important reagents to diagnose the country priority diseases. Lack of feedback and supervision, training of staff, refunding of transport and telephone expenditures and per diem has impact on the overall performance of the surveillance system.

Limitations

Due to shortage of time and transport, the study was conducted on accessible health facilities which might be limited its representativeness. Date of receipt and reported is not registered in reporting format because of this we did not calculate timeliness of the report.

3.1.5. Conclusion

Lastly we concluded that supportive supervision on quarterly basis is a good trend in Tigray region but specific surveillance system evaluation and feedback is not practiced at regular basis. Laboratory participation in surveillance is very limited and quality assurance system is not practiced in health facilities by the regional health research laboratory. Data utilization is very low at the lower level of the reporting unit. No refunding mechanism for personal telephone expenditures. Reporting entities are almost governmental health facilities, only limited number of private health sectors have participated in reporting of the diseases under surveillance.

3.1.6. Recommendations

- Training should be given to the surveillance focal persons and reserve health professionals, including onsite training and per diem should be considered to the reporters of the health data by their own expenditures and for those who travel long distance to investigate or supervise in regard to surveillance. Or create toll free telephone service
- Regional health bureau should develop time frame for data analysis and distribute to all health facilities and district health offices and reagent procurement should perform by the laboratory professionals rather than pharmacists
- Regional health bureau should put in place feedback and supervision specifically to surveillance system at least twice per year and private and NGO health facilities should be aware the importance of reporting of cases and legally enforcement to report priority diseases of the country to respective institutions.

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Chapter IV: Health profile Description Report

4.1. Aysaita District Health Profile Evaluation, Afar region, Ethiopia, April, 2016

Abstract

Introduction

Health Profiles are about the health of people and about the conditions in which they live. It is essential tool for change and thus must be an integral part of local decision-making and strategic planning processes. The preparation of profiles provides a lively, scientifically and evidence based account of health in the district; it can stimulate public interest and political commitment; and it can identify targets for the future and monitor progress towards them.

Health profile is important for prioritizing health program and health related problems of the community at any level. So far in our country, it is not familiar to find prepared district health profile even though basic for planning and for appropriate intervention; and is an entry point for operational research. As we know many Stake holders were working on health and they may need compiled health and health related issues health profile but due to lack of this information they made their project intervention haphazardly.

The objective of this study to assess health and health related issues about health status of the Aysata District, Afar Region, in April, 2015

Methods and Materials

Different instruments like checklists and semi structured questionnaire were used as tools for data collection from various governmental organizations such as district health office, health facilities, education sector, finance office, agriculture sector, district water resource office, district electric power authority and district political administration office.

Result

The district has 2 health centers and 9 health posts; with ratio of 1: 30,295 health center to population ratio and 1: 6,732 health post to population ratio. Health center coverage was above 100 % and health post 98.8%; with the ratio of 1:39,525, 1:3,040 and 1:3,953 health officer, nurse, HEW to population respectively.

No X-ray technicians and environmental health experts were found in the district. From the total district health manpower females account 38.7%. About 350 community health agents were working in the district on health promotion and disease prevention activities. The overall health worker to population ratio was 1.02 per 1000 population. No diagnostic laboratories were available in the district.

Conclusion

The overall health worker ratio per 1000 population was 1.02. This result is far less than the standard set by the World Health Organization of 2.3 per 1000 population. Malaria was the top causes of morbidity in 2015, 68.6%, outbreak was occurred in 2015; lack of ITNs coverage and problem of environmental sanitation may contributed to its existence. Females experience higher incidence of HIV/AIDS 0.346/1000 which is 1.8 times higher than males this may be attributed to the biological vulnerable nature of females and/or more of those were engaged as commercial sex workers. But there was encouraging screening

program which diagnosed significant amount of peoples in its system. The overall 0.54% prevalence of HIV in Aysata district is less than the EDHS 2011 finding (1.5%).

5.1.1. Introduction

Health Profiles are about the health of people and about the conditions in which they live. It is essential tool for change and thus must be an integral part of local decision-making and strategic planning processes. The preparation of profiles provides a lively, scientifically and evidence based account of health in the district; it can stimulate public interest and political commitment; and it can identify targets for the future and monitor progress towards them¹.

The Health profile is a summarized auditing and discussion of health related data and important health related indicators to describe the health and related social, economic, political and cultural factors in the geographic area under discussion¹.

Based on the EDHS 2011, the Afar Regional State has a total population of 1,602,995, consisting of 892,998 men and 709,997 women; urban inhabitants number 213,519 or 13.32% of the population, a further 1,474,755 or 92% were pastoralists and 128,239 or 8% were agro-pastoralist. With an estimated area of 72,052.78 square kilometers, this region has an estimated density of 22.2 people per square kilometer (1). For the entire region 247,255 households were counted, which results in an average for the Region of 5.6 persons to a household, with urban households having on average 4 and rural households 6 people. Ethnic groups include Afar (90.03%), Amhara (5.22%), and Argobbaa (1.55%) Tigray (1.15%), Oromo (0.61%), Belaya (0.59%), and Hadiya (0.18%). 95.3% of the population is Muslim and 4.7% is Christian (3.9% Orthodox Christian, 0.7% P'ent'ay, and 0.1% Catholics)².

Based on Population of Ethiopia Regions, Zone, and Woredas 2011, Aysata District have total population of 60,589, consisting of 32,446 male and 28,143 Female.

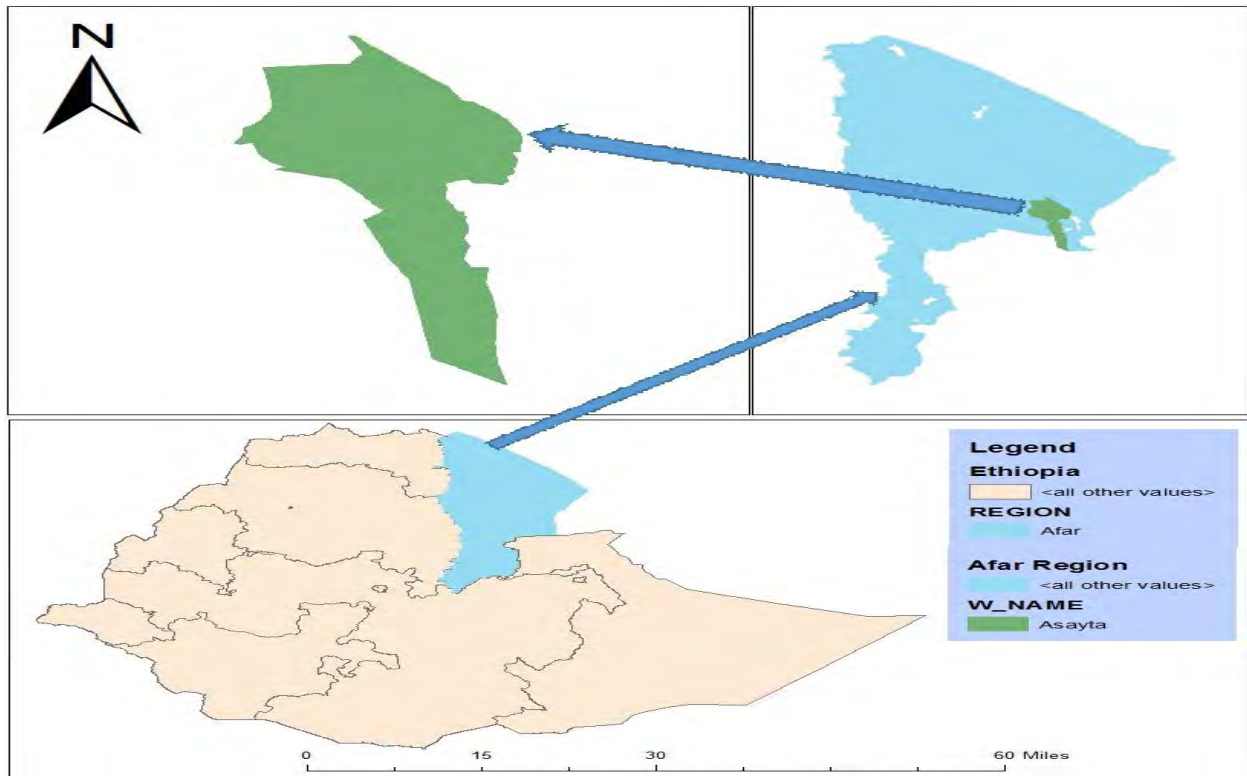


Figure 16. Geographic description of Aysata district, Afar Eegion, Ethiopia

Rationale of the study

Health profile is important for prioritizing health program and health related problems of the community at any level. So far in our country, it is not familiar to find prepared district health profile even though basic for planning and for appropriate intervention; and is an entry point for operational research. As we know many Stake holders were working on health and they may need compiled health and health related issues health profile but due to lack of this information they made their project intervention haphazardly.

Therefore this project work hopefully makes access of compiled health and health related issues of the district for planning, prioritizing health program and health related problems.

5.1.2. Objectives

General objective

- To assess health and health related issues about health status of the Aysata District, Afar Region, April, 2015

Specific objective

- To assess existing health infrastructure of the district.
- To assess and describe health indicators and to identify problems for priority setting
- To assess primary health care coverage of the district.
- To describe endemic diseases as well as its control and prevention programs in the district.

5.1.3. Methods and Materials

Different instruments like checklists were used as tools for data collection from various governmental organizations such as district health office, health facilities, education sector, finance office, agriculture sector, district water resource office, district electric power authority and district political administration office.

We interviewed concerned health office heads, experts, health professionals of various disciplines and heads and experts of other sector offices. We examined posted charts on the walls of the office for a list on top causes of morbidity, mortality, organizational structure and others were evaluated.

We reviewed annual reports of the relevant sectors that have sent to the region. We also collected, analyzed, and interpreted the available data in health office and health institutions.

5.1.4. Result

Historical back ground of the area

Aysata is one of the eight districts found in zone one of Afar Region. It is a town in northeastern Ethiopia, and before 2007 G.C. it was the capital of the Afar Region of Ethiopia. It was established in 16th century name of historical place during Ahmad Gran. The Sultan of Auwssa/ Aysata great rule from the capital of the once- Adal, an Afar-Somali kingdom.

Population and Demographic information

Based on the EDHS 2011, it has a population of 60,589, consisting of 32,446 male and 28,143 women which was 1:1 male to female ratio (1). From the total population total live birth was 1,935 (3.2), under one

years old children constitutes 1883 (3.1%), under five 6,506(10.73%), women of child bearing age 13,030 (21.5%) and pregnant women are 1212 (2%). from the total population segment 146,240(92.5%) lives in rural part of the district. The annual growth rate is considered to be 2% per annum, average fertility rate was 6.5 children per women in life during her reproductive ages and average house hold size was 5.5 per house hold. No data was available for age group above 65 years old due to this age dependency ratio could not be calculated. Religious composition was Muslim 59,377 (98 %), orthodox 727(1.2%), catholic 242 (0.4 %), others 242(0.4).

Geography and climate

It located in the Afambo woreda, part of the Region's Administrative Zone 1, the town has a latitude and longitude of 11°34'N 41°26'E coordinates: 11°34'N 41°26'E and an elevation of 300 meters. The climate varies from cool months of rain fall, about two months, to dray seasons of ten months with an overall average minimum and maximum temperature of 35 °c and 43°c, and total average rainfall ranges 600 mm/year to 1200 mm/year. Most of the district area accounts lowland (in 95%), kola (5 %). The district far from samara (capital city of Afar regional state of Ethiopia) 300 km and Addis Ababa (capital city of Ethiopia) 854 km.

Administrative and political structure

Aysata district has 11 rural and 2 urban kebelles with all sector offices concentrated in Aysata town which is the capital of the district. The number of kebeles with transportation access were 10, number of kebeles without transportation access were 2, number of kebeles with electric power were 3, number of kebele without electric power were 10, number of kebeles with telephone services(cable based/ wireless) were 13, and there were 1 supporting NGO in the area. The ruling political party were APDP (Afar people democratic

party). All the sector offices of the district are responsible for the Regional administrative office. There was one banking service available which was CBE (commercial bank of Ethiopia).

Productivity and income

Aysata has a fertile farm land. From the total area of hectares 97,717 is suitable for agriculture but so far only 60,142 hectares were used to cultivate a variety of crops cereals and Date. The rest of the area is used for grazing, parking of wild animals. About 95% of the total population is pastoralist. The remaining 5% depends on merchandise, hotel and catering, governmental and NGO employees. From the overall 60,142 hectares cultivated in 2015 and harvested in 2015 a total of 1,062,765 quintals of different crops and cereals like, maize (610,462), cotton (322,147), and other oil crops (123,156) were collected.

In regard to animal husbandry there were 410,367 cattle, 106,320 goats, 95,544 poultries, 8192 donkeys, and 341 sheep found. The district has 247,255 households of those 41.4% have above the bench mark, 14.4 average bench mark and 54.2 below the bench mark level yearly income. In this purpose bench mark refers to the planned achievement per household but not in terms of daily income per capita, no data was found in this regard; but considered most of the people earned below bench mark refers to the un planned investment per household but not in terms of daily income per capita, no data was found in this regard; but considered most of the people earned below \$1 per day per capita. Despite the fact that no adequate data was found about the total number of jobless people, there were 2384 documented unemployed peoples living there at unemployment rate of 39.3.7 per 1000 population \$1 per day per capita.

Education

Aysata district has a total of 18 schools, of these 1 kindergarten, 13 primary and 2 secondary schools, and 2 collages exist with a total of 14,274 students enrolled in 2015. Females account 22% of the total students

enrolled. From a total of 3,140 female students, 1319 (42%) in elementary and 592(44.9%) in secondary schools were females. A total of 218 teachers were registered, most (67%) were males.

7 schools have access to protected wells and rivers, 49.8% latrine coverage but 71.5% of them were not a standard latrine it serves for temporary purpose only. All the schools (5 elementary and 2 high schools) have Anti HIV/AIDS clubs.

Health status

The district has 2 health centers and 9 health posts; with ratio of 1: 30,295 health center to population ratio and 1: 6,732 health post to population ratio. Health center coverage was above 100 % and health post 98.8%; with the ratio of 1:39,525, 1:3,040 and 1:3,953 health officer, nurse, HEW to population respectively.

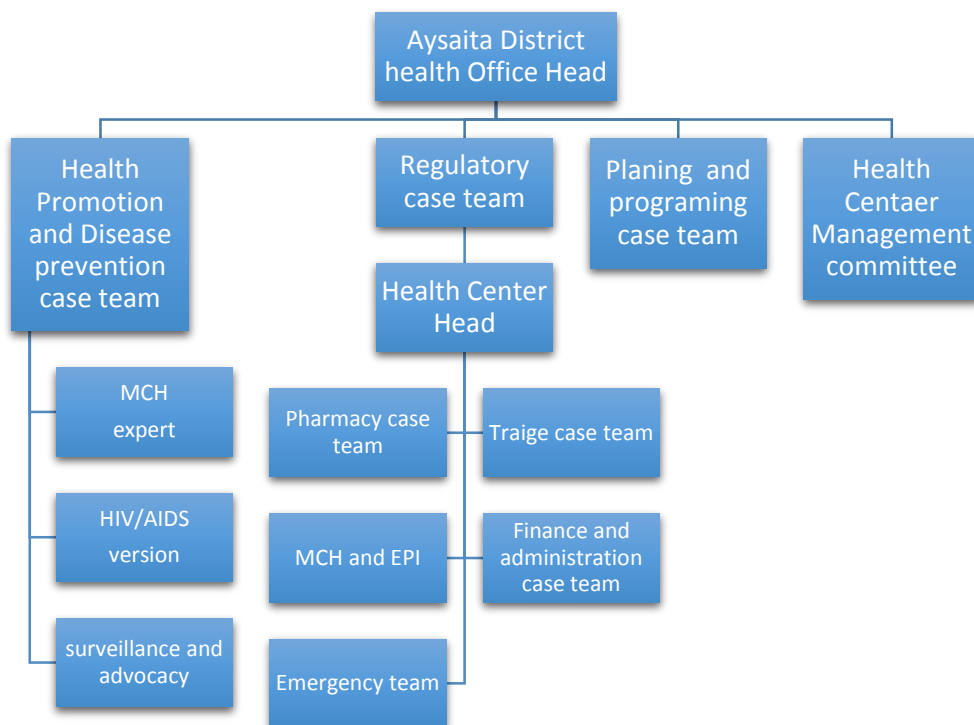


Figure17. Organization structure of Aysata District, Afar region, Ethiopia, 2016

Table 9. Man power of Aysata District, Afar region, Ethiopia, 2016

Profession	Health worker: population			Specification	Ratio
	Male	Female	Total		
Physician	1	0	1		1: 60,589
Health Officer	2	0	2		1: 30,294
Laboratory				All are	
Technologist/Technician	4	0	4	Technician	1: 15,147
Nurse	7	6	23		1: 2,634

Pharmacy				
Technician/Pharmacist	1	2	3	1: 20,196
X- ray Technician	0	0	0	
Midwife	1	1	2	1:30,294
HEW	6	7	13	1: 4,660
Supportive	5	8	14	1: 4327
Total	28	24	62	

No X-ray technicians and environmental health experts were found in the district. From the total district health manpower females account 38.7%. About 350 community health agents were working in the district on health promotion and disease prevention activities. The overall health worker to population ratio was 1.02 per 1000 population. No diagnostic laboratories were available in the district.

Table 10. Number of Health Facilities in Aysata District, Afar Region, 2015

Type of Health facility	Number	Health Facility: Population Ratio
Hospital	1	1: 60,589
Health Center	2	1: 30,295
Health Post	9	1: 6732
Private Clinic	3	1:20,196
Pharmacy	5	1:12,118
Diagnostic Laboratory	0	
Rural Drug Vendor	4	1:15,147

Table 11. Ten top leading cause of OPD visit (morbidity) in Aysata District, Afar region, 2015

S. Number	Disease	Number (%)
1.	Malaria	68.6%
2.	URTI	19%
3.	Intestinal parasite	9%
4.	LRTI	4%
5.	Dysentery	3.5%
6.	Eye infection	2.3%
7.	Gastritis	2.1%
8.	Arthritis	1.9%
9.	Anemia	1.4%
10.	Skin infection	1.2%

Malaria was the leading causes of morbidity even though it shows a 14% decrement trend from 2014. No data was available for top causes of admission, <5 children and top causes of mortality. The above depicted data is a 9 month record except for malaria which includes complete yearly data.

Table 12. MCH and EPI of Aysata District, Afar Region. Ethiopia, 2015

Description	Base line	planned	Achieved	Remark
	50%	75%	76%	
ANC coverage				
Attended delivery	20%	50%	51%	

Chapter IV: Health Profile Description Report

PNC coverage	50%	60%	64.4%	
BCG coverage	80%	90%	87%	
Measles vaccination coverage	50%	95%	78%	
	-			No data
OPV		-	-	found
	-			No data
Pent 1		-	-	found
	-			No data
Pent 2		-	-	found
Pent 3	63%	83%	83%	
Fully vaccine	50%	72%	52%	
	-			No data
Pent 5		-	-	found
contraceptive prevalence	65%	80%	78.5	
TT2 for pregnant	80%	90%	80%	
TT2 for non-pregnant	80%	90%	81%	

Table 13. Environmental sanitation and availability of safe drinking water in Aysata district, 2015

Description	Number (%)
latrine coverage	60%
latrine coverage utilization rate	35%
safe water supply coverage	53%
Number of Kebele accessed safe water supply	80%

Although pit latrine has been constructed in most of households (60%); its utilization rate is low (35%). Safe water coverage was reported to be 53% and 10(80%) kebelles had access to safe water. Except for

Endemic Disease

Malaria: - Malaria is endemic throughout the year with peak cases during rainy seasons. Ninety seven percent of the population of the district is at risk of malaria. Incidence of malaria was 71% and 68.6% in 2014 and 2015 respectively. No ITNs were distributed since 2014. There was shortage of coartem and RDTs, equal distribution between non endemic areas of the region. No data was found for malaria admitted cases and deaths as most of the health facility. From the planned about 24,000 people to give health education regarding malaria 61.4% was achieved.

HIV/AIDS: - In 2015 a total of 24,911 clients were screened for HIV among those females composed 32%. From a total screened 33(12 males and 21 females) diagnosed positive for

HIV. The overall AR was 0.54 per 1000 population. Females experienced 0.346/1000 higher incidence than males who have 0.19/1000. There were a total of 116 PLWHA (66.4% account females) at prevalence of 0.98% and 57 patients were on ART in 2015. Health education was given to 21,768 people and condoms had been distributed to 11,822 users. Only 1 health centers of the district give ART service.

Tuberculosis/leprosy

Eligible Tuberculosis (TB) (All forms) were 114 and base line case detection rate were 0%. Targeted case detection rate were 86(60%) but the achievement were 12(8%) in 2015. Pulmonary tuberculosis treatment success rate and cure rate were 0%. Proportion of health posts providing community DOTS/MDT service were 25%. Base line for Leprosy Case Detection Rate were 0 and targeted case detection were 33% but

achieved 2%. 91(80%) The TB patients were screened for HIV but no data was found about co-infection prevalence.

Occurrence of outbreak

There were no measles outbreak in the district in 2015. Malaria outbreak was occurred in all 13 kebelles, in the district which affected 12035 cases. Factors that contributed to the outbreak were no use of ITNs during sleeping and also (sanitation problem there was a convenient breeding site of stagnant water and damp sites for mosquitoes).

Communication and utilities

Provision of requisite infrastructure was very low in Aysata. 2 kebelles and 2 health posts have source of electric power, and all health centers have generators as a source of power. All kebeles have transport facility which is non-asphalted road, and 88% had accessed to wireless telephone communication.

Health service expenditure and financing

Table 14. Health service expenditure and financing

Source	Amount	Remark
Total District budget	741,567	
Allocated to Health Centers	615,256	
Total per capital expenditure	120,000	
Salary	4,123	
Total income	18,132	

There are NGOs who support the district in different way MSH gives technical support on ART, HAPCO assigned man power, WHO gives training to professionals and it covers costs of EPI.

5.1.5. Discussion

Aysaita has a large fertile farming land and had a lot of livestock resources but most of the farmers were engaged in traditional farming and livestock rearing methods. It has limited infrastructure coverage; 2 kebelles have electricity which is very crucial for daily activity of citizens and in health facilities to maintain medicines, reagents and to manage patients in the night shift.

The overall health worker ratio per 1000 population was 1.02. This result is far less than the standard set by the World Health Organization of 2.3 per 1000 population. Malaria was the top causes of morbidity in 2015, 68.6%, outbreak was occurred in 2015; lack of ITNs coverage and problem of environmental sanitation may contributed to its existence. Females experience higher incidence of HIV/AIDS 0.346/1000 which is 1.8 times higher than males this may be attributed to the biological vulnerable nature of females and/or more of those were engaged as commercial sex workers. But there was encouraging screening program which diagnosed significant amount of peoples in its system. The overall 0.54% prevalence of HIV in Welqait district is less than the EDHS 2011 finding (1.5%).

5.1.6. Conclusion

The district HC: population ratio which is at 1: 30, 295, in regard to national standard 110.7% coverage, most of the district population is extremely underserved due to scattered area they live. So far only one health center gives inpatient and ART services. There is also shortage of experienced manpower in health facilities due to high staff turnover and unwillingness to go to the remote areas which has no infrastructure coverage.

Malaria is the main public health concern of Aysata district which were the top causes of morbidity. ITNs distribution and indoor and outdoor residual spraying malaria control mechanisms was not conducted.

5.1.7. Recommendation

Strong inter sectoral collaborative effort is needed towards adequate safe water supply, installation of electricity, and to introduce ICT. Additional manpower professional should be deployed to fulfil the gaps and Health centers should be well equipped to give in patient service. Adequate coartem supply and ITNs distribution should be conducted on regular basis, public should be sensitized in respect to promote their health, prevent disease, and to visit health facilities before complication occurred.

Conflict negotiator elders and religious fathers should be established to break the immemorial culture of the society.

Sector offices of the district should record the same reliable data in respect to demographic and climatic information of the district.

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Chapter V: Manuscript for Scientific Presentation for peer Reviewed Journal

5.1. Measles outbreak in Gela'lo District, Afar Region, Ethiopia, March, 2016

Ali Endris Mohammed¹, Professor Alemayehu Woerku^{1,2}, Mrs. Alefech Adisu^{1,3}

Introduction

Measles is a highly contagious human disease caused by RNA virus, which belongs to genus Morbillivirus which grows in the cells that line the back of the throat and lungs. It is transmitted through droplet nuclei or direct contact with infected person's respiratory secretions which is a most contagious, with one case can infecting twenty other individuals. It is characterized by symptoms like fever, cough, runny nose, conjunctivitis and a generalized maculopapular rash. The rash occurs 14 days after exposure to the virus (within a range of 7 to 18 days) and lasts for 5 to 6 days, and then fades on average⁴

Methods and Materials

From February 27, 2016 to March 15, 2016; we conducted observational unmatched case - control. We compared measles case patients with two control subjects recruited from the closest household. We designed a structured questionnaire in English and translated to the local language Afaric. We made house-to - house investigations to identify measles case and administer the questionnaire.

Result

We identified 79 suspected cases and 1 deaths in 2 kebeles of the district. A 1.25% case fatality rate from 27th February, 2016 15th March 2016. Seventy three of the patients (93.3%) were from Kodie kebele (attack

rate of 15.2 per 1000 population) and seven of the patients (11.3%) were from Debel Kebele (attack rate 0.18 per 1000 population).

We determined that prior vaccination (odds ratio (OR) = 4.7, 95% confidence interval (CI): 1.87 - 12.2), P - *Value* (0.0009) were highly associated with the disease. Knowledge of measles transmission of the caretaker of pediatric patients (OR= 0.49, 95% CI: 0.12 - 1.96), p - *value* (0.3), after adjusting for study difference, we find (MLH OR = 0.49, 95% CI: Case 0.1 - 1.8 and Controls 0.08 - 2.11, p - *value* = 0.3) that larger than the relative OR in either of the sex strata, suggesting that sex is indeed a confounder. Knowledge of measles transmission had no association to the disease.

¹ Ethiopian Field Epidemiology Training program (EFETP), Addis Ababa, Ethiopia

² School of Public Health, Addis Ababa University, Ethiopia

³ Tigray Region, Regional laboratory

Introduction

Based on the EDHS 2011, the Afar Regional State has a total population of 1,602,995, consisting of 892,998 men and 709,997 women. Urban inhabitants number 213,519 or 13.32% of the population. A further 1,474,755 or 92% were pastoralists and 128,239 or 8% were agro - pastoralist².

Measles is a highly contagious human disease caused by RNA virus, which belongs to genus Morbillivirus which grows in the cells that line the back of the throat and lungs. It is transmitted through droplet nuclei or direct contact with infected person's respiratory secretions which is a most contagious, with one case can infecting twenty other individuals. It is characterized by symptoms like fever, cough, runny nose, conjunctivitis and a generalized maculopapular rash. The rash occurs 14 days after exposure to the virus (within a range of 7 to 18 days) and lasts for 5 to 6 days, and then fades on average⁴.

Yet the only reservoir of measles virus is human beings; it can be transmitted by an infected person from four days prior to the onset of the rash to four days after the rash erupts. For people exposed to measles who have not been vaccinated almost 90% develop measles⁴.

Measles can be associated with complications such as diarrhea, pneumonia, encephalitis, croup, and otitis media and at last death due to viral replication or bacterial super infection. It can also cause miscarriage and premature birth in pregnant women. Increased disease severity and deaths due to complications are more common among poorly nourished young children especially those with vitamin A deficiency and human immunodeficiency virus (HIV) or other immune suppressing diseases, and adults greater than 20 years old (10 – 15)⁴.

In Afar Region measles is the major public health concern of all vaccine preventable diseases. In 2015, all 34 of the 34 districts reported measles with 1213 suspected cases and 80 deaths. From those 60% of the cases and 73% of the deaths occurred in under 5 year's children¹.

On February 20, 2016, the Gela'lo District Health Office announced to the Afar Regional Health Bureau Public Health Emergency Management (PHEM) department 79 suspected measles cases and 1 deaths occurred in two kebele (Debel and kodie) of the district. The region deployed a team of investigators on February 26, 2016, to undertake possible investigations and intervention measures⁵.

This study was conducted to investigate the measles suspected outbreak of Gela'lo District of the Afar region, February 26, 2016 to March 15, 2016 to confirm the existence of the outbreak by identifying the causative agent of the outbreak; by describing the data in terms of place, person and time; identifying potential risk factors of disease transmission and based on our finding to take possible intervention measures to control the outbreak and prevent occurrence of further cases.

Methods and Materials

We define: a suspected measles case based on World Health Organization (WHO) case definition, as any person with fever, maculopapular generalized rash and cough, and either coryza, or conjunctivitis or any person in whom a clinician suspects measles. A laboratory confirmed case-patient was defined as a patient who tested positive for measles specific IgM. An epidemiologically linked case-patient was defined as a patient without laboratory testing that met the measles case definition and either had contact with a laboratory confirmed case or lived in the same or adjacent district of a laboratory - confirmed case with in the period of the outbreak¹¹.

From February 26, 2016 to March 15, 2016; we conducted observational unmatched case-control. We compared measles case patients with two control subjects recruited from the closest household. We designed a structured questionnaire in English and translated to the local language Afaric. We made house-to-house investigations to identify measles case-patients and administer the questionnaire.

We used line list of suspected measles cases in Gela'lo District. All the households which suspected measles cases available were included in the study. We used simple random sampling method to select the measles case if more than 1 cases in a household. We selected two Controls per each case from the closest household with voluntary participation.

Data was exported into Epi - Info 7 (version 7.1.5.00). If records were found out of range; it was rechecked with the corresponding questionnaire, accordingly correction methods was taken. Analysis was done using the software Epi - info 7 (version 7.1.5.00).

Result

We identified 79 suspected cases and 1 deaths in 2 kebeles of the district. A 1.25% case fatality rate from 27th February, 2016 to 15th March 2016. Sixty three of the patients (93.3%) were from Kodie kebele (attack rate of 15.2 per 1000 population) and seven of the patients (8.7%) were from Debel Kebele (attack rate 0.18 per 1000 population).

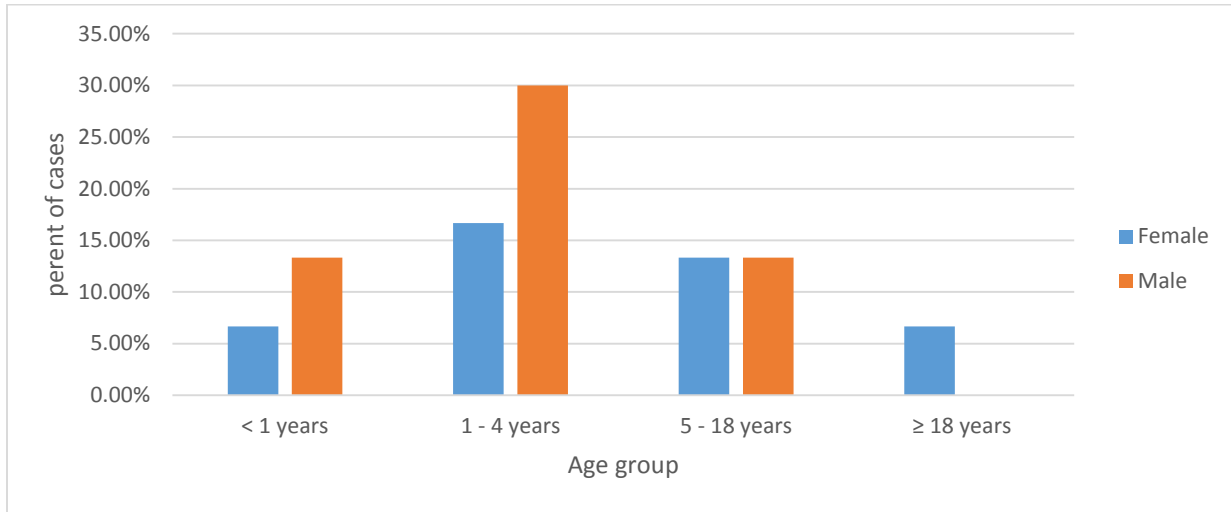


Figure 18. Sex and age group description of Measles cases Gela'lo District, Afar r region, Ethiopia

We determined that prior vaccination (odds ratio (OR) = 4.7, 95% confidence interval (CI): 1.87 - 12.2), P - Value (0.0009) were positively associated with the disease. Knowledge of measles transmission of the caretaker of pediatric patients (OR= 0.49, 95% CI: 0.12 - 1.96), p - value (0.3), after adjusting for study difference, we find (MLH OR = 0.49, 95% CI: Case 0.1 – 1.8 and Controls 0.08 – 2.11, p - value = 0.3) that larger than the relative OR in either of the sex strata, suggesting that sex is indeed a confounder. Knowledge of measles transmission had no association to the disease.

Living in a room with more than six people (OR = 13, 95% CI: 3.9 - 42.4) and p - value (1×10^{-6}) were positively associated with the disease. Recent contact with suspected measles patients (active measles cases) (OR = 3.87%, CI: 0.8 - 18.4), and p - value (0.07) were not associated with the disease.

Level of income (OR = 13, CI: 29 - 140.96), and p - value (9.72×10^{-8}) were positively associated with the disease. Educational status and marital status were not significant factors associated with disease contraction (Table 15).

Table 15. Crude analysis of measles cases and controls with regard different variables, Gela'lo District, Afar Region, Ethiopia, 2016.

Variable	Case	Control	Total	Odds	CI*		P – Value
				Ratio	Lower	Upper	
Vaccinated	20(66.67%)	18(30%)	38(42.2%)				
Unvaccinated	10(33.34%)	42(70%)	52(57.8)	4.667	1.825	11.93	0.0009
Total	30(100%)	60(100%)	90(100%)				
Knows measles transmission	3(11.1%)	11(18.33%)	14(15.5%)				
Don't know measles transmission				0.494	0.127	1.926	0.303
Total	30(100%)	60(100%)	90(100%)				
Living in 1 room more than 6 people	15(50%)	10(16.67%)	25(27.78%)				
Living in 1 room less than 6 people				5	1.86	13.4	0.00087
Total	30(100%)	60(100%)	90(100%)				
Recent contact history with measles cases	28(93.34%)	34(56.67%)	62(68.9%)				
No recent contact history with measles cases	2(6.66%)	26(43.33%)	28(31.1%)	10.7	2.33	49.08	0.00039
Total	30(100%)	60(100%)	90(100%)				

Have travel History	1(3.34%)	4(6.67%)	5(5.55%)				
Have no travel History	29(96.66%)	56(93.33%)	85(94.45%)	0.48	0.051	4.52	0.51
Total	30(100%)	60(100%)	90(100%)				
Mother Illiterate	4(13.34%)	5(8.34%)	9(10%)				
Mother Literate	26(86.66%)	55(91.66%)	81(90%)	1.69	0.41	6.82	0.456
Total	30(100%)	60(100%)	90(100%)				
Low income	15(50%)	2(3.34%)	17(18.89%)				
Medium and high income	15(50%)	58(96.66%)	73(81.11%)	29	5.96	140.92	0.000009
Total	30(100%)	60(100%)	90(100%)				
Single	1(33.34%)	6(10%)	7(7.78%)				
Married	29(66.66%)	54(90%)	83(92.22%)	0.31	0.035	2.72	0.265
Total	30(100%)	60(100%)	90(100%)				

CI* = confidence interval

Complications

There were 1 death identified among the 80 patients with measles (case fatality rate 5.8%). All patients who came from the kodei and Debel Kebeles. From all suspected measles cases, 66.7% were less than 5 years. The patients who died had a sign and symptom of malnutrition, according to a local health provider. We determined complications among patients enrolled in the case-control study of the 30 case-patients, 60% developed diarrhea, 75.8% developed pneumonia, 43.3% had ear infection, 10% had convulsions, 6.67% had change in vision, and 6.67% had blindness.

Prevention and control actions taken

Vaccination of measles was given for defaulters aged six to 59 months; cases were managed by distributing supportive treatments (Antibiotics, tetracycline ointment, oral rehydrating salt, Vitamin A, and anti-pyretics). We delivered intensive health education campaign with community leaders and health professionals at social gathering areas like school.

We discussed with community leaders, health professionals and administrative office of the district how to create awareness among the community, two Nurses and two health extension workers made daily house to house visit to search additional cases, trace defaulters of vaccination and to see patient progress. After intervention activities were initiated the number of cases began to decline rapidly.

Conclusion

Majority of the cases were under 5 years old. From those 80 measles suspected cases, 23.33% of them had signs and symptoms of malnutrition. This was due to El Ni - ño global impact which aggravated the drought in the pastoralist regions like Afar region in Ethiopia

The occurrence of this outbreak in under 5 years' cases may be due to the accumulation of susceptible under 5 years' children which was not vaccinated due to low coverage of measles vaccination.

Afar region has made steady progress with measles vaccination programs among children < 5 years since the region started EPI. Gela'lo District also has made from 90.6% to 90.9% from 2015 to 2016 G.C⁵. But, based on our findings 66.67% of suspected measles cases were not vaccinated.

In the crude analysis we found that prior vaccination was the most protective of disease transmission. Prior vaccination rate was higher among controls (80.8%) than cases (19.2%)

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Chapter VI: Abstract for Scientific Presentation

6.1. Secondary data analysis of maternal deaths, in Tigray region, Ethiopia, from 2013 to 2015

Introduction

Pregnancy is a normal healthy state. Most of the deaths are preventable. The International health and development community had called for action to address this problem. The Millennium Declaration in 2000; goal 5 had had called for 75 % reduction in maternal mortality ratio, from 1990 to 2015.

Ethiopia is one of the six countries that contribute to about 50% of the maternal deaths Worldwide. The others being India, Nigeria, Pakistan, Afghanistan and the Democratic Republic of Congo (Lancet, April 2010).

We conducted retrospective study of maternal death audit in Tigray region to describe the data in term of time, place, and person. The causes of maternal deaths were described by percent.

Methods and materials

We conducted retrospective study of maternal death audit in Tigray region. Any women aged 15 - 49 years, who died while she was pregnant or within 42 days of the termination of pregnancy were counted. Any woman less than 15 years old who died while she was pregnant was included. Those women who died in study period but were not pregnant, were excluded. The data were cleaned by MS excel and analyzed by Epi info 7.

Result

The number of maternal deaths in three years were 286. In 2013 G.C, 45.5% of deaths were occurred and 72.64% were direct obstetrics. The timing of deaths relation to pregnancy in postpartum were 76.89%. Most of the deaths were due to hemorrhage followed by sepsis which were 50.94% and 8.49% respectively.

Conclusion

Most of the deaths occurred in those three years were preventable deaths. It possible to lower the number of avoidable maternal death

6.2. Maternal Deaths surveillance and Response in Tigray Region, Ethiopia, 2016

Introduction

Public health surveillance is an ongoing, systemic collection, analysis, interpretation and dissemination of health data for the planning, implementation and evaluation of public health programs.

Because, measuring maternal mortality is difficult and complex, reliable estimates of the dimensions of the problem are not generally available and assessing progress towards the goal of reducing maternal Mortality is difficult. In particular, it tells us nothing about the faces behind the numbers, the individual stories of suffering and distress and the real underlying reasons why particular women died. We conducted MDSR evaluation to evaluate the performance of the existing surveillance system of maternal deaths of the North Western Zone, Tigray region, April, 2016.

Methods and Materials

This surveillance system evaluation was conducted in 4 districts of North West Zone of Tigray Region which has a total of 8 districts (one town and 7 woreda). North West zone have a total population of 835,853 based on the 2007 population projection. There are 1 hospitals (zonal), 21 health centers and 52 health posts.

The surveillance system evaluation included a total of twelve study units; eight governmental health facilities (one Hospital, four health centers and three health posts), two district health offices of the Western Zone of Tigray Region, the Regional Health Bureau and the Regional Research Laboratory.

Result

In most of the health facilities and districts standard case definitions of the selected disease are available. Maternal death is defined as the death of woman while pregnant or within 42 days of the termination of pregnancy irrespective of the duration and site of the pregnancy, from any cause, related to or aggravated by the pregnancy, labor or its management but not from accidental or incidental cause.

In 16 of the 20 health facilities (80%) there were national manuals for MDSR. But in 4(10%) of the health facilities which had not national manual for MDSR were health posts in rural area.

Conclusion

There was a surveillance focal person in all the visited sites but the focal persons had work overload and lack of capacity to do data analysis regularly. There was a poor practice of interpretation and utilization of MDSR data at facility and district level, simply compile data from the next lower level and submitted to region without further analysis. Thus the collected data has a limited usefulness. The flow of data from lower level (health post) to higher level (regional and national) is very great, however; reported deaths were underestimated due to the trend of reporting only from governmental health facilities and very few higher private and NGO clinics, poor health seeking behavior of the population (0.97%), which is much more less than the WHO standard (2.5) this means based on the WHO standard everyone is expected to visit health facility 2.5 times per year.

Chapter VII. Narrative Summary of Disaster Situation Visited

7.1. Belg/Sugum rapid emergency need assessment in health sector, Afar region, 2015

Executive summary

Introduction:

Participatory humanitarian needs assessments help understand the actual emergency situations at the grassroots level. The Government of Ethiopia has been conducting two Disaster Risk Management and Food Security Sector led by multi-agency emergency needs assessments following the Meher/Karma and Belg/Sugum rainy seasons every year in selected hotspot woredas nationwide.

This health/nutrition emergency needs assessment was anticipated to identify, analyze and evaluate public health risk factors resulted from the outcomes of 2015 Sugum season in Afar Regional State based on six hotspot woredas, (two woredas from zone four and four woredas from Zone two). It is known to be affected with recurrent drought. Moreover, access to food and nutrition, water supply and sanitation, financial income, and health services is very low. The major health risks in the region are Malaria, Diarrhea, pneumonia & other AURTI².

Objective

- To assess the impact of the Belg/Sugum season on the community's health and nutrition status, 2015.

Method and materials

The 2015 multi-agency *Belg/Sugum* emergency needs assessment commenced on June 23rd with briefing at the regional level and completed after six days on July 10th. Woreda level briefings were discussed with higher officials, heads and experts of line offices including administration, Health, pastoral and agro-pastoral office, Water Resources office, Women and Children offices. For the health part, targeted data sources were Woreda Health Offices records, Woreda officials, experts, community members and NGOs implementing in the areas.

Result

Multi-sector Public Health Emergency Management (PHEM) coordination forums in most of the assessed woredas are either nonexistent or nonfunctional. Only 50% of them are reported to happen on a monthly or quarterly basis. Likewise, Public Health Emergency (PHE) preparedness and response plan is not available in 4(66.7% of visited) woredas. All of visited woredas do not have accessible emergency response fund and trained RRT.

All visited woredas except Bidu (Zone 2), expressed their fear of increased malaria cases in the coming six months. Risk factors include being malaria endemic area and presence of breeding sites; lesser ITN utilization rate (33% in the visited woredas) or inadequate (average 69%) coverage of IRS.

Discussions

Multi-sector Public Health Emergency Management (PHEM) coordination forums in most of the assessed woredas were either nonexistent or nonfunctional and Public Health Emergency (PHE) preparedness and response plan were not available in 4(66.7% of visited) woredas. These gaps should be highly considered by the woredas themselves and by the region.

The common top five morbidity causes for children under five years of age and the top 5 causes of morbidity above 5 years had a slight variation in all assessed woredas but the magnitude of these disease were different.

Conclusion

The region and woredas should allocate budget for coordination and preparedness and Strengthen communication system/ use of all possible means.

Those woredas which had high number of cases and low supplies should be prioritized and Avail emergency drugs and supplies in ample amount. The woredas should conduct measles SIA in their district and neighboring districts with suspected measles cases and strengthen routine EPI.

The Region should Strengthen Health & Nutrition activities and deploy nutrition supplies for Barahle and Bidu urgently.

7.1.1. Introduction

The Afar regional state is one of the nine regional state of Ethiopia situated in the northeastern part of the country. The Afar triangle, the northern part of which is the Danakil Depression, is part of the great rift valley of Ethiopia, and is located in the north of the region. The southern part of the region consists of the valley of the Awash River, which empties into a string of lake along the Ethiopian-Djibouti border. It is divided in to five administrative zones, 32 woredas, 2 town administrations and 404 kebeles.

Based on the EDHS 2012, the Afar Regional State has a total population of 1,602,995, consisting of 892,998 men and 709,997 women; urban inhabitants number 213,519 or 13.32% of the population, a further 1,474,755 or 92% were pastoralists and 128,239 or 8% were agro-pastoralist. With an estimated area of 72,052.78 square kilometers, this region has an estimated density of 22.2 people per square kilometer¹.

Participatory humanitarian needs assessments help understand the actual emergency situations at the grassroots level. The Government of Ethiopia has been conducting two Disaster Risk Management and Food Security Sector led multi-agency emergency needs assessments following the Meher/Karma and Belg/Sugum rainy seasons every year in selected hotspot woredas nationwide.

This health/nutrition emergency needs assessment was anticipated to identify, analyze and evaluate public health risk factors resulted from the outcomes of 2015 Sugum season in Afar Regional State based on six hotspot woredas, (two woredas from zone four and four woredas from Zone two). It is known to be affected with recurrent drought.

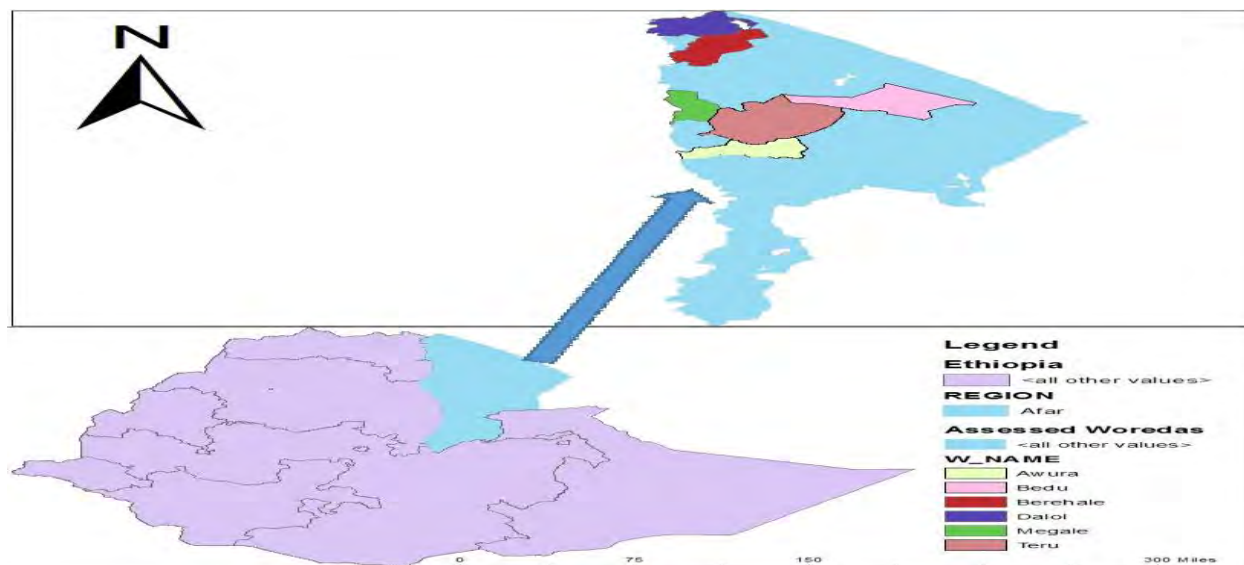


Figure 19. Geographic description of assessed woreda in Afar Region, Ethiopia

Table 16. Profile of assessed woredas (districts)

Woreda	Population				Health facilities		
	Total	M	F	U5	Hospital	HC	HP
Teru	74,756	43,841	30,915	5,455	0	2	5
Awra	38,401	21,095	16,779	2,822	0	2	7
Bidu	75,000	42,000	33,000	5,512	0	1	2
Barahle	88,261	50,950	37,311	6,487	0	4	13
Magale	30,999	16,917	14,082	2,278	0	2	6
Dalol	92,444	51,775	40,669	6,795	0	3	11
Ground total	399,861	184,578	139,756	23,838	0	14	161

7.1.2. Objectives

General objective

- To assess the impact of the Belg/Sugum season on the community's health and nutrition status in these six woredas, 2015

Specific objectives

- To assess the type, degree and effects of any epidemics occurred
- To identify top-five causes of morbidity in both < 5 children and adults
- To assess the woredas' practice in public health emergency management (PHEM) and coordination of multi-sector PHEM forums
- To show the trend of malnutrition
- To suggest the development of necessary emergency health and nutrition preparedness and response plans based on the findings of the assessment.

7.1.3. Methods and materials

The 2015 multi-agency *Belg/Sugum* emergency needs assessment commenced on June 23rd with briefing at the regional level and completed after six days on July 10th. Woreda level briefings were discussed with higher officials, heads and experts of line offices including administration, Health, pastoral and agro-pastoral office, Water Resources office, Women and Children offices. For the health part, targeted data sources were Woreda Health Offices records, Woreda officials, experts, community members and NGOs implementing in the areas.

Data collection was made using structured formats and checklists while multi-sector discussion with Woreda government, document review, community interview and field observation were used for verification. Findings were analysed using MS Excel.

7.1.4. Results

Health Profile

I. Coordination

Multi-sector Public Health Emergency Management (PHEM) coordination forums in most of the assessed woredas are either nonexistent or nonfunctional. Only 50% of them are reported to happen on a monthly or quarterly basis. Likewise, Public Health Emergency (PHE) preparedness and response plan is not available in 4(66.7% of visited) woredas. Meanwhile, all of visited woredas do not have accessible emergency response fund and trained RRT.

Table 17. Coordination of visited woredas

Coordination in Visited Woredas	Teru	Awra	Bidu	Barahle	Magale	Dalol
Multi-sector PHEM coordination forum	N	N	N	Y	N	N
PHE preparedness and response plan	N	Y	N	N	Y	N
having accessible emergency response fund	N	N	N	N	N	N
Trained RRT	N	N	N	N	N	N

II. Morbidity and Mortality

As shown in tables 2.1.4.2 and 2.1.4.3. Top five morbidity causes for both children under five years of age and above 5 years in the assessed areas had a slight variation in order. But the common top five morbidity causes for children under five years of age were, diarrhea, pneumonia, malaria, malnutrition and acute febrile illnesses. The top 5 causes of morbidity above 5 years were: Malaria, UTI, Diarrhea, URTI and Pneumonia.

Table 18. Top five cause of morbidity of below 5 years of assessed woredas in Afar region, 2015

Below 5 years Morbidity						
S.N	Awra	Teru	Magale	Barahle	Bidu	Dalol
1	Diarrhea/Non bloody	Malaria	Malaria	Diarrhea	Pneumonia	URTI
2	Malaria	Diarrhea	Pneumonia	Pneumonia	Malnutrition	Diarrhea
3	Pneumonia	Pneumonia	Diarrhea	URTI	Diarrhea	AFI
4	AFI	Malnutrition	Malnutrition	AFI	conjunctivitis	Pneumonia
5	Malnutrition	AFI	URTI	Malaria	otitis Media	Malaria

Table 19. Top five cause of morbidity of above 5 years of assessed woredas in Afar region, 2015

Above 5 years Morbidity						
S.N	Awra	Teru	Magale	Barahle	Bidu	Dalol
1	Malaria	UTI	Malaria	Malaria	UTI	URTI
2	URTI	URTI	Bronchitis	Diarrhea	Pneumonia	Diarrhea
3	Diarrhea/non bloody	Malaria	UTI	AFI	Bronchitis	AFI
4	Trauma	Pneumonia	URTI	Pneumonia	Diarrhea	Pneumonia
5	UTI	AFI	intestinal parasite	URTI	Conjunctivitis	Malaria

III. Outbreak prone diseases

The main diseases in focus were all the 20 diseases under surveillance with special attention to Malaria, AWD, Meningitis and Measles. But there were no detected outbreaks in assessed woredas.

Malaria

Malaria was the top cause of morbidity for both under-fives and above five years. Malaria is the top highest number was registered in Zone four, Awra and Teru. Within the past five months a total of 3,533 cases were diagnosis. The minimum case of malaria cases were in Bidu, which was 9. No death were registered in all assessed woredas.

All visited woredas except Bidu (Zone 2), expressed their fear of increased malaria cases in the coming six months. Risk factors include being malaria endemic area and presence of breeding sites; lesser ITN utilization rate (33% in the visited woredas) or inadequate (average 69%) coverage of IRS.

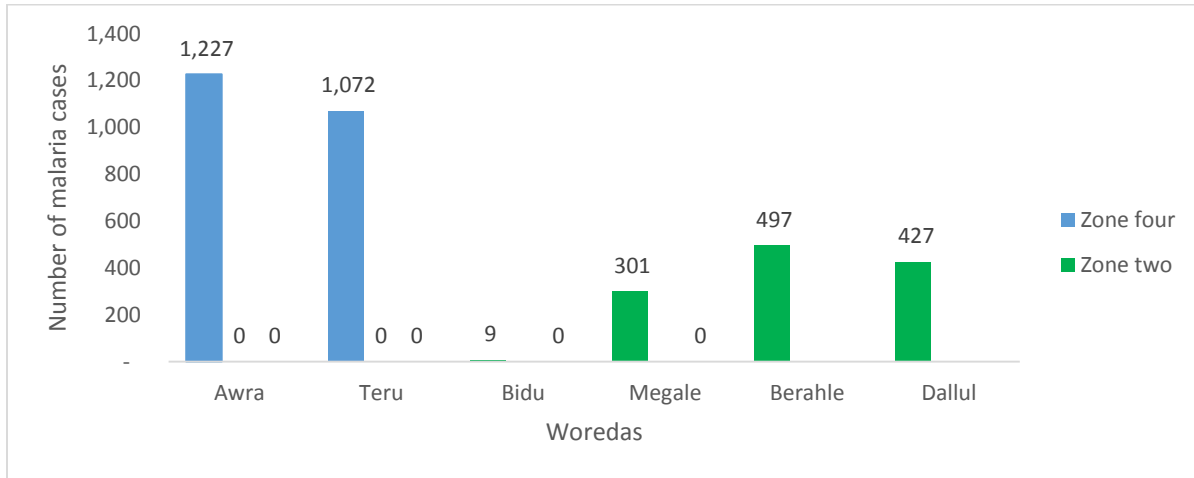


Figure 20. Malaria cases of assessed woredas in Afar region, January – May, 2015

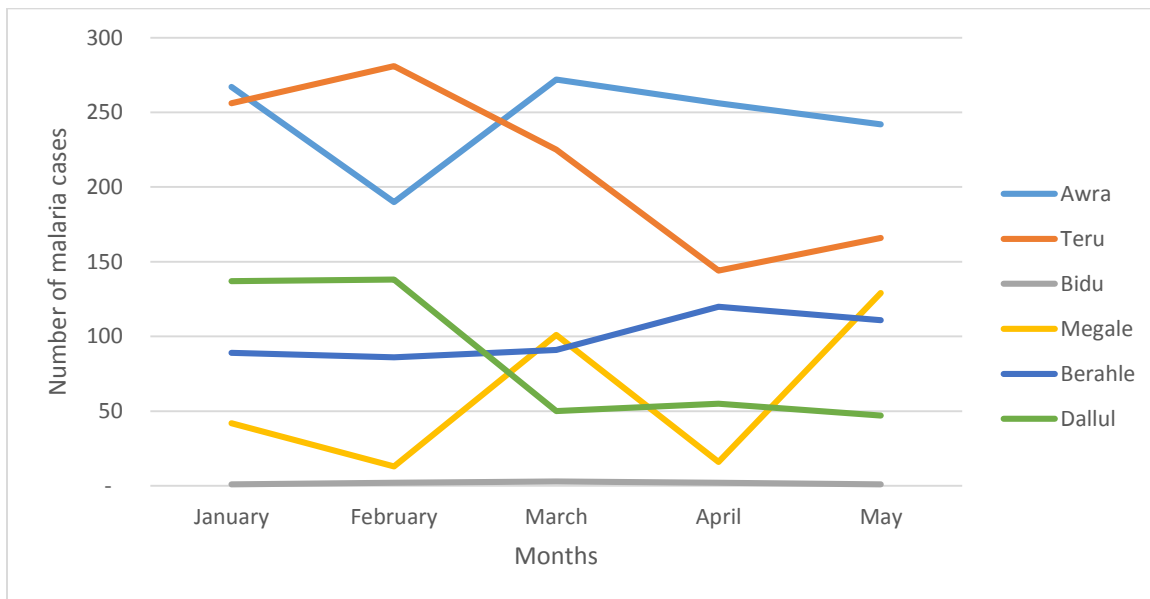


Figure 21. Trend of malaria cases stratified by assessed woreda in Afar region, 2015

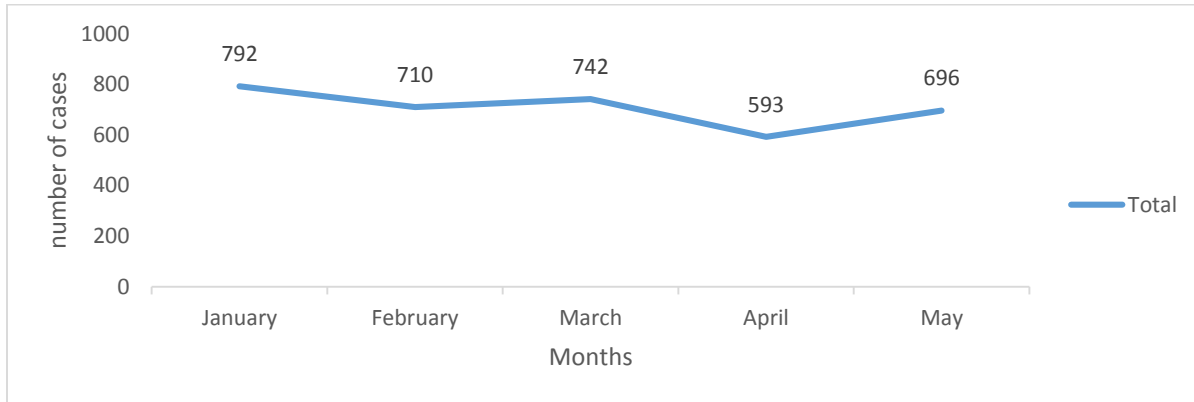


Figure 22. Trend of total malaria cases from January – May in Afar region, 2015

Acute Watery Diarrhea

Within the past three years no AWD was registered with in the health institutions of assessed woredas. The latrine coverage of assessed woredas ranges from minimum in Bidu 5% with utilization rate of 3% and the maximum coverage in Magale woreda with utilization rate of 55%. The maximum safe water coverage was 26% registered in Barahle and the lowest was in Bidu which was 0. The average latrine coverage in all assessed woredas were 27% with utilization coverage of 22%. The average safe water coverage for the assessed woredas is 9.5%.

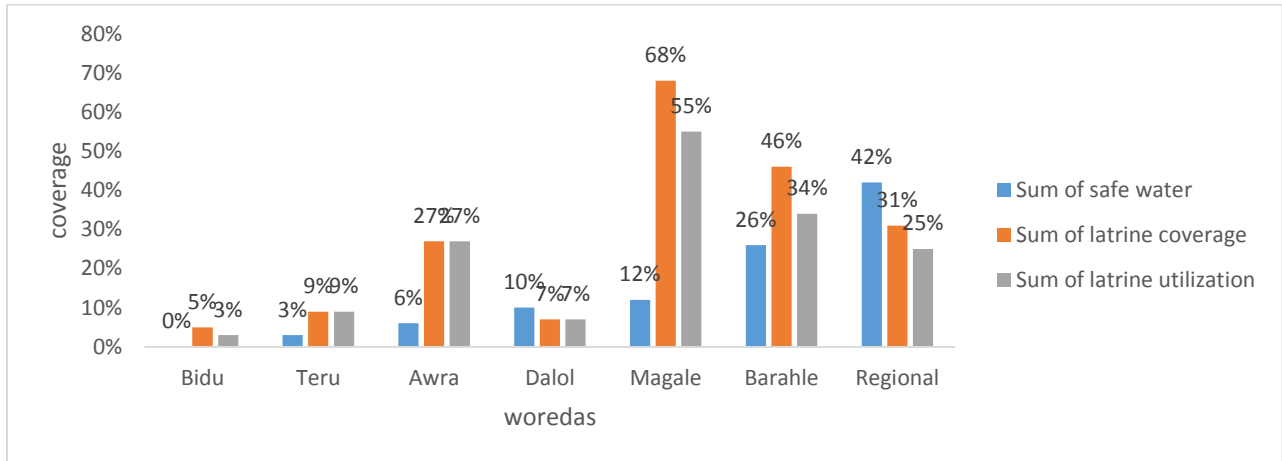


Figure 23. Latrine coverage, latrine utilization, and safe water utilization in all assessed woreda in Afar region, 2015

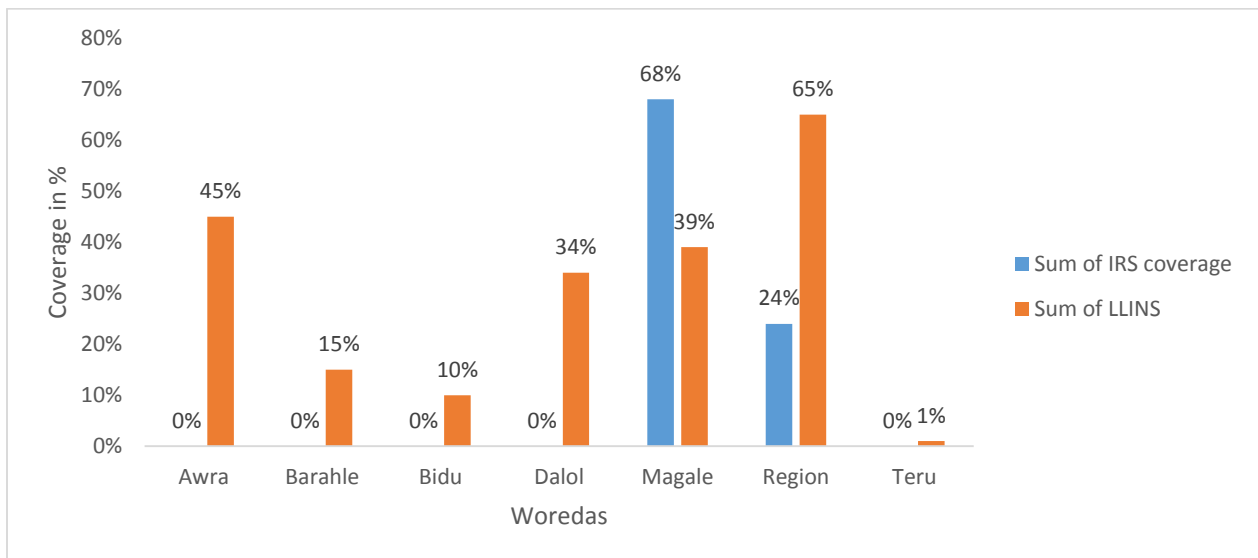


Figure 24. IRS and LLINS coverage of assessed woredas in Afar region, 2015

Measles:

There were no detected suspected measles case in the assessed woredas. The coverage of measles vaccination in the selected woredas ranges from 62% (Magale) and 76 % (Bidu and Awra). There are only three woredas which undergone supplementary immunization activities (SIA) in assessed woredas. The average routine EPI measles coverage is 70%.

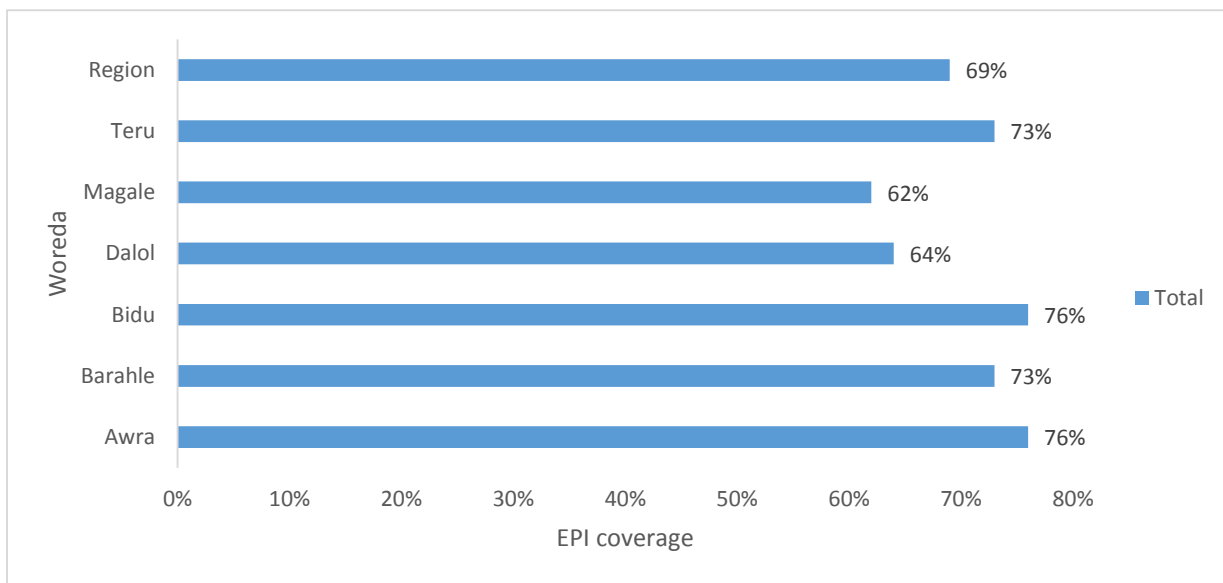


Figure 25. EPI coverage of assessed woredas in Afar region, 2015

Meningitis:

In Barahle there was 1 suspected death case of Meningitis. The case was 5 years, male, died immediately. The case was not further investigated and no confirmed cases of meningitis reported in the 5 months period and also no suspected case in the last 3 years in these woredas.

IV. Emergency health and nutrition

Nutrition Situation

The trend of malnutrition of under 5 years for the last 5 months showed some decline in April, but heads down after April. The overall malnutrition situation in the assessed woredas were poor with proxy SAM ranging from 0.7 in Bidu and 12.5% in Barahle. The regional proxy SAM rate were 4.1% which falls under normal, but needs special attention as there were aggravating factors. No shortage of nutrition supplies were reported in all those woredas.

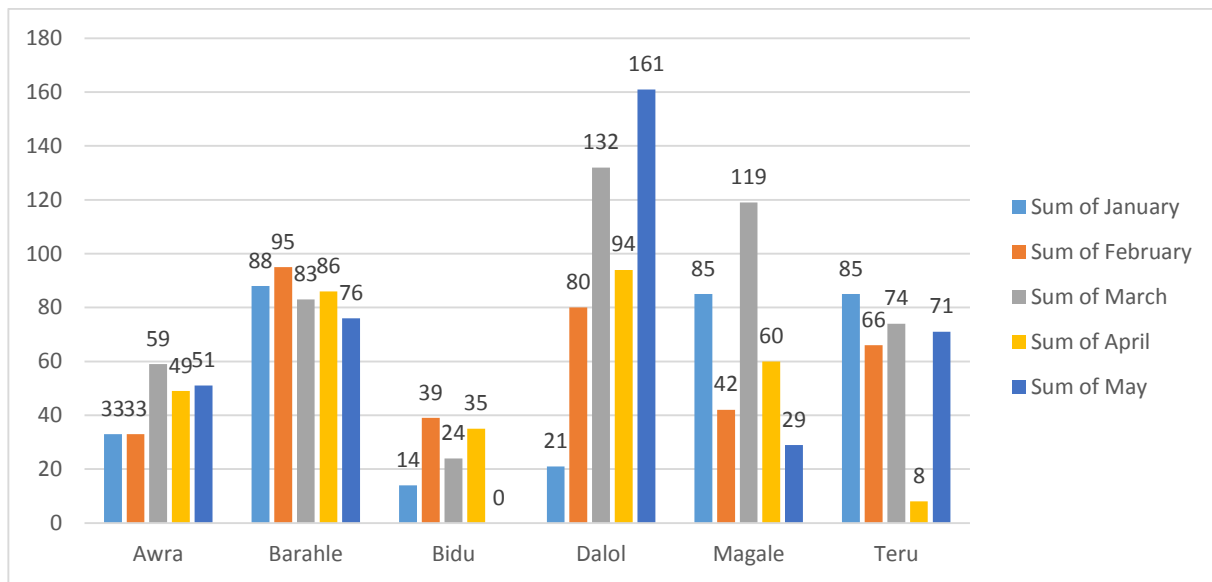


Figure 26. Total SAM cases of assessed woredas in Afar region, From January to May, 2015

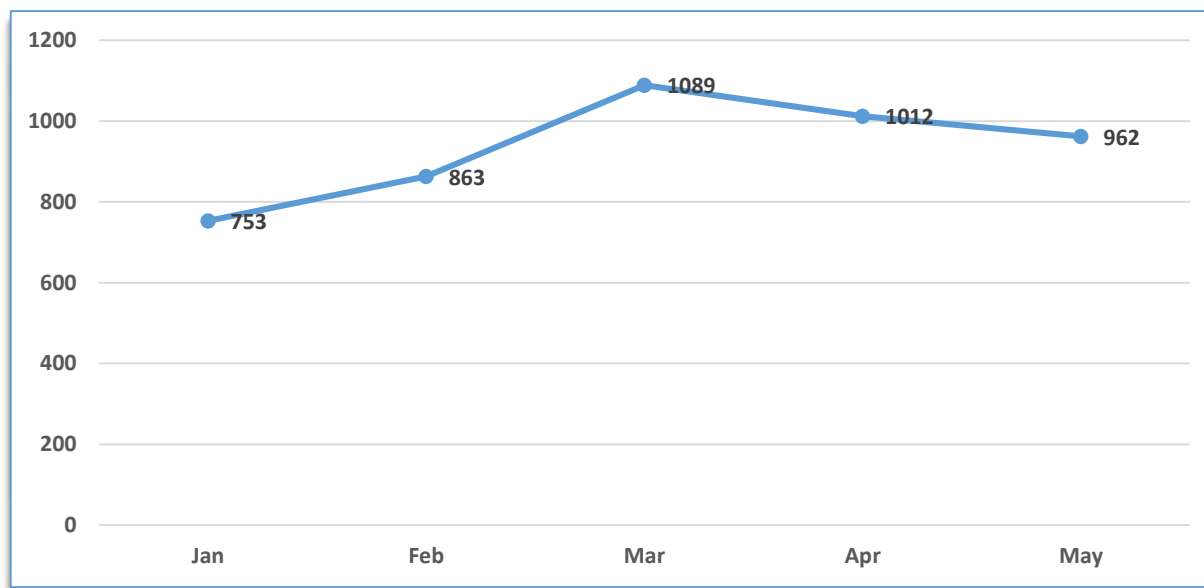


Figure 27. Trend of SAM cases of Afar region from January to May, 2015

V. Availability of emergency drugs

In all Woredas the availability of emergency drugs and supplies were assessed. Based on the findings, almost all woredas have emergency drugs and supplies, but not in enough amount. Coartum, Amoxicillin suspension and Vit A were mentioned by most woredas as shortages. ORS were the supply excessively available in all the woredas. RDT and LP set for meningitis, and CTC kit for AWD were not available in all the assessed woredas.

Table 20. Availability of emergency Drugs and supplies in assessed Districts

Drugs/Supplies	Bidu	Magale	Barahle	Dalol	Awra	Teru	Total
Ringer Lactate in bag	30	0	0	0	0	0	188
ORS in sachets	1200	7000	2000	0	1000	1500	47231
Doxycycline in capsules	60	0	0	0	0	0	27115

Syringe with needle each	30	0	0	0	50	0	12811
Gloves in pairs	10	0	0	0	25	0	5505
Amoxil Suspension In bottles	0	0	0	0	0	0	295
Tetracycline Ointment In tubes	0	0	0	0	20	0	218
Vitamin A in tin	1	0	0	4	1	0	28
Coartum for Malaria in strips	15	0	0	30	10	0	4062
RDT for Malaria in	50	0	0	50	40	0	542
RDT for Meningitis	0	0	0	0	0	0	0
LP Set	0	0	0	0	0	0	0
CTC Kit	0	0	0	0	0	0	0
RUTF in cartoon of 150 sachet	30	78	0	104	57	20	419
F-100 in sachet	0	28	50	50	0	0	148
F-75 in sachet	0	42	50	50	1	0	153

7.1.5. Discussion

Multi-sector Public Health Emergency Management (PHEM) coordination forums in most of the assessed woredas were either nonexistent or nonfunctional and Public Health Emergency (PHE) preparedness and response plan were not available in 4(66.7% of visited) woredas. These gaps should be highly considered by the woredas themselves and by the region.

The common top five morbidity causes for children under five years of age and the top 5 causes of morbidity above 5 years had a slight variation in all assessed woredas but the magnitude of these disease were different.

The overall health and nutrition condition in the assessed woredas were at high risk of increased malnutrition rate and possible outbreak especially high SAM cases in Barahle (12.5%).

Low report of SAM and Malaria cases from Bidu provided that the woreda was hot spot under priority II classification (66 Malaria (only 1 case in May) and 77 SAM in 5 months while malnutrition was 3 cause of morbidity for U5).

No budget allocated for coordination and emergency preparedness.

7.1.6. Recommendation

The region and woredas should allocate budget for coordination and preparedness and Strengthen communication system/ use of all possible means.

Those woredas which had high number of cases and low supplies should be prioritized and Avail emergency drugs and supplies in ample amount. The woredas should conduct measles SIA in their district and neighboring districts with suspected measles cases and strengthen routine EPI.

The Region should Strengthen Health & Nutrition activities and deploy nutrition supplies for Barahle and Bidu urgently.

Preparedness plan

The preparedness plan considers to address main public health concerns addressed in the assessment including drugs, nutrition and medical supplies, operational cost and mobilization cost needed with in the region

Table 21. Summary of preparedness plan

Cost Break down for health and nutrition Emergency preparedness and response, Afar July-December 2015					
Public Health Concern	Total Cost of drugs, supplies and CTC Kit	Operational cost	Inter woreda resource mobilization	Total	USD
AWD	17,870,286	7,148,114.52	2,680,543	27,698,944	1,338,113
Malaria	4,017,750	1,607,099.93	602,662	6,227,512	300,846
Measles	160,004	64,001.50	24,001	248,006	11,981
Meningitis	4,110,356	1,644,142.26	616,553	6,371,051	307,780
Malnutrition	18,972,611	7,589,044.43	2,845,892	29,407,547	1,420,654
Total	45,131,007	18,052,403	6,769,651	69,953,060	3,379,375

7.1.7. References

1. Wikipedia, the free encyclopedia. Afar region, Ethiopia. June, 2012. 2. CSA.
2. Housing and population census of Ethiopia, 2007.
3. CSA. Ethiopia Demographic and Health Survey. Addis Ababa, Central Statistics Authority, 2014

Chapter VIII: Proposal for Epidemiological Research project

8.1. Prevalence of malaria and Factors associated with it among workers in Tendaho Sugar project, Aysata, Afar region

8.1.1. Introduction

Tendaho Sugar Factory found at lower Awash River Basin of Afar Regional State around Mile, Dubti, Aysata, and Afambo woredas at a distance of 670 k.ms. From Addis Ababa. The project were started in 2006 E.C. with 50,000 hectares of lands to cultivate and a two-phase factory construction with a 26,000 TCD with its full capacity and the Factory expected to create 42, 0000 jobs opportunity³.

The project builds 17,223 residential and 308 non-residential house have been planned to be built. To date 3,387 residential and 61 non-residential house have been constructed in the first phase and more 5,628 residential and 85 non-residential house have been built in the second phase of the housing project. Totally 9,015 residential and 146 non-residential houses have been built³.

Aysata is one of the eight districts found in zone one of Afar Region. It is a town in northeastern Ethiopia, and before 2007 G.C. it was the capital of the Afar Region of Ethiopia. It was established in 16th century name of historical place during Ahmad Gran. The Sultan of Auwssa/ Aysata great rule from the capital of the once- Adal, an Afar-Somali kingdom.

Based on the EDHS 2011, it has a population of 60,589, consisting of 32,446 male and 28,143 women which was 1:1 male to female ratio¹.

Statement of the problems

Based on our ayasat Distric Health profile evaluation, Malaria was the leading causes of morbidity even though it shows a 14% decrement trend from 2014. No data was available for top causes of admission, <5 children and top causes of mortality.

Literature review

In the horn of Africa, Ethiopia and Eritrea have also experienced substantial decrease in the burden of malaria linked to the introduction of malaria control measures. Substantial increases in the funding for malaria control and procurement and distribution of effective means for prevention and treatment are associated with fall in malaria burden⁶.

Approximately 52 million people (68%) live in malaria risk areas in Ethiopia, primarily at altitudes below 2,000 meters. Malaria is mainly seasonal with unstable transmission in the highland fringe areas and of relatively longer transmission duration in lowland areas, river basins and valleys. Historically, there have been an estimated 10 million clinical malaria cases annually. Since 2006, however, cases have reduced substantially. On average, 60%-70% of malaria cases have been due to *P. falciparum*, with the remainder caused by *P. vivax*. *Anopheles arabiensis* is the main malaria vector; *An. pharoensis*, *An. funestus* and *An. nili* play a role as secondary vectors⁴.

Ethiopia is also one of the most malaria epidemic-prone countries in Africa. Rates of morbidity and mortality increase dramatically (i.e. 3-5 fold) during epidemics. Since 2005, Ethiopia has scaled-up one of the largest and most ambitious malaria control programs in Africa, designed to support the country's Health Sector Development Plan (HSDP), the NSP and the national child survival strategy, in order to reduce under-five mortality rates by two thirds by 2015. This SUFI phase has been possible as a result of substantial increases in resources from various funding sources and the commitment of the Government of Ethiopia (GoE). These

resources have enabled an unprecedented scale-up of malaria control interventions: prompt and effective treatment, case management through rolling-out of the highly efficacious anti-malaria drugs (i.e. ACTs), and selective vector control, with a special emphasis on increasing coverage and use of ITNs, and targeted and timely application of IRS of households with insecticide⁴.

Due to the unstable and seasonal transmission of malaria in country: protective immunity of the population is generally low and all age groups are at risk. Prevalence of malaria is currently estimated to be 1.3%⁵.

Ethiopia's malaria control program is currently shifting from the SUFI phase to consolidating and refining malaria reduction interventions, through integrated programming for impact. This will involve gradually moving from scaling-up for impact to programming (integrated within the overall health system) for sustainable and equitable long-term impact. The challenge now is maintaining the existing high LLIN coverage and increasing utilization rates. Further, targeting IRS based on an epidemiologically sound, affordable and sustainable approach continues to be a challenge⁴.

Significance of the study

Human factors in Ethiopia contributing to the spread of malaria include population growth and movements, urbanization, water development schemes, agricultural development, conflicts, and improper use of drugs and the attendant consequences of the emerging drug-resistant malaria parasites. The findings of this study will help to design strategies for improving malaria surveillance in the development project areas in Ethiopia.

8.1.2. Objectives

General objective

- To assess the prevalence of malaria and factors associated with it among workers of Tendaho Sugar

Factory project and Aysata district, Aysata, Afar Region, Ethiopia, 2016

Specific Objectives

- To determine prevalence of malaria among the factory workers
- To assess the possible risk factors associated with the occurrence of malaria
- To measure the coverage of malaria control services including insecticide-treated nets (ITNs), IRS, and antimalarial medicines used for treatment
- To recommend malaria prevention interventions

8.1.3. Methods and Materials

Study Area and Period: This study will be conducted in Tendaho Sugar Project and Aysaita District, Aysata Woreda, Afar region, Ethiopia, from August 30, 2016 to September 30, 2016.

Source population: the source population for this study will be Aysata woreda (District) total population and Tendaho sugar project workers.

Study Population: The study population will be Tendaho Sugar project workers and adjacent kebeles to Tendaho sugar project. The estimated study population.

Study Sample and study unit: the study unit of this study will be the households which selected by our sampling methods and the study unit will be the respond which we will interview in our study.

Study Design: Cross-sectional Study design

Sample Size Determination: The minimum sample size required for a large population;

(N = 20,000) is: $n = \frac{(Z_{\alpha/2})^2 p (1-p)}{E^2}$ = the required minimum sample will be obtained from Epi info 7 (Statcalc).

Where; Z = 1.64 P = 1.3% w = ±10%, 90% CI Since, the above sample is taken from a relatively large population (N = 60,589), the required minimum sample is 493 households.

The minimum sample size required for second objective on factors associated with malaria with two population proportion: $n = \frac{(Z_{\alpha/2})^2 p (1-p)}{E^2}$ = the required minimum sample will be obtained from Epi info 7 (StatCalc), the sample size is 840. We take the maximum sample size of the two as a final and we take n = 840.

Sampling Methods: we will use systemic random sampling methods using Sampling frame of our study population by numbering 1 to N household to draw n Sampling unit. The K^{th} intervals which we will draw the study sample will be calculated by; $K^{\text{th}} = N/n$, whereas, N = study population, and n = total sample size which needed in our study. The first household will be selected by simple random sampling between 1 to K^{th} value and the other will be included in our study by K^{th} interval.

Inclusion criteria: Participants should live in the project sites at least for the last 15 days.

Exclusion Criteria: Workers who were seriously ill or couldn't respond for questions and households which will be closed during data collection will be excluded.

Ethical consideration

Ethical clearance will be obtained from the Ethical review board of SNNPR Health Bureau. Communication with the different office administrators will be made through formal letter obtained from the regional Health Bureau. Oral permission will be asked for sugar factory project office authorities for their cooperation. After the purpose and objective of the study have been informed, verbal consent will be obtained from each study participants. Participants will also be informed that participation will be on voluntary basis and they can stop or leave from the participation at any time if they are not comfortable about the questionnaire. In order to keep confidentiality of any information provided by study subjects, the data collection procedure will be unidentified/unnamed and keeping their privacy during the interview by interviewing them alone.

Variables

Independent variables are sex, age, marital status, household socio-economic characteristics and malaria-specific issues such as: household characteristics including number of sleeping rooms and places. Status of IRS, including whether insecticide had been applied to household structures and whether re-plastering of interior walls of dwellings had taken place. Household ownership and utilization of nets, source of origin, and treatment status of nets.

Dependent variables is the outcome: malaria infection

Operational definition

Educational level: Illiterate: person who cannot read and write

Primary: person who complete 1-8 grades

Secondary: person who complete high school (9-12) grade

Tertiary: Person who complete college and above

Data Collection and management

The data collectors will be trained on data collection tools. In order to collect blood specimens and conduct interview at the same time from the study subjects, the data collectors will be laboratory technicians who are diploma and above. The blood sample will be tested by RDT and data will be collected using structured questionnaire. We will collect primary data from the project workers by interviewing them. These data will be collected during the 2nd malaria transmission season of Ethiopia (April - May). To ensure accuracy, the questionnaire will be originally prepared in English, translated to Afaric, and then translated back to English.

Data Analysis

The collected data will be cleaned and the data will be entered and analyzed using Epi-Info and SPSS. For Statistical analysis we will use univariate, bivariate and multivariate data analysis.

Dissemination of Result:

The findings of this project will be disseminated to Aysata district health office and Tandaho sugar factory project coordination office, the Afar regional Health Bureau/Public Health Emergency Management Case team, Federal Ministry of health of Ethiopia/EHNRI, EFETP coordination office for scientific community, an attempt will be made to present the findings in different conferences and workshops and will be sent to publication on scientific journals.

Action Plan

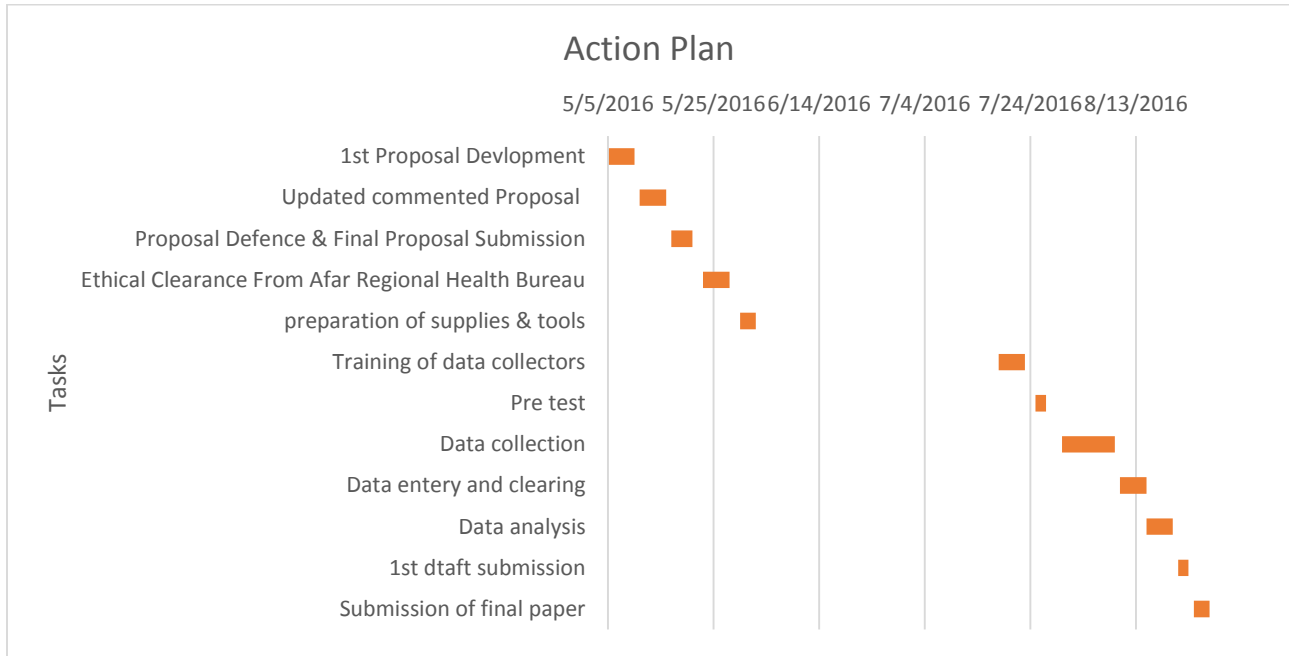


Figure 28. Action plan

Table 22. Budget Plan

Personnel cost	Planned Cost	10% contingency	Total
Data collection Training	\$1,636	\$163.55	\$1,799
Data collection on field	\$3,272	\$327.20	\$3,599
Field supervisor	\$45	\$4.50	\$50
Gas	\$3,372	\$337.20	\$3,709
Stationeries	\$50	\$5.00	\$55
To disseminate Result	\$100	\$10.00	\$110
Other	\$150	\$15.00	\$165
Total	\$8,625	\$862	\$9,487

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2. CSA. Population and housing census. Addis Ababa, Central Statistics Authority, 2007.
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4. MoH. National Malaria guideline. 3rd edition. Addis Ababa, Ethiopia. January, 2012
5. MoH. National Malaria indicator survey. Addis Ababa, Ethiopia. September, 2012
6. W. prudehomme O’Mear, J. nekesa Mangeni, R. Steketee, B. Green wood. Changes in the burden of malaria in sub-Saharan Africa. The lancet infectious disease. August, 2010

Chapter IX: Additional Output Reports

9.1. Tigray Region Health Bureau, Health Promotion and Disease Prevention Core Process, Public Health Emergency Management Case (PHEM) weekly bulletin

WEEK 25, 2015 (WK-50 EFY) BULLETIN

I. Introduction:

These bulletins represent the reporting period of WHO week No. 25, 2015 (Wk 50 EFY) and serves to provide information on public health emergencies and surveillance activities for evidence based decision making. The regional priority diseases and conditions under PHEM are 22 in number the one Hepatic veno-occlusive diseases is region specific reportable diseases. The bulletin shows surveillance reports existence of disease outbreaks, epidemiologic trend distribution and completeness & timeliness of report.

Table 23. Distribution of immediately and weekly reportable diseases, Tigray PHEM, WHO week-25, 2015.

Type of disease/condition	No. of cases	No. of Deaths
Immediate reportable Diseases		
Acute Flaccid Paralysis/ polio	0	0
Anthrax	2	0
Avian Human Influenza	0	0
Cholera	0	0
Dracunculiasis (Guinea Worm)	0	0
Measles	3	0
Neonatal Tetanus	0	0
Pandemic Influenza	0	0
Rabies	13	0
Severe Acute Respiratory	0	0

Smallpox	0	0
Viral Hemorrhagic Fever	0	0
Yellow fever	0	0
Maternal Death		1
Weekly Reportable disease		
Dysentery	1069	0
Malaria	2670	0
Meningitis	0	0
Relapsing fever	0	0
Typhoid fever	397	0
Typhus	4	0
Malnutrition(Severe)	115	0
Hepatic Veno-occlusive Disease(HVOD)	0	0

Malaria

From a total of 11374 suspected cases examined by microscopy & RDT 2670 (23.47%) of them are positive.

From the total positives, *Plasmodium falciparum* constituted 64.76%, *Plasmodium Vivax* was 35.24% and 1.2% of them are inpatient with no death are reported.

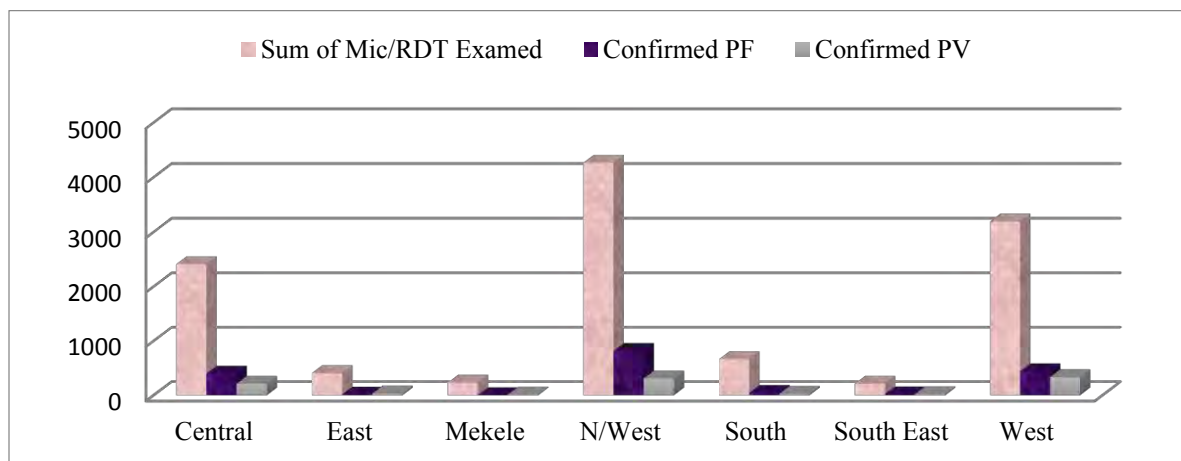


Figure 29. Number of Malaria suspected diagnosed & confirmed cases by zone TRHB WK 25, 2015 (WK 50, 2007EFY)

Dysentery

In week 25, a total of 1069 dysentery cases with no death were reported in the region. These cases were reported from 186 reporting units (46 woredas). Tsegedey Woreda were the leading by reporting 83 cases followed by Mereb Leke, Mekelle & Adwa Town which reported 69, 66 & 61 cases respectively.

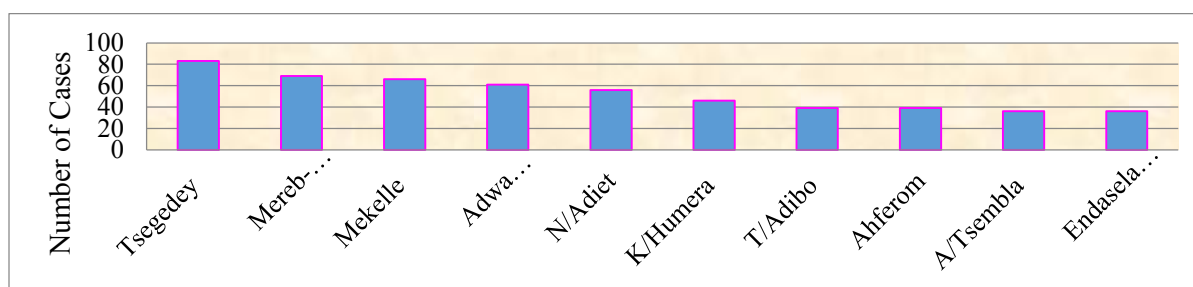


Figure 30. Districts with high number of Dysentery cases in Tigray region, week 25, 2015 (Wk 50 EFY).

Acute Malnutrition (SAM)

In week 25, a total of 115 SAM cases with no death were reported 20.87% of them are in patient. These cases were reported from 57 reporting unit (30 woredas). Endaslassie town is the leading by reporting 11 cases followed by Tselemti, Mekelle Town & A/Tsembla Woreda by reporting 9, 8 & 8 cases respectively. Majority (70%) of the woredas reported less than 5 SAM cases and 30% of the woredas reported 5-11 SAM cases.

Typhoid fever

A total of 397 typhoid fever cases with no death were reported in week 25. These cases were reported from 66 health facilities (23 woredas). Mekelle town is the leading by reporting 113 cases followed by S/Humera, Endaslassie & Tsegedey Woreda which reported 59, 39 & 39 cases respectively.

Ten top woredas with high number of typhoid fever cases for this week are presented in figure Three.

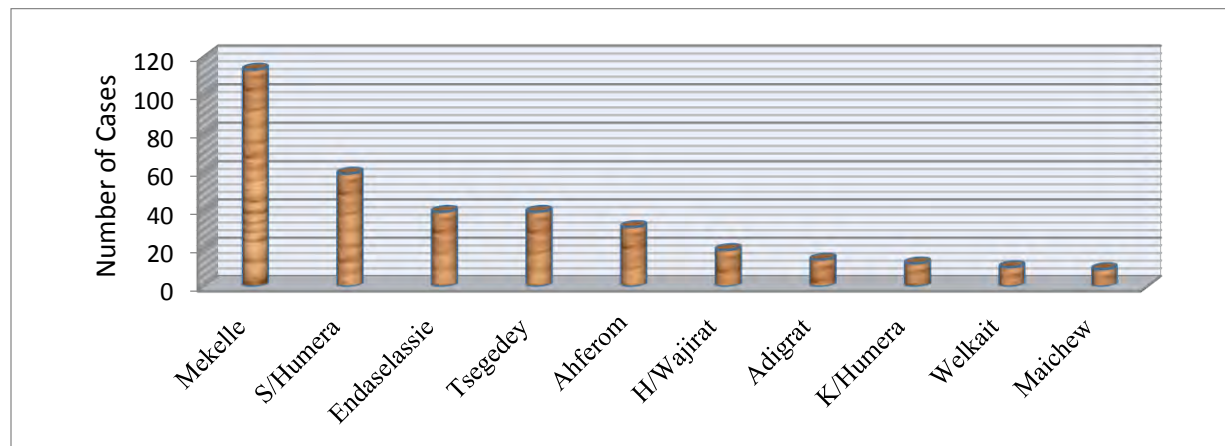


Figure 31. Districts with high number of typhoid fever cases in Tigray region, week 25, 2015.

II. Weekly Surveillance report

An important indicator of a quality reporting system is the completeness and timeliness at each level. The overall completeness & timeliness of report regional in week no. 25, 2015 was 99.9% & 93.38% respectively. Completeness & Timeliness of N/west, Mekelle, S/East & South zones were the highest 100%, Central 100% & 83.33%, East zone 100% & 88.89%, Western 98.86% & 98.86% respectively.

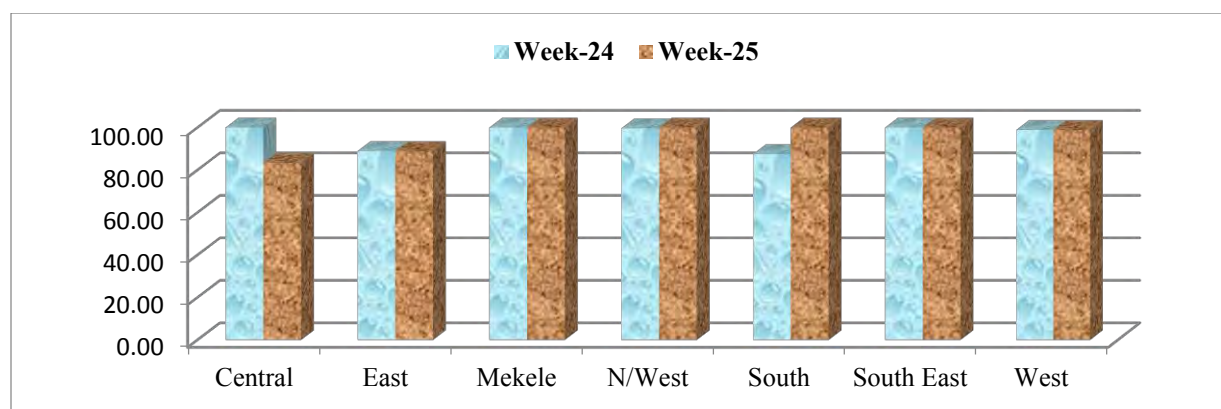


Figure 32. Timeliness by Zone in week 24 & 25/2015

WEEK 28, 2015 (WK- 53 EFY) BULLETIN

III. Immediately and weekly reportable disease

Table 24. Distribution of Weekly and Immediately Reportable disease, Tigray PHEM, WHO week-28, 2015.

Type of disease/condition	No. of	No. of
IMMEDIATELY REPORTABLE		
1. Acute Flaccid Paralysis/ polio	1	0
2. Anthrax	0	0
3. Avian Human Influenza	0	0
4. Cholera	0	0
5. Dracunculiasis (Guinea Worm)	0	0

6.Measles	5	0
7.Neonatal Tetanus	0	0
8.Pandemic Influenza	0	0
9.Rabies	5	0
10.Severe Acute Respiratory Syndrome (SARS)	0	0
11.Smallpox	0	0
12.Viral Hemorrhagic Fever	0	0
13.Yellow fever	0	0
14.Maternal Death		0
WEEKLY REPORTABLE		
1.Dysentery	961	0
2.Malaria	4007	0
3.Meningitis	0	0
4.Relapsing fever	0	0
5.Typhoid fever	458	0
6.Typhus	0	0
7.Malnutrition(Severe)	95	0
8.Hepatic Veno- occlusive	0	0

Malaria

Of the total of 13535 suspected cases of malaria tested by RDT/Microscopy, 4007 (29.6%) were confirmed cases. From the total confirmed cases 2749(68.6%) were plasmodium falciparum with 29 inpatients cases, and no reported death. Of the total confirmed cases 1777(44.3%), 1277(31.8%) and 635(15.8%) were from N/west, West and central zones of Tigray respectively.

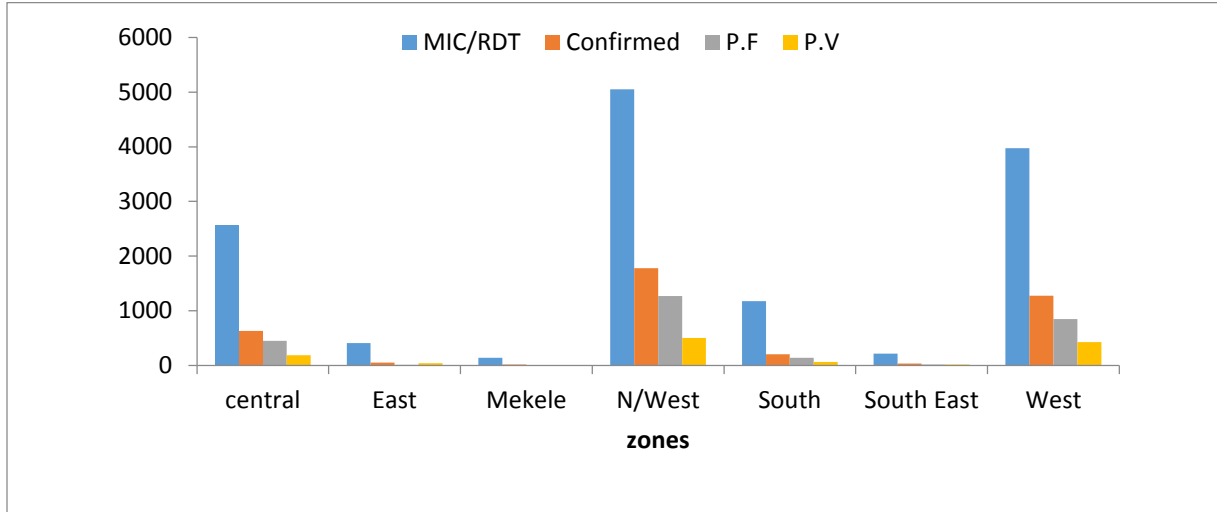


Figure 33. Shows number of tested, confirmed, P.F and P, V malaria cases by zone, Tig RHB PHEM, WHO week 28, 2015.

Dysentery

There were a total of 961 dysentery cases with 40 inpatients. The highest reported cases of dysentery were from central zone, 341 (35.5%) followed by N/west and west with 196(20.4%) and 165(17.2%) cases respectively with no reported death.

Typhoid Fever

Of the total of 458 typhoid fever cases ,with 9 inpatient, the most reported cases were from west and mekelle zones with 176(38.4%),94(20.5%) cases respectively.

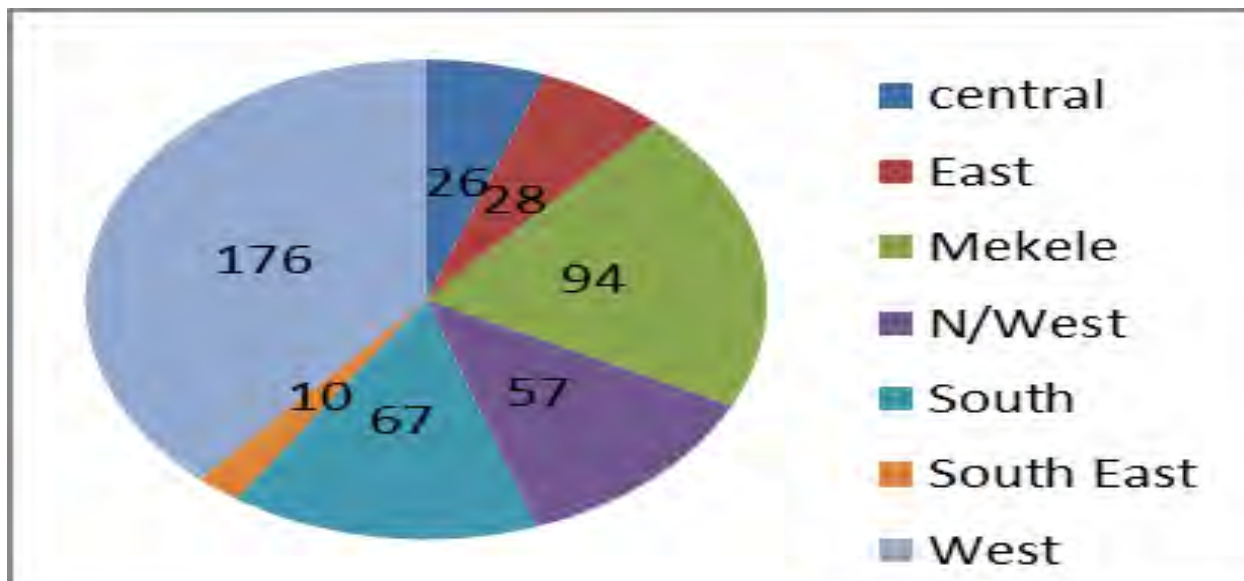


Figure 34. Proportions of typhoid fever cases by zone, TRHB PHEM, WHO week 28, 2015

SAM

As we can see from the table below there were a total of 95 severe malnutrition cases with 18 admissions and no death. South and central zone accounts for 27(28.4%) and 23(24.2%) of the total weekly SAM cases respectively.

Table 25. Number of severe malnutrition cases by zones, TRHB, WHO week 28, 2015.

Zone	SAM OPD	SAM IP
South	22	5
Central	15	8
N/West	17	1

West	6	1
S/East	8	0
Mekelle	5	2
East	4	1

Measles cases

In According to WHO week 28 report, there were 8 measles cases, 3 from Ofla and 3 from S/Samre weredas with no death.

Rabies

There were 5 reported rabies cases from central (4 cases) and west (1 case) zones of tigray. 2 of them were from Adwa town.

Report completeness and Timeliness

Every health facility expects to report completely and timely for all the reportable disease under PHEM. This is also one of the indicators of national PHEM guideline. The report completeness and timeliness of all health facilities regional, PHEM week 28 was 99.85% and 91.95 % respectively.

Completeness & Timeliness of Mekelle, south, S/east & west zones were the highest 100%respectively, N/West100% & 62.50%, Central 99.42% & 99.42%, East zone 100% & 88.89% respectively.

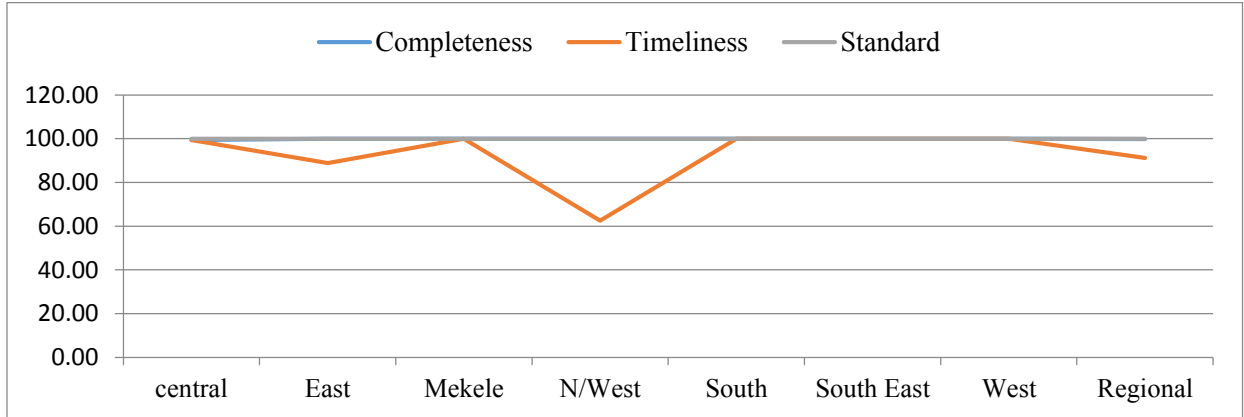


Figure 35. Report completeness and timeliness by zone, TRHB PHEM, WHO week 28, 2015.

WEEK 29, 2015 (WK- 54 EFY) BULLETIN

Immediately reportable diseases:

Anthrax

In week 29, 2015; there was one 5 years male case of anthrax from central zone, N/Adet woreda, sheleko kebele. It was reported from Axum hospital and the date of onset was in July 20, 2015 and no specimen was taken. It was treated as outpatient, no vaccination was given, and it is alive.

Rabbis

In week 29, 2015; there were 19 suspected cases of rabbis. 47.37 % of them were reported from Shul hospital, 31.6 % were from Adwa hospital, 5.3 % were from Abiadi hospital, and 15.7 were unknown.

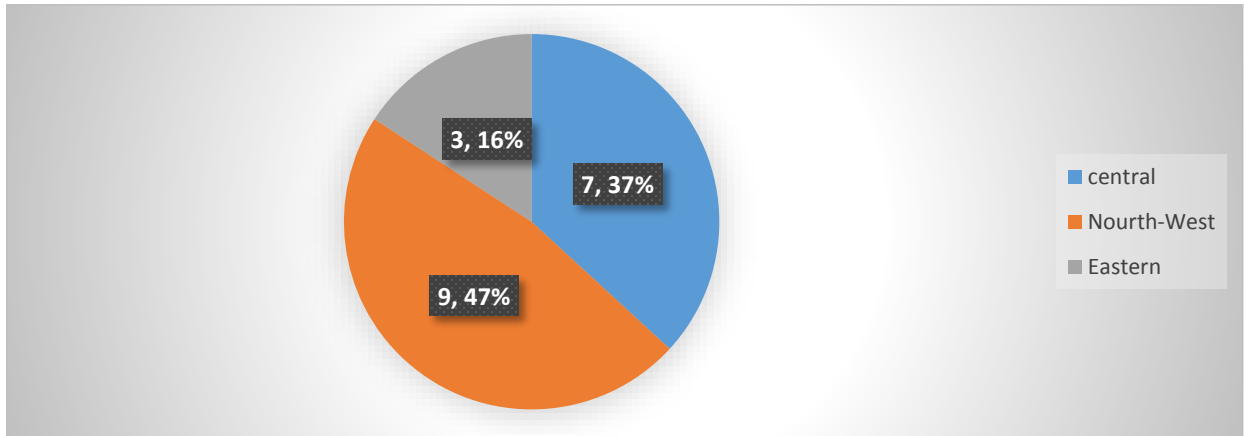


Figure 36. Suspected Rabbis cases stratified by reported zone in Tigray region, week 29, 2015

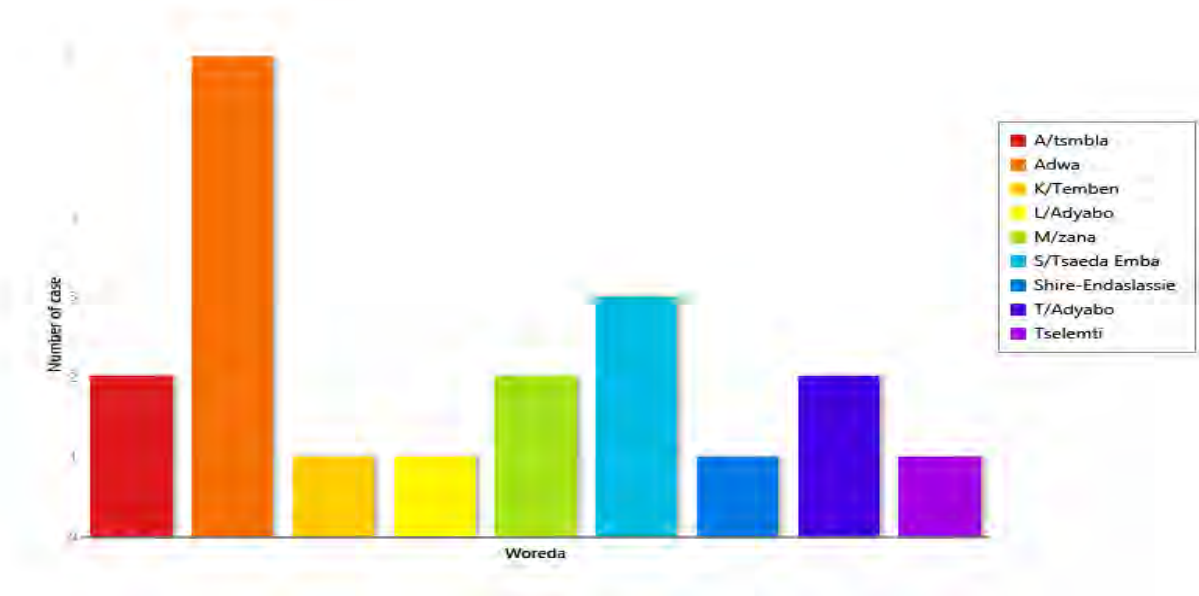


Figure 37. Suspected Rabbis cases stratified by woreda in Tigray region, week 29, 2015

Measles

In week 29, 2015; there was one 4 years male case of measels from Eastern zone, Adigrat town, kebele 6 and the date of onset was in July 20, 2015 and no specimen was taken. It was treated as outpatient, no vaccination was given, and it is alive.

Weekly reportable diseases

Dysentery

As depicted in fig. 3.1.1, there were 925 cases of dysentery and 911(98.5%) were diagnosed at OPD, 14(1.5%) were diagnosed at IPD. From those all cases diagnosed at OPD, 184(20.2 %) were from western zone, 253(27.8 5%) were from N/west zone, 239(26 %) were from central zone, 136(14.9 %) were from Eastern zone, 46(5 %) were from Mekelle zone. From those diagnosed at IPD dysentery case, 3(2.2 %) were from western zone and 11(77.8 %) were from mekelle special zone.

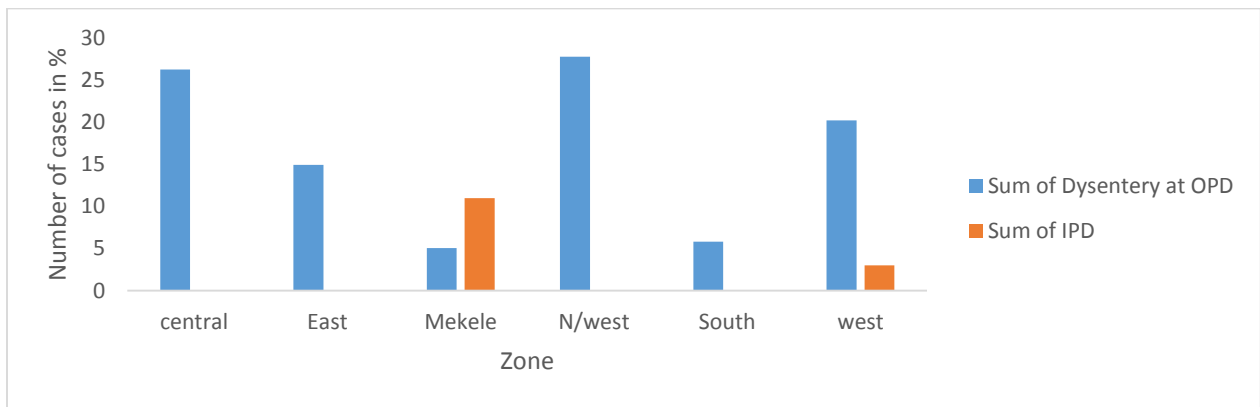


Figure 38. Number of dysentery cases stratified by zone in Tigray region, week 29, 2015

As depicted in fig. 3.1.2 the trend of dysentery in Tigray region from week 17 to week 29 were in steadily increased except in week 23 which was very high from threshold level and decreased in week 29 from threshold level.

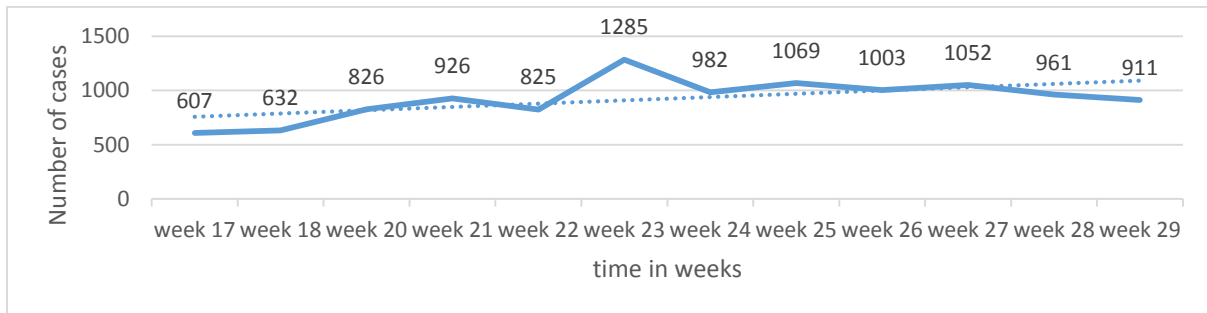


Figure 39. Trend of dysentery cases from week 17 to 29, 2015

Malaria

In week 29, 2015 there were 17294 cases of malaria and 12990(75.1%) were diagnosed by Mic/RDT, 2945(17%) were PF, and 1359(7.9%) were PV. As depicted in fig. 3.2.1, from five zone of the region, high number of cases were reported from N/west zone which were 3963(30.5%) cases diagnosed by mic/RDT, 834(28.3) were PF, 502(36.9) were PV.

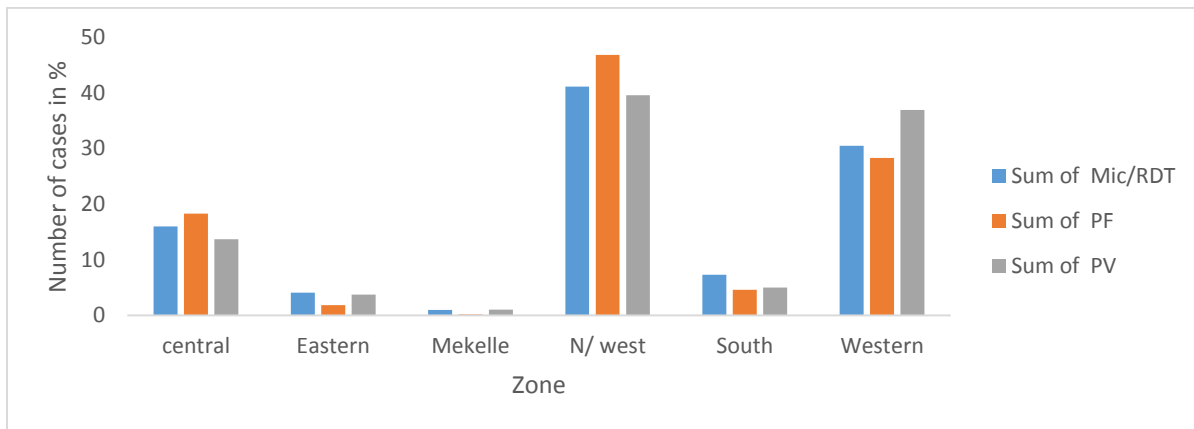


Figure 40. Cases of malaria stratified by zones in Tigray region, week 29, 2015

As depicted in fig. 3.2.2 the trend of malaria from week 17 to 29, 2015, there were high number of cases in week 23 and 29. In week 29, 2015 the high number of cases due to drought which were caused by shortage of Belg seasonal rainfall.

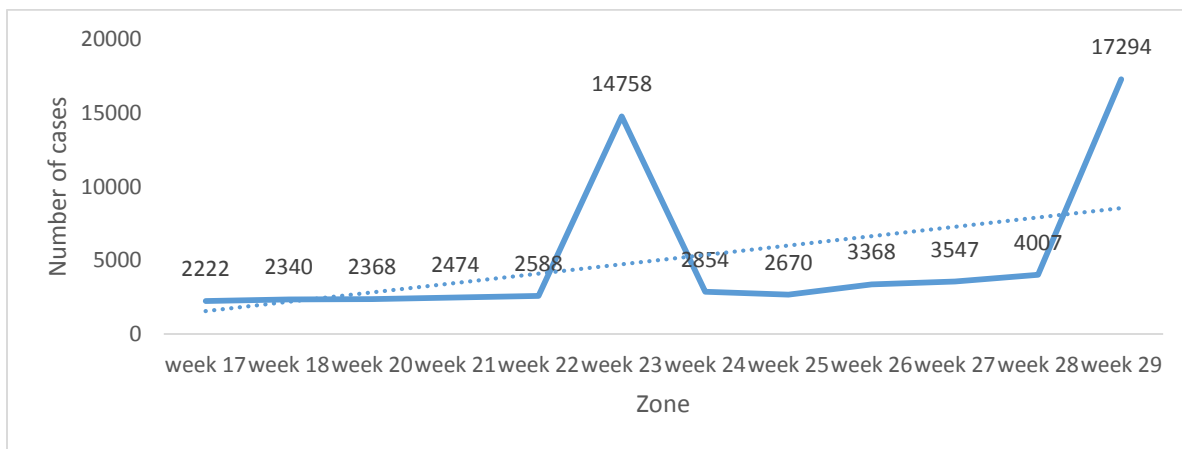


Figure 41. Trend of malaria in Tigray region from week 17 to 29, 2015

Typhoid fever

In week 29, 2015, there were 424 cases of typhoid fever. 14(3.3%) were diagnosed at IPD and 410(96.7%) were OPD. As depicted in fig. 3.3.1, from 410 cases diagnosed at OPD, the highest 129(31.46%) were from Western zone and from 14 cases diagnosed at IPD, 11(78.57%) were from Mekelle zone.

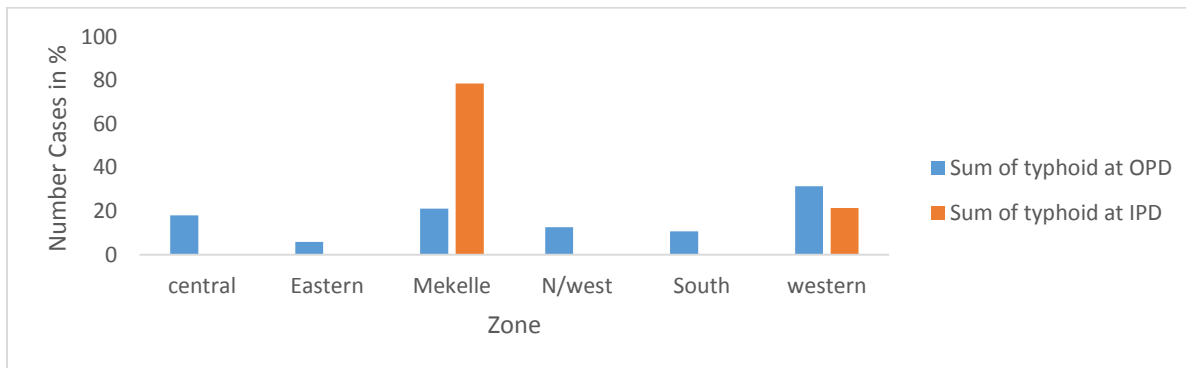


Figure 42. Cases of typhoid fever stratified by zones in Tigray region, week 29, 2015

As depicted in fig. 3.3.2, the trend of typhoid fever from week 17 to 29, 2015 have been below threshold level except week 22, 23, 24, and 28.

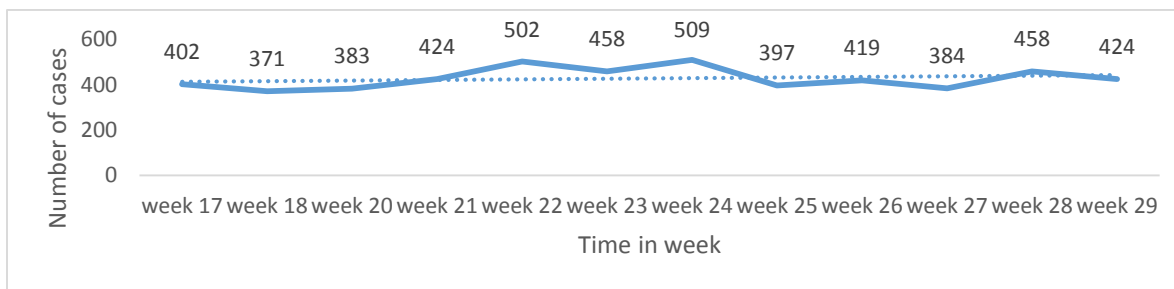


Figure 43. Trend of typhoid fever in Tigray region from week 17 to 29, 2015

Epidemic typhus

In week 29, 2015, there were 7 cases of epidemic typhus cases and 6 cases were from south zone and 1 case were from mekelle. There were no death occurred in week 29, 2015 due to it.

As depicted in fig. 3.4.1 the trend of epidemic typhus was had been decreased from week 18 to 28 below threshold level but slight increase of cases happened in week 29, 2015.

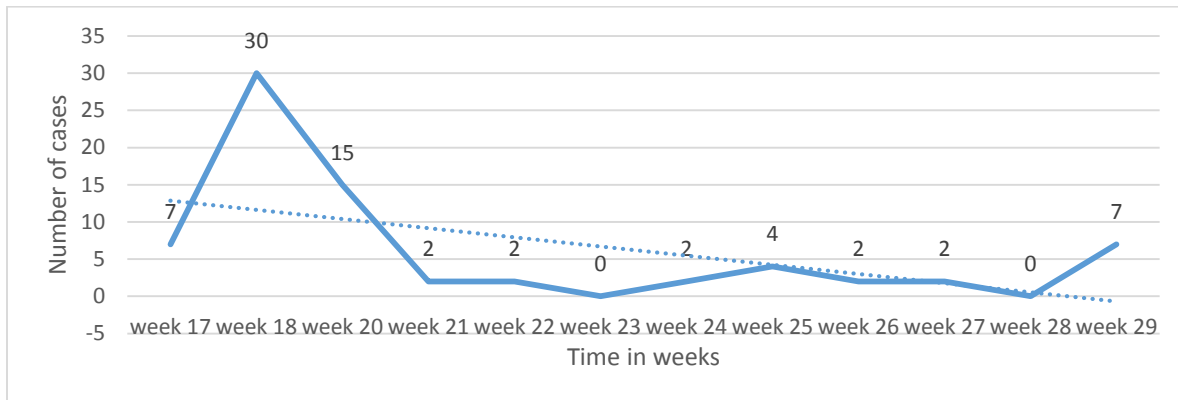


Figure 44. Trend of epidemic typhus in Tigray region from week 17 to week 29, 2015

Sever Acute Malnutrition

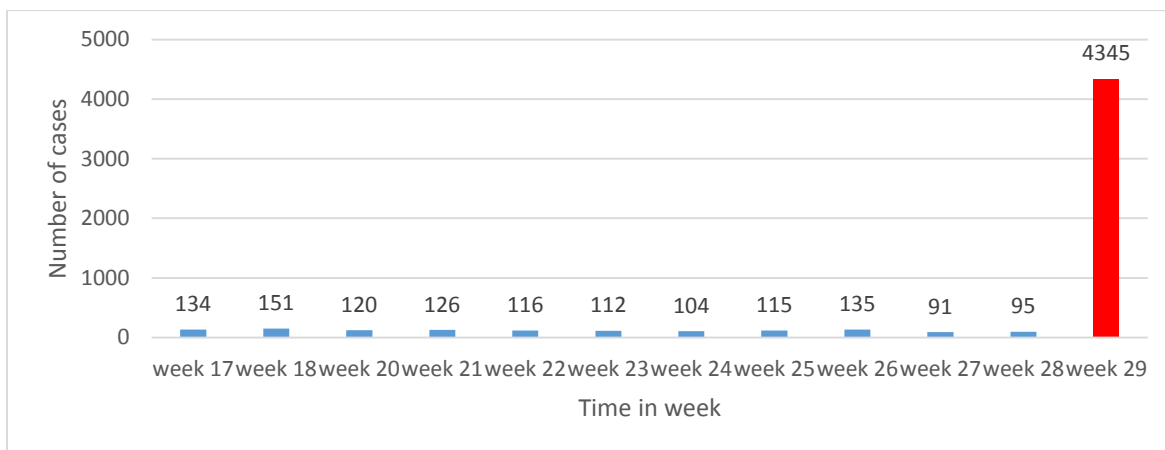


Figure 45. Trend of SAM in Tigray region from week 17 to 29, 2015

Report completeness and timeliness

Every health facility & districts needs to report completely and timely for all the reportable disease under PHEM. This is also one of the indicators set by national PHEM guideline. When we see the report completeness and timeliness of the district health office in WHO week 29, 2015 in 45 woredas were 100%

& 100% respectively except welkayit which was 90 % of timeliness. Regional completeness & Timeliness was 100% and 99.6% respectively.

Data collection tools

Annexes 1. Questionnaire for Measles outbreak investigation

Instructions: italics don't read out loud.

Data collector information: Name: _____ Phone number: _____

Date of Data collection: _____

Region _____ Zone _____ District _____ Kebele _____ Got _____ House: _____ Longitude: _____
Latitude: _____

Who is answering the questionnaire?

Parent/ guardian of sick person Sick person other (please specify) _____

Socio-demographic information

11. Patient Name _____

12. Patient phone number: _____ (house phone No.) _____

7. How old are you? : _____ months _____ years

8. Sex: Male Female

9. What is your occupation? Farmer Merchant Housewife Unemployed

Government Pastoralist Student Not applicable other _____

10. What is your ethnicity? Oromo Tigre Amhara Gurage Other (specify)

11. What is your religion?: Orthodox Protestant Muslim Catholic other _____

Annexes

12. What is your marital status ? : Single Married Widowed Divorced Not applicable

13. Have you ever attended school?: yes (go to question 10) No (go to question 11)

14. What is the highest level of education you have completed? (read answers): KG Primary Secondary Tertiary Not applicable

15. Father's occupation : Farmer Merchant Unemployed

Government Student Pastoralist Other _____

16. Parents' of case/control's education : Mother: Illiterate Primary Secondary Tertiary

Father: Illiterate Primary Secondary Tertiary

I. Knowledge Questions

1. Do you know measles, or are you not sure? yes No I don't know

2. How do you think measles is transmitted, or do you not know? You can pick more than one response:

Through the air Fecal/oral Food Close contact with an ill person other _____

3. How do you think measles can be prevented, or do you not know? :

Vaccination, There is no prevention local healing other _____

4. Who do you think can be affected by measles, or are you not sure?

Children less than 5 years old

Children between 5-18 years

People over 18 years old

Any age groups of both male and women

Don't know

Annexes

Other (specify): _____

5. Why do some people vaccinate their children with measles vaccine?

To prevent measles other _____

6. What is the routine age for a child to be vaccinated with measles vaccine, or do you not know?

3 months 6 months 9 months Other Don't know

7. Do you think vaccination can prevent measles? Yes No Don't know

II. Clinical presentations (*for case ONLY*)

8. What were the symptoms?

a) rash: Yes No

b) fever: yes No

c) runny nose: yes No

d) red eyes: yes No

e) cough : yes No

f) Tiny white spots or sores inside the mouth Yes No

9. What is the date when you first saw a rash on your body? : ____/____/_____

10. Were you in your home village when you first noticed you were ill? Yes (skip to question 12)

No (go to next question)

11. Where were you when the illness started? District; _____ Kebele;

12. How long have you had a rash? _____ days

13. Do you still have the rash? yes No

Annexes

14. Did you visit health facility for this illness? Yes (date went to facility ___/___/___) No (go to RISK FACTORS section)

15. How long were you sick before visiting the health facility? _____ in days/hours

16. Admitted: Yes No, If yes, date admitted: ___/___/_____

a. Treatment given? yes No, if yes

ORS Antibiotics Vitamin A Supplementary food

TTC ointment Anti-pyretic other _____

b. Outcome: Alive death

17. Did you have any of the following complications when you were sick with measles?

g) Pneumonia: yes No

h) Diarrhea: yes No

i) Ear infection: yes No

j) Convulsions yes No

k) Change in vision: yes No

18. Blindness: yes No

19. Did you travel four days prior to or four days after rash onset?

Yes (go to question #19) No (go to question #20)

20. Where did you travel to? _____

III. Risk factors

VACCINATION STATUS

21. Can I see your immunization card? Yes (go to question 22) No (go to question 21)

Annexes

22. Were you vaccinated against measles?: Yes (go to question 22) No (go to question 25) Don't know (go to question 25)

23. What is the number of measles vaccine doses received? One Two More than two

Age of first dose _____

Age of second dose _____

Age of third dose _____

24. Were these vaccinations given during routine programming (at the health center during vaccination days) or during a campaign, or both? : Routine program Campaign Both Don't know

25. Date last measles vaccine dose received? ___/___/_____ (GO TO QUESTION #22)

26. What is the main reason were you not vaccinated against measles? Clinic was too far you were absent during vaccination campaign you didn't know it was time for vaccination you think the vaccine will hurt the child someone told you not to go you are scared of vaccines

Other, (specify) _____

EXPOSURE

27. Did you have contact with a person with measles symptoms the 2-3 weeks before onset of illness? Yes No don't know

28. Have you travelled outside of your village the 2-3 weeks before onset of illness? Yes, No. If yes, District _____ Kebele _____

29. Is there other person with measles symptoms in your household?: Yes No

30. Does the case have any symptoms of malnutrition? (Malnutrition being...): yes, No.

Annexes

a. If yes, on OTP: Yes, No

31. How long does it take you to walk to the health center from your house? Less than 10 minutes

10-30 minutes 31 minutes – 1 hour More than 1 hour More than 2 hours

Annexes

Annexes 2. Questionnaire for scabies outbreak investigation

Data collector information: Name: _____ Phone number: _____

Date of Data collection: _____

Region _____ Zone _____ District _____ Kebele _____ Got _____

House: Longitude: _____ Latitude: _____

Who is answering the questionnaire?

Parent/ guardian of sick person Sick person other (please specify) _____

Respondent category: case control active case: Yes No

1.2. Socio-demographic information

1. Patient Name _____

2. Patient phone number: _____

3. Age: years _____ month's _____ Sex: Male Female

4. Father's occupation: Farmer Merchant Unemployed Government Student
 Pastoralist Other _____

5. How much is your annual income? -----

6. Parents of case/control's education: Mother: Illiterate Primary Secondary Tertiary

Annexes

Father: Illiterate Primary Secondary Tertiary

7. Family size: _____

1.3. Knowledge Questions

32. What is Scabies, or are you not sure? Yes No Don't know

33. How do you think Scabies is transmitted? You can pick more than one response:

Through skin contact by sharing clothes of ill person close contact with an ill person

Other _____

34. How do you think Scabies can be prevented? :

Personal hygiene& sanitation Avoid contact with Scabies patient local healing other -----

35. Who do you think can be affected by Scabies, or are you not sure?

Children less than 5 years old Children between 5-18 years People over 18 years old

Any age groups of both male and women don't know other (specify): _____

36. Do you think good personal hygiene can prevent scabies? Yes No Don't know

37. Where did you go first when you get Scabies? Health Facility Traditional Healers

Holy Water Stayed at home other :(Specify) _____

38. How do you think Scabies can be cured? Using modern medicine Using traditional

Medicine Holly water By feeding nutritious foods Keeping the sick person indoor

Other (Specify) _____

1.4. Clinical presentations (for case ONLY)

Annexes

1. What were the symptoms? A. skin rash: Yes No C. tiny red burrows:
Yes No B. red bumps and blisters: Yes No D. relentless itching: Yes

2. When is the date when you first saw a rash on your body? : ____/____/_____

3. Were you in your home village when you first noticed you were ill? Yes (skip to question 15)
 No (go to next question)

4. Where were you when the illness started? District; _____ Kebele;

5. How long have you had a rash? (Duration of rash) _____ days

6. Do you still have the rash? Yes No

7. Did you visit health facility for this illness? Yes (date went to facility ____/____/____) No (go
to question # 8)

8. How long were you sick before visiting the health facility? _____ in days/hours

1. Treatment given? yes No, if yes 5% Permethrin cream 25% benzyl benzoate lotion
 10% Sulfur ointment 10% Crotamiton cream 1% lindane lotion

17. Did you have the following Complications a. Secondary infection? Yes N b.
Bacterial skin infection such as impetigo? Yes No

1.5. Exposure (Risk factors)

1. Have ever have any skin contact with Scabies disease case (the last two month)
 Yes No
2. Have you ever had a sexual contact with a Scabies partner (the last two month)

Annexes

Yes No

3. At what frequency did you wash your body

4. Have you ever travel to a place with a scabies epidemic area (the last two month) yes

No

5. Have you share any clothes with friends with Scabies case yes No

6. How many members of family living together

7. How many sleeping rooms (beds)

8. Did you have the following access for personal hygiene? water yes No Toilet yes

No

Annexes

Annexes 3. Tools for Evaluation of Surveillance System

3.1. Health Post Level Questionnaire

Identifiers: Assessment team: _____ Type of health facility: _____ Date: _____

District: _____ Interviewer: _____ Region/province: _____

Respondent: _____ Respondents position: _____ Name of health facility: _____

_____ Surveillance system: _____

1. Number of Health Post with national surveillance manual

Is there a national manual for surveillance at Health Post? Obs: Observe national surveillance manual: Yes No Unknown Not applicable

I. Case detection and registration

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

Yes No Unknown Not applicable

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

Yes No Unknown Not applicable

4. Does the Health Post have standardized case definitions for the priority diseases (each priority disease)

Meningitis, AFP (polio), measles, malaria?

Yes No Unknown Not applicable

II. Data reporting

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

Yes No Unknown Not applicable

Annexes

6. Does the Health Post reported accurately cases from the registry into the summary report to go to higher level

Observed that the last monthly report agreed with the register for 4 diseases (1 for each targeted group [eradication; elimination; epidemic prone; major public health importance])

a. Obs: Measles	Y	N	U	N/A
b. Obs: Malaria	Y	N	U	N/A
c. Obs: Meningits	Y	N	U	N/A

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

Yes No no Known Not applicable

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

Obs: Weekly: -----/12 times the number of sites

Obs: immediately: -----/----- times the number of sites

9. On time (use national deadlines)

Obs: Number of weekly reports submitted on time:- ____ /12 times the number of sites

Obs: Number of immediately reports submitted on time: -----/----- times the number of sites

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

How do you report?

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

Annexes

f. Other

11. Strengthening reporting

How can reporting be improved?

12. Data analysis

Percent of sites that:

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

Observe description of data by age and sex

Yes No Unknown Not applicable

14. Does the Health Post describe data by place

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

Yes No Unknown Not applicable

15. Does the Health Post describe data by time

Observed description of data by time: Yes No Unknown Not applicable

16. Does the Health Post Perform trend analysis

Observed line graph of cases by time

Yes No Unknown Not applicable

17. Epidemic response _____

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

Yes No Unknown Not applicable

19. Feedback

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

Yes No Unknown Not applicable

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

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

Yes No Unknown Not applicable

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

Yes No Unknown Not applicable

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

Observed the minutes or report of at least 1 meeting between the health facility team and the community members within the six months

Yes No Unknown Not applicable

25. Supervision:

26. Was HEWs supervised in the past 6 months?

Yes No Unknown Not applicable

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

Annexes

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

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

Yes No Unknown Not applicable

29. Training

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

Yes No Unknown Not applicable

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

32. Resources

33. Does the Health post have

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

34. Data management

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

35. Communications

Annexes

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

36. Information education and communication materials

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

37. Hygiene and sanitation materials

- a. Spray pump
- b. Disinfectant

38. Protection materials (list) _____

39. Satisfaction with surveillance system

40. Satisfaction with the surveillance system

Are you satisfied with the surveillance system?

- Yes No Unknown Not applicable

Annexes

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

42. Opportunities for integration

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

Attributes

a) Usefulness

1. Total population of the district under surveillance _____

2. How many cases and deaths reported in the district from the following disease past 6 month?.

a) Malaria cases _____Deaths _____

b) Measles cases _____Deaths _____

3. Does the surveillance system help?

a) To detect outbreaks of these selected priority diseases early? Yes No N/A

b) To estimate the magnitude of morbidity, mortality and factors related to these diseases?

Yes No N/A

c) Permit assessment of the effect of prevention and control programs?

Yes No N/A

b) Simplicity

4. Do you feel that data collections on a case report form are time consuming? Yes No N/A
5. If yes, how long it takes to fill the format? a, <5 minute b- 10-15minuts c- >15 minutes

c) Flexibility

6. Do you think that the current reporting formats used for other newly occurring health Event (disease) without much difficulty? Yes No N/A
7. Do you think that any change in the existing procedure of case detection, reporting, and formats will be difficult to implement? Yes No N/A

If yes, how _____.

d) Data Quality

8. Are the data collection formats for these priority diseases clear and easy to fill for All the data collectors/ reporting sites? Yes No N/A
9. Are the reporting site / data collectors trained/ supervised regularly? Yes No N/A

If, **Obe:** Review the last months report of these diseases

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

Annexes

11. Percent of reports which are complete(that is with no blank or Unknown responses) from the total reports _____

e) Acceptability

12. Do you think all the reporting agents accept and well engaged to the surveillance activities? Yes

No N/A

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

13. **If no**, what is the reason for their poor participation in the surveillance

Activity?

a) Lack of understanding of the relevance of the data to be collected

b) No feedback / or recognition given by the higher bodies.

c) Reporting formats are difficult to understand

d) Report formats are time consuming

e) If Others: _____.

f) Representativeness

14. What is the health service coverage of the district? _____%.

15. Do you think, the populations under surveillance have good health seeking behavior for these priority

diseases? Yes No N/A

46. Who do you think is well represented by the surveillance data? Urban / rural

g) Timeliness

47. What proportion of health facilities reports in acceptable time-----?

h) Stability

48. Was there lack of resources that interrupt the surveillance system?

Yes

No

N/A

If yes, how did you manage it? _____

49. What do you suggest to overcome such problems? _____

i. Sensitivity:

Do you think the surveillance system captures most of the priority disease (cases) under surveillance in the HP/Community? Yes, No, If No what is the reason-----

j. PVP:

Do you think cases reported by the surveillance system are actually cases? E.g. measles

Yes, NO, If No gives explanations

k. Completeness:

What is the report completeness of Ur HP in the past 6 months? -----

Annexes

3.2. District (intermediate level) questionnaire

Identifiers

Assessment team _____

District _____

Date _____

region/province _____

Interviewer _____

country _____

Respondent _____

surveillance system _____

Is the Districts has available national surveillance manual?

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

Obs: Observe national surveillance manual:

Yes No unknown Not Applicable

I. Case confirmation

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

3. Yes No unknown Not Applicable

4. Does the District has fully employed District focal person On PHEM?

Yes No unknown Not Applicable

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

Yes No unknown Not Applicable

II. Data reporting

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

Annexes

Yes No unknown Not Applicable

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

Weekly: _____ /12 times the number of health facilities

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

On time (use national deadlines)

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

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

10. Is the Districts have means for reporting to next level? Yes No

How do you report?

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

Strengthening reporting

11. How can reporting be improved?

III. Data analysis

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

Annexes

Obs: Observed description of data by age and sex

Yes No unknown Not Applicable

13. Describe data by place

Obs: Observed description of data by place (locality, village, work site etc)

Yes No unknown Not Applicable

14. Describe data by time

Obs: Observed description of data by time

Yes No unknown Not Applicable

15. Perform trend analysis

Obs: Observed line graph of cases by time

Yes No unknown Not Applicable

16. List:

17. Have an action threshold for each priority disease

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

Yes No unknown Not Applicable

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

(Ask for 2 priority diseases)_

1. _____

2. _____

19. Have appropriate denominators

Annexes

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

20. Yes No unknown Not Applicable

21. Who is responsible for data analysis? _____

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

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

IV. Outbreak investigation

23. Does the Districts were investigated outbreaks in the past 6 months?

Yes No

Number of outbreaks suspected in the past 6 months: _____ Investigated _____?

Have you ever conducted an outbreak investigation? Yes No

Has your District ever investigated an outbreak?

Yes No unknown Not Applicable

V. Epidemic preparedness

24. Have your District a plan for epidemic preparedness and response?

Obs: Observed a written plan of epidemic preparedness and response

Yes No unknown Not Applicable

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

Obs: observed the stocks of drugs and supplies at time of assessment

Yes No unknown Applicable

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

Yes No unknown Not Applicable

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

Yes No unknown Not Applicable

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

Obs: Observed minutes (or report) of meetings of epidemic management committee

Yes No unknown Not Applicable

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

Yes No unknown Not Applicable

VI. Responses

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

Yes No unknown Not Applicable

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

Obs: Observed that the District responded within 48 hours of notification of most recently reported outbreak (from written reports)

Yes No unknown Not Applicable

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

Annexes

Yes No unknown Not Applicable

Obs: what was the case fatality rate for most recent outbreak? (Observe from outbreak report)

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

Yes No unknown Not Applicable

VII. Feedback

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

Yes No unknown Not Applicable

Obs: Observed the presence of a written report that is regularly produced to disseminate surveillance data (District and higher)

35. How many feedback bulletin or reports has the District received in the last year from the higher level?

a) 1 b) 3 c) 6 d) 9 E) 12 F) Not received

VIII. Supervision

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

Obs: Observed supervision report or any evidence of supervision in last 6 months

Yes No unknown Not Applicable

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

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

Expected Achieved: Not Done:

(Obtain required number of visits from central level)_____

Annexes

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

Reason 1 _____

Reason 2 _____

Reason 3 _____

IX. Training

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

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

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

X. Resources

42. I. Do the District have Important Logistics?

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

43. Data management

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

Annexes

44. Communication

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

45. Information education and communication materials

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

46. Hygiene and sanitation materials

- a.* Spray pump
- b.* Disinfectant

XI. Surveillance co-ordination:

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

Yes No unknown Not Applicable

XII. Satisfaction with surveillance system with surveillance system

48. Are you satisfied with the surveillance system?

Yes No unknown Not Applicable

Annexes

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

50. Opportunities for integration

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

Attributes

a) Usefulness

51. Total population of the district under surveillance _____

52. How many cases and deaths reported in the district from the following disease past 6month?

a) Malaria cases _____ Deaths _____

b) Measles cases _____ Deaths _____

53. Does the surveillance system help?

a) To detect outbreaks of these selected priority diseases early? Yes / No

b) To estimate the magnitude of morbidity, mortality and factors related to these diseases? Yes/ No

c) Permit assessment of the effect of prevention and control programs? Yes/ No

Annexes

b) **Simplicity:**

54. Do you feel that data collections on a case report form are time consuming? Yes/No

55. If yes, how long it takes to fill the format? a, <5 minute b- 10-15minuts c- >15minutes

c) **Flexibility:**

56. Do you think that the current reporting formats used for other newly occurring health event (disease) without much difficulty? Yes / No

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

If yes, how _____.

d) **Data Quality:**

58. Are the data collection formats for these priority diseases clear and easy to fill for all the data collectors/ reporting sites? Yes/ No

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

If, **Obe:** Review the last months report of these diseases

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

61. Percent of reports which are complete(that is with no blank or Unknown responses) from the total reports _____

e) **Acceptability:**

Annexes

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

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

63. **If no**, what is the reason for their poor participation in the surveillance activity?

- a) Lack of understanding of the relevance of the data to be collected
- b) No feedback / or recognition given by the higher bodies.
- c) Reporting formats are difficult to understand
- d) Report formats are time consuming
- e) If Others: _____.

f) Representativeness:

64. What is the health service coverage of the district? _____%

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

66. Who do you think is well represented by the surveillance data? Urban / rural

g) Timeliness:

67. What proportion of health facilities reports in acceptable time? -----%

Stability:

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

If yes, how did you manage it? _____

69. What do you suggest to overcome such problems? _____

3.3. Laboratory Assessment Tool

General information

Name of the laboratory		
Address of the laboratory:	Telephone _____ Fax _____ e-mail _____	
Level of the Laboratory :	Community Health Facility District	
Affiliation of the Laboratory :	Public/Private/Academic /Religious Institution / NGO	
Building Facilities and utility services		
Is the laboratory in a free-standing building or part of larger structure?		
How many rooms with bench space are there in the laboratory		
Do the Laboratory have the following services available? Electricity/Running water		

Annexes

Is there a back-up power source in case of power failure (E.g. emergency generator)?	Yes	No	
<i>If yes</i> , what systems are protected?			
Refrigerators/freezers	Yes	No	
Computers	Yes	No	
Other(specify)	Yes	No	
What types of communications systems are available?			
Post	Yes	No	
Telephone	Yes	No	
Fax	Yes	No	
Satellite phone	Yes	No	
E-mail (no. computers)	Yes	No	
Internet (no. computer)	Yes	No	
Laboratory staff			

Annexes

1. Medical Laboratory Professionals Number a. MSc/MPH b. Bsc c. Dipoma		
2. Assistants (not doing tests)		
3. Clerical/Cleaner		
Has training been conducted for the laboratory staff on		
Malaria		
Other epidemic prone diseases (briefly describe)		
If yes when was the last training been conducted for your laboratory staff?		

Reagents & kits

Where you are getting your reagents?	From a commercial supplier
	From another laboratory

Annexes

	Supplied by Regional/Zonal/District/health office	
Was there shortage of reagents in the last six months which are used for identifying diseases	Yes	No
If Yes, What Are the most important reasons?	Lack of funds Lack of information Un prioritizing others(specify)	
What type of water is used for preparation of media and reagents?		
Deionized Distilled	Yes	No
Distilled	Yes	No

Tests performed at the laboratory

Disease	Specimen type	Assay Performed	Yes	No	Number/ Month
Meningitis	CSF	a. Cell count b. Latex agglutination c. Gram stain			
Watery	Faeces	Microscopy of wet			

Annexes

diarrhea (cholera)		Preparation Culture-TCBS Culture-Alk. Peptone Serotyping			
Malaria	Blood	Thick/Thin film Microscopy			
Measles	Serum Throat swab, conjunctival swab	IgM by EIA Other serological test Virus isolation			
Yellow fever	Blood, postmortem Liver	IgM Virus isolation			
Suspect	Blood,	Culture			

Annexes

typhoid or brucellosis	faeces serum	Identification tests A-M susceptibility Serological tests (Widal, brucella agglutinins)			
Hepatitis	Serum	Anti-HAV IgM Anti-HbsAg Anti-HCV IgM			
Viral haemorrhagic fevers (any)	Serum Serum, other tissue specimens	IgM Virus detection			
Acute flaccid paralysis	Faeces	Virus isolation Virus typing			

Specimen collection, labeling and handling

Annexes

Do request forms contain ALL of the following patient information: specimen source, date and time of collection, type of test requested?	Yes	No
Are specimens that are received labeled with the patient's name and unique identifiers?	Yes	No
Does the laboratory have a logbook/electronic record of all specimens sent for diagnostic testing?	Yes	No
Are specimens discarded after testing, or are they stored?	Discarded Stored	
Does your laboratory refer bacteriology isolates or serum samples to a reference laboratory?	Yes	No
<i>If yes</i> , reason for referral (<input type="checkbox"/> <input type="checkbox"/> all)		
Confirmation	Yes	No
Identification of unknown organism	Yes	No
Test not performed on site	Yes	No
Number of sample referred in the last six month?		
Types of transport media used (<input type="checkbox"/> <input type="checkbox"/> all that apply)		
Trans-isolate	Yes	No
Cary and Blair	Yes	No
Viral transport medium	Yes	No
Other (describe):		

Reporting procedures

Annexes

Are records kept of the number and type of tests performed and results?	Yes	No
Does the laboratory have a list of diseases that are supposed to be reported to the Ministry of Health?	Yes	No
Does the lab staff know what diseases should be reported?	Yes	No
Does the lab provide regular reports of patients with reportable diseases to any of the following Ministry of Health offices/institutions?		
District Health Office	Yes	No
State Health Office	Yes	No
National / MOH level	Yes	No
If reports are submitted, how frequently?		
Weekly	Yes	No
Monthly	Yes	No
Quarterly	Yes	No
Other	Yes	No
<u>Quality control procedures and programs</u>		
Does the laboratory use any system for internal quality control?	Yes	No
Does the laboratory participate in any external quality assurance or proficiency schemes?	Yes	No

Annexes

Was there any general laboratory supervision conducted to this laboratory?	Yes	No
If yes, how often in for the last one year?	one times/two times/ three and more	
Does your laboratory have a system for regularly monitoring of quantities of reagents and materials so that there is warning if stocks become low?	Yes	No

Annexes

3.4. Zonal level questionnaire

Identifiers:

Interviewer:

Respondent:

Date:

Surveillance System:

Interviewer name:

of health facility:

I. General

I. Availability of national Maternal Death Surveillance and Response Manual

1. Is there a national Maternal Death Surveillance and Response Manual?

A. Yes B. No C. Not applicable D. Unknown

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

II. Case Detection and Registration

Annexes

3. Do you have standard case definitions for the Country's priority diseases maternal death, malaria, typhoid fever, and measles etc.?

A. Yes B. No C. Unknown D. Not applicable

4. Observe the standard case definition for maternal death

A. Yes B. No C. Unknown D. Not applicable

III. Data reporting.

Presence of recommended reporting forms in the center at all times over the past 6 months

5. Is the central level responsible for providing surveillance forms to the health facilities?

A. Yes B. C. Unknown D. Not applicable

If yes, have you lacked appropriate surveillance forms at any time during the last 6 months?

A. Yes B. No C. Unknown D. Not applicable

7. What are the reporting entities for the surveillance system?

A. Public health facilities C. Private health facilities

B. NGO health facilities D. Others_____

E. Military health facilities

8. Number of district reports (either directly or through an intermediate level) received

Annexes

Each reporting period at the central level during the past 3 months:

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

Weekly: /12 times the number of districts

Immediately: /----- times the number of districts

On time (use national deadlines)

Number of weekly reports received on time: /12 times the number of districts

10. Was there any report of the maternal death in the past 1 month?

A. Yes B. No

11. If yes, with in what time is the report received after detection of the case/ diseases?

A. Less than 1 hour D. 3- 7 days

B. 2-24 hour E. After 1 week

C. 1- 2 days

12. Number of districts that have means for reporting to next level by e-mail, telephone, and fax or radio

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

A. Mail D. Radio

Annexes

B. Fax E. Electronic

C. Telephone F. Others

IV. Data analysis

Does the central level:

14. Describe data by person (cause of death, age at death, timing relation to pregnancy, ANC follow up and basic package provided)?

(Observe) description of data by age and sex:

A, Yes B. No C. Unknown D. Not applicable

15. Describe data by place?

(Obs) Observed description of data by district (tables, maps)

Yes No Unknown Not applicable

16. Describe data by time?

Observe description of data by time:

A. Yes B. No C. Unknown D. Not applicable

17. Perform trend analysis?

Do you have an action threshold defined for maternal death?

Annexes

- A. Yes B. No C. Unknown D. Not applicable

Observe line graph of cases by time

- A. Yes B. No C. Unknown D. Not applicable

18. List area or year(s) for which line graph is observed

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

21. How often do you analyze the collected data?

- A. Daily D. Monthly
B. Weekly E. Quarterly
C. Every 2 weeks F. As needed

22. Have appropriate denominators?

Observe presence of demographic data (E.g. population by district and hard to reach groups)

- A. Yes C. No D. Unknown E. Not Applicable

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

Annexes

Has the region had free stock of drugs, vaccines, and supplies for pregnant mother at all times and after delivery to one month in past one year?

- A. Yes B. No C. Unknown D. Not applicable

32. Experience of a shortage of drugs, vaccines or supplies in past one year?

- A. Yes B. No D. Unknown E. Not applicable

34. If yes, list: _____

35. Presence of a budget line for surveillance and response

Is there a budget line for MDSR?

- A. Yes B. No C. Unknown D. Not applicable

35. Is there a functional Ambulance services for each woreda (district)?

36. I. Existence of a regional MDSR committee

Observed minutes (or report) of meetings of MDSR committee

- A. Yes B. No C. Unknown D. Not applicable

V. Response to epidemics

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

Annexes

Obs: Observed that the central level responded within 48 hours of notification of most recently reported outbreak (from written reports with trend and intervention)

Yes No Unknown Not applicable

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

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

Yes No Unknown Not applicable

VI. Feedback

Existence of a report or bulletin that is regularly produced to disseminate surveillance data:

40. How many feedback bulletin or reports has the regional level produced in the last year?

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

Yes No Unknown Not applicable

Supervision

Percent of supervisors that made the required number of supervisory visits in the past 6 months

Annexes

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

Obtained required number of visits from regional level _____

43. the most usual reasons for not making all required supervisory visits. (Text)

VII. Training

Percent of health personnel trained in disease surveillance

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

45. Have you been trained in disease surveillance?

Yes No Unknown Not applicable

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

Percent of health personnel that have received post-basic training in epidemic management

Annexes

47. Have you received any post-basic training in epidemic management?

Yes No Unknown Not applicable

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

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

Strengths _____

Weaknesses _____

Opportunities _____

Threats _____

VIII. Resources

Percent of sites that have:

50. Data management

a. Computer e. Statistical package

b. Printer f. Data manager

c. Photocopier

Annexes

51. Communications

- a. Telephone service d. Satellite phone
- b. Fax e. Computers that have modems
- c. Radio call

52. Budget line _____

53. Logistics _____

Surveillance

Have a functional computerized surveillance network

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

- Yes No Unknown Not applicable

Budget for surveillance

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

- Yes No Unknown Not applicable

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

Opportunities for strengthening surveillance

57. How could surveillance be?

X. Surveillance Co-ordination

Existence of focal unit for surveillance at RHB level

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

Yes No Unknown Not applicable

Opportunities for integration

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

Questionnaire for Attributes and level of Usefulness:

1. Total population under surveillance _____

2. What is the incidence / Prevalence of -----in your area/region in 2003 EFY

Annexes

Measles _____ cases _____Deaths

Malaria _____ cases _____Deaths

Typhoid fever _____ cases _____Deaths

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

Does the surveillance system help?

1. To detect outbreaks of these selected priority diseases early? Yes/ No
2. To estimate the magnitude of morbidity and mortality related to this disease, including identification of factors associated with these diseases? Yes/ No
3. Permit assessment of the effect of prevention and control programs? Yes/ No

Observe (confirmation): interventions and diseases trends analyzed ---Available //Not available

Describe Each System Attributes:

A. Simplicity:

1. Is the case definition of AWD, malaria, AFP (polio), and measles easy for case detection by all level health professionals? Yes/ No
2. What are the organizations which need to receive reports of the surveillance data?
3. Do you feel that additional data collected on a case are time consuming? Yes/No

Annexes

How long it takes to fill the format? A, <5 minute B-10-15minuts C- >15 minutes

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

A. Measles

B. Malaria

C. Typhoid fever

B. Flexibility:

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

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

Comment: _____

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

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

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

Annexes

3. Observe: Review the last months report of these diseases

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

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

D. Acceptability:

1. Do you think all the reporting agents accept and well engaged to the surveillance activities?

Yes/No

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

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

A. Lack of understanding of the relevance of the data to be collected

B. No feedback / or recognition given by the higher bodies for their contribution; i.e. no dissemination of the analysis data back to reporting facilities

C. Reporting formats are difficult to understand

D. Report formats are time consuming

Annexes

E. Other: _____

E. Representativeness:

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

2. Do you think the populations under surveillance have good health seeking behavior for these diseases?

Yes / No

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

Timeliness:

1. -----

2. -----

F. Stability:

1. Was the new BPR restructuring affect the procedures and activities of the surveillance of these diseases?

Yes/ No

2. Was there lack of resources that interrupt the surveillance system? Yes

Annexes

3.5. Consent Form

My name is (data collectors name) _____ I am evaluating the surveillance system and response in Medebay Zana hospital. The whole objective of the study is to assess the effectiveness and efficiency of surveillance system and response in Shire hospital. The information you provide on this study will only be used for academic and public health interventions and all information will be kept confidential. This questionnaire may take around 35 minutes and at any time of the interview, you have the right to stop or pass or to ask explanation for any of questions items listed in the questionnaire. If you agree to participate in this study please approve by putting your signature below.

Signature -----

3.6. Survey Questionnaire for Key Informants

Part one – General Information

1.1 Interview date _____ 1.2. Name of Woreda/Zone/NGO _____

1.3. Date of start of implementing/participating in MDSR ___/___/___

1.4. Position of the interviewee in the organization _____

Part two - Implementation Status

2.1. How many health posts and health facilities are participating in MDSR system in your Zone/ Woreda/ HC?

2.2. How many of them are participating consistently (9 months in annum) -----

2.3. Is there a function MDSR task force at regional/Zonal/Woreda level? (If “No” pass to question 2.5)

Yes No

2.4. If “Yes” for question 2.3, please list members of maternal death review committee

2.5. How do you disseminate the results of maternal death surveillance findings to stakeholders?

A. we haven't yet share any result yet B. Workshops

Annexes

C. Printed reports/bulletins

D. Other specify _____

2.6. Do you regularly give feedbacks to the next lower level? (If “No” pass to the next part)

A. Yes

B. No

2.7. If “Yes” to question 2.6, in what duration do you give the feedbacks?

A. Not regular

B. Every Month

C. Every Quarter

D. Others (specify) _____

Part Three – Attributes and Usefulness of the Surveillance

S.No	List of Attributes measures	Scale of Measurements				
		Strongly Agree	Agree	Neutral	Disagree	Strongly Disagree
	1. Simplicity					
1.1	The data sources of MDSR is easy and manageable					
1.2	MDSR system doesn't take much of my time or have no influence on my other activities					
1.3	Data analysis at Woreda level is easy and manageable					
1.4	the system is integrated with other surveillance systems					

Annexes

1.5	To work in the system it doesn't need a high level training (can work just by orientations only)					
1.6	Sending report to the next level is easy and manageable					
1.7	Distributing the surveillance report is easy manageable					
2. Flexibility						
2.1	The surveillance system adopts to the users improvement demands					
2.2	If you agree please give an example that the system adopts users comment or suggestion for improvement					
3. Acceptability						
3.1	Proportions of Woredas regularly and consistently participating in the system					
3.2	Proportion of health facilities consistently participating in the system					
4. Sensitivity						
4.1	The system picks most of the maternal deaths in the facility /Community					
4.2	If you don't agree why do you think the reasons for not picking most of the deaths					
5. Predictive Value Positive						

Annexes

5.1	Deaths reported in this system are actually maternal deaths					
5.2	If you don't agree give examples or explanations					
6. Representativeness						
6.1	The monthly maternal death report represents the situation in the facility/community					
7. Timelines						
7.1	MDSR data is always ready when we need it for planning purposes					
8. Cost						
8.1	The system is not costly as compared to the current benefits we gain from it					
8.2	Estimate of the cost of the system (include all personnel, transportation and material costs)					
9. Usefulness						
9.1	The current system have an ability to estimate maternal death in the facility/community					
9.2	The current system have an ability to show the trend of maternal death in the facility/community					

Annexes

9.3	The current system have an ability to show the progress and effect of preventive and control methods applied against maternal death					
9.4	The current system have an ability to indicate major causes of maternal deaths in the health facility/community					

Annexes

Annexes 4. Health profile data collection tools

Data collection tools for health profile of Aysaita district, Afar region, Ethiopia

Date _____

Region _____ Zone _____ Woreda _____ Respondant _____ Interview
er _____

1. Historical back ground of the area

1.1 Establishment time of the area as woreda _____

1.2 Name of historical places _____

1.3 Historical Nomination _____

2. Population and demography

2.1. Total population of the woreda _____ Male _____ Females _____

2.2. M to F Ratio _____

2.3. Ethnic composition _____

2.4. Population density _____

2.5. Total live births _____

2.6. Under one year population _____

Annexes

2.7. Under five year population _____

2.8. Reproductive year female population _____

2.9. Annual growth rate _____

2.10. Religion:

Orthodox _____

Muslim _____

Protestant _____

Catholic _____

Others _____

3. Geographic and climate condition

3.1. Square km of the area _____

3.2. Location of the district from capital of the region _____

3.3. Boundaries _____

3.4. Altitude of the area _____

3.5. Latitude of the area _____

3.6. Longitude _____

Annexes

3.7. Annual Rainfall _____ Main rainy season _____

3.8 .Annual Temperature _____

3.9. Maximum temp _____

3.10. Minimum temp _____

4. Political and administrative organization

4.1 Number of Kebeles (Urban) ____ (Rural) ____ Total _____

4.2 Number of Kebeles with transportation access _____

4.3 Number of Kebeles without transportation access _____

4.4 Number of Kebeles with electric power _____

4.5 Number of Kebeles without electric power _____

4.6 Number of kebeles with telephone service (cable based/wireless _____

4.7 Number of Kebeles without telephone service _____

4.8 How many supporting NGOs are in the area _____ ?

4.9 Ruling political party _____

4.10 Bank _____

5. Productivity and income

5.1 main base of economy _____

5.2 Average income level _____

5.3 part of the population (%) whose economic source is from

Annexes

a) Farming _____

b) Animal production _____

c) Trade _____

d) Government employee (salary) _____

e) Others _____

5.4. Productivity of the land/hectare _____ kuntal/hectar

5.5. Common crop products _____

5.6. GDP (during harvesting season/ meher) _____ kuntal

5.7. GDP from irrigation _____ kuntal

5.8 .Total GDP _____ kuntal

5.9. Employment rate & unemployment rate _____

6. Water supply

6.1. Source of water _____

6.2. Number of pipe water supply _____

6.3. Is there chlorination of water _____

6.4. Frequency of chlorination _____

Annexes

7. Education

7.1. Number of enrolled elementary schools (male and female) _____

7.2. Number of enrolled secondary schools (male and female) _____

7.3. Number of colleges/universities total number of students _____

7.4. Number of teachers at elementary _____, secondary _____ and colleges/universities _____

8. Social situation:

8.1. Number of libraries _____

8.2. Number of NGO working on public health _____

8.3. Number of youth clubs _____

9. Health service institutions and infrastructure

S.NO	Type of health institution		No of institutions
1	Number of Hospitals	with sustainable/ 24 hour /electric power	
		without sustainable/ 24 hour /electric power	
		with telephone service(cable based/mobile)	
		without telephone service (cable based/mobile)	
		with piped water supply	
		Without piped water supply	
2	Number of Health	with sustainable/ 24 hour /electric power	
		without sustainable/ 24 hour /electric power	

Annexes

		with telephone service (cable based/mobile)	
		without telephone service (cable based/mobile)	
		with piped water supply	
		Without piped water supply	
3	Number of Hospitals		
4	Number of Health centers		
5	Number of Health post		
6	Number of private clinics		
7	Number of Pharmacies		
8	Number of Drug vendors		
9	Number of Diagnostic laboratories		
10	Hospital to population ratio		
11	Health center to population ratio		
12	Health posts to population ratio		
13	Physical health service coverage		

9.14. Top 10 diseases of morbidity and mortality in adult OPD:-

Morbidity cases			Mortality cases		
Rank	Diseases	%	Rank	Disease	%
1			1		
2			2		
3			3		
4			4		
5			5		
6			6		

Annexes

7			7		
8			8		
9			9		
10			10		

9.11. Top 10 Diseases of morbidity and mortality in under 5 OPD:-

Morbidity cases			Mortality cases		
Rank	Diseases	%	Rank	Disease	%
1			1		
2			2		
3			3		
4			4		
5			5		
6			6		
7			7		
8			8		
9			9		
10			10		

10. Health staff to population ratio:

Health officers _____

Annexes

Nurses _____

Medical lab _____ Pharmacy _____, Env'tal _____

Health extension workers _____

Other _____

11. Vital statistics and health indicators

S. No	Indicator	Rural	Urban	Total
1	Under 5 population			
2	Productive age female (15-49 years)			
3	Pregnant women			
4	Live births			
5	Total fertility rate			
6	Crude birth rate			
7	Crude death rate			
8	maternal mortality rate			
9	Child mortality			
10	Under 5 mortality rate			
11	Infant mortality rate			
12	Dependency ratio			
13	Average household size			

12. Maternal health coverage

S.No	Type of service	Coverage (%)
------	-----------------	--------------

Annexes

1	Antenatal care (ANC) Coverage (%)	
2	Contraceptive acceptance rate (CAR (%))	
3	Contraceptive prevalence rate (CPR (%))	
4	Post-natal care (PNC) Coverage	
5	Proportion of delivery attended by skilled personnel	

13. Endemic disease

A) Tuberculosis

S. No	Cases	Number		
		Male	Female	total
1.	TB case detection rate			
2.	TB treatment success rate			
3.	TB treatment cure rate			
4.	Defaulters			

b) MALARIA

S. No	Malaria cases	Adult		Under 5		Preg.	Total
		Male	Female	Male	Female		

Annexes

								M	F
1.	Confirmed malaria cases	Pf							
		Pv							
		Mixed							
2.	Admission cases due to malaria								
3.	IRs coverage	Urban							
		Rural							
4.	Households with at least one LLIN	Urban							
		Rural							

c) HIV/AIDS

HIV prevalence _____

HIV Incidence _____

VCT _____

PMTCT _____

ON ART _____

PITC _____

14. DISASTERS AND OUT BREAKS OCCURRED, immediately reportable disease

14.1 Were any disasters occurred in these years _____?

Annexes

14.2 If Q.14.1 is yes list the name

14.3 Which of the above mentioned disaster(s) was (were) Happened more than once?

14.4 How many out breaks occurred in the last 5 years _____

(List _____)

14.5 Which of the above mentioned outbreak(s) was (were) occurred more than once?

14. Nutrition, food

shortage _____

Healtheducation _____

Health budget allocation

Essential

Annexes

Drugs and other

supplies _____

15. Discussion of the highlights and the main findings of the health profile assessment and description

Annexes 5. Questionnaires for Narrative summary for Disaster and risk assessment

5.1. Belg humanitarian needs assessment tools for health sectors at Woreda level in Afar region, June 2015

Serial No. Interviewer name _____ Institution: _____
_____ Interview Date: (dd) ____ (mm) ____ /2011 _____ Region: _____
_____ Zone: _____ Woreda _____

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

SECTION I: SOCIO- DEMOGRAPHIC PROFILE 1.1. Woreda total population: M _____ F: _____
_____ Under5 ____ Total: ____ 1.2. Special Population (if any): Pastorals _____

Refugees ____ IDPs ____ Migrant Workers __ SECTION II: HEALTH PROFILE 2.1. Morbidity and

Mortality (List top 5 causes of Morbidity and Mortality) in the year 2003 EC a. Morbidity b. Mortality 1. 1.

2.2. List number of cases/deaths from January-October 2012 AWD Malaria Measles Meningitis Cases

Deaths Cases Deaths Cases Deaths Cases Deaths January February March April May

2.3. Ongoing outbreak? Is there any ongoing outbreak of any disease? YES _____ NO _____ If

yes, specify the type of disease Number of cases _____ Deaths _____ (specify the

time period) 2.4. Preparedness: Is there emergency drugs and supplies enough for 2 months? Or easily

accessible on need? Ringer Lactate (to treat AWD cases) Yes No ORS (to treat AWD cases):

Yes No

Doxycycline (to treat AWD cases): Yes No Consumables : Syringes, Gloves (for AWD

management): Yes No Amoxil sups (measles) Yes No Tetracycline ointment

(measles) Yes No Vit A (measles) Yes No Coartem for Malaria

Annexes

Yes No Lab supply: RDT for Malaria Yes No Lab supply: RDT (pastorex) for Meningitis

Yes No Number of CTC kit available: (for AWD) Yes No Main shortage (if any): Specify 2.5.

Coordination

Is there a multi sectoral PHEM coordination forum? Yes No is there a drought response plan? Yes No

SECTION III: RISK FACTORS Diseases Risk factors for epidemics to occur Yes No Malaria Malaria

endemic area Presence of malaria breeding site Interrupted or potentially interrupting rivers

Unprotected irrigation in the area LLINs coverage <80% Depleted prevention and control activities

Meningitis Was there Meningitis epidemic in the last 3 years (If yes specify date) If yes : number of

people vaccinated AWD Was there AWD epidemic in the last three years (If yes specify date) Source of water safe? (Indicate the source)

Measles Ongoing measles cases widespread malnutrition is vaccination coverage good? (Indicate <1 measles vaccine coverage) Any other observations you made or any risks of epidemics?

5.2. Rapid Belg/Sugum assessment tools for Health Sector at Region/Zonal level

Interviewer name _____ Institution: _____

Institution: _____ Interview Date: (dd) ____ / (mm) ____ /2012 ____

Region: _____ Zone _____

Main contact at this location:

Name: _____

Position: _____

Tel: _____

1. COORDINATION

A. Is there a functional multispectral coordination forum for the health sector? Yes No B. Are all relevant government, NGOs and UN agencies represented? Yes No C. Frequency of regular meeting? (Weekly, Every 2 weeks, monthly.....) 2. Is there any ongoing outbreak? Yes No If yes, specify the type of disease _____ Number of cases _____ Deaths _____ (specify the time period) 3. Mention anticipated epidemics _____, If yes please indicate Zone/Woreda at risk and risk population per anticipated risk:

1.1. Public Health emergency Management

Annexes

A. Is there a Public Health Emergency Preparedness and response plan? Yes No If yes, is the plan funded? Yes No

B. Is there a trained staff on PHEM Yes No If yes specify number of trained personnel _____ Drugs and medical supplies

Total requirement Available Gap

I. Meningitis vaccine

II. Drugs: Coartem, Oily CAF, Doxycycline, Ringer lactate, ORS, Amoxil suspension.

Annexes

6. Questionnaires for Epidemiological research project

6.1. Informed Consent

Hello. My name is _____ and I am working with the Ministry of Health. We are conducting a national survey about malaria. We would very much appreciate your participation in this survey. The information you provide will help the government to plan health services. The survey usually takes between 10 and 20 minutes to complete. Whatever information you provide will be kept strictly confidential and will not be shown to other persons. Participation in this survey is voluntary and you can choose not to answer any individual question or all of the questions. However, we hope that you will participate in this survey since your views are important.

At this time, do you want to ask me anything about the survey?

May I begin the interview now?

Signature of interviewer: _____ Date: _____

RESPONDENT AGREES TO BE INTERVIEWED 1

RESPONDENT DOES NOT AGREE TO BE INTERVIEWED.... 2 — < END

Annexes

6.1. Questionnaire for prevalence of Malaria and risk factors of it among workers in Tendaho Sugar project and Aysata District, Aysata, Afar Ethiopia

Instructions: italics don't read out loud.

1. *Data collector information:* Name: _____ Phone number: _____

2. *Date of Data collection:* _____

Region _____ Zone _____ District _____ Kebele _____ Got _____ House: _____ Longitude: _____
Latitude: _____

3. *Who is answering the questionnaire?*

Parent/ guardian of sick person Sick person other (please specify) _____

A. Socio-demographic information

18. Patient Name _____

19. Patient phone number: _____ (house phone No.) _____

20. How old are you? : _____ months _____ years

21. Sex: Male.....1 Female.....2

22. What is your occupation? Farmer.....01 Merchant.....02 Housewife.....03

.....04 Unemployed.....05 Government.....06 Pastoralist.....07 Student.....08

Not applicable.....09 other _____.....10

23. What is your ethnicity? Oromo.....1 Tigre.....2 Amhara.....3 Gurage.....

Other (specify) _____.....4

Annexes

24. What is your religion?: Orthodox.....1 Protestant.....2 Muslim.....3
Catholic.....4 other _____.....5

25. What is your marital status?: Single.....1 Married.....2 Widowed.....3
Divorced.....4 Not applicable.....5

26. Have you ever attended school? Yes.....99 (go to question 27) No.....100 (go to question
28)

27. What is the highest level of education you have completed? (read answers): KG.....1
Primary.....2 Secondary.....3 Tertiary.....4 Not applicable.....5

28. Father's occupation : Farmer.....1 Merchant.....2 Unemployed.....3
 Government.....4 Student.....5 Pastoralist.....6 Other
_____.....7

29. Mother: Illiterate.....1 Primary.....2 Secondary.....3
Tertiary.....4

Father: Illiterate.....1 Primary.....2 Secondary.....3 Tertiary.....4

30. Have you ever given birth? yes.....99 No.....100 (go to question 33)

31. Do you have any sons or daughters to whom you have given birth who are now living with you?
 Yes.....99 No.....100 (go to question 33)

32. How many sons live with you? _____ and how many daughters live with you? _____ IF NONE,
RECORD '00'.

B. Knowledge

33. Have you ever heard of an illness called malaria? yes.....99 No.....100 (go to question)

34. What was the first symptom? _____

Annexes

35. When was the 1st symptom started (date of onset of symptoms) DD/MM/YY _____

36. What were others symptoms?

a) Fever: Yes.....99 No.....100 , if yes duration of fever ____ was it constant fever? Yes.....99
 No.....100 or every other days fever? Yes.....99 No.....100

b) Vomiting: Yes.....99 No.....100 c) Diarrhea: Yes.....99 No.....100 , d) Anorexia
(appetite loss): Yes.....99 No.....100 ,

e) Headache: Yes.....99 No.....100 f) Sweating: Yes.....99 No.....100 , g) Chilling
and shivering: Yes.....99 No.....100 ,

h) Weakness: Yes.....99 No.....100 , I) Caught: Yes.....99 No.....100 , j) Back
pain: Yes.....99 No.....100 , k) Muscle pain: Yes.....99 No.....100 ,

l) Rigor: Yes.....99 No.....100 ,

37. Ask the following signs for complicated malaria only

38. Altered consciousness (e.g. confusion, sleepy, drowsy, comma) Yes.....99 No.....100

, Not able to drink or feed Yes.....99 No.....100 , Severe dehydration, Yes.....99

No.....100 p) Persistent fever, Yes.....99 No.....100

q) Frequent vomiting Yes.....99 No.....100 , Convulsion or recent history of convulsion

Yes.....99 No.....100 Unable to sit or stand up Yes.....99 No.....100 , Pallor

(Anemia) Yes.....99 No.....100 , No urine output in the last 24 hours Yes.....99

No.....100 , Bleeding Yes.....99 No.....100 , Jaundice (yellowish coloration)

Yes.....99 No.....100 , Difficult breathing Yes.....99 No.....100 Other

conditions that cannot be managed at this level _____

Annexes

39. Did you visit health facilities? Yes.....99 No.....100 , if yes, when did you visit health facilities? DD/MM/YY _____

40. Did you get any treatment 1. Yes.....99 No.....100 , if yes, what treatment did you get?

(a) Coartem Yes.....99 No.....100 , was it for PF Yes.....99
No.....100

(b) Chloroquine? Yes.....99 No.....100 , was it for PV Yes.....99
No.....100

(c) Quinine tablets Yes No , was it for pregnant and <5 Kg? Yes.....99
No.....100

(d) Quinine injection Yes.....99 No.....100 , was it for sever malaria Yes.....99
 No.....100

(e) Other treatment given _____

41. Did you recover completely after the treatment: Yes.....99 No.....100

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

43. Blood samples taken: Yes.....99 No.....100

44. If yes Q18, what was the result: Positive.....1 negative.....2

C. Risk Factors:

45. Specific living areas _____

46. Sleeping areas in side home _____ outside home _____

47. Do you stay outside over night? Yes.....99 No.....100

48. Is there anybody in your home with similar sign and symptoms? Yes.....99 No.....100

49. Did you travel outside your village in the past 2-3 wks Yes.....99 No.....100

50. If yes Q 24, indicate (a) Date of travel DD/MM/Y _____

(b) The place of travel _____

(c) Date when you returned back DD/MM/YY _____

If Q 24 is yes, is there sick patient (same symptoms) in the place where you have been yes.....99
No.....100

51. Is there a similar sick patient in your house hold Yes.....99 No.....100

52. Do you have bed net in your household Yes.....99 No.....100 , If is yes, how often do
you use Always Sometimes Never

53. Do mothers and children given priority of using bed nets? Yes.....99 No.....100

54. If yes Q 30 the number of bed nets _____

55. Was deltamethrine sprayed this year? Yes.....99 No.....1000

56. If yes Q31 when? _____

57. If yes Q31 how many? Once.....1 twice.....2

D. Environmental investigation

59. Place of stay during night? _____

60. is there any artificial water -holding containers close to your home? Such as:

A. old tires: Yes.....99 No.....100

B. Plant in the containers /flower –pots Yes.....99 No.....100

C. plant with temporary water pools yes.....99 No.....100

D. Open deep well: Yes.....99 No.....100

E. Broken glass bottles Yes.....99 No.....100

Annexes

F. Cans Yes.....99 No.....100

G. Plastic container Yes.....99 No.....100

H. Gutter to collect rainwater: Yes.....99 No.....100

I. Uncovered water storage/ septic tank Yes.....99 No.....100

J. Stagnant water Yes.....99 No.....100

61. Presence of mosquito vectors/ mosquitoes breeding sites around the home or vicinity? Yes.....99
No.....100

62. If Q 37 yes, presence of larvae in breeding sites Yes.....99 No.....100

63. Types of house screened Yes.....99 No.....100 unscreened Yes.....99
No.....100

64. Do you use repellents Yes.....99 No.....100

65. Protective clothing Yes.....99 No.....100

66. Waste collection: Yes.....99 No.....100

67. Unprotected irrigation Yes.....99 No.....100

68. Presence of Intermittent rivers cloths to the community Yes....99 No...100

69. Presence of tick grass Yes.....99 No.....100

E. Awareness assessment

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

71. How it transmitted? -----

72. How it can be prevented? -----