Addis Ababa University, College of Health Sciences,

School of Public Health

Ethiopian Field Epidemiology and Laboratory Training Program (EFELTP)

Compiled Body of Works in Field Epidemiology

By

Zekarias Adamu

Submitted to the School of Graduate Studies of Addis Ababa University in partial fulfillment for the degree of Master of Public Health in Field Epidemiology

June, 2012

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Dr. Mer'Awi Aragaw

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Approval by Examining Board

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Chairman, School Graduate Committee

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Advisor

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Examiner

_____ _____

Examiner

Acknowledgements:

I would like to thank my wife for her encouragement to join and complete this program even if she is in need of more support at that time. Really “zed” it is not my effort only to have this master program to complete; it is your effort and patience and day to day moral and financial support of you that made me to be successful in the program.

My deepest gratitude goes to my adviser, Dr Mer’Awi Aragaw, for his engagement in guiding and reviewing my field works. And I also acknowledge Dr Adamu Addise and Dr Richard Luce for their excellent comments and coordinating whole academic program.

Above all, I thank all the individuals and institution those support me throughout the process of desired goals of the program.

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List of abbreviations

NNT	Neonatal tetanus
PHEM	Public Health Emergence Management
TT	Tetanus Toxin
WHO	World Health Organization
FMOH	Federal Ministry of Health
IDSR	Integrated Disease surveillance and response
RHB	Regional Health Bureau
ZHO	Zonal Health office
DHO	District Health office
HF	Health Facility
HEW	Health Extension worker
SPH-AAU	Addis Ababa University School of public health
EFY	Ethiopia Fiscal year
KAP	Knowledge Altitude and Practice
WHA	World Health Assembly
PNC	Postnatal care
ITN	Insecticide treated net
BoFED	Bureau of Finance and Economic Development
IRC	International Rescure Committee
UNICEF	United Nation international Children Economic Fund
NGOs	Non-Governmental Organizations
EPI	Expanded program on Immunization

IMNCI	Integrated management of Neonate and Child illness
HDW	Hand dug well
PMTCT	Prevention of Mother to child transmission
ART	Antiretroviral therapy
VCT	Voluntary Consoling and testing

Preface:

The Ethiopian Field Epidemiology and Laboratory Training program (EFELTP) Started with Collaborative effort of School of Public Health/Addis Ababa University, the Federal Ministry of Health of Ethiopia, the Ethiopian Public Health Association (EPHA) and CDC-Atlanta, USA. The Ethiopian Field Epidemiology and Laboratory Training program (EFELTP) is 2 year master program that comprises 75% field work with an essence of learning by working in public health activities and other health related priority issues; and awards MPH in field Epidemiology. The residents were assigned at regional level for practical session and during their residence time they are expected to do the compile works to be award master degree.

This compiled works has nine main sections or chapters which all of them were done during the residency time of the program. Out of nine sections eight are expected outputs during the residency time; such as outbreak investigation, report of analysis of surveillance data, evaluation of the surveillance system, description of a health profile report, writing of finalized scientific manuscript for peer review journals, abstract submit ion to /presentation in/ scientific conferences, writing protocol/proposal of epidemiologic research project and a summary of disaster situation visited/risk assessment and other additional works are included in section nine.

The overall outputs of field residency in the program are presented in a summarized way as follows; in the outbreak investigations chapter or section two outbreaks were investigated and well documented. These were Measles outbreak from Chenta kebele, Bahir Dar zuria and Typhus outbreak at Debre Berhan prison in Debre Berhan. One reports of surveillance data analysis and description on Suspected Rabies in Amhara region.

A surveillance system evaluation and a Health profile description report was also done in Bambasi Woreda; Benishangul gumuz regional state. One scientific manuscript prepared for peer review journals. Three abstracts were also prepared and submitted for scientific conferences. A report on health nutrition needs assessment (risk assessment) on

prioritized districts of Amhara regional state was also conducted with other team members from the food security center, WHO, UNICEF and EHNRI.A finalized epidemiologic research project proposal on a title; Retrospective assessment of Dog bite injury in Assosa Town.

In addition to the above there are additional works that has been stated in this document such as training participation as trainee and trainer, Participation of different international conference as well as office routine work.

Chapter I: Outbreak/Epidemic investigations:

1.1. Measles Outbreak investigation in Chenta kebele, Bahir Dar Zuria woreda, Amhara Regional State, Ethiopian April 22-June 07, 2011.

Authors: Zekarias Adamu[1]
Name of FELTP: Ethiopia FELTP
FELTP Graduation: 2012

Abstract

Backgrounds: In 2011, Ethiopia faced measles outbreak from different regions of the country. Bahir Dar Zuria woreda, Amhara Region is one of affected woreda by measles outbreak. Bahir Dar Zuria woreda health office reported the Chenta outbreak to Regional Health Bureau, Public Health Emergency management department by telephone on April 9, 2011. The report initiated outbreak investigation to identify the etiology, assess risk factors and propose appropriate intervention.

Methods: Descriptive study was conducted in Chenta kebele, Bahir Dar zuria, Amhara Regional state, from April 20 to June 7, 2011. Data were collected by using measles outbreak reporting line list and unstructured questionnaire. Those cases that develop fever, rash and either cough or Coryza or Conjunctivitis were searched from clinic registration and house to house. Descriptive analysis done by entering and recoding collected data using Epi-info version3.5.1 and Microsoft office Excel 2007.

Results: A total of 46 cases with 2 deaths (Case fatality rate CFR=4.35%) were identified in Chenta Kebele. The age range was 1 to 38 year with median age of 11.5 year; and age distribution of cases were 11(23.9%), 17(37%) and 18(39.1%) cases at age groups of 1 to 4, 5 to14 and 15 to 38 years old respectively. Of 46 cases 24(52.2%) were Females. The vaccination status of cases were 24(52.2%) not vaccinated, 17(37%) received 1 dose and 5(10.9%) received 2 doses of measles vaccine. The first index case of Chenta has travel history to Dehina Mariam which reported measles outbreak prior to Chenta.

Conclusion and Recommendation: .In this kebele, legible children are found not vaccinated. Travel history to measles affected area and accumulation of susceptible children in the kebele may have facilitated the outbreak. And hence, strengthening routine and supplemental immunization activities and early control of localized outbreak elsewhere will prevent future outbreaks and expansion of outbreaks.

Introduction:

Measles is an acute viral infectious disease caused by virus that grouped under paramyxoviridae virus family and genus Morbillivirus. For Morbillivirus that causes Measles humans are the only reservoirs. The measles virus is highly contagious with secondary attack rate >90% in susceptible host (1). Measles is a systemic infection viral disease (2,). The primary site of infection is respiratory epithelium of nasopharynx. The measles virus is shed from the nasopharynx beginning with the prodrome until 3 to 4 days after rash onset (3, 4). The prodrome phase is 10 to12 days from exposure. The incubation period of the disease is 7-18days, averagely 14days (2, 3, 5, 6). The case fatality rate is 1 per 1000 in developed countries where as in developing countries estimated 3% to 6% but it might be 20%-30% in high risk population like in infants under 12 months of age, malnourished person and people infected with human immunodeficiency virus(3). It is the leading causes of childhood morbidity and mortality among vaccine preventable diseases. It is a human disease and not known to occur in animals (3).

In 2008, there were 164,000 measles deaths globally –nearly 450 deaths every day or 18 deaths every hour (6). Of these more than 95% of measles deaths occurred in low income countries with weak health infrastructures (6) and mostly in children under the age of five year(6). From 2009 to 2010, cases of measles increased dramatically in Europe, with notifications increasing from 7175 to 303674 (7). Of these, 21877 people were admitted to hospital and 21 died. The case fatality was 0.69 deaths/1000 reported cases. 71% of people infected were aged less than 20 years and 85% were unvaccinated (7). In 2011, World health organization has reported outbreaks in 24 Europe countries. From January to March 2011, 9349 cases were reported (7). Measles is widely known in Ethiopia and it has many names in various ethnic languages, e.g., Kufign, Ankelis or Shifta. In 1980 Ethiopia introduced measles vaccination as part of the Expanded Program on Immunization (EPI) (8). Measles is one of immediately reportable disease in the country. From 2005 to 2009 a total of 175221 cases and 127 deaths were reported nationally. Of these 5.07 %(8894) were from rural and 2.54 %(4460) not identified as rural-urban and 51.9% of cases were male. During this period the median age was 4 years old. The age group 1-4 years constitutes 41.7 %(7323) (8). In 2011, Ethiopia faced measles outbreak from different

regions of the country. These regions are Amhara, Oromia, Tigray, SNNPR and Benishangul Gumuz regional states experienced the outbreaks at different areas of their region, (9). Amhara Regional State reported measles outbreak from almost all zones, with a total of 1471 cases and 6 deaths (0.41%CFR) were reported. High number of cases, 29% (423) was reported from Mekete woreda and 21 %(305) cases from Raya Kobo (10).

Bahir Dar Zuria woreda, Amhara Region is one of affected woreda by measles outbreak. From this woreda two kebeles namely, Dehina Mariam and Chenta were affected by measles outbreak in 2011.

Even though measles outbreak has occurred prior to Chenta in Dehina Mariam starting January 2011, Bahir Dar zuria woreda health office PHEM department reported the Chenta outbreak to Regional health bureau, Public health Emergency management department by telephone on April 9, 2011. This information initiated us to investigate the rumor of outbreak and to assess the risk factors and to set appropriate prevention and control intervention measure

Objectives:

General objective:-

To describe, verify and characterize rumor of measles outbreak in Chenta Kebele; Bahir dar from April 30, 2011

Specific Objectives:-

To verify the outbreak rumor in the Chenta kebele,

To describe the outbreak,

To identify the cause(s) of the outbreak in Chenta Kebele.

Methods:

Study Area: The Investigation was conducted in Chenta Kebele. Chenta is rural kebele found in Bahir Dar zuria woreda in west direction of Bahir dar. The kebele is approximately 20km from Bahir Dar. The kebele has one Health post with 1 nurse and two health extension workers. Chenta kebele has 7,736 total populations, 1047 under 5 populations and 193 less than one year infant population. The measles vaccination coverage of the kebele is 74%.

Study Design: Descriptive study was conducted in Chenta kebele, Bahir Dar zuria, Amhara Regional state, from April 20 to June 7, 2011.

Study Subjects: Residents of Chenta kebele those developed fever, rash and cough or Coryza or Conjunctivitis.

Sample Size and Sampling: All cases were taken. The case definition used was Standard case definition of WHO, “any person with fever, rash and cough or conjunctivitis or Coryza” which is used for measles surveillance (4).

Instruments: Structured and non Structured/about travel history, contact person/ questionnaires were used for collecting data on the variables

Variables: Age, sex, patient Name, on set of rash, vaccination status, sample taken, outcome, travel history, Kebele, Name of health facility and woreda

Data collection: Data were collected by principal investigator/resident and my colleagues; and were collected using questionnaire and observing records from health facility and from woreda report. Additional cases were searched by home to home visit. 12 cases collected by Home to home visit and included in to line list

Data Analysis: Descriptive analysis done by entering and recoding collected data using Epi-info version3.5.1 and Microsoft office Excel 2007.

Results:

Chenta Kebele which was my investigation site is the rural kebele approximately 20km from Bahir Dar town and has a total population of 7736 and less than one year infant population is 193. The measles vaccination coverage of the kebele is 74%.

A total of 46 cases were occurred in Chenta Kebele. Out of 46 cases 2 were died. The case fatality rate was 4.35%.The median age was 11.5 year and age range was 1 to 38 year. Of 46 cases 24(52.2%) were Females. The vaccination status of cases were 24(52.2%) not vaccinated, 17(37%) received 1 dose and 5(10.9%) received 2 doses of measles vaccine. The age group of cases were 11(23.9%) 1 to 4 years, 17(37%) 5 to14 years and 18(39.1%) 15 to 38 years.

The attack rate of the outbreak was 6 per 1000 people (46/7736) where as under 5year attack rate was 10.5 per1000 people (11/1047)

Table 1.1.1. The distribution of cases by age group and vaccination status in Chenta kebele, Bahir Dar Zuria woreda, April 20 –June 7, 2011.

Age group in year	Vaccinated No (%)	Unvaccinated No (%)	Total
1-4	11(100)	0	11
5-14	10(59)	7(41)	17
15-38	1(5.5)	17 (94.5)	18
Total	22(48)	24(52)	46

The outbreak was started 22 April, 2011 and prior to this date the case was zero. The detail of the outbreak time description is showed below in figure1.1.1

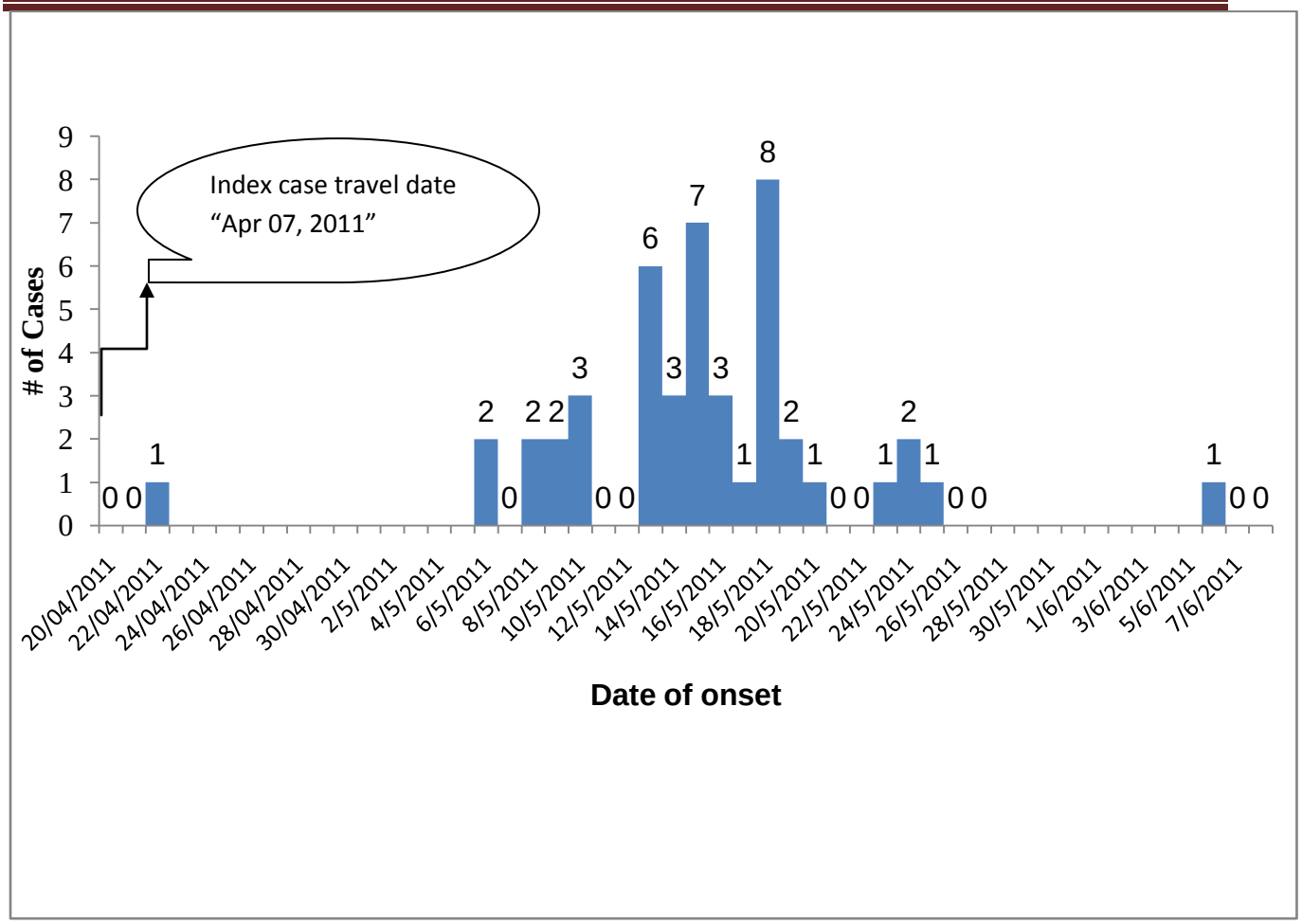

Figure 1.1.1: Epidemic curve of measles outbreak in Chenta, Amhara regional state, Ethiopia, April 20-June 7, 20011.

The case that had onset on April 22, 2011 has travel history on April 07, 2011 to Dehina Mariam for wedding ceremony. Dehina Mariam was one of measles outbreak affected kebele from Bahir Dar Zuria starting January 9, 2011 to May 2011.The person was 25 years-old male and not vaccinated to measles vaccine. He is alive but his oldest brother contracted the disease after him and died. In his family his sister also contracted the disease.

Laboratory:

The sample was not taken; the outbreak was epidemiologically confirmed by Epidemiological linkage with that of Dehina Mariam since Dehina Mariam outbreak was confirmed by Laboratory.

Discussion:

Measles cases fatality rate was 4% in this investigation site and the figure is found between the case fatality rate estimated for developing countries; which is 3 to 6% but it is higher than case fatality rate of the region which was reported in the same year. The Chenta kebele Measles vaccination coverage was 74%. Even the Measles vaccination coverage was 74% the immunized Children could be 85% of 74%. This coverage is so low. Therefore the reason for high case fatality rate (CFR) may be due to high unvaccinated /susceptible/ group or the regional CFR is diluted with those of high vaccinated areas Epidemic. The other possible reason may be the community low health seeking behavior.

Out of 46 cases 18(39.1%) cases were in the age group 15 to 38.The reason could be in the area more adults were not vaccinated for ever during their childhood life time and susceptible cohort groups may be high in this age group and low vaccination coverage to develop herd immunity. The population in the age group 15 to 38 may be high in this outbreak affected kebele.

The first index case of Chenta has been gone to Dehina Mariam which has measles outbreak prior to Chenta; for wedding ceremony. During the wedding Ceremony measles outbreak was in Dehina Mariam. Probably the Dehina Mariam outbreak was spread to Chenta.

Limitation:

Since the study is simply descriptive it is impossible to determine the risk factor and drive strong conclusion on causation.

Conclusion:

Perhaps Outbreak of Chenta might be spread from Dehina Mariam and presence of not vaccinated Cohort might be the cause for the outbreak.

Recommendation:

Missed children or cohort should be vaccinated by campaign or mobile team-(supplemental immunization activities), and monitoring of the susceptibility status of the community and early warning should be strengthen at all level to response timely

Acknowledgement:

I would like to thank my adviser Dr Mer'Awi Aragaw for his invaluable Contribution and commenting this outbreak report and field base supervisor who arranged the investigation trip and the Bahir Dar Zuria woreda Health office, PHEM officer who took me to Epidemic site

In addition my gratitude goes to WHO officer, Ato Tesfaye Tilaye who supported me by transportation and technically and those who assist and help me by giving invaluable information

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Annex:

Figures and Tables:

Table: 1.1.2. The distribution of vaccination status among cases in Chenta, Bahir Dar zuria woreda, Ethiopia April 22-June 07, 2011

Vaccination status	Frequency	Percent
Not Vaccinated	24	52.2%
One dose	17	37.0%
Two dose	5	10.9%
Total	46	100.0%

Table: 1.1.3. The distribution of age group among cases in Chenta, Bahir Dar zuria woreda, Ethiopia April 22-June 07, 2011.

Age group	Frequency	Percent
1-4	11	23.9%
5-14	17	37.0%
15-38	18	39.1%
Total	46	100.0%

1.2. Typhus outbreak investigation in Debre Berhan Prison, Amhara Region, Ethiopia from 4th to 15th July 2011.

Authors: Zekarias Adamu[1]

Name of FELTP: Ethiopia FELTP

FELTP Graduation: 2012

Abstract:

Background: Typhus refers to a group of infectious diseases that are caused by Rickettsial organisms and result in an acute febrile illness. Typhus is currently prevalent in mountainous regions of Africa, South America, and Asia. Ethiopia reports approximately 90% of typhus cases to world health organization each year. On July 8, 2011, the North Shewa Zonal Health Department reported increased number of acute febrile illness cases in Debre Berhan Prison.

Methods: Descriptive study was conducted in Debre Berhan Prison on July 12 and 13, 2011. Secondary data from line list and primary data of cases that experienced acute febrile illness since July 4th 2011 were collected. 63 conveniently selected cases were interviewed with Structured Questionnaire. Review of medical records of admitted cases were done from Debre Berhan Referral Hospital. Secondary and primary data were entered in Epi-info and analyzed for descriptive and risk factor variables.

Results: A total of 130 cases were identified from July 4th to 15th 2011 in Debre Berhan prison. Out of these cases 2 were died. All cases and deaths were males. The median age of cases was 27 years with age range of 17-67 years old. Live in crowded condition with <1m2/person. Among 63 cases interviewed, 57(90%) and 51(81%) cases interviewed had complained rat and fleas infestation in their room respectively. and 12 case were positive for welfilex test.

Conclusions and Recommendation: The prison was infested by rat, fleas and louse and over crowded with <1m^2/person. Probably overcrowding, rat, fleas and louse infestation of the prison and prisoners may have led to occurrence of this typhus outbreak in the prison;

appropriate actions were taken to control the outbreak. And hence, health education, improved hygiene and sanitation and living condition will prevent future outbreaks.

Introduction:

Typhus refers to a group of infectious diseases that are caused by Rickettsial organisms and result in an acute febrile illness (1, 2). It is a bacterial disease spread by lice or fleas (3). It is caused by one of two types of Bacteria called *Rickettsia typhi* or *Rickettsia prowazekii*. The form of typhus depends on which type of bacteria causes the infection (3).

Rickettsia typhi causes murine or endemic typhus (3, 5, and 6). It is usually seen in areas where hygiene is poor and the temperature is cold. Endemic typhus is sometimes called "jail fever (3)." The risk factors for murine typhus include, exposure to rat fleas or rat feces and exposure to other animals (such as cats, opossums, raccoons, skunks, and rats)(3). The disease is mild and transmitted by fleas on rat. Its mortality rate is low. If appropriate antibiotics are used it is 1% but without use of antibiotic it is 4 %(6). In most cases it is self-limited illness without complications but risk of severity may intensify with male. Its incubation period is 1 to 2 weeks. It is occurred worldwide (6).

Rickettsia prowazekii causes Epidemic Typhus and Brill-Zinsser disease. Brill-Zinsser disease is a mild form of epidemic typhus (3, 5, 6, and 8). It occurs when the disease re-activates in a person who was previously infected (5). It is more common in the elderly. Lice and fleas of flying squirrels spread the bacteria (3).Epidemic Typhus is a severe acute disease with prolonged high fever up to 40^0c (104^0F), intractable headache, and a pink-to-purple raised rash, due to infection with a Rickettsia prowazekii(4,6*).* It is a potentially fatal infectious disease and transmitted by Human body louse. It is mainly cause epidemics following wars and disaster. Flying squirrel is a reservoir for squirrel-associated epidemic typhus. The disease has incubation period 1 to 2 weeks (5, 6, and 7). Its mortality rate is 10% to 40 %(9, 7) but it can be close to zero if properly treated.

Epidemiology:

Epidemic typhus is currently prevalent in mountainous regions of Africa, South America, and Asia (5, 7, and 10). Typhus is common in mountainous and cool areas (7). It is

occurred over crowed areas like Military camps, Prison and unhygienic surrounding (1, 10).Globally typhus continues to kill a weighted average of 0.2 people per million, per annual (1). Ethiopia reports approximately 90% of cases to WHO each year (9).

Typhus is known to Ethiopia as “Tessibo Beshita” indicating the seriousness of the disease. The disease existed in the country for centuries, but the first epidemic was reported in 1866, in Army comps and prisons. Numerous local Epidemics have been reported since the 1940s in Ethiopia, especially in prisons, refugee camps, relief shelters, and rural villages. For Ethiopia Ministry of health between 1987 to 1990 the range of typhus cases reported were 2,000 to 4,500 cases from all Administrative regions. Louse-borne typhus infections increases during the cool, rainy seasons, with persisting famine, political unrest, poor hygienic conditions, and crowded living conditions which are potential for large outbreaks(11).

In Debre Berhan prison the acute febrile illness cases increased starting on July 4th 2011 and Debre Berhan zonal health department report an increased number of this acute febrile illness cases in the prison on July 8th 2011 to Amhara regional Health Bureau Public Health Emergency Management Department. Amhara regional Health Bureau Public Health Emergency Management Department send my colleague,Tekle Haymanot Gebre Hiwot and me, , to investigate causes and risk factor of acute febrile illness cases increment and to verify the increment is outbreak or not. The investigation helped to know the causes of outbreak and to implement appropriate prevention and control measures to stop further spread of outbreak. In addition the finding of this investigation can be lesson learnt for future prevention of outbreak.

Objectives:

General Objective

To verify, characterize, identify the causative agent and suggest control and prevention measures for outbreak in Debre Berhan prison, July 2011.

Specific Objectives:

To verify the rumor of outbreak in Debre Berhan prison;

To describe/Characterize the outbreak epidemiologically;

To identify the possible causative agent of outbreak in Debre Berhan prison.

To identify the possible source of outbreak in Debre Berhan prison.

To propose prevention and control measures of the outbreak in Debre Berhan prison.

Methods and Materials:

Study area: Debre Berhan prison is located in Debre Berhan town which is 130km from Addis Ababa, Capital city of Ethiopia. The prison is near (about 500m) the main road to Addis Ababa. It has a total of 1964 prisoners with 1922(97.9%) males. In the clinic 2 heath workers are serving prisoners and Staff. The prison has pipe lined water supply for drinking, bathing and cloth washing. Forty-eight seat of toilet were available in the prison and it is separate for females and males.

Study Design: Descriptive study includes environmental and sanitary inspection, and clinical and laboratory investigations were conducted in Debre Berhan prison on July 12 and 13, 2011.

Study Subjects: Prisoners of Debre Berhan those developed acute febrile illness or cases with Weil Felix test positive from July 4th to 15th 2011.

Sample Size and Sampling: All acute febrile illness or Weil Felix test positive Cases that have been seen in Debre Berhan prison on July 4th to 15th 2011 were taken as case.

Instruments: Structured and non Structured questionnaire were used for collecting data on the variables. The instrument, questionnaire used were epidemic line list and other that were developed for investigation during outbreak.

Variables: Age, sex, patient Name, clinical sign and symptoms, water supply, latrine, existence of insect, hygiene(body, cloth, cleaning of the room), sharing of utensils, number of people in room, sample taken, outcome, ventilation and area of classes.

Data collection: Data were collected by principal investigator/resident and my colleagues, Tekle Haymanot Gebre Hiwot. For 130 cases the data was collected on age, sex, date of onset, outcome but for 63 cases additional variables like Number of people living in the room, hygienic condition, bathing frequency, presence of insect in the room and housing condition.

Data Analysis: Descriptive analysis done by entering collected data using Epi-info version3.5.1 and Microsoft office Excel 2007.

Results:

A total of 130 cases were identified from June 4th to 15th in Debre Berhan prison. Out of these cases 2 were died. All cases identified were males. The median age of cases was 27 years with age range of 17-67 years old. .

The outbreak started on July 4th 2011 and highest peak was on July 7th 2011 with 40 cases on this day. The detail trend of the outbreak by time/ date of onset/ was also described in figure 1.2.2.

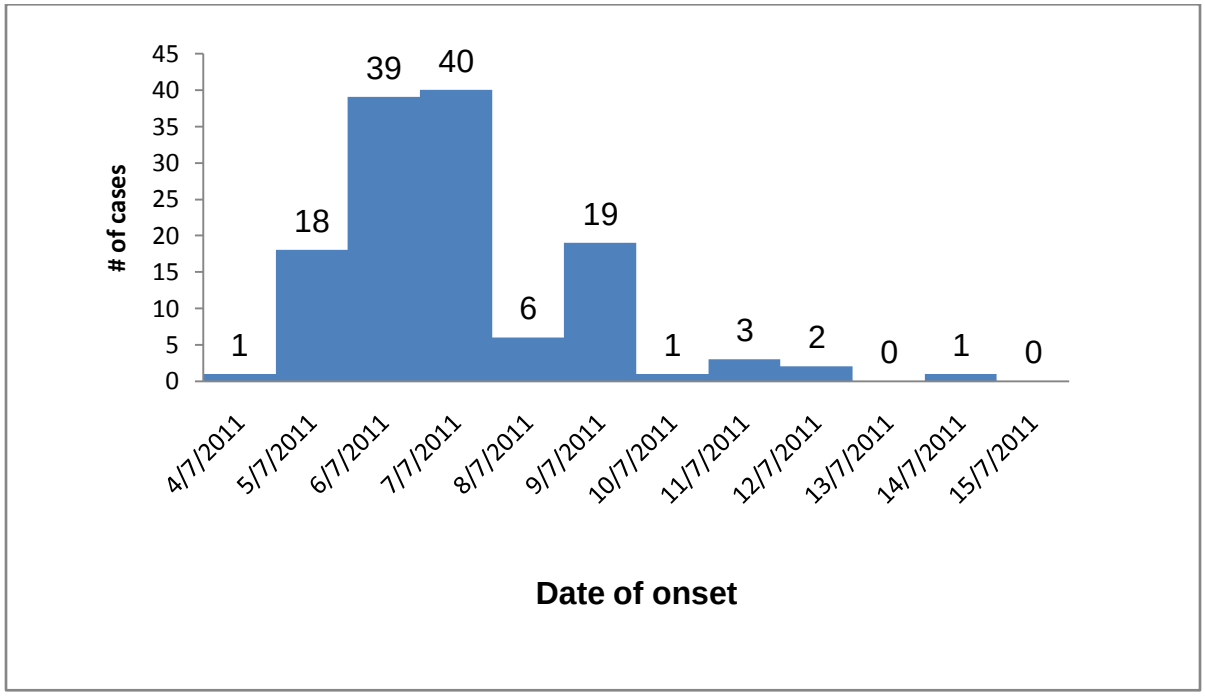

Figure: 1.2.2. Epidemic curve of Typhus outbreak in Debre Berhan prison, Amhara region, from 4th to 15th July.

The attack rate of the outbreak was 6.6% (130/1964) with case fatality rate 1.5% (2/130).

From 130 cases identified, the first 63 cases that we have meet were interviewed with structured questionnaire. The 63 cases interviewed had signs and symptoms; fever, Headache, Cough, Diarrhea, Vomiting, Abdominal cramp and later on Rash. Out of 63 cases; 62(98.4%) and 49(77.8%) were experienced fever and headache respectively

(table 1.2.1). Other than sign and symptoms listed in table 1; 10 and 9 cases had felt joint pain and chilling respectively.

Table: 1.2.1. Signs and symptoms of the cases in Debre Berhan prisoners 4th to 15th of July 2011.

Signs and symptoms	Number cases(N=63)	Percent
Fever	62	98.4
Headache	49	77.8
Cough	35	55.6
Diarrhea	34	54.0
Vomiting	30	47.6
Abdominal Cramp	24	38.1
Any rash	16	25.4

From the 63 cases interviewed; 20 cases of them were from Adisu Gbi. For other Blocks; the number of cases and attack rates were specified in table 1.2.2.

Table: 1.2.2. The Number of population, Cases and attack rate (AR) by Block in Debre Berhan prison 4th to 15th of July 2011.

S.No	Name of affected Block	Total population	# of Cases	Attack rate (AR)(%)
1	Adisu Gbi	459	20	4.36
2	Gbi	450	19	4.22
3	Tmehert Bet	300	13	4.33
4	Magazen	212	7	3.30
5	Tliku Gbi	128	3	2.34
6	Room-12	122	1	0.82
7	Total	1671	63	3.77

Out of 63 cases interviewed, 36(64.3%) of cases were admitted to hospital or in the separate room of the prison and take their treatment under the follow up of health worker and 20(35.7%) of cases were treated as outpatient,. 30(47.6%) of cases had contact with other similar disease before illness in their room that makes people the chance of arthropods exchange one to others and the rest were the first patient in their class room.

Environmental and personal hygiene Assessment:

The prison has 49 class rooms for the prisoners residential, 2 class rooms for kitchen and 3 class rooms for clinic. In the prison 40 peoples live per class room averagely. In maximum 150 and minimum 21 peoples live per class rooms. The prison had pipelined water supply for drinking and washing purpose. The prisoners was witnessed the water

supply was not interrupted. The prison had also 48 seats (41 prisons per seat) of toilet and cleaned every morning by prisoners.

Housing condition was assessed during investigation and I had the chance of visiting the rooms. And averagely 2 prisoners were living per 1msq.They were using grass mattress for sleeping and beds were arranged 1person bottom the other top of him. By side it was also closed to the other bed and has possibility of close contact of each other. Out of 63 cases interviewed about the ventilation 59(93.7%) were living in rooms have no windows or other type of ventilation and 9(14.3%) had one window on top of the wall. Among 63 cases interviewed, 57(90%) and 51(81%) of them were witnessed that their room had rat and fleas respectively and 34(54%) had louse in their day and night clothes.

Of 63 cases interviewed, 54(87.1%) were cleaning their room daily at morning. Whereas 6(9.7%) and 4(3.2%) were cleaning their room every 3 days and weekly respectively. And 29(46%) and 23(36.5%) cases were change their cloths every three days and per week respectively.6 (9.5%), 4(6.4%) and 1(1.6%) were change their cloths every 4 days, per 2 weeks and daily basis correspondingly. Of 63 cases interviewed 40(63.5%), 13(20.7%) and 6(9.5%) were wash their cloths per week, per 2 week and every 3 days where as the rest 3(4.8%) and 1(1.6%) were when get dirty and monthly bases correspondingly. Out of 63 Cases interviewed 40(63.5%) of cases were wash their body every 3days (table 3).

Laboratory:

Out of 130 cases, for 12 cases weil-Felix test was done in Debre Berhan referral hospital and all were positive or reactive for weil-Feilx test.

Discussion:

The onset of outbreak was on July 4th 2011 with peak at July 7th and onward the numbers of cases were decreased. All cases identified were males. Out of 63 cases interviewed, 57(90%), 51(81%) and 34(54%) of cases witnessed that the prison were infested with Rat, Fleas and Louse respectively. The weather condition of Debre Berhan at July is rainy season and it is cold. The prisoners were living in over crowed condition which is 2 prisoners per 1m.sq.

All cases were males in this investigation. This mean, it is not that Typhus do not affect the females but it might be due to less number of females,37(2%) in the prison, and It might be also due to females better housekeeping and personal hygiene than male in general.

The insect in the clothes and in the room have been priory to outbreak. The vectors, like body louse and rate fleas are one of important vectors that transmit diseases. As we described the prison was infested by rats, Louse, fleas and bed bugs. The two important vectors for transmission of typhus are the body louse and rat fleas. In the prison, among 63 cases, 57(90%) and 51(81%) cases were told presence of rate and fleas infestation in their room respectively. Similarly 34(54%) cases were told that they have louse in their day and night clothes. Probably these vectors were responsible for outbreak in the prison. In addition of the presence of the stated vectors the overcrowding makes the transmission easy and the disease causing organism by the help either body louse or rat flea transmitted one person to other person and led to outbreak

Typhus infections increases during the cool, rainy seasons, with persisting famine, political unrest, poor hygienic conditions, and crowded living conditions which are potential for large outbreaks(11). Similarly this outbreak occurred at July 2011 which is cool season and in the prison that has overcrowding living condition. The weathers condition at this season and poor hygiene of prison and prisoners perhaps favorable for Vectors and this led to high production of vectors. Typhus occurred as outbreak in prisons, refugee camps, army camps and relief shelters. similarly this typhus outbreak was investigated in Debre Berhan prison.

Actions taken:

The number of cases increased from July 4th to 7th and onward it decreases because the intervention measure was started on July 7th by North shewa zonal health department. All rooms were deloused and prisoners were ordered to keep their personal hygiene. The outbreak got attention early case detection and follow up of cases to finish their anti biotic/treatment is under control of health professionals. The health professional follow the treatment because 1 patient dead was not take the treatment given by health workers.

Limitations:

Since the study design is descriptive, it is not strong to show causation relationship. The study simply assess the presence of insects but did n't identify weather vectors are infected or not.

Conclusions:

The prison was infested by rat, fleas and louse and over crowded with <1m^2/person. Therefore overcrowding, rat, fleas and louse infestation of the prison and prisoners may have led to occurrence of this typhus outbreak in the prison.

Recommendations:

To interrupt the transmission of this disease Debre Behan prison, Debre Berhan Town Administrative health office and North shewa zonal health department Should collaborate to Delouse and destroy the vector; body louse and fleas from the room. Debre Berhan prison should do additional classes and reduce overcrowding by Communicating Higher responsible bodies unless overcrowding is still risk for future occurrence of outbreak. The prisoner should keep their classes and clothes free of vectors for prevent the disease (like regular Health education…). The Debre Berhan prison should avail ventilation for the rooms and regular Health education should be given for prisoner on hygiene.

Acknowledgements:

I would like to thank my Adviser D.r Mer'Awi Aragaw for his delicate and invaluable comment for developing this report and field base supervisor Mr. Bassazino Alemu who arranged the outbreak investigation.

My expression also goes to North shewa zonal health department and prison coordinator. In addition my deepest gratitude goes to Mr. Belay Bezabih who supported me technically and also I wish to thank Teklehaymanot Gebre hiwot for his support during data collection.

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Chapter-II Surveillance Data Analysis Report:

2.1. Monthly Surveillance report data analysis of Suspected Rabies cases in Amhara Region, 2006-2009.

Abstract

Introduction: Rabies is a viral zoonotic disease caused by negative-strand RNA viruses from the Lyssavirus genus. It is a fatal disease that is transmitted by different mammalian species to humans. In Africa, more than 90% of human rabies is attributed to the canine rabies variant transmitted by domestic dogs. Human rabies is an important public health issue in Ethiopia; however surveillance data not comprehensive. Therefore, this analysis was undertaken to improve understanding of rabies epidemiology in the region

Methods: Monthly surveillance system (IDS R) data reports from (July/2006 to June/2009) submitted by zonal health offices to the Amhara Regional Health Bureau were analyzed using Excel.

Results: The total of 1000 suspected rabies cases and 4 deaths were reported from 2006 to 2009.Post exposure prophylaxis used in the region for the suspected cases of rabies. The suspected rabies cases reported by the year ranges 66 to 484 and the trend was increasing. The highest cases reported at February (298) and September (189).Six inpatient cases reported from 2006-2009.

Conclusion: The suspected human rabies cases reported were increased year to year due to rabid dog bite. Since this analysis shows that human rabies increment in the region due to dog bite, dogs should be vaccinated and owners' of dogs should manage their dogs.

Introduction:

Rabies is a viral zoonosis disease caused by negative-strand RNA viruses from the Lyssavirus genus (1). From point of entry the virus is neurotropic, traveling quickly along the neural pathways in to central nervous system (CNS) (2). It is a fatal disease that is considered a reemerging zoonosis throughout much of the world (3). Although rabies can infect and be transmitted by a wide range of mammals; reservoirs comprise only mammalian species within orders carnivora. From perspective of human rabies, the vast majority of human cases >90% results from bite of rabid domestic dog (1).Human rabies, transmitted by dogs is an important public health issue in Ethiopia (4). All human cases of rabies were fatal until a vaccine was developed in 1885 by Louis Pasteur and Émile Roux (6).In 1996 G.C world survey of rabies recorded a global total of 33212 cases, of which 238 were in Africa and 32772 in Asia (5).

Globally, rabies is considered to be a relatively insignificant human disease, accounting for only 1% of deaths attributable to infectious diseases (5).However, there is widespread recognition that the number of deaths officially reported in much of African does not reflect the true incidence of the disease(5). In 1998, more than 33,000 people died worldwide because of rabies (4).Annual reports of the Ethiopian Health and Nutrition Research Institute indicated a total of 488 human deaths that occurred in 1964 and 1975. In 1992 and 1993; 464 human cases were reported in Addis Ababa whereas in the entire country only 26 and 35 cases were officially reported to WHO respectively.

In 2005, 67 suspected rabies cases were reported from different zones to the region, Amhara regional state.

Even though suspected human rabies cases were collected by monthly surveillance report, its data analysis was not done in the region.

The main purpose of this surveillance data analysis is to view the trend of suspected rabies cases in Amhara Regional State.

Amhara regional state is one of the nine regional states of the nation. It is the 2nd largest regional state with the area of 286,259 Km sq and it is the home for 18.5 million peoples who constitute ¼ of the national population, of these 49.6% is women and the annual growth rate is 1.8. The 87% of the people live in rural and the rest is urban. The population density of the region is about 93 inhabitants/Sq km. In the region there are more than 3 ethnicities; namely Amhara, Agawo, Oromo and others, of this the largest population is Amhara.

The region share international boundary with republic of Sudan in the North West, national boundary with Tigray in the North, Afar in the east, Oromia in the South and Benishangul gumuz in the South west. Its altitude ranges from 500m-4620m above sea level and annual temperature is 12.4-27.8 degree Celsius. The annual rainfall is 300-2000mm and two rainy seasonal, from June- September and February-April are occurred but the former one is the main rainy season.

Administratively; it is divided in to 11 zones, 3 towns administrative and the zones are sub divided in to 166 woredas and at lower level in to kebeles.

There are 16 governmental and 6 private hospitals, 691 health centers, 3052 health post and 6620 rural and 461 urban health extension workers are available. The physical health service is 98.9%.

Objective:

The primary purpose of the suspected human rabies data analysis is to investigate suspected human rabies trend from 2006-2009 in Amhara regional state.

Specific objectives:

- To describe monthly surveillance reported cases of suspected human rabies trend from 2006-2009 in Amhara regional state, Ethiopia.
- To identify most affected reporting sites/zone/ from the region from 2006-2009

Methods:

Regional monthly surveillance data which was available electronically in Amhara Regional State was reviewed. During the time of reporting, reporting sites were report cases by using case definition. The case definition was: *History of animal bite followed by acute on set of headache fever, malaise, and indefinite sensory changes often referred to the site of animal bite wound at late stage paresis or paralysis, hydrophobia delirium & convulsion or any person who bitten by suspected dog or other animals(9).*

The regional health bureau, previously named IDSR unit, received those data from 11 reporting sites. The data were available in electronic form at regional level. This is a review of suspected human rabies cases reported from 2006-2009.

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Results:

The total of 1000 suspected rabies cases and 4 deaths were reported in four year from different zones of Amhara regional state, Ethiopia. The average annual suspected rabies cases were 250 in the region. In 2006 (66), in 2007(108), in 2008(342) and in 2009(484) cases were reported (see table-2.1).Starting 2006 to 2009 cases were increasing (see fig-2.1).

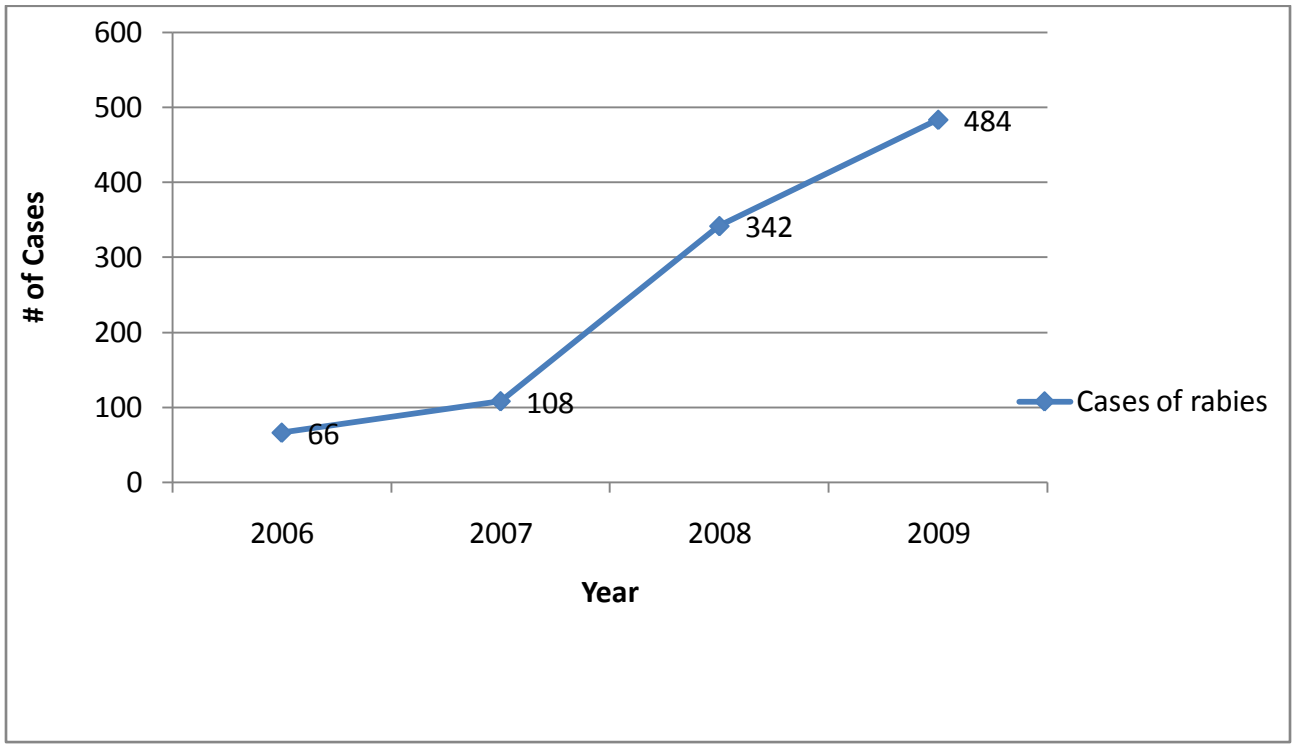

Fig 2.1 Trend of Suspected rabies cases by year in Amhara region, 2006-2009

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The highest, 484(48%) of suspected cases were reported in 2009 where as the lowest, 66(7%) of cases were reported in 2006 (see fig-2.2). The multiple peaks of cases were in February and September. Starting from July the cases were raising and attend the peak at September and then dropped down up to January. The highest peak, about 298 suspected cases, was reported in February. The reported cases were fluctuating month to month with large difference ranging from 18-298 cumulative cases of four year (see fig-2.3).

N-Gonder zone reported the highest suspected cases, 46(70%) in 2006 While 62(57%) cases in 2007 and177 (37%) cases in 2009 were reported in N-shewa. From 2008 most cases, 129(38%) were reported from waghimra. But from 2006-2009 there is no reported cases from Bahirdar and Oromia zones. (See fig-2.4).

From 2006-2009, the highest (31%) suspected cases were reported from N-Shewa followed by waghimra (27%) and the lowest (1%) were reported from Awi (from fig-2.4).

The number of reported inpatient cases were 6 where as the number of reported deaths were 4. The case fatality rate from inpatient cases was 4/6*100, which was 66%.

From 2006-2009 the reporting sites were fluctuating from month to month and year to year.

Discussion:

Cases were increased year to year as seen from the fig 2.1, and the average annual cases of suspected rabies cases in the region were 250 per year, this was higher than the officially reported rabies cases to the WHO in 1992, 26 cases and in1993, 35 cases(5). Actually this might be due to Expansion of reporting sites, increasing of awareness on case definition, increasing of health seeking behavior of the community, true increment of the cases and high population of dog.

The reported fatal cases, 6 cases, of rabies in the region were reported and this was lower than retrospective record review study done in Addis Ababa and surrounding areas from 2006-2009 , Show that the fatal cases of rabies were 386 humans with annual range of 35 to 58(4.)

Virtually 100% of those infected with rabies who do not receive the vaccine will die (2).But as seen in fig 2. 8, the case fatality rate is 4/6*100=66% which was lower than 100% ,this is Probably due to miss reported/over, under/Miss classification or the cases may be admitted do to other disease. In addition to above reasons, it might be discharged/ referred before death. The number of rabies deaths reported in this four year was 4 which mean 1 death per year. Actually it was lower than the rabies death incident, 1-5 per 100,000/year, in developing countries (1).In 2006, the highest (43) rabies deaths were recorded in Africa and it was reported from Ethiopia (4) which was very higher than the deaths reported in the region from 2006-2009 . The cases were increasing year to year but the deaths reported were very few which might be linked with high production of the post exposure prophylaxis (PEP) and given for victims or probably, the deaths and cases of the region may not shows real incident which means under reporting could be experienced in the region.

Limitation:-

- The data quality is poor.
- It lacks person variable which is one of descriptive Epidemiological variable
- Some reporting sites are silent
- There is no reason for data collection i.e. No one use them for action.

Conclusion:-

The suspected human rabies cases reported were increased yearly from 66 cases in 2006 to 484 cases in 2009. In general the burden of human rabies in the region is increasing due to dog bite.

Recommendation:

The regional health bureau, PHEM unit, should pay attention to collect all reports of human rabies cases from the reporting sites and regularly monitor the cases. Since this analysis shows that human rabies increment in the region due to dog bite, dogs should be vaccinated and owners' of dogs should manage their dogs. In addition to the above recommendation, PHEM unit should communicate Agricultural bureau and the street dogs has to be killed regularly.

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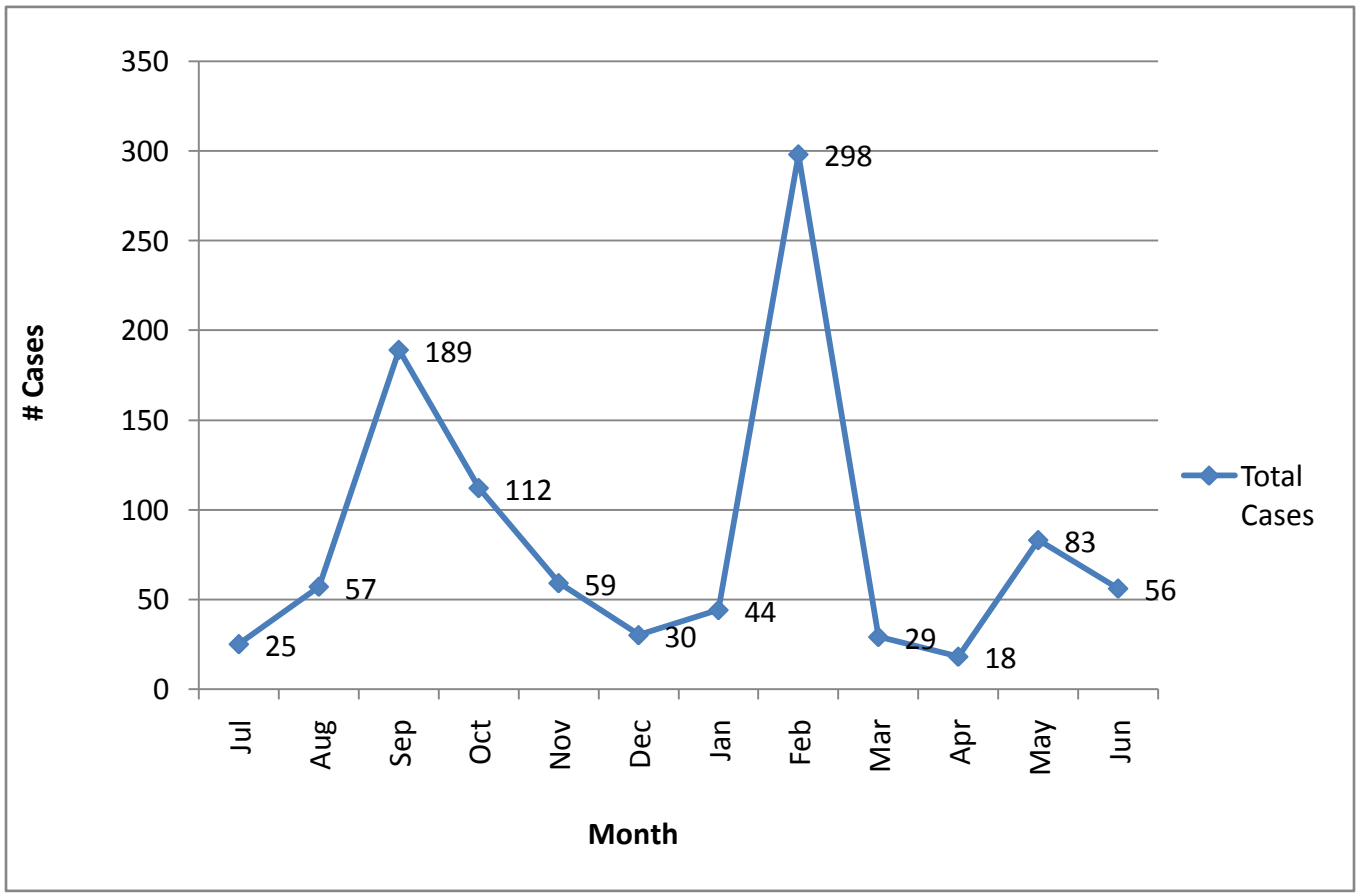

Fig 2.3 Four year trend of Rabies cases by month, Amhara region, 2006-2009.

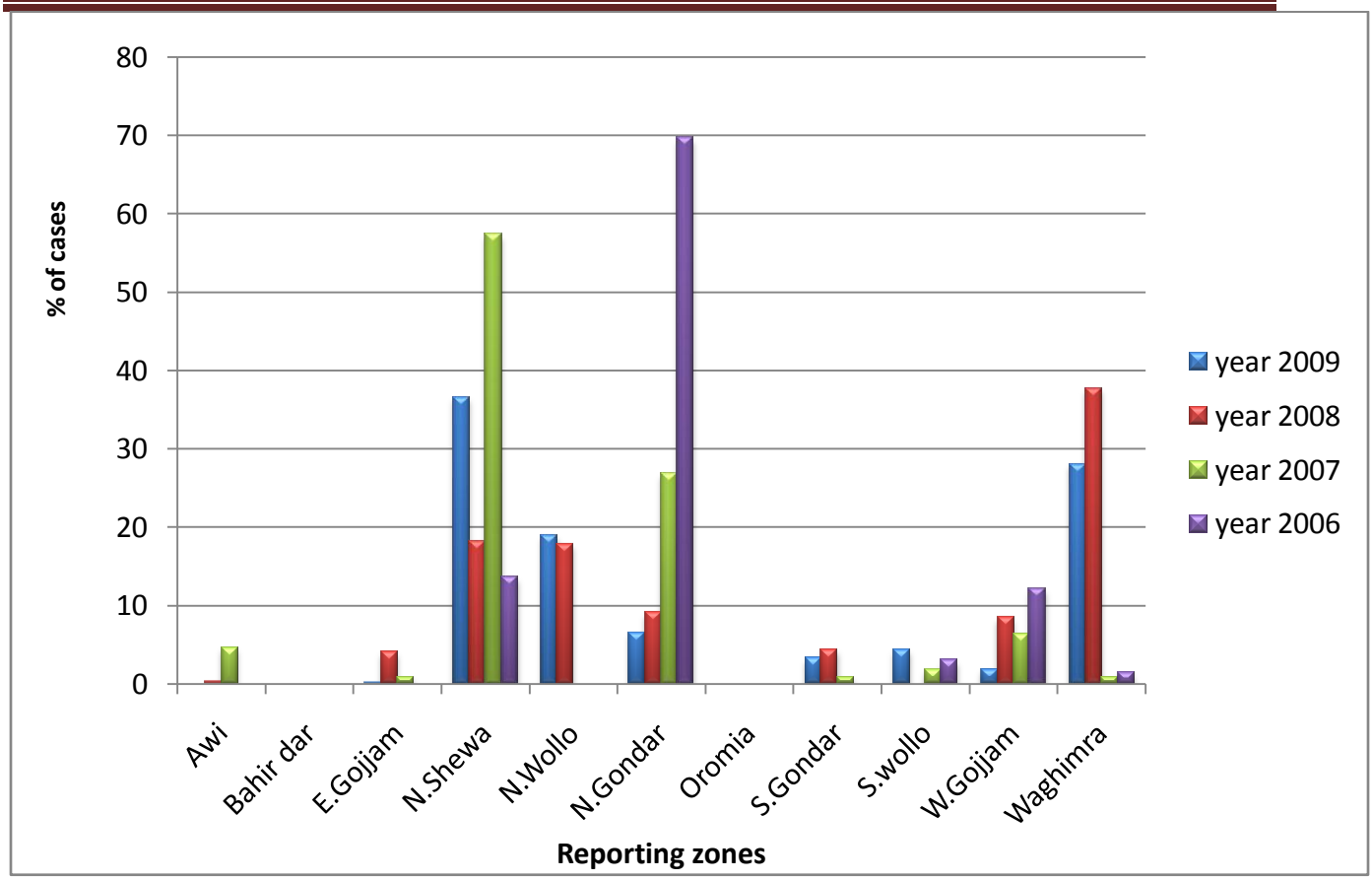

Fig: 2.4 Percent of reported suspected rabies cases by zone in Amhara region, in each year.

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Table-2.2 Number of reporting sites in each month by reporting site categories in Amhara region, 2006.

Category of report site	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun
Supposed to report	77	113	131	124	124	132	116	132	130	129	133	111
Report for month	94	106	114	113	115	117	100	116	123	123	113	105
Report on time	94	106	112	109	114	117	100	113	123	123	103	105
Completeness in %	122	94	87	91	93	89	86	88	95	95	85	95
Timeliness in %	122	94	85	88	92	89	86	86	95	95	77	95

Table-2.3 Number of reporting sites in each month by reporting site categories in Amhara region, 2007.

Category of report site	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun
Supposed to report	139	140	140	142	146	149	145	147	147	130	150	111
Report for month	131	123	125	125	127	138	123	135	140	116	124	93
Report on time	130	128	125	116	116	136	119	133	138	116	124	93
Completeness in %	94	88	89	88	87	93	85	92	95	89	83	84
Timeliness in %	94	91	89	82	79	91	82	90	94	89	83	84

Table-2.4 Number of reporting sites in each month by reporting site categories in Amhara region, 2008

Category of report site	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun
Supposed to report	151	145	149	140	148	149	156	147	114	156	150	13
Report for month	137	114	138	121	129	138	138	144	112	150	138	13
Report on time	137	118	137	121	107	136	141	139	112	150	138	13
Completeness in %	91	79	93	86	87	93	88	98	98	96	92	100
Timeliness in %	91	81	92	86	72	91	90	95	98	96	92	100

Table-2.5 Number of reporting sites in each month by reporting site categories in Amhara region, 2009

Category of report site	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun
Supposed to report	151	148	149	140	264	147	269	147	114	156	150	13
Report for month	135	135	140	121	186	144	203	144	112	150	138	13
Report on time	128	140	139	121	172	142	205	139	112	150	138	13
Completeness in %	89	91	94	86	70	98	75	98	98	96	92	100
Timeliness in %	85	95	93	86	65	97	76	95	98	96	92	100

Chapter III – Evaluation of Surveillance System:

3.1. Measles and Neonatal tetanus surveillance system evaluation report of Bambasi District in Benishangul Gumuz Regional State 25 June, 2011.

Abstract:

Introduction: Public health Surveillance is the ongoing systematic collection, analysis, and interpretation of outcome specific data for use in the planning, implementation, and evaluation of public health practice. The surveillance information should be used to identify research and service needs, which in turn help to define training needs. In Ethiopia public health surveillance have been implemented by different strategies. Now a day the strategy and the system of public health surveillance changed due to newly emerging Business process reengineering.

Measles and NNT were the diseases that are under active surveillance in the country. The purpose of this evaluation is to review measles and NNT surveillance in the district for 2003EFY. To determine Measles and NNT surveillance system is meeting its objectives, and operating as efficiently as possible and identifying the merit, worth and effectiveness of the system.

Methods: The cross sectional study was conducted in Bambasi Wereda, Assosa zone, in Benishangul gumuz Regional State. This Wereda was selected for its easy accessibility and the finding in health profile shows that there is low reporting of the cases of measles and NNT. In the study 2 health centre,3 health post and 1 woreda health office were included.

Results: The Surveillance system was run in the region as well as assessed woreda. The number of diseases under surveillance was 19 even if from National regions and woredas expected to report 20 diseases. None of the facilities have any Standard case definition for all priority diseases except case definition of Measles, NNT and AFP. All facilities have registration book for cases.None of assessed facilities did report measles and NNT in 2011. The district was collected reports from public health facilities only by reporting formats. For the past six months in the district reporting format scarcity was not occurred since the district has reporting formats both in hard copy and soft copies. Reporting schedule in the district was according to PHEM unit of the regional health bureau which was based on weekly and immediately. The district has 23 health facilities of which 12(52%) health facilities were reporting listed under surveillance diseases. The reviewed past six month report that the district report to the next level was 21/22(95.5%)

and all of them were reported within deadline. All assessed areas were supervised by Zonal health department, regional health bureau and partners at least 2 times per year. The main thing here missed was written feedback from all stakeholders and no one remember/follow what was gave/identified on previous supervision trip as gap. Beside to this dissemination of finding/report to stakeholders by using different way of communication channel was not here at all level. What they did was simply reporting weekly reports to next level of administrative division. Starting from zonal level focal person, the district focal person and health workers were not train on PHEM. Resource for communication, data management, transportation, for active case search and logistics for regular supervision were not available for the program at zonal, district and facility level.

Conclusion and Recommendation:

The reporting of cases was not consistent at each level. The surveillance system in placed but the training and regular supervision with feedback is not carried out. Due to this facilities are reported 7 cases weekly bases by the own reporting formant. Cases definition is not there during assessment. Measles and NNT were not reported in the year. Report copies were not documented well.

Therefore woreda health office and other stakeholders should carry out supportive supervision and give feedback to strengthen the systems. In reporting format the health facilities and woreda health officer should use the national reporting format which has 20 reporting diseases. Documentation should be strengthening at each level. Training also mandatory.

Introduction:

Public health Surveillance is the ongoing systematic collection, analysis, and interpretation of outcome specific data for use in the planning ,implementation , and evaluation of public health practice(1,2).A surveillance system includes the functional capacity for data collection and analysis, as well as the timely dissemination of information derived from these data to persons who can undertake effective prevention and control activities(1).

The first public health action that can be related to surveillance probably occurred during the period of bubonic plague , when public health authorities boarded ships in the port near republic of Venice to prevent persons ill with plague-like illness from disembarking(1).

The current concept of public health surveillance evolve from public health activities developed to control and prevent disease in community(1). The primary function of the application of the term epidemiologic to surveillance, was to distinguish this activities from other forms of surveillance (e.g. military intelligence and to reflect its broader application (1).

The surveillance information should be used to identify research and service needs, which in turn help to define training needs. Unless this information provided to those who set policy and implement programs, its use is limited to archives and academic pursuits, and the material is therefore considered to be health information rather than surveillance information (1).

In Ethiopia, public health surveillance has been implemented by different strategies. Previously it was started by vertically for each disease which was not economical for monitoring the diseases independently.

After this integrated disease surveillance and response (IDSR) strategy was introduced and implemented throughout the country. All Regional Health Bureaus were expected to report 23 selected diseases for federal ministry of health (FMOH) and FMOH to world health organisation.

In 2009, the strategy and the system of public health surveillance changed due to newly emerging Business process reengineering. The system broadens to include any emergency beside to diseases outbreak and selected 20 diseases to surveillance in the country. Regions were expected to report those diseases and any health and health related emergencies. The task of surveillance has been authorized by health sectors and health workers at all levels. In addition to government health sectors Non-governmental organisation were engaged as stake holder. World Health Organisation was the main actor of surveillance as stake holders in Ethiopia. According to new system established weekly report of 20 diseases were reported from Health facilities to different levels of stake holders. The detail reporting ladder is specified below.

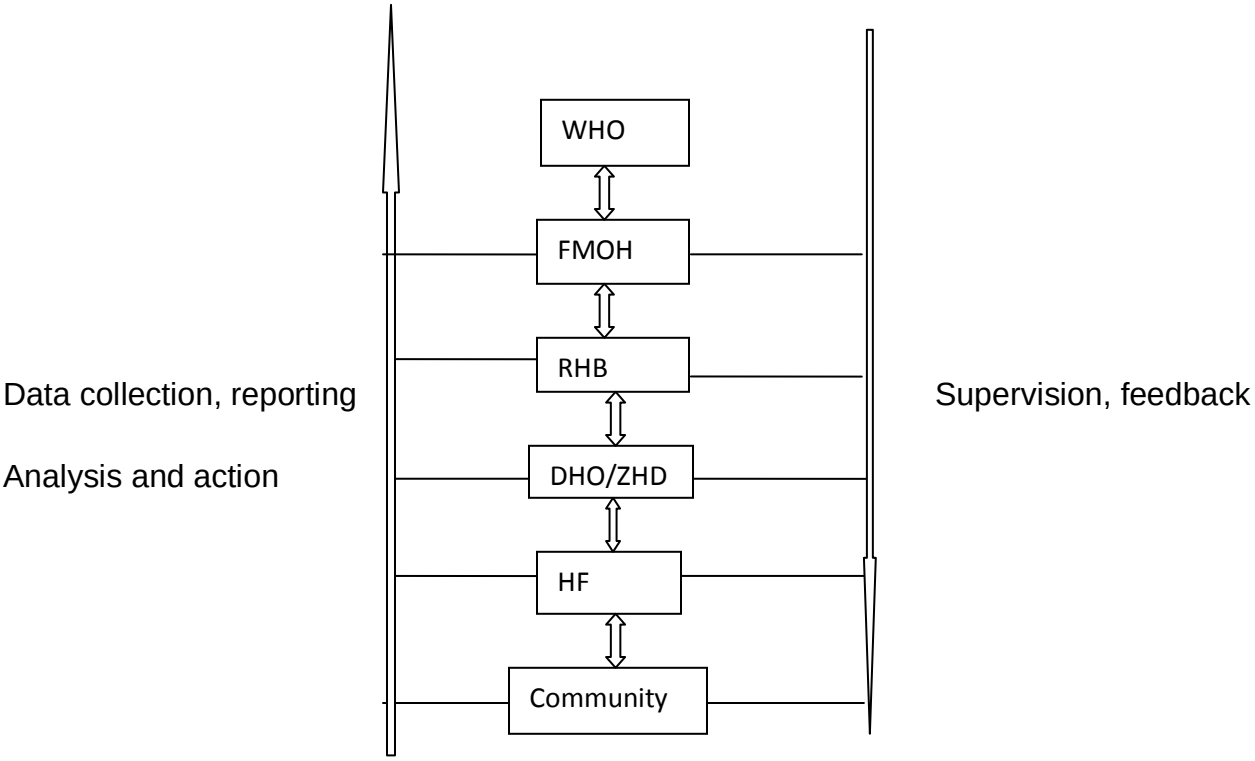

Fig-3.1. Surveillance system reporting ladder in the country.

Measles and NNT were the diseases that are under active surveillance in the country. Measles and NNT has been also under elimination program in the world and as the

member country of WHO, Ethiopia has been started and implementing this elimination program in the country.

In Bambasi Wereda, there were low reporting cases of measles and NNT cases were not reported for the past 5 years. The intension of this evaluation is to review the past experience of surveillance of these diseases as well as to identify the merit and demerit of the system in the district.

Rationale of the study:

The purpose of the evaluation is to review measles and NNT surveillance in the district for 2003EFY. Despite low immunization coverage of measles in the district, there was low/null measles case report. Measles is a viral vaccine preventable disease but the disease is still leading cause of mortality among vaccine preventable diseases. In Ethiopia a number of measles outbreaks were reported in different regions and districts. In Benishangul gumuz regional state some of the district like Mandura Wereda, Dangur Wereda, Pawi Wereda, Assosa Wereda and Belogingafoy Wereda were reporting suspected measles cases but Bambasi Wereda was silent.

NNT was not reported for the past 5 years in the region despite of low safe and clean delivery and also low TT immunization coverage both for pregnancy and non-pregnancy women. That is why I went to evaluate the surveillance on those diseases in the district.

Objectives:

General Objective

To determine Measles and NNT surveillance system is meeting its objective, and operating as efficiently as possible and identifying the merit, worth and effectiveness of the system.

Specific objectives

To describe operating system of Measles and NNT surveillance system in Assosa zone Bambasi woreda, Benishangul gumuz.

To describe different reporting formats used in surveillance system.

To identify the number of reporting levels used in surveillance system.

To describe reporting frequency implemented in surveillance system.

To assess documentation system and use of data for reported cases in surveillance system.

To assess different attributes of surveillance systems.

Methods and Materials

Study Area: The cross sectional study was conducted in Bambasi Wereda, under Assosa zone, in Benishangul gumuz regional state. This Wereda was selected for its easy accessibility and the finding in health profile shows that there is low reporting of the cases of measles and NNT. The total population of this Wereda is estimated to be 58,945 (projection from the 2007 census) and of this 49% were females. The whole population is under surveillance for these diseases.

Study Subjects:

- Health facilities (Health Centers, and Health Posts)
- Woreda Health Offices, Zonal Health Desks, and the Regional Health Bureau.
- Health workers

The study subjects' distribution is shown below in the following table in the study area.

Study subjects	Number	Remark
Wereda health office	1	
Health centers	2	
Health post	3	
Health workers	10	
Zonal health desk	1	Only for referring sent copies of the district data.
Regional health Bureau	1	Only for referring sent copies of the district data and for lab results

Selection of the district health facilities were done as in the steps below

1. From the district 2 Health centers and 3 health posts, those facilities reporting the report for the district were selected by convenient method based on accessibilities.
2. From each selected health facilities two health workers those working at OPDs were selected for interviews.
3. From the Wereda the responsible persons were interviewed.
4. The regional health bureau and zonal health desk responsible persons were asked about the district surveillance operation.

Instruments:

The following mechanisms were used to collect the required data.

1. Record review:

   At District: Weekly surveillance reports submitted by all health facilities for the period 2003EFY, report tracking tools, Cases investigation forms, outbreak reports, results of data analysis, epidemic preparedness plan of measles, reports of immunization of measles and TT records were reviewed.

   At facility: Patient registration, copies of weekly reports, results of data analysis, schedules and reports for community outreach activities, case investigation forms and standard case definitions of measles and NNT records were reviewed.

   At zonal: weekly reports submitted by the district, cases investigated and sent to lab were reviewed.

   At regional: cases investigated and sent to lab by the districts were reviewed.
2. Interview:

   At facility: PHEM focal person and persons working at OPDs were interviewed.

   At Wereda: PHEM officers and those working with him closely were interviewed.

   At regional and Zonal: responsible person for PHEM were interviewed.
3. Individual Self administered questionnaire:

   Self administered questionnaires were administered for those interviewed to assess their KAP on Measles and NNT surveillance.

Data collection:

Data were collected by principal investigator/resident and were collected using questionnaire and observing records.

Data Analysis:

Data were entered and analyzed using the Microsoft Excel and Epi-info version3.5.1.

Dissemination of the Study:

The result of the study will be submitted to the SPH- AAU and the respective zonal and regional health bureau with a hard copy, and other stakeholders working in the area. If possible the finding will be presented to stake holders, Wereda health office, Zonal health desk, facilities health workers and Regional Health Bureau, PHEM at Regional health Bureau. The findings also will be published in local or international journals for the consumption of the wider national or international scientific community.

Results:

On the regional level I was discussed with PHEM officer and Respective heads by introducing that I need to do surveillance evaluation. They accept and informed me that was their interest but there was no selected area to do the evaluation I presented my plan to all of the respective responsible bodies, and they agreed and wrote me permission letter to the district. Similar discussion was made at district

Description of the importance of Measles and NNT in Benishangul Region and the relevance of the surveillance system

Measles:

Measles is the disease that targeted to elimination in the world and all WHO member states were running this strategy likewise Ethiopia is one of state that implements the program. Measles is the leading cause of less than 5 years mortalities. In Benishangul Gumuz the disease is commonly occurred in outbreak form 3 years ago and in this year, 2011 the disease also occurred as outbreak. Therefore timely information is needed to act on it before devastating life of people. For this and since it is under elimination, surveillance of the disease is important.

Neonatal Tetanus (NNT):

NNT is the disease that affects the new born infant. It occurs when tetanus spores come into contact with open cuts during childbirth. The spores are **produced** by Clostridium tetuni bacteria. These spores germinate and produce a toxin which spreads through the nervous system. This causes spasms, stiffening and convulsions, which can also be triggered by the slightest sound, touch or light. It is difficult to eradicate this disease because tetanus bacteria are part of the natural environment normal flora of the intestines of animals and humans.

In 1989, the World Health Assembly (WHA) adopted a resolution calling for the elimination of NNT as a public health problem from the world by 1995. It defines NNT elimination as “less than one case per 1000 live births in every district of every country”2.

The World Health Organization (WHO)’s goal was to eliminate and maintain NNT elimination from all countries by the year 2000, except those affected by conflicts3.

As member country, Ethiopia adopt NNT elimination program but the reporting of the disease is weak. Similarly NNT in Benishangul Gumuz for the last five year there is no reported cases. To achieve elimination goal strong surveillance is mandatory.

Description of the Surveillance system:

System in place: Nationally new surveillance system, Public health emergency management program; was started 2 years ago and there were 20 selected under surveillance diseases of which 13 diseases were reported immediately when any cases identified and the rest 7 were reported on weekly bases. The selection of the under surveillance diseases were based on public health importance, epidemic prone, targeted for eradication and elimination globally. Therefore every region in the nation was mandatory to report the 20 nationally selected diseases and beside to this a region can include their own regional priority diseases.

Surveillance was conducted routinely in regions and the reporting unit at lower level was facilities. The facilities were expected to report to woreda, woredas' were reporting to Zones and also zones and special woredas were reporting to region and then the region to FMOH. Like ways in Benishangul Gumuz regional state Surveillance reporting sequence was similar as stated above. So, Bambasi woreda was reporting by principle 19 selected diseases to Assosa zone on weekly and immediately bases.

Target diseases under surviellace in PHEM

Even though the targeted diseases nationally were 20, on reporting format of PHEM of the region only 19 diseases were listed. These were:-

1. Malaria
2. Meningococcal meningitis
3. Dysentery
4. Typhoid fever
5. Relapsing fever
6. Epidemic typhus
7. MUAC <11cm and/or bilateral edema
8. AFP/polio
9. Anthrax
10. Cholera
11. Drancunculosis/Guinea worm
12. Measles
13. Neonatal tetanus
14. Pandemic influenza
15. Rabies
16. SARS
17. Small pox
18. Viral Hemoregic fever
19. Yellow fever

Avian human influenza, included in National PHEM disease listed, was missed here in Bambasi woreda, Benishangul gumuz regional state PHEM reporting format.

Objectives of the surveillance system in PHEM:

The surveillance system was designed in order to detect any public health event on time and to respond on time. In addition to this to predict any emergency situation and prepare preparedness

The objective of the measles and NNT Surveillances:

The two diseases were targeted for elimination in order to reduce morbidity and mortality on newborn infant and less five year children.

Case detection and Registration:

Case detection was done clinically according to what they have in their mind but not by Guideline. None of the facilities have any Standard case definition for all priority diseases except case definition of Measles, NNT and AFP. All facilities have registration book for cases.

Measles Standard case definition:

1. **Suspected**: Any person with fever and maculopapular (non-vesicular) generalized rash and cough, Coryza or conjunctivitis (red eyes) or any person in whom a clinician suspects measles.
2. **Confirmed**: A suspected cases with laboratory confirmation (positive IgM antibody) or epidemiological link to confirmed cases in an epidemic.

Neonatal Tetanus Standard case definition:

1. **Suspected**: Any newborn with a normal ability to suck and cry during the first two days of life, and who between the 3rd and 28th day of age, cannot suck normally, and becomes stiff or has convulsions or both.
2. **Confirmed:** There is no confirmation for NNT or no stated confirmed case definition.

According to the above case definition self administered questionnaires were given for those working at under five OPDs clinicians. The aim was whether they knew the cases definition of NNT and measles. A total of 11 health workers from five facilities were told to write the case definition of NNT and measles. Of these 3(27%) and 6(54%) health worker were write correctly case definition of NNT and Measles respectively.

Reporting:

Reporting of diseases listed under surveillance is mandatory for district to report next level. The district collects reports from public health facilities only by reporting formats. For the past six months in the district reporting format scarcity was not occurred since the district has reporting formats both in hard copy and soft copies. Reporting schedule in the district was according to PHEM unit of the regional health bureau which was based on weekly and immediately. The district has 23 health facilities of which 12(52%) health facilities were reporting listed under surveillance diseases. The reviewed past six month report that the district report to the next level was 21/22(95.5%) and all of them were reported within deadline. From reviewing document, the numbers of facilities generated report for the district for past four month were specified as follows in table 3.1.

Table: 3.1 the frequency of reporting facilities by week in Bambasi Woreda, 2003 or 2011.

Dates of report covers	# Facilities expected to report	#Facilities Report on time	# Report late	Not sent	Remark
28/06-04/07/2003	12	12	0	0	
5-11/07/2003	12	6	0	6	
12-18/07/2003	12	10	0	2	
19-25/07/2003	12	11	0	1	
26/07-2/08/2003	12	9	0	3	
3-9/08/2003	12	10	0	2	
10-16/08/2003	12	10	0	2	
17-23/08/2003	12	11	0	1	
24-30/08/2003	12	11	0	1	
1-7/09/2003	12	0	0	12	
8-14/09/2003	12	12	0	0	
15-21/09/2003	12	9	0	3	
22-28/09/2003	12	9	0	3	
29/09-5/10/2003	12	10	0	2	
6-12/10/2003	12	10	0	2	
13-19/10/2003	12	9	0	3	

As reviewed past report document copies of six month all facilities assessed and the district was not using the regional reporting format for reporting. On their copies only Malaria, meningococcal meningitis, Dysentery, Typhoid fever, Relapsing fever, Epidemic Typhus and MUAC were reported to next level. And their reporting format was consists the above listed eight diseases only but the rest diseases were filled at zonal level with zero report.

Data Analysis:

Among assessed areas none of them did data analysis. Actually the analysis was for selected diseases.

Epidemic preparedness and response:

Epidemic preparedness was not common in the district so that Epidemic preparedness plan was not there during assessment. Beside to this the Epidemic management committee, Rapid response team and multi sector Epidemic management committee was not established. As woreda PHEM officer saw the above committees were established during epidemic and they were not functional after epidemic. In fact except malnutrition occurred in one Goti of the district, there was no Epidemic occurred for the past one year. The woreda response to verify malnutrition was within 2 days but since Lack of preparedness was there at that time to intervene on time.

Suppervision and Feedback:

District supervises health facilities 4 times per year and more but the feedback was not there when the assessment done and written form of feedback was not common rather they gave orally. All assessed areas were supervised by Zonal health department, regional health bureau and partners at least 2 times per year. The main thing here missed was written feedback from all stakeholders and no one remember/follow what was given/ identified on previous supervision trip as gap. Beside to this dissemination of finding/report to stakeholders by using different way of communication channel was not here at all level. What they did was simply reporting weekly reports to next level of administrative division.

Training:

Starting from zonal level focal person, the district focal person and health workers were not train on PHEM. At facility level neither the assigned focal persons nor Health worker were trained on IDSR or PHEM. Only one training were given in 2003 for district level focal persons on PHEM but those who took training were not working on surveillance

and also there was no training manual developed on PHEM even for reading and referring for those working on program. It is time of shifting from IDSR to PHEM So that more awareness creation/training was not conducted.

Resource and materials Available for Surveillance:

Resource for communication, data management, transportation, for active case search and logistics for regular supervision were not available for the program at zonal, district and facility level. Only at regional level one desk top computer and Tell phone were available. The program was run by using others program resources at the zonal, District and health facility level. There were no budget line and allocated budget for the program. The district PHEM unit officer and Facility focal persons were using their mobile for reporting weekly reports and to inform unusual condition. The expense was not covered even. Whether supervision or reporting of data dependant on other program.

The Laboaratory:

Laboratory test of the cases were sent to EHNRI but there is no Regional laboratory. The results of laboratory were too late and sometimes it did not sent to the region and also to the district.

Description of the performance and attributes of the surveillance system:

Usefullness:

All respondents strongly agreed that the surveillance system was useful for early notification and detection of epidemic, to keep uniformity of reports, for quick and urgent diagnosing diseases by using case definition and beside to this it is helpful for forecasting and for preparation of emergencies.

The main problem was on implementation part, which was in fact they stressed that it lacks guidelines, manuals for implementation, case definitions of all diseases under surveillance are lower level, capacity building of workers and logistics.

In general if the above difficulties are solved; the usefulness of surveillance system is unquestionable.

Simplicity:

- In the detection of case:

Simplicity of case definition was looked according to IDSR case definitions. If the cases definition that the PHEM was prepared for all under surveillance diseases similar to IDSR, it is not difficult to identification of suspected cases. And they agreed that if the case definition for professionals and health extensions would distributed to all levels, it is easy to understand and apply by all levels of health professionals. Sending sample for confirming cases was very difficult for assessed area and for the region itself due to transportation issue. The farthest kebeles cannot offer adequate sample within recommended time range. The region yet did not have regional laboratory so that it is difficult to confirm samples within the region. Due to this samples were sent to Addis Ababa which was 660km from regional town and it is clear that above 760km from woreda town.

- Data flow:

Respondents from all assessed areas stated that data flow was set clearly at all levels from health post to higher levels. Reporting schedule, reporting format and also diseases to be reported also clearly indicated in the reporting format. But even though they understood that it was simple, actually during the time of assessment the reviewed report copies indicates that all assessed areas were reporting only 8 disease out of 20 reportable disease by cutting 8 diseases lists from reporting format. And they didn't report zero report of immediately reportable disease unless they found cases.

Lack of communication materials like telephone, public transport, internet, and fax to report cases to the next higher bodies such as from health post and health center to woreda health office, from woreda health office to Zonal health department were the main problems. So that this compromise timeliness of the report. In deed health workers usually use their personal mobile phones in case of urgent conditions.

- Data management:

Data were sent from the health facilities to the woreda health office, the Zonal and Regional Health Bureau by using reporting formats by paper or tell phone and use of the data was also very limited at all levels. The use of data limited was not due to difficulty rather than it is not common practice throughout the region.

Flexibility:

The system was more flexible and even in reporting format there is option for to report region specific priority diseases. The emerging diseases can be also included at any time if the conditions assumed as important for public health surveillance. So that, there is no hard rule for to be not included in to the system whether new or reemerging diseases. Now a day the IDSR which was the old system has been changed to PHEM. The development of the PHEM made the system more flexible to be report any new health event without difficulties. The reporting formats itself are more easy and has option for others to be specified.

As the region was late adopter of PHEM system the professionals at all level were not understood about the process. They stressed that more training and orientation should be conducted on any amendment occurred from that of IDSR program whether on cases definition, reporting format or any other else.

As it was mentioned in the above under reporting, reporting sites were not well trained or regularly supervised in all visited sites. There were no any regular crosschecking of the data and feedback.

Acceptability:

The acceptability of the system was related with reporting sites, uses of the systems and active participation in the case detection and reporting.

The reporting agents of the system were 12 health facilities out of 23 health facilities. And also the reporting facilities and agents were reporting the reports on the weekly bases. Even though the reporting facilities were 52% in the project area, it was below 50% at zonal level and regional level. The main challenge for the low level of reporting

rate was lack of communication, inaccessibility, lack of regular supervision, lack of feedback and lack of responsible person to report. In addition to these work load of health workers and culture of reporting data to the next level was not taken as part of routine work of health workers.

Sensitivity:

The main issue under this is how the case definition of the diseases was sensitive in order to include all suspected cases of Measles and NNT. To measure sensitivity of surveillance system of two diseases is impossible because of limitation of finding of suspected cases late by the system.

Predictive value positive:

This attribute is difficult to measure since the laboratory tests were not available. NNT does not have laboratory test, simply they use case definition to detect case of NNT where as for measles both case definition and laboratory test were used but the positive and negative results were not available.

Representativeness:

Issue of representativeness depends on the number of reporting facilities/reporting rate of facilities/, the health service coverage, the surveillance performance, knowledge of the health workers, accessibility of facility to community, health seeking behavior and income of the community. In addition the above limitation in the district the reporting facilities were 12 out of 23.Therefore the surveillance catches only the ice berg of the cases. But if good surveillance system exists it is possible to overcome the event before damaging health of public. Even if the above factors are not measured by parameters, the representativeness of the system was low at all level throughout the region as well as project area. But the representative can be increased by building the capacity of HEW and using them since they are deployed at all kebeles. Beside to the above mentioned factors, for reporting communication materials also play great role.

Timeliness:

The reporting rates of the health facilities in the District were found to be low (table 3.1). But of those which reported, the number of facilities which reported timely was difficult to know exactly; for the reports were not segregated, nor date report received were not recorded in almost all forms as mentioned earlier in the data quality.

Stability:

The new system affects the reporting frequency and lead to decreasing of timeliness and completeness. The new system needs more infrastructure and communication without this it is unstable and cannot achieve the objective.

Discussion:

Nationally new surveillance system, Public health emergency management program; was started 2 years ago and there were 20 selected under surveillance diseases of which 13 diseases were reported immediately when any cases identified and the rest 7 were reported on weekly bases including the immediately reportable diseases with zero. For the regions and respective Administrative levels it is mandatory to report them. In Bambasi woreda all visited facility does not aware of this as result all visited facilities were reporting 7 diseases only on weekly bases and this is what I reviewed from report copies. The rest 13 immediately reportable once were filled at zonal level when the zone report to the region as if they were being zero. They did these since all the immediately reportable once are always zero therefore there is no done to fill by health facilities them. Here the system is not the same throughout the region because the regional health bureau informed all health facilities are expected to report all 20 selected to respective level and they were doing so, but the case of Bambasi is unique and which they did not recognized yet. The cases is actually happen might be for seek of making things simple for the health facility but in other way it disturbs the system and the cases might be missed and it plays a great role on data quality. The reporting format is also different with that of the national; in the national reporting format there is 20 diseases but in the regional reporting format only 19 diseases. Avian human influenza, included

in National PHEM disease listed, was missed here in Bambasi woreda, Benishangul gumuz regional state PHEM reporting format.

As newly started PHEM Guidelines were expected at each facility level; but IDSR or PHEM guideline/manual are not available during assessment in all visited facilities. These are may be due to changing of position as a result the previously charged expert take the materials to his home and own it or the newly charged might not be know the place where the guideline is.

The health workers were not train on the newly started program. The intensive training will be needed since the facilities workers were not aware of the program. The lower/front level workers are very essential for program implementation.

Measles and NNT were not available in all the visited facilities. This is perhaps due to the low awareness or negligence or weak surveillance .Therefore for future regular supervision and active a case search is necessary.

Limitation of Study:

Laboratory tested cases and clinical reported cases were not available.

Conclusion and Recommendation:

The reporting of cases was not consistent at each level. The surveillance system in placed but the training and regular supervision with feedback is not carried out. Due to this facilities are reported 7 cases weekly bases by the own reporting formant. Cases definition is not there during assessment. Measles and NNT were not reported in the year. Report copies were not documented well.

Therefore woreda health office and other stakeholders should carry out supportive supervision and give feedback to strengthen the systems. In reporting format the health facilities and woreda health officer should use the national reporting format which has 20 reporting diseases. Documentation should be strengthening at each level.

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My gratitude goes also to Assosa zonal health department surveillance officers, Mr. Dugassa and the regional health bureau surveillance officer.

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Annex

3.1. Data collection tool**:**

Wereda LEVEL QUESTIONNAIRE:

Identifier

Date_____

Assessment team name: _____

Interviewer name: _____

Respondent name & position:

_____

Surveillance System: _____

General:

II. Availability of a National Surveillance Manual/Guideline

1. Is there a national manual for surveillance?
   Yes / No / Not applicable / Unknown
2. ***If yes***, describe (last update, diseases included, case definitions, surveillance and control, integrated or different for each disease):
   _____
   _____
   _____
   _____
3. Measles and NNT Guidelines:

S.No	Name of Guide line		Remark
	Measles(observe& write name)	NNT(observe& write name)	
1			
2			
3			

4. If guidelines were available, did you use them? Yes No
5. If no why?
   _____

_____
_

6. Are health facilities having copies of Guide line? Yes No Why? _____ _____ _____ _____.

III. Case Detection and Registration

7. Do you have standard case definitions for the Country's priority diseases like NNT, AFP (polio), malaria, and measles?
   Yes / No / Unknown / Not applicable
8. **Obs [1 to n priority diseases] Observed** the standard case definition for (each priority disease) Yes No Unknown Not applicable

IV. *Data reporting::*

Presence of recommended reporting forms in the country at all times over the past 6 months

9. Have you reporting forms in hard and soft copies? Yes No Unknown Not applicable
10. ***If not*** why?
11. have you lacked appropriate surveillance forms at any time during the last 6 months? Yes No Unknown Not applicable
12. What are the reporting entities for the surveillance system?
    a. Public health facilities
    b. NGO health facilities
    c. Military health facilities
    d. Private health facilities
    e. Others_____
13. **Percent of facility reports received each reporting period at the district level during the past 6 months:**

    Number of reports in the last 6 months compared to expected number

    # of Weekly: _____ # of HF reported_____

    # 0f immediately: _____ **#** of HF reported_____

14. **On time (use national deadlines)**
    Number of weekly reports received on time: _____
15. Was there any report of the immediately reportable diseases in the past 1-2 month? Yes/ No
16. If yes, with in what time is the report received after detection of the case/ diseases?
    a. Less than 1 hour

b. 2-24 hour
c. 1- 2 days
d. 3- 7 days
e. After 1 week

17. **By what means you receive reports from HF?** _____ _____**and by what you sent to the next level?** _____

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

18. **Percent of HF that have means for reporting to next level by e-mail, telephone, or radio** _____
19. **Capacity to report to next level by e-mail, telephone, fax or radio:**

How do you report?

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

V. Data analysis

Does the district level:

20. **Describe data by person** (case based, outbreaks, and sentinel)?

(Obs) Observed description of data by age and sex:

Yes No Unknown Not applicable

21. **Describe data by place?**

(Obs) Observed description of data by district (tables, maps)

Yes No Unknown Not applicable

22. **Describe data by time?**

(Obs) Observed description of data by time:

Yes No Unknown Not applicable

23. **Perform trend analysis?**

Obs Observed line graph of cases by time

Yes No Unknown Not applicable

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

_____ _____ _____

25. **Have an action threshold defined for each priority disease?**
    Do you have an action threshold defined for Measles,NNT, AFP (polio), malaria? Yes No
    Unknown Not applicable
26. Who is responsible for the analysis of the collected data? _____
27. How often do you analyze the collected data?
    a. Daily
    b. Weekly
    c. Every 2 weeks
    d. Monthly
    e. Quarterly
    f. As needed……..
28. **Have appropriate denominators?**
    Obs Observed presence of demographic data (population of different groups)
    Yes No Unknown Not Applicable

VI. Outbreak Investigation

Percent of suspected outbreaks that were investigated in 2003EFY:

29. Number of outbreaks suspected in the past year:_____
30. List the diseases: _____
31. Of those, number investigated: _____
    (Observe reports and take copies if possible)

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

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

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

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

VII. Epidemic preparedness(relevant for epidemic prone diseases)

34. **Existence of district plan for epidemic preparedness and response**
    Obs Observed a written plan of epidemic preparedness and response
    Yes No Unknown Not applicable

35. **Existence of emergency stocks of drugs, vaccines, and supplies at all times in past 1 year:**
    Has the district had emergency stocks of drugs, vaccines, and supplies at all times in past 1 year?
    Yes No Unknown Not applicable

36. **Experience of a shortage of drugs, vaccines or supplies during the most recent epidemic (or outbreak)**
    Has the region experienced shortage of drugs, vaccines or supplies during the most recent epidemic (or outbreak)?
    Yes No Unknown Not applicable

37. **Existence of a standard case management protocol for NNT, Malaria, AFP (polio), measles**
    Obs Observed the existence of a written case management protocol for at least 1 priority disease
38. ***If*** ***yes***, list:_____

39. **Presence of a budget line for epidemic response**
    Is there a budget line for epidemic response?
    Yes No Unknown Not applicable
40. **I. Existence of a district epidemic management committee**
    Observed minutes (or report) of meetings of epidemic management committee
    Yes No Unknown Not applicable

41. **Existence of district rapid response team for epidemics**
    Does the region have a rapid response team for epidemic?
    Yes No Unknown Not applicable

VIII. Response to epidemics

42. **Ability of the district level to respond within 24 hours of notification of most recently reported outbreak:**
    Obs Observed that the district level responded within 24 hours of notification of most recently reported outbreak (from written reports with trend and intervention)

    Yes No Unknown Not applicable

43. **Ability of the district 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

IX. Feedback

Existence of a report or bulletin that is regularly produced to disseminate surveillance data:

44. How many feedback letters or reports has the district level produced in the last year? _____
45. **Obs:** Observed the presence of a report or letter that is regularly produced to disseminate surveillance data for HF or next level:
    Yes No Unknown Not applicable

X. Supervision

Percent of supervisors that made the required number of supervisory visits in the past 6 months

46. How many supervisory visits have you made in the last 6 months? _____
    Obtained required number of visits from district level _____
47. The most usual reasons for not making all required supervisory visits. (Text)
    _____
    _____
    _____
    _____

XI. Training

Percent of health personnel trained in disease surveillance

48. What percent of your subordinate personnel have been trained in surveillance? _____
49. Have you been trained in disease surveillance?
    Yes No Unknown Not applicable
50. ***If yes,*** specify when, where, how long, by whom?
    _____
    _____
    _____

51. **Obtain and analyze the content of the surveillance and epidemic management training**
    Strengths_____
    Weaknesses _____
    Opportunities _____
    Threats _____

XII. Resources

Percent of sites that have:

52. **Data management**
    Computer

Printer
Photocopier
Data manager
Statistical package

53. **Communications**
    Telephone service
    Fax
    Radio call
    Satellite phone
    Computers that have modems
54. **Budget line** _____
55. **Logistics** _____

XIII. <u>Surveillance</u>

Budget for surveillance

56. Is there a budget line for surveillance in the district level budget?
    Yes No Unknown Not applicable
57. ***If yes***, what is the proportion: %

Opportunities for strengthening surveillance

58. How could surveillance be improved?
    _____
    _____
    _____

XIV. <u>Surveillance Co-ordination</u>

Existence of focal unit for surveillance at District level

59. **Obs** Is there a focal unit for surveillance at the district level? [Observe organogram of district to confirm]
    Yes No Unknown Not applicable

Opportunities for integration

60. 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
   - NNT _____cases _____Deaths _____
   - Measles_____cases _____Deaths _____
   - AFP(polio) _____cases _____Deaths _____
   - Malaria _____cases _____Deaths_____

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

Does the surveillance system help?

1. To detect outbreaks of these selected priority diseases early? Yes/ No
2. To estimate the magnitude of morbidity and mortality related to these diseases, including identification of factors associated with these diseases? Yes/ No
3. Permit assessment of the effect of prevention and control programs? Yes/ No

Observe (confirmation):

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

II. Describe Each System Attributes:

i. Simplicity:

1. Is the case definition of NNT, malaria, AFP (polio), and measles easy for case detection by all level health professionals? Yes/ No
2. What are the organizations which need to receive reports of the surveillance data
3. Do you feel that additional data collected on a case are time consuming? Yes/No
4. How long it takes to fill the format? a, <5 minute b-10-15minuts c- >15 minutes
5. How long does it take to have laboratory confirmation of
   A. NNT_____NA
   B. Measles_____
   C. AFP (Polio)_____
   D. Malaria_____

ii. Flexibility:

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

   Comment:_____
   _____
   _____
   _____

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

1. Are the data collection formats for these priority diseases clear and easy to fill for all the data collectors/ reporting sites? Yes/ No
2. Are the reporting site / data collectors trained/ supervised regularly? Yes/No
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

    _____
    _____
    _____

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

    _____
    _____
    _____

iv. Acceptability:

1. Do you think all the reporting agents accept and well engaged to the surveillance activities? Yes/No
2. If yes, how many are active participants (of the expected to)?

    _____
3. If No, what is the reason for their poor participation in the surveillance activity?
    A. Lack of understanding of the relevance of the data to be collected
    B. No feedback / or recognition given by the higher bodies for their contribution; i.e. no dissemination of the analysis data back to reporting facilities
    C. Reporting formats are difficult to understand
    D. Report formats are time consuming
    E. Other:

    _____
    _____
    _____

v. Representativeness:

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

vi. Timeliness:

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

vii. Stability:

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

HEALTH FACILITY QUESTIONNAIRE

Identifiers
Date_____

Assessment team name: _____

Interviewer name: _____

Respondent name & position:
_____

Surveillance System: _____

1. **Percent of health facilities with national surveillance manual**
   Is there a national manual for surveillance at this site?
   Obs Observe national surveillance manual:
   Yes No Unknown Not applicable

I. Case detection and registration

2. **Percent of health facilities that have a clinical register**
   Obs Observed the existence of a clinical register
   Yes No Unknown Not applicable

3. **Percent of health facilities that correctly register cases**
   Obs Observed the correct filling of the clinical register during the previous 30 days
   Yes No Unknown Not applicable

4. **Percent of health facilities that have standardized case definitions for the country's priority diseases**
   Do you have a standard case definition for: (each priority disease) AWD, AFP (polio), measles, malaria?
   Yes No Unknown Not applicable

5. **Obs** Observed the standard case definition for: (each priority disease)
   Yes No Unknown Not applicable

6. **Percent of health facilities that use standardized case definitions for the country's priority diseases**
   Obs Observed the respondent correctly diagnosing one of the country's priority diseases using a standard case definition
   Yes No Unknown Not applicable

(Select one of the priority diseases in the facility's clinical register and ask how they diagnosed it — interviewer should have the standard case definition from MOH)

II. Case confirmation

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

Are you able to collect sputum Y N U N/A
Stool Y N U N/A
Blood Y N U N/A
CSF at this facility? Y N U N/A

8. **Obs** Observed the presence of materials required to collect

Stool Y N U N/A
Blood/serum Y N U N/A
CSF Y N U N/A

9. Percent of health facilities that have the capacity to handle specimens until shipment

Do you have the capacity to handle sputum, stool, blood/serum and CSF until shipment at this facility?

Yes No Unknown Not applicable

10. **Obs** Observed presence of functional cold chain at health facility

Yes No Unknown Not applicable

11. Percent of health facilities that have the capacity to ship specimens to a higher level lab

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

Yes No Unknown Not applicable

13. **Obs** Observed presence of packing materials for shipment of specimens at health facility

Yes No Unknown Not applicable

III. Data reporting

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

Have you lacked appropriate surveillance forms at any time during the last 6 months?

Yes No Unknown Not applicable

15. **Percent of sites that reported accurately cases from the registry into the summary report to go to higher level**
    Observed that the last monthly report agreed with the register for 4 diseases (1 for each targeted group [eradication; elimination; epidemic prone; major public health importance])
    a. **Obs** Measles Y N U N/A
    b. **Obs** Malaria Y N U N/A
    c. **Obs** AFP (polio) Y N U N/A
    d. **Obs** NNT Y N U N/ A
    e. **AWD** Y N U N/A

16. **Percent of sites that reported each reporting period to the next higher level during the past 3 months**
    Number of reports in the last 3 months compared to expected number
    Obs Weekly: _____
    Obs immediately:_____

17. **On time (use national deadlines)**
    Obs Number of weekly reports submitted on time:-_____ /12 times the number of sites
    Obs Number of immediately reports submitted on time: ___/___times the number of sites

18. **Percent of HF that have means for reporting to next level by e-mail, telephone, fax or radio**
    How do you report?
    a. Mail
    b. Fax
    c. Telephone
    d. Radio
    e. Electronic
    f. Other
19. **Strengthening reporting**
    How can reporting be improved?
    _____
    _____
    _____
    _____

IV. Data analysis

Percent of sites that:

20. Describe data by person (outbreaks, sentinel)
    Obs Observed description of data by age and sex
    Yes No Unknown Not applicable

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

22. **Describe data by time**
    Obs Observed description of data by time
    Yes No Unknown Not applicable

23. Perform trend analysis
    Obs Observed line graph of cases by time
    Yes No Unknown Not applicable

24. **Have an action threshold for each priority disease**
    Do you have an action threshold for any of the Country priority diseases?
    Yes No Unknown Not applicable

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

26. Who is responsible for data analysis? _____

27. How often do you analyze the collected data?
    a. Daily
    b. Weekly
    c. Every 2 weeks
    d. Monthly
    e. Quarterly
    f. As needed……..

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

V. Epidemic preparedness

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

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

Yes No Unknown Not applicable

VI. Epidemic response

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

Has the health facility implemented prevention and control measures based on local data for at least one epidemic prone disease?

Yes No Unknown Not applicable

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

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

Yes No Unknown Not applicable

VII. Feedback

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

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

Obs Observed at least 1 report or bulletin at the health facility from a higher level during the past year on the data they have provided

Yes No Unknown Not applicable

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

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

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

Yes No Unknown Not applicable

VIII. Supervision:

34. Percent of individuals supervised in the past 6 months

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

Obs Observed supervision report or any evidence of supervision in last 6 months
Yes No Unknown Not applicable

35. **Of those supervised in the previous 6 months, percent of individuals for which the supervisor from the next higher level reviewed surveillance practices appropriate to their level**
Obs Observed supervision report or any evidence for appropriate review of surveillance practices
Yes No Unknown Not applicable

IX. Training

36. **Percent of health personnel trained in disease surveillance and epidemic management**
Have you been trained in disease surveillance and epidemic management?
Yes No Unknown Not applicable

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

X. Resources

Percent of sites that have:

38. **Logistics**
    a. Electricity
    b. Bicycles
    c. Motor cycles
    d. Vehicles
39. **Data management**
    a. Stationery
    b. Calculator
    c. Computer
    d. Software
    e. Printer
    f. Statistical package
40. **Communications**
    a. Telephone service
    b. Fax
    c. Radio call
    d. Computers that have modems
41. **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:

42. Hygiene and sanitation materials

a. Spray pump
b. Disinfectant

43. Protection materials (list) _____ _____ _____

_____

_____

_____

XI. Satisfaction with surveillance system

44. Satisfaction with the surveillance system

Are you satisfied with the surveillance system?

Yes No Unknown Not applicable

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

_____

_____

_____

46. Opportunities for integration

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

_____

_____

_____

_____

Health Post Level Questionnaire

Identifiers

Date_____

Assessment team name: _____

Interviewer name: _____

Respondent name & position:

_____

Surveillance System: _____

1. **Percent of health facilities with national surveillance manual**
   Is there a national manual for surveillance at this site?
   Obs Observe national surveillance manual:
   Yes No Unknown Not applicable

I. Case detection and registration

2. **Percent of health facilities that have a clinical register**
   Obs Observed the existence of a clinical register
   Yes No Unknown Not applicable

3. **Percent of health facilities that correctly register cases**
   Obs Observed the correct filling of the clinical register during the previous 30 days
   Yes No Unknown Not applicable

4. **Percent of health facilities that have standardized case definitions for the country's priority diseases**
   Do you have a standard case definition for: (each priority disease) AWD, AFP (polio), measles, malaria?
   Yes No Unknown Not applicable

5. **Obs** Observed the standard case definition for: (each priority disease)
   Yes No Unknown Not applicable

6. **Percent of health facilities that use standardized case definitions for the country's priority diseases**
   Obs Observed the respondent correctly diagnosing one of the country's priority diseases using a standard case definition
   Yes No Unknown Not applicable

(Select one of the priority diseases in the facility's clinical register and ask how they diagnosed it — interviewer should have the standard case definition from MOH)

II. Data reporting

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

Have you lacked appropriate surveillance forms at any time during the last 6 months?

Yes No Unknown Not applicable

8. Percent of sites that reported accurately cases from the registry into the summary report to go to higher level

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

a. **Obs** Measles Y N U N/A
b. **Obs** Malaria Y N U N/A
c. **Obs** AFP (polio) Y N U N/A
d. **Obs** AWD Y N U N/A

9. Percent of sites that reported each reporting period to the next higher level during the past 3 months

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

Obs Weekly: /12 times the number of sites

Obs immediately: /-- times the number of sites

10. 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

11. Percent of HF that have means for reporting to next level by e-mail, telephone, fax or radio

How do you report?

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

12. **Strengthening reporting**
    How can reporting be improved?
    _____
    _____
    _____
    _____

III. Data analysis

Percent of sites that:

13. Describe data by person (outbreaks, sentinel)
    Obs Observed description of data by age and sex
    Yes No Unknown Not applicable

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

15. **Describe data by time**
    Obs Observed description of data by time
    Yes No Unknown Not applicable

16. **Perform trend analysis**
    Obs Observed line graph of cases by time
    Yes No Unknown Not applicable

IV. Epidemic response

17. **Percent of sites that implemented prevention and control measures based on local data for at least one epidemic prone disease**
    Has the health facility implemented prevention and control measures based on local data for at least one epidemic prone disease?
    Yes No Unknown Not applicable

V. Feedback

18. **Percent of sites that have received a report or bulletin from a higher level during the past year on the data they have provided**
    How many feedback bulletin or reports has the health facility received in the last year? ___

Obs Observed at least 1 report or bulletin at the health facility from a higher level during the past year on the data they have provided

Yes No Unknown Not applicable

19. **Percent of health facilities that conducted at least semi-annual meetings with community members to discuss results of surveillance or investigation data**
How many meetings has this health facility conducted with the community members in the past six months? _____

Obs 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

VI. Supervision:

20. **Percent of individuals supervised in the past 6 months**
How many times have you been supervised in the last 6 months?_____

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

Yes No Unknown Not applicable

21. **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**
Obs Observed supervision report or any evidence for appropriate review of surveillance practices

Yes No Unknown Not applicable

VII. Training

22. **Percent of health personnel trained in disease surveillance and epidemic management**
Have you been trained in disease surveillance and epidemic management?

Yes No Unknown Not applicable

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

VIII. Resources

Percent of sites that have:

24. Logistics

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

25. Data management

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

26. Communications

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

27. **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:

28. Hygiene and sanitation materials

a. Spray pump
b. Disinfectant

29. Protection materials (list) _____ _____ _____

_____

_____

IX. Satisfaction with surveillance system

30. Satisfaction with the surveillance system

Are you satisfied with the surveillance system?

Yes No Unknown Not applicable

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

32. Opportunities for integration

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

_____
_____
_____
_____

Chapter IV – Health Profile Description Report:

4.1. District health profile assessment report of Bambasi woreda in Benishangul Gumuz Regional State, Ethiopia

1. Executive Summary

Introduction: Health profile is a profile of health and health related indicators in the District or province. Health profile is a profile that audit and summarize existing heath and health related data in the District. It is useful for prioritizing health program and health related problems of community at any level. Therefore before running of health and health related program; health profile of project area is needed. The project is aimed to assess health and health related indicators of the Bambasi woreda in Benishangul gumuz regional state in 2003.

Methods: The study area was Bambasi Wereda in Benishangul gumuz regional state. The area was selected because its health profile yet did not known and it has highest population next to Assosa from Assosa zone woredas and addition to this easy accessibility to transport system and for better data access. Bambasi has 58,945 total populations. The data were collected from Wereda health office, Wereda agricultural office, Wereda Educational office, Wereda finance and economic office, Wereda Administrative, Bambasi town municipal, BoFED and Assosa meteorology Branch office using questionnaire, by interviewing or reviewing available records.

Results: The district, Bambasi divided in to 36 rural and 2 urban kebeles and ruled by Benishangul gumuz people's Democratic Party. The weather type of the district is Kola with altitude of 1460m above sea level. The estimated total population of the district was 58,945 for 2003E.c, or 2011. Out of these 29,904(51%) was male and Male to female ratio was 1.03. Among 58,945 total populations, 45,985(78%) of population were living in rural. The district has 58.3% health service coverage. The coverage was estimated from constructed and functional health post per kebeles.

Malaria was the leading cause of morbidity from top ten diseases both adult and less than 5year age outpatient department. The second leading one for adult was acute febrile illness (AFI) where as for less than 5years it was diarrhea.

Conclusion and recommendation: Malaria is the leading cause of morbidity in the district both in adult and less than 5 years Outpatient department (OPD). Diarrhea in less 5 years OPD and AFI in adult OPD is the second leading causes of morbidities.

Vital statistical records were not available and not recorded. The total population used was different by different sectors in the district. Drug shortage, refreshment training on business process reengineering (BPR), safe water supply for rural and urban is the main problems of the district.

Therefore to overcome these problem different actors like regional government, NGOs and the district should participate. The district sectors should keep the records as much as possible. Demographic and other data that used by the district sectors should be the same and inform through the sectors.

2. Introduction:

Health profile is a profile of health and health related indicator in a District or province. It 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 purpose of this work is to review existing health and health related profiles in the district in order to put them in one document for users.

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.

3. Objectives

- To assess health and health related indicators of the Bambasi woreda in Benishangul gumuz regional state in 2003 E.C.

3.1 Specific objectives:

- To assess human resources of the district.
- To describe existing health infrastructure of the district.
- To describe the infrastructure of the district.
- To assess primary health care coverage of the district.
- To describe endemic diseases as well as its control and prevention program in the district

4. Methods:

Study area: The study area was Bambasi Wereda in Benishangul gumuz regional state. The area was selected because its health profile yet did not known and it has highest population next to Assosa from Assosa zone woredas and addition to this easy accessibility to transport system and for better data access. Bambasi has 58,945 total populations. Of this 49 % were females.

Study design: The design was cross sectional review of records**.**

Study subjects: The data were collected from Wereda health office, Wereda agricultural office, Wereda Educational office, Wereda finance and economic office, Wereda Administrative, Bambasi town municipal, BoFED and Assosa meteorology Branch office.

Data collection and collection instrument: data were collected using record review, self administered questionnaire and interview. The data were collected by questionnaire, interviewing or self administered for responsible person and in addition reviewing available records.

Data analysis: The collected data were entered in to computer and analyzed by using MS-excel and MS-word for write up.

Dissemination of the study: The result of this document will be submitted to SPH-AAU and will be availed for Bambasi health office, regional health bureau and zonal health desk in Hard copy as well it may be released in to internet for public use.

5. Results:

5.1. Historical Background and culture

According to town municipal information, Bambasi was established in 1596 e.c. At that time Bambasi was small village. During the time period of 1959-1982e.c Bambasi shows some development and act as deputy woreda under Begi woreda. The district, Bambasi after 1986 e.c, became woreda Administrative by including Bambasi town and rural surrounding kebeles. The district was now under Assosa zone, Benishangul gumuz regional state. Bambasi town was the capital city of the woreda/district.

Amhara, Berta, Oromo, Tigre, Guragie, Mao and other ethnicities were living in the district. But the ethnicity population proportion data was not found during my data collection.

5.2. Geography and Climate

The district town, Bambasi is 42km in east of Assosa; the capital city of Benishangul Gumuz region state and 635km from Addis Ababa and located on the main road of Assosa to Addis Ababa. The district is bounded with Oromia regional state in the east, Odabilidegul woreda in north east, Assosa woreda in west and Mao-komo in south direction and its area is 1,462.35 square kilometer. The average annual temperature of the district is 20 degree Celsius where as the annual rainfall ranges from 1200-1400mm.The weather type of the district is Kola with altitude of 1460m above sea level.

5.3. Administrative and political

The district, Bambasi divided in to 36 rural and 2 urban kebeles and ruled by Benishangul gumuz people's Democratic Party. The district has developmental, social and administrative sectors office. In addition to the above sectors of government, there are different supporting local and international NGOs in the district. These were world vision; Goal Ethiopia and IRc have their office in the district but the rest UNICEF, WHO, INTERNATIONAL AID SERVICES were supporting indirectly through the region.

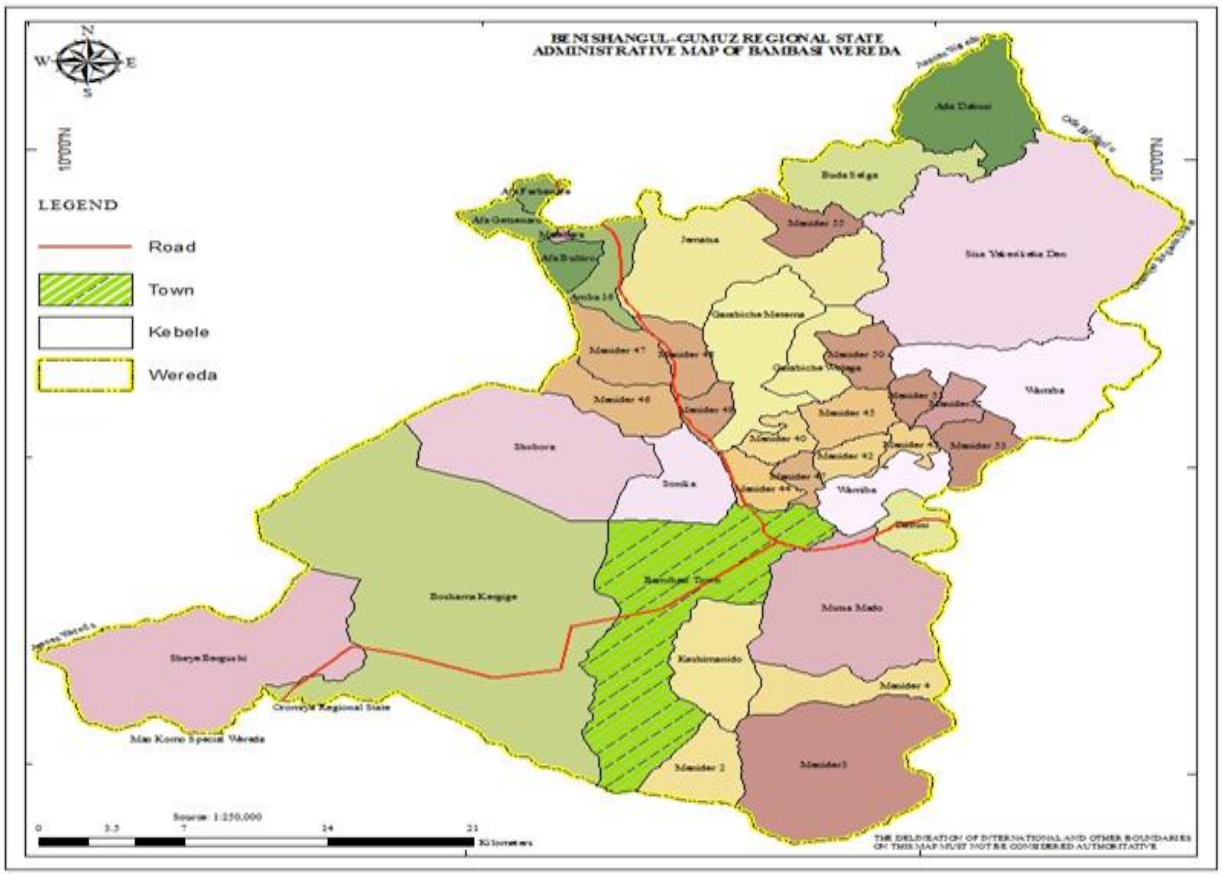


Figure 4.1 Map of Bambasi woreda Administrative

5.4. Demographic information

The estimated total population of the district was 58,945 for 2003E.c, or 2011. Out of these 29,904(51%) was male and Male to female ratio was 1.03:1. Among 58,945 total populations, 45,985(78%) of population were living in rural. The population density of the district is 40.3. The district total population used for 2003 e.c was different from sector to sector within the district. For example health office were using 43,100 but woreda administrative office uses 46,129 and both of them were lower than the estimated population for 2011G.c or 2003 E.c as well as 2007G.c population census which was 58,945 and 48,694 respectively. According to the population census of 2000

e.c, 32,474(66.7%) population were Muslim/Islam, 14,249(29.3%) population were followers of orthodox, 1865(3.8%) peoples were protestant and the rest 0.2% were catholic in the district.

Table.4.1 Lists of Kebeles with respective demographic information of the district, Bambasi according to 2000 e.c/2007 G.c housing and population census.

Kebeles	Population			Number of Households	Household Size
	Both Sexes	Male	Female		
Bambasi 01-Town	3,762	1,932	1,830	957	3.9
Bambasi 02-Town	5,384	2,746	2,638	1,284	4.2
Afa Ferbenare	286	143	143	60	4.8
Afa Getsenaro	510	235	275	114	4.5
Metehara	58	32	26	10	5.8
Afa Buldaro	709	359	350	138	5.1
Amba 16	1,588	798	790	366	4.3
Jematsa	1,101	530	571	240	4.6
Menider 55	800	409	391	189	4.2
Buda Selga	641	309	332	179	3.6
Eda Dabusi	555	251	304	152	3.7
Menider 50	892	477	415	191	4.7
Menider 51	585	297	288	124	4.7
Menider 52	716	369	347	153	4.7
Menider 53	705	371	334	149	4.7
Menider 43	765	385	380	175	4.4
Menider 42	550	275	275	116	4.7
Menider 45	1,594	821	773	379	4.2
Garabiche Welega	744	369	375	201	3.7
Garabiche Metema	929	443	486	245	3.8
Menider 49	1,420	725	695	317	4.5
Menider 48	1,613	794	819	382	4.2

Source: From 2000/2007 Ethiopia housing and population census data.

Table 4. 2 Lists of Kebeles with respective demographic information of the district, Bambasi according to 2000 e.c/2007 G.c housing and population census.

Kebeles	Population			Number of Households	Household Size
	Both Sexes				
Menider 47	1,791	895	896	403	4.4
Menider 46	2,210	1,141	1,069	493	4.5
Shobora	1,174	570	604	293	4.0
Sonika	894	424	470	218	4.1
Menider 44	1,333	665	668	280	4.8
Menider 40	1,479	763	716	332	4.5
Menider 41	574	284	290	130	4.4
Wamiba	2,213	1,105	1,108	510	4.3
Dabusi	809	394	415	180	4.5
Mutsa Mado	4,172	2,134	2,038	851	4.9
Menider 4	1,404	797	607	344	4.1
Menider 3	678	400	278	194	3.5
Menider 2	302	169	133	95	3.2
Keshimanido	2,163	1,150	1,013	472	4.6
Boshama Kergige	725	331	394	201	3.6
Sheye Bergushi	866	428	438	201	4.3
Bambasi-Wereda	48,694	24,720	23,974	11,318	4.3

Source: From 2000/2007 Ethiopia housing and population census data.

5.5. Infrastructure

The town, capital city of Bambasi and 6 rural kebeles were accessed with 24 hour electricity power. In addition to this, 37/38(97%) of the district kebeles were accessed with mobile net work service. Only the town was accessed with cable based tell phone service. The Asphalt road that connects the capital city of the region with Addis Ababa passed through Bambasi town. Almost all kebeles were accessed by vehicle or motorcycle in all seasons.

5.6. Education

The district has 25 first cycle elementary schools, 7 second cycle primary schools, 2 high schools and 1 preparatory school. There were a total of 6267 students in grade 1-4, 5762 students in grade 5-8, 1226 students in grade 9-10 and 196 students in grade 11-12. Female students proportion were 2980(47.55%) from 1-4 grade, 2827(49.06%) in grade 5-8, 479(39.07%) in grade 9-8 and 71(36.22%) in grade 11-12.

The student dropout rate and repeat of the district were 11% and 12% in 2002 respectively. But the proportion of students passed to the next class was 85.4%.

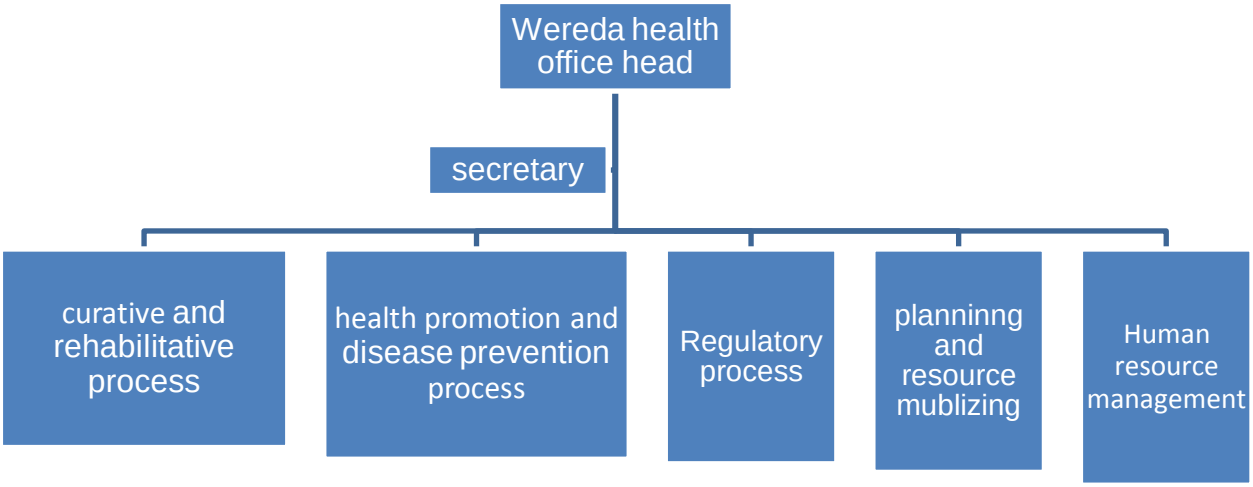
In the district 10 schools have latrine for male and female separately where as 15 schools have latrine for both sex together. Only 1 school was accessed tape water with pipe and other 1 school was harvesting rain water. The rest were not accessed with water supply.

5.7. Productivity and income

The main livelihood of the community in the district is Agriculture. According to district agricultural office information, about 99% of the community in the district was based on mixed farming. The rest 1% was based on small scale trade. In the district; “mashila”, maize, nugi, dagussa, teff, green paper and sesame were some of crops produced. Rearing of cattle, goat and sheep were common practice in the district beside crop production. Cow milk is peculiar for Bambasi town; therefore it is common in cafeteria and in restaurant for drinking in the town.

5.8. District health system

5.8.1. Organogram of district health office:



The Wereda was not equipped with human source according the organogram. There is still unoccupied position that could be filled for effective implementation of programs.

Other services like finance and purchasing services were using by pool system with other sectors. Wereda finance and economic development office give this service for health sector and others when they request the service they needed.

5.8.2. Health service institutions:

The district has 58.3% health service coverage. The coverage was estimated from constructed and functional health post per kebeles. But according 1 health post per 5000 population it is above 100% (i.e. only 11 health post and 2 health centers would be constructed), Now 21 health posts and 2 health center were constructed which shows 10 health posts are access.

Table 4.3**: Type and number of health facilities in Bambasi district, Benishangul Gumuz, 2003 E.c**

Ser.No.	Type of health Facility	Number	Remark
1	Hospital	0	
2	Health center	2	1HC to 29,473 population
3	Health post	21	1HP to 2807 population
4	Diagnostic Laboratory	0	
5	Private Clinic	9	
6	Pharmacy store	0	
7	Rural drug vendor	3	
	Total	35	

5.8.3. Vital statistics and health indicators:

The district vital statistics data like infant mortality rate,<5 year mortality rate, crude birth rate, total fertility rate and life expectancy were not found.

Table:4. 4 Different categories of population by sectors in Bambasi district, 2003 E.C/2011

Sectors used	Total population	Urban	Rural	Male	female	<1 year	<5 year	Pregnancy
Health office for 2003 E.c	43100	6005	37095	21162	21938	1465	2672	1594
Wereda Administrative for 2003 E.c	46,129	6,376	39,754	NA	NA	1568	2860	NA
Estimation of Census for 2003e.c/ 2011	58,945	12,960	45,985	29,904	29,041	2004	3655	NA
Census of 2000e.c/2007	48,694	9,146	39,548	24,720	23,974	1657	3019	NA

*NA: not available

5.8.4. Immunization coverage

EPI program is one of the programs conducted in diseases prevention and health promotion department in the district health sector. In the district 1297(80.8%) and 1048(68.4%) children were vaccinated for penta-3 and measles respectively. The percent of fully vaccinated children were 52.3% and defaulter rate was 16.43% in 2003 EFY.

5.8.5. Maternal health service coverage

The total of 1227(78.9%) pregnant women were followed ANC in 2003EFY but 304 mothers were visited for PNC in the same year. About 89(5.7%) of deliveries were attend by skilled birth personnel. And HEWs were delivered 287(48.8%) mothers in 2003EFY. The district has no data about the number of deliveries carried out in health institutions. The two health centers were the only health facilities that provide IMNCI service in the district.

5.8.6. Water, hygiene and sanitation

There was 6929 pit-latrine with 75% coverage in the district for 2003EFY.Out of this the rural constitutes 61% and the rest 14% was Urban. The rural and urban latrine coverage was 65% and 99% respectively.

The main drinking water source of the district was hand dug well (HDW), Shallow Well, deep well and protected springs. Safe water coverage of the district was estimated to be 67 %(rural 17.5% and urban 49.5 %.)

5.8.7. Health education:

All rural kebeles were covered with Health extension workers and they are engaged on health education to bring behavioral change of the communities, by doing this they could made community to lead health life practice. By day to day HEW effort 2527 cumulative model households were graduated in the district up 2003 EFY. The topic that HEWs thought was about 16 health extension packages program.

5.8.8. Leading cause of morbidity and Mortality:

In the district there was no data about the top ten causes of mortality but the top ten causes of morbidity were specified in the following table 4.5.

Table: 4. 5. Top ten diseases of morbidity in adult OPD in 2003 EFY, Bambasi Wereda.

Rank	Type of diseases	%	Remark
1	Malaria	36.8	
2	AFI	10.9	
3	Helminthiasis	10.2	
4	Diarrhea/all type/	5.9	
5	Pneumonia	4.2	
6	UTI	3.8	
7	Injuries, poisoning and external causes	2.8	
8	Upper ARI	2.56	
9	Anemia	2.5	
10	Diseases of skin	1.9	
11	Others	18.4	

Table 4: 6 Top ten diseases of morbidity in under 5 years OPD in 2003 EFY, Bambasi Wereda.

Rank	Type of diseases	%	Remark
1	Malaria	35.3	
2	Diarrhea/all type/	17.3	
3	AFI	11.5	
4	Helminthiasis	9.3	
5	Pneumonia	6.7	
6	Upper ARI	2.9	
7	Diseases of skin	2.6	
8	Disease of ear	2.5	
9	Injuries	1.89	
10	Infections and parasite	1.8	
11	Others	8.2	

5.8.9. Endemic diseases:

Malaria, Helminthiasis, Diarrhea and acute febrile illness were common in the district. Among them malaria was the leading cause of morbidity.

7.8.9.1 Malaria prevention and control program:

Since malaria is common in the area like other part of the region, the prevention and control program was conducted in the district. In the district, 2003EFY, distribution of ITN, draining of mosquitoes breeding sites, indoor residual spray and treating of patients were under taken activities.

The ITN coverage of the district was estimated 84.4% and about 81.5% of the kebeles were sprayed with indoor residuals as a result about 71.5% of population were

protected for the fiscal year. Beside the above activities, 250m^2 Mosquitoes breeding sites were drained.

7.8.9.2. **TB and leprosy**:

TB detection rate of the district was 16.6% where as the cure rate was76.4%. In the district there were no patients that interrupt the treatment.

There were 3 leprosy patients in the districts in the fiscal year that start treatment and they were successful complete the treatment.

7.8.9.3. **HIV/AIDS**:

One of focus area in the district was HIV/AIDS prevention and control program. ART, PMTCT and VCT programs were conducted. 1 health facility provides the above programs comprehensively and 1 facility provides PMTCT and VCT only. The disease prevalence in the district was estimated to be 2.2% and 241 clients were receiving ART.

5.8.10. Immediately reportable diseases:

The immediately reportable diseases were followed by surveillance officer. In the district surveillance is under health promotion and disease prevention department which is newly emerged due to Business process reengineering. Under this program 19 diseases were under surveillance. Among 19 diseases, 12 diseases were immediately reportable diseases. The district reported one AFP case, one of immediately reportable disease to EHNRI in 2003 E.c and laboratory result was pending now.

5.8.11. Nutrition, food shortage and any other disasters:

In one of the district kebeles, wemba, in Goti selama dabusi rats were destroyed the food crops starting July 2002 or 2003EFY. Due to this problem about 1058 people became food insecure. Following this condition 250 under five children were malnourished. The detail preliminary assessment that was done by the District Health office and Regional Health Bureau is specified below in table 4.7.

Table: 4.7 Assessment of Malnutrition in Bambasi Woreda, October 2003 E.c.

S.No	Name of Goti	Total population	<5 year children		MUAC			Edema	Remark
			M	F	<11	11-12	>12		
1	Wemba goti-5	346	17	28	5	4	30	2	
2	Wemba goti-6	455	58	56	4	12	98	0	
3	Wemba goti-7	257	25	44	4	3	37	0	
	Total	1058	100	128	13	19	171	2	

5.8.12. Human resource /health workers

Here under human resource the emphasis was given for health workers only. The number of health workers and their ratio to population in the district is given below in table 4.8. The health workers number included there is not only the facility but also the office health workers and private institution working in the districts.

Table 4. 8 Health workers with respect to population ratio in Bambasi Woreda 2003 E.c.

Ser no	Health worker type	Numbers		Ratio to population	Remark
		Gov't	Private		
1	Specialist	0	0		
2	GP	0	0		
3	HO	4	0	1HO to 14,736 population	
4	Nurses (all type)	40	8	1nurse to 1228 population	
5	Mid-wife	2	0	1mid-wife to 29,473 population	
6	Pharmacy	5	0	1 pharmacy to 11,789 population	
7	Laboratory	5	5	1 lab to 5,895 population	
8	ENHS	2	0	1enhs to 29,473 population	
9	HEW	74	0	2 per rural kebeles	
10	TBA	76	0	2 per kebele	
11	CHWA	76	0	2 per kebele	

5.8.13. Essential drugs and other supplies:

Health centers were using their own budget for drug purchasing so that there is no shortage of essential drugs supplies in the facilities of the district but the district was complaining the shortage of Budget for drug purchasing to be distributed for health posts.

6. Discussion:

The number of total population used for 2003EFY in the districts was lower than the population census of 2000 E.c. Due to this denominator, many indicators were under estimated. The difference might be lack of access to the census data for project it or giving less attention for population data. For future the district expect/better to use the same population data throughout the sectors within the district. This evidence/data is useful for planning of almost every program. Under or over estimated population may hamper/hinder Effective and efficient use of resources. Therefore it is better to have correctly projected or counted population data.

Malaria is the leading cause of morbidity in the district accounting 35.3% and 36.8% in under five and adult OPD respectively in the district. This is higher than nationally reported outpatient (15.5%) of 2002/2003 G.c.

The other diseases which were leading causes of morbidity in the district are AFI and Helminthiasis accounting 10.9% and 10.2% of OPD visits in adult respectively. But in children the second leading causes of morbidity was diarrhea with 17.3% OPD visits.

7. Limitation:

Lack of data on vital statistics and written document for referring.

8. Conclusion and recommendation:

Malaria is the leading cause of morbidity in the district both in adult and less than 5 years Outpatient department (OPD). Diarrhea in less 5 years OPD and AFI in adult OPD is the second leading causes of morbidities.

Statistical records like births, deaths and fertility rate were not known and not recorded. The total population used was different by different sectors in the district.

The district main problems as stated by the Health office experts were shortage of clean water in urban and rural, drug shortage, budget inadequacy, Lack of refreshment training on BPR for staffs, scarcity of computer for data handling and management and

lack of regular follow up/supervision from higher level were the listed problems that shall be solved for fruitful implementation of different programs in the sector.

In general different actors like regional government, NGOs and the district should participate to solve the problem. The district sectors should keep the records as much as possible. Demographic and other data that used by the district sectors should be the same and inform through the sectors.

9. Acknowledgements

I would like to thank the EFELTP coordinators for arranging and advising me for preparation of this health profile and also I wish to extend my gratitude to my regional supervisor, Ato Basazino Alemu for his arranging the preparation of this health profile and I would like to express my deepest appreciation to Bambasi Woreda sectors those cooperate for giving data and Ato Guru, Ato Ayalew, Ato Margia for availing the data and assisting me by giving invaluable information. At the last but not the least, my thanks goes to Wereda educational, Agricultural, Administrative office, Bambasi town municipal, BGR-BOFED and Meteorology Assosa breach office those who provide different data for me.

10. References:

1. Belay Bezabih, Tadele Tsehaye, Mer'Awi Aragaw (MD): South Achefer District Health profile. Amhara Region, Ethiopia; November 2010 G.C.
2. Federal Democratic Republic of Ethiopia Ministry of health: Health and Health Related Indicators. Addis Ababa, Ethiopia; 2002 E.C
3. Central Statistics agency: Housing and population census. Addis Ababa, Ethiopia; 2007 G.C/2000E.C.

11. Annex:

Date_____

Name of respondent_____

4.11.1. Health profile checklist:

1, Background:-

1.1, Historical aspects /foundation/ _____Name of district_____# 0f kebele _____ Administrative division_____

1.2, distance from capital city of the region _____km

1.3, Area by Sq.kilometer _____

1.4, Latitude and longitude_____

1.5, Boundaries:

- In north _____
- In north west_____
- In north east_____
- In south_____
- In South west_____
- In South east_____
- In west_____
- In East_____

1.6, Climate:

- Annual Temperature _____
- Annual Rainfall _____Main rainy season_____
- Weather_____%,_____%,_____%

1.7 ,Ethncity_____%,_____%,_____ %_____%_____%_____ %_____%_____%_____ _

1.8, Livelihood of community:_____
_____
_____

1.9. Literacyrate_____%,_____%,_____%
_____%,_____%,_____%,

1.20. Religion_____%,_____%,_____%
_____%,_____%

2. Demographic and vital statistics:-

2.1. Demography:-

- Total population_____
- Urban _____Rural_____
- Male _____Female _____M to F Ratio_____
- Proportion of Under 1 year_____%
- Proportion of Under 5year_____%
- Proportion of Pregnancy_____%
- dependency Ratio_____%
- # 15-64 year aged population _____

2.2. Vital Statistics:-

- Infant mortality rate per 1000_____
- <5 year mortality rate per 1000_____
- Crude birth rate per 1000_____
- Child mortality rate per 1000_____
- Total fertility rate_____
- Life expectancy _____M_____F_____

3. Infrastructure:-

Institution	Tele communication	Electric city	Road	Transportation	Total # of institution in district
Did district accessed? Y/N					
Did office accessed? Y/N					
# of facility accessed					
School					
1.# 1st cycle					
2.# 2nd cycle					
3.# secondary school					
4.# preparatory school					

4. Health infrastructure:-

4.1 Health Facility:

- # of Hospital_____ Gov 't_____ private _____others_____
- # of health center____ Gov 't_____ private_____ others_____
- # of health post_____ Gov 't_____ private_____ others_____
- # of Higher clinic_____ Gov 't _____private _____others_____
- # of medium clinic____ Gov 't_____ private _____others_____
- # of lower clinic_____ Gov 't_____ private _____others_____
- # of Drug vender_____ Gov 't _____private _____others_____
- # of Pharmacy shop____ Gov 't _____private _____others_____

4.2. Physical Health service Coverage_____

5 Human Resource/Health worker:-

- # of Specialist ____Gov 't Employee ____private Employee ____others_____
- # of GP_____ Gov 't Employee ____private Employee ____others_____
- # of HO_____ Gov 't Employee ____private Employee ____others_____
- # of Nurses(all)_____ Gov 't Employee ____private Employee ____others_____
- # of mid-wife(all)____ Gov 't Employee ____private Employee ____others____

- # of Pharmacy____ Gov ‘t Employee ____private Employee ____others____
- # of laboratory____ Gov ‘t Employee ____private Employee ____others____
- # of ENHS_____ Gov ‘t Employee ____private Employee ____others____
- # of HEW_____TBA_____CHWA_____
- # of others_____ Gov ‘t Employee ____private Employee ____others_____

6. Maternal and child health:-

6.1. Immunization:-

- Penta-3/ Coverage_____,_____%
- Measles/ coverage_____,_____%
- Fully immunized/coverage _____,_____%
- Defaulter rate_____,_____
- TT coverage_____,_____%

6.2. Maternal health service:-

- Antenatal Coverage_____,_____%
- Proportion of deliveries attended by skilled birth personnel_____,_____%
- Postnatal Coverage_____,_____%
- Contraceptive acceptance rate_____,_____%
- Institutional delivery _____by HEW_____
- # of health facilities giving IMNCI service _____
- 0ther Service_____

7. Hygiene and Environmental Service:

- Latrine coverage _____%,Rural _____%,urban_____%
- Safe water coverage_____%, Rural _____%,urban_____%

7.1Total number of Latrine by type:-

Latrine type	Number	Households with latrine
1.		
2.		
3.		
4.		
5.		
6.		
Total		

7.2 Total number of facility with latrine:-

Facilities	# facilities with latrine		Available with hand washing /only for facility latrine/	# of facilities with water supply			
	Separate latrine for Male &Female	Both sex use together		Tape water with pipe	well	Hand dug	Container
School							
1st cycle							
2nd cycle							
Secondary school							
Preparatory							
Others							
Hospitals							
HCs							
HPs							

8. Disease prevention &control Service:-

8.1 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		
7			7		
8			8		
9			9		
10			10		

8.2. 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		

8.3. Malaria control &prevention:-

- ITN coverage _____utilization_____
- DDT Spray _____
- Env'tal Management_____

8.4. TB and Leprosy:-

- TB Detection rate_____
- TB Cure rate_____
- TB defaulter_____
- Leprosy case detection rate_____
- Leprosy treatment completion rate_____
- Others _____

8.5. HIV/AIDS:

- HIV/AIDS prevalence_____ Incidence_____
- # 0f PLWHA receiving ART_____
- # Health facility giving ART service_____
- ## Health facility giving PMTCT_____
- # Health facility giving VCT_____
- # Health facility giving the above all service comprehensively_____

8.6. Disaster /Outbreak:

- # of outbreak occurred_____

- Type of diseases occurred as outbreak:
  1_____
  2_____
  3_____
  4_____
  5_____
  # Disaster_____
  Type of Disaster_____ _____
  _____ _____
  _____ _____
- Lists of reportable diseases
  1_____2_____
  3_____4_____5
  _____6_____7_
  _____8_____9__
  _____10_____11__
  _____12_____13___
  _____14_____15____
  _____16_____17_____
  _____18_____19_____
  _____20_____21_____
  _____22_____23_____
  _____24_____

9, Health extension program:-

- # of rural kebele covered by health extension workers _____&uncovered_____
- # of urban kebele covered by HEW _____&uncovered_____
- # of cumulative model household Graduated _____
- # of model kebele Graduated_____
- #TBA_____#CHA_____
- Others_____
  _____
  __

10. Allocated Budget for health:-

_____BY Gov't_____ by NGO
_____Expenditure_____

10.1. Utilization_____

11. Stakeholders:-

Name	NGOs		Area of focus	Remark
	International	Local		

12 .The main health problem of the district is:_____
_____
_____

13.IF you have anything to add:_____

THANK YOU!

Chapter V-Scientific Manuscripts for Peer reviewed Journals:

5.1. Measles Outbreak investigation in Chenta kebele, Bahir Dar Zuria woreda, Amhara Regional State, Ethiopian April 22-June 07, 2011.

Authors: Zekarias Adamu[1]

Name of FELTP: Ethiopia FELTP

FELTP Graduation: 2012

Abstract

Backgrounds: In 2011, Ethiopia faced measles outbreak from different regions of the country. Bahir Dar Zuria woreda, Amhara Region is one of affected woreda by measles outbreak. Bahir Dar Zuria woreda health office reported the Chenta outbreak to Regional Health Bureau, Public Health Emergency management department by telephone on April 9, 2011. The report initiated outbreak investigation to identify the etiology, assess risk factors and propose appropriate intervention.

Methods: Descriptive study was conducted in Chenta kebele, Bahir Dar zuria, Amhara Regional state, from April 20 to June 7, 2011. Data were collected by using measles outbreak reporting line list and unstructured questionnaire. Those cases that develop fever, rash and either cough or Coryza or Conjunctivitis were searched from clinic registration and house to house. Descriptive analysis done by entering and recoding collected data using Epi-info version3.5.1 and Microsoft office Excel 2007.

Results: A total of 46 cases with 2 deaths (Case fatality rate CFR=4.35%) were identified in Chenta Kebele. The age range was 1 to 38 year with median age of 11.5 year; and age distribution of cases were 11(23.9%), 17(37%) and 18(39.1%) cases at age groups of 1 to 4, 5 to14 and 15 to 38 years old respectively. Of 46 cases 24(52.2%) were Females. The vaccination status of cases were 24(52.2%) not vaccinated, 17(37%) received 1 dose and 5(10.9%) received 2 doses of measles vaccine. The first index case of Chenta has travel history to Dehina Mariam which reported measles outbreak prior to Chenta.

Conclusion and Recommendation: .In this kebele, legible children are found not vaccinated. Travel history to measles affected area and accumulation of susceptible children in the kebele may have facilitated the outbreak. And hence, strengthening

routine and supplemental immunization activities and early control of localized outbreak elsewhere will prevent future outbreaks and expansion of outbreaks.

Introduction:

Measles is an acute viral infectious disease (1) caused by virus (2) that grouped under paramyxoviridae virus family and genus Morbillivirus (3).For Morbillivirus that causes Measles humans are the only reservoirs (4).The case fatality rate is 1 per 1000 in developed countries where as in developing countries estimated 3% to 6% but it might be 20%-30% in high risk population like in infants under 12 months of age, malnourished person and people infected with human immunodeficiency virus.

In 2008, there were 164,000 measles deaths globally –nearly 450 deaths every day or 18 deaths every hour (6). Of these more than 95% of measles deaths occurred in low income countries with weak health infrastructures (6) and mostly in children under the age of five were affected(6). From 2009 to 2010, cases of measles increased dramatically in Europe, with notifications increasing from 7175 to 303674 (7). Of these, 21877 people were admitted to hospital and 21 died. The case fatality was 0.69 deaths/1000 reported cases. 71% of people infected were aged less than 20 years and 85% were unvaccinated (7). In 2011, World health organization has reported outbreaks in 24 Europe countries. From January to March 2011, 9349 cases were reported (7).

Measles is widely known in Ethiopia. In 1980 Ethiopia introduced measles vaccination as part of the Expanded Program on Immunization (EPI) (8). Measles is one of immediately reportable disease in the country. From 2005 to 2009 a total of 175221 cases and 127 deaths were reported nationally. During this period the median age was 4 years old. The age group 1-4 years constitutes 41.7 %(7323) (8).

In 2011, Ethiopia faced measles outbreak from different regions of the country. These regions are Amhara, Oromia, Tigray and Benishangul Gumuz regional states experienced the outbreaks at different areas of their region (9). Amhara Regional State reported measles outbreak from almost all zones, with a total of 1471 cases and 6 deaths (0.41%CFR) were reported. High number of cases, 29% (423) was reported from Mekete woreda and 21 %(305) cases from Raya Kobo (10).

Bahir Dar zuria woreda which found in Amhara region is one of affected woreda by measles outbreak. From this woreda two kebeles namely, Dehina Mariam and Chenta were affected by measles outbreak in 2011.The total cases of Dehina Mariam was 82 where as in Chenta kebele 46 cases were reported. (10).

Chenta kebele which was my investigation site is the rural kebele approximately 20km from Bahir Dar town and has a total population of 7736 and less than one year infant population is 193. The measles vaccination coverage of the kebele is 74% (11).

Even though measles outbreak is occurred prior to Chenta in Dehina Mariam starting January 2011, Bahir Dar zuria woreda health office PHEM department reported the Chenta outbreak to Regional health bureau, Public health Emergency management department by telephone on April 9, 2011. This information initiates us to investigate the rumor of outbreak and to assess the risk factor of outbreak in Chenta kebele. The investigation helps to know the cause of the outbreak and enables to verify whether the outbreak has possible epi-linkage from other source. And to set appropriate prevention and control intervention measure.

Methods and Materials:

Study Area: The Investigation was conducted in Chenta Kebele. Chenta is rural kebele found in Bahir Dar zuria woreda in west direction of Bahir dar. The kebele is approximately 20km from Bahir Dar. The kebele has one Health post with 1 nurse and two health extension workers. Chenta kebele has 7,736 total populations, 1047 under 5 populations and 193 less than one year infant population. The measles vaccination coverage of the kebele is 74%.

Study Design: Descriptive study was conducted in Chenta kebele, Bahir Dar zuria, Amhara Regional state, from April 20 to June 7, 2011.

Study Subjects: Residents of Chenta kebele those developed Fever, Rash and cough or Coryza or Conjunctivitis.

Sample Size and Sampling: All cases were taken. The case definition used was Standard case definition of WHO which is used for measles surveillance.

Instruments: Structured and non Structured/about travel history, contact person/ questionnaires were used for collecting data on the variables

Variables: Age, sex, patient Name, on set of rash, Vaccination status, sample taken, outcome, travel history, Kebele, Name of health facility and woreda

Data collection: Data were collected by principal investigator/resident and my colleagues; and were collected using questionnaire and observing records from health facility and from woreda report. Additional cases were searched by home to home visit. 12 cases collected by Home to home visit and included in to line list

Data Analysis: Descriptive analysis done by entering and recoding collected data using Epi-info version3.5.1 and Microsoft office Excel 2007.

Results:

A total of 46 cases were occurred in chenta kebele. Out of 46 cases 2 death were registered. The case fatality rate was 4.35%.The median age was 11.5 year and age range was 1 to 38 year. Of 46 cases 24(52.2%) were Females. The vaccinated status of cases were 24(52.2%) not vaccinated, 17(37%) received 1 dose and 5(10.9%) received 2 doses of measles vaccine. The age group of cases were 11(23.9%) 1 to 4 years, 17(37%) 5 to14 years and 18(39.1%) 15 to 38 years.

The outbreak was started 22 April, 2011 and prior to this date the case was zero. The detail of the outbreak time description is showed below in figure1.

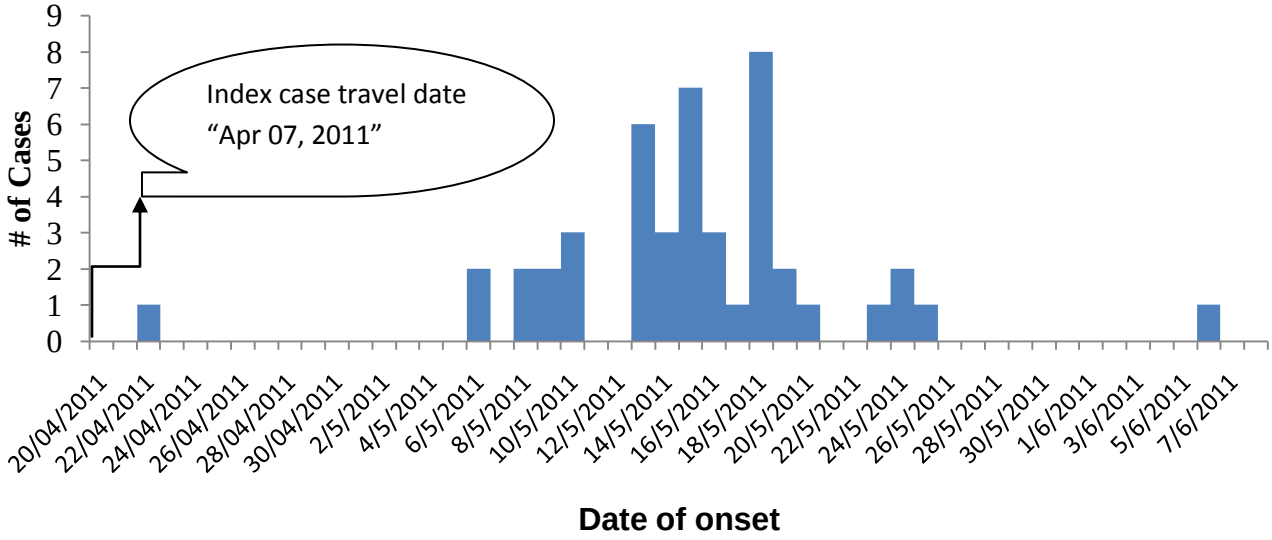


Figure 5.1: Epidemic curve of measles outbreak inchenta,Amhara regional state,Ethiopia, Apirl 20-June7, 2011.

Out of 46 cases 8(17.4%) had date of on set on May18, 2011 which was the high peak for the outbreak and next to this the second peak 7(15.2%) cases had date of onset on May 15, 2011. For further refer figure 5.1.

The case that had onset on April 22, 2011 has travel history on April 07, 2011 to Dehina Mariam for wedding ceremony. Dehina Mariam was one of measles outbreak affected kebele from Bahir Dar zuria starting January 9, 2011 to May 2011.The person was 25 years-old male and not vaccinated to measles vaccine. He is alive but His oldest brother contract the disease after him and died. In his family his sister also contracts the disease.

Laboratory:

The sample was not taken; the outbreak was epidemiologically confirmed by Epidemiological linkage with that of Dehina Mariam since Dehina Mariam outbreak was confirmed by Laboratory

Discussion:

Measles cases fatality rate was 4% in this investigation site and the figure is found between the case fatality rate estimated for developing countries; which is 3 to 6% but it is higher than case fatality rate of the region which was reported in the same year. The Chenta kebele Measles vaccination coverage was 74%. Even the Measles vaccination coverage was 74% the immunized Children could be 85% of 74%. This coverage is so low. Therefore the reason for high case fatality rate (CFR) may be due to high unvaccinated /susceptible/ group or the regional CFR is diluted with those of high vaccinated areas Epidemic. The other possible reason may be the community low health seeking behavior.

Out of 46 cases 18(39.1%) cases were in the age group 15 to 38.The reason could be in the area more adults were not vaccinated for ever during their childhood life time and susceptible cohort groups may be high and low vaccination coverage to develop herd immunity. The population in the age group 15 to 38 may be high in this outbreak affected kebele.

The first index case of Chenta has been gone to Dehina Mariam which has measles outbreak prior to chenta; for wedding ceremony. During the wedding Ceremony measles outbreak was in Dehina Mariam. Probably the Dehina Mariam outbreak was spread to

Chenta. Since the study is simply descriptive it is impossible to determine the risk factor and drive strong conclusion on causation.

Conclusions:

Perhaps Outbreak of Chenta might be spread from Dehina Mariam and presence of not vaccinated Cohort might be the cause for the outbreak.

Recommendations:

Bahir Dar Zuria woreda health office and other stakeholder should vaccinated missed children or cohort by campaign or mobile team in order to increase herd immunity of the Community in chenta. Early warning should be strengthen at all level to response timely.

Acknowledgements:

I would like to thank my adviser Dr Mer'Awi Aragaw for his invaluable Contribution and commenting this outbreak report and field base supervisor who arranged the investigation trip and the Bahir dar zuria woreda health office, PHEM officer who took me to Epidemic site.

In addition my gratitude goes to WHO officer, Ato Tesfaye Tilaye who support me by transportation and technically and those who assist and help me by giving invaluable information.

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Chapter VI- Abstracts for Scientific Presentation:

6.1. Measles Outbreak investigation in Chenta kebele, Bahir Dar Zuria woreda, Amhara Regional State, Ethiopian April 22-June 07, 2011.

Authors: Zekarias Adamu[1]

Name of FELTP: Ethiopia FELTP

FELTP Graduation: 2012

Abstract

Backgrounds: In 2011, Ethiopia faced measles outbreak from different regions of the country. Bahir Dar Zuria woreda, Amhara Region is one of affected woreda by measles outbreak. Bahir Dar Zuria woreda health office reported the Chenta outbreak to Regional Health Bureau, Public Health Emergency management department by telephone on April 9, 2011. The report initiated outbreak investigation to identify the etiology, assess risk factors and propose appropriate intervention.

Methods: Descriptive study was conducted in Chenta kebele, Bahir Dar zuria, Amhara Regional state, from April 20 to June 7, 2011. Data were collected by using measles outbreak reporting line list and unstructured questionnaire. Those cases that develop fever, rash and either cough or Coryza or Conjunctivitis were searched from clinic registration and house to house. Descriptive analysis done by entering and recoding collected data using Epi-info version3.5.1 and Microsoft office Excel 2007.

Results: A total of 46 cases with 2 deaths (Case fatality rate CFR=4.35%) were identified in Chenta Kebele. The age range was 1 to 38 year with median age of 11.5 year; and age distribution of cases were 11(23.9%), 17(37%) and 18(39.1%) cases at age groups of 1 to 4, 5 to14 and 15 to 38 years old respectively. Of 46 cases 24(52.2%) were Females. The vaccination status of cases were 24(52.2%) not vaccinated, 17(37%) received 1 dose and 5(10.9%) received 2 doses of measles vaccine. The first index case of Chenta has travel history to Dehina Mariam which reported measles outbreak prior to Chenta.

Conclusion and Recommendation: .In this kebele, legible children are found not vaccinated. Travel history to measles affected area and accumulation of susceptible

children in the kebele may have facilitated the outbreak. And hence, strengthening routine and supplemental immunization activities and early control of localized outbreak elsewhere will prevent future outbreaks and expansion of outbreaks.

6.2 Typhus outbreak investigation in Debre Berhan Prison, Amhara Region, Ethiopia from 4th to 15th July 2011.

Authors: Zekarias Adamu[1]

Name of FELTP: Ethiopia FELTP

FELTP Graduation: 2012

Abstract:

Background: Typhus refers to a group of infectious diseases that are caused by Rickettsial organisms and result in an acute febrile illness. Typhus is currently prevalent in mountainous regions of Africa, South America, and Asia. Ethiopia reports approximately 90% of typhus cases to world health organization each year. On July 8, 2011, the North Shewa Zonal Health Department reported increased number of acute febrile illness cases in Debre Berhan Prison.

Methods: Descriptive study was conducted in Debre Berhan Prison on July 12 and 13, 2011. Secondary data from line list and primary data of cases that experienced acute febrile illness since July 4th 2011 were collected. 63 conveniently selected cases were interviewed with Structured Questionnaire. Review of medical records of admitted cases were done from Debre Berhan Referral Hospital. Secondary and primary data were entered in Epi-info and analyzed for descriptive and risk factor variables.

Results: A total of 130 cases were identified from July 4th to 15th 2011 in Debre Berhan prison. Out of these cases 2 were died. All cases and deaths were males. The median age of cases was 27 years with age range of 17-67 years old. Live in crowded condition with <1m2/person. Among 63 cases interviewed, 57(90%) and 51(81%) cases interviewed had complained rat and fleas infestation in their room respectively. and 12 case were positive for welfilex test.

Conclusions and Recommendation: The prison was infested by rat, fleas and louse and over crowded with <1m^2/person. Probably overcrowding, rat, fleas and louse infestation of the prison and prisoners may have led to occurrence of this typhus outbreak in the prison; appropriate actions were taken to control the outbreak. And hence, health education, improved hygiene and sanitation and living condition will prevent future outbreaks.

6.3. Monthly Surveillance report data analysis of Suspected Rabies cases in Amhara Region, 2006-2009.

Abstract:

Authors: **Zekarias Adamu**[1] Dr Mar'Awi Aragaw[2] Dr Richard Luce[3]

Name of FELTP: Ethiopia FELTP

FELTP Graduation: 2012

Introduction: Rabies is a viral zoonotic disease caused by negative-strand RNA viruses from the Lyssavirus genus. It is a fatal disease that is transmitted by different mammalian species to humans. In Africa, more than 90% of human rabies is attributed to the canine rabies variant transmitted by domestic dogs. Human rabies is an important public health issue in Ethiopia; however surveillance data not comprehensive. Therefore, this analysis of available was undertaken to improve understanding of rabies epidemiology in the region

Methods: Monthly routine surveillance system data reports from (July/2006 to June/2009) submitted by zonal health offices to the regional health bureau were analyzed using Excel.

Results: The total of 1000 suspected rabies cases and 4 deaths were reported from 2005 to 2009.Post exposure prophylaxis used in the region for the suspected cases of rabies. The suspected rabies cases reported ranges 66 to 484 and the trend was increasing. The highest cases reported at February (298) and September (189).Six inpatient cases reported from 2006-2009.

Conclusions: The suspected human rabies cases reported were increased year to year due to rabid dog bite. Since this analysis shows that human rabies increment in the region due to dog bite, dogs should be vaccinated and owners' of dogs should manage their dogs.

Chapter VII – Narrative Summary of Disaster Situation Visited:

7.1. Meher Assessment of North Shewa, East Gojjam and Awi zones in Amhara regional state, North West part of Ethiopia from November 21 to December 19, 2011.

Introduction:

In Ethiopia there are two main multi-sectoral seasonal assessments for Humanitarian needs Preparedness. The two main multi-sectoral seasonal assessments in Ethiopia are the Belg and Meher seasonal assessments. Belg season is from February to June whereas Meher season is from June to October. Therefore the Belg assessment is done at the end of Belg season whereas meher assessment done at the end of meher season. In 2011 meher assessment was conducted nationally starting 21th November for 20 days. In the Assessment I take part in the N.Shewa, E.Gojjam and Awi zones of Amhara Region. From three zones of the region listed above ten hotspot woredas were selected to assess the public health Emergency problems, the capacity of the health system to cope up the problem and preparing preparedness plan for anticipated public health emergency problems. The assessment results were compiled at regional level and presented in the national 2012 Humanitarian Requirements Document for appeal.

Objective:

General objective

The Assessment aim is to identify anticipating public health problem, existing capacity of the woreda to cope up the anticipating Public health problem and to be prepared for those problems in term of resource in selected woreda of Amhara regional state.

Specific objectives

To assess the type, magnitude, and likelihood of occurrence of different public health emergencies in selected woredas

To assess the existing capacity of the health system in managing public health emergencies

To develop emergency preparedness plans for the region

Methods:

The Assessment was conducted as part of 2011 Meher Health and nutrition emergency needs assessment in N.shewa, E.Gojjam and Awi zones and selected woredas from those zones of Amhara regional state from 21th November to 19th December 2011. Descriptive data were collected and Descriptive analysis was made. Discussion was made/held with zonal level disaster prevention and preparedness (DPP) committee, and non health sectors such as water resources, education and food security coordination and disaster prevention offices and with zonal and woreda level health officials.

Nationally prepared standard checklist was used for data collection. Secondary data from selected health office and institution was reviewed. Observation of selected facilities and drug stores reviews were made. The key issue was debriefed with Zonal level disaster prevention and preparedness (DPP).The variables like Number of cases and deaths, essential drug Availability, anticipating disease of the locality and Epidemic prone diseases and preparedness plan for them were assessed.

Data were analyzed by using excel-MS and the report disseminated for FMOH; PHEM directorate for resource mobilization.

Results:

Population:

A total of ten woredas were selected and assessed for meher health and nutrition needs assessment from N.Shewa, E.Gojjam and Awi zones. The total population in the assessed woredas was 1078221 of which 664842 were females and 123995 were under five years old children. Ankesha was one among ten assessed woredas and has highest (20.2%) of total population followed by Basoliben which has 13.9% total population. For detail refer table 7.1. Even though special population, Migrant worker were not estimated well. Roughly 3000-5000 migrants worker were found Basoliben, Jawi and Ankesha.

Morbidity and Mortality:

Averagely top five causes of morbidity in assessed woredas were Malaria, Helminthiasis, upper respiratory tract infection, diarrhea and gastritis according to their largest to smallest order of patient load. The habit of recording mortality was not experienced well. Due to this problem top five causes of mortality in assessed woredas were not identified during assessment.

Epidemics from July to October 2011:

Epidemic prone diseases like AWD, Malaria, Measles, and Meningitis Epidemics were not occurred in assessed woredas from stated time interval (July to October 2011). Cases and deaths of AWD and Meningitis were zero from those all assessed woredas whereas 2 suspected measles cases were reported; 1 from Dejen woreda and 1 from Shewa robit but no death. A total of 33855 malaria cases were reported from the assessed woredas and the attack rate was 3.14% with the highest attack rate in Jawi (15.8%) and the least from Mojana wodera (0.01%). The peak month for the summarized cases found to be August 2011. No death was reported from the assessed woredas. (Fig 7.1)

Ongoing outbreak of any diseases was not reported during assessment from assessed woredas.

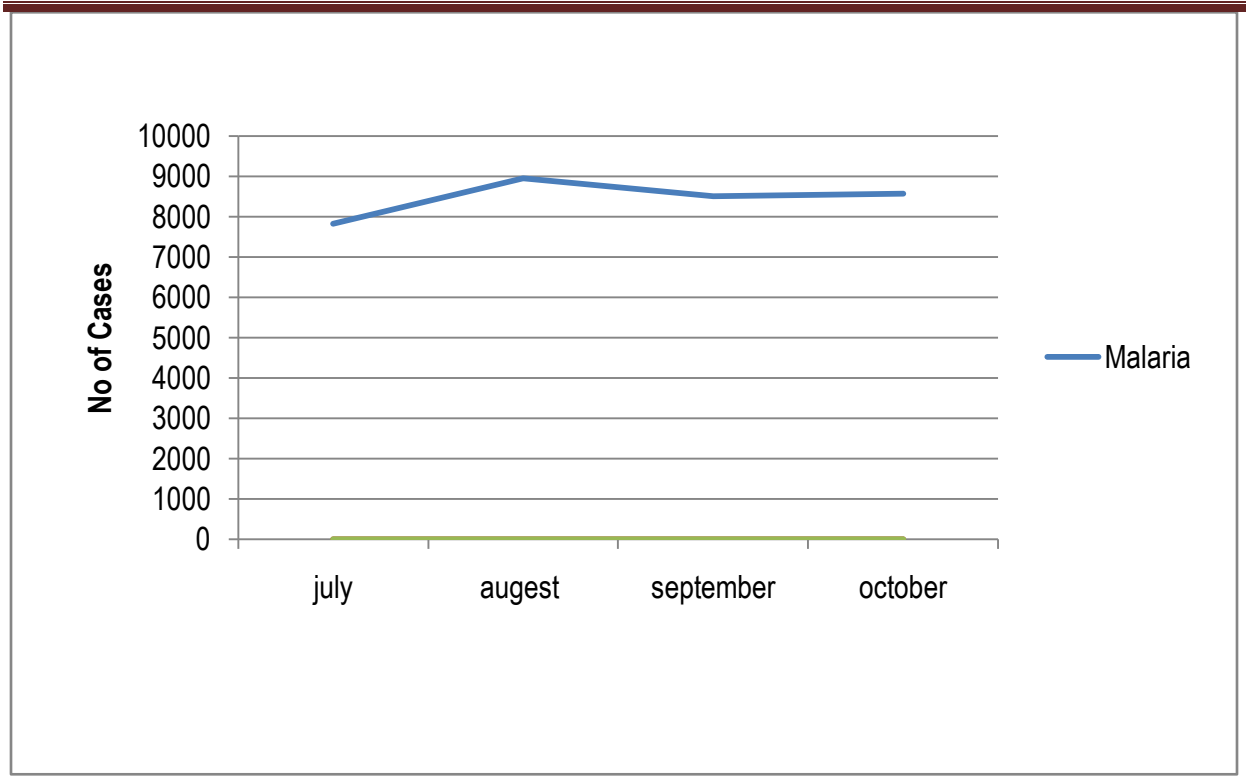


Fig 7.1 Distribution of malaria cases by month in assessed woredas of N.shewa, E.Gojjam and Awi zones from July to October, 2011.

Disease prevention and control:

The 90% of the assessed woredas have greater than 80% of measles vaccination coverage for children under one year old. Dangila zuria woreda was the only woreda which has 78% measles vaccination coverage for children under one year old from assessed woreda.

Out of 10 Assessed woredas 8 of them have greater than 80% LLINTs coverage whereas two of them, Mojanawedera and dangila zuria did not distribute LLINTs for the last five years. But other prevention and control activities like environmental management have been done in all the assessed woredas.

Emergency Drugs and Supplies:

Of 10 assessed woredas, six (60%) of them did not have in stock Ringer Lactate, three (30%) ORS, three (30%) doxycycline, three (30%) syringe and gloves and only one

woreda did not have TTC eye ointment. For detail see Fig 7.2. Whereas from all the assessed woreda and zones none of have RDT (Pastorex) for meningitis. The available drugs and supplies that are reported are not adequate for the coming six months.

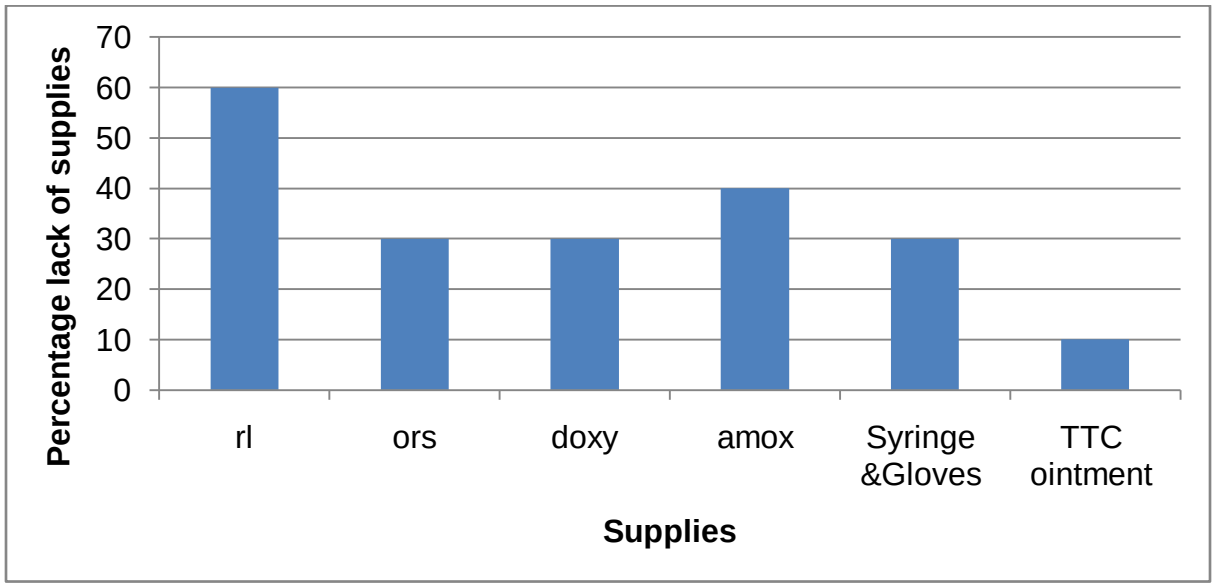


Fig 7.2 Lack of emergency drugs by supply type in the assessed woredas of Amhara region, Ethiopia, 2011

Human resource: In each woredas and zones trained personnel either on PHEM or IDSR were available.

Coordination and PHEM:

Coordination forum: Nine woredas (90%) have coordination forum but all are not active this time and have no budget for response.

PHEM: all the assessed woredas did not have epidemic response plan. Except Antsokiagemiza woreda all do not have public health emergency preparedness and response plan. Including RHB all the assessed zones have dedicated PHEM staff. With respect to trainings provided for PHEM staff all members from both regional and zones trained on PHEM, IDSR. All the assessed zones do not have trained staff on epidemic preparedness and response plan.

Anticipated risk of epidemics:

Acute Watery Diarrhea (AWD): four woredas (Mojanawedera, Shoarrobit, Kewot and Antsokia) have experienced AWD outbreak on 2009. And the safe water coverage in this woredas is also very low but the figure did not specified. Mojanawedera woreda, where the Tsadikane Mariam Holy water is found is at higher risk. Around 12000 people visit this area per year. And the septic tank of the toilets at this place is full and there is also an open hole this in turn contaminate the river which is besides. Around four kebeles use the river for house hold consumptions.

Malaria: it is endemic to Basoliben, Debre Elias, Jawi, Ankesha and Dangila zuria woredas and they have reported higher number of cases. A number of permanent and temporary breeding sites have been identified and there is also an protected irrigation and interrupting rivers. The LLINTs coverage is greater than 80% for this woredas except Dangila zuria, which have not distributed LLINTs for the last five years. Though the LLINTs coverage is very good the utilization is still in question since we observed that the farmers are using the bed net for harvesting their crops.

Measles: Dangila zuria and Jawi woredas have risk of measles outbreak since they have been experiencing an outbreak from 2010- June 2011. There is also high population movement in Jawi woreda. The under one year measles vaccination coverage in Dangila zuria woreda is less than 80% (i.e78%) which may contribute for measles outbreak.

Conclusion:

Based on the findings from all the assessed woredas need emergency medical supplies for preparedness of any risk of epidemics.

Recommendations:

- Stock for essential drugs and medical supplies for emergency needs should be secured both at woreda and zonal level
- Trainings for PHEM staffs in epidemic preparedness planning and estimation of supplies
- Strengthen multi sectoral information communication and reporting in different levels of the health sector
- Follow up and education should be strengethen for the utilization of LLITNs
- Construction of septic tank for the toilets at `Tsadikane Mariam Holy Water` is mandatory

Annex:

Table 7.1 Population by age and sex in the assessed woredas

Zone	Woreda name	Total population	Male	Female	Under 5	Above 5	Percent Pop
North shoa	Antsokia	87206	43634	43572	10028.69	77177.31	8.09
	Mojana wodera	75612	38184	37428	8695.38	66916.62	7.01
	Shewarobit	42220	21592	206110	4855.3	37364.7	3.92
	Kewot	88293	45554	42739	10153.695	78139.305	8.19
East Gojjam	Dejen	111686			12843.89	98842.11	10.36
	Basoliben	150109	73815	76294	17262.535	132846.465	13.92
	Debre Elias	89783	45789	43994	10325.045	79457.955	8.33
Awi	Jawi	86453	45234	41219	9942.095	76510.905	8.02
	Ankasha	217938	108323	109616	25062.87	192875.13	20.21
	Dangila	128921	65051	63870	14825.915	114095.085	11.96
Total	10	1078221	487176	664842	123995.415	954225.585	100

Table 7.2 Distribution of AWD, malaria, Meningitis and Measles cases by zone and assessed woreda

Zone	woreda	AWD	Malaria	Meningitis	Measles	population	AR malaria
North Shoa	Mojanawodera	0	6	0	0	75612	0.01
	Antsokia	0	654	0	0	87206	0.75
	Kewot	0	663	0	0	88293	0.75
	Shoa robit	0	843	0	1	42220	2.00
East Gojjam	Dejen	0	904	0	1	111686	0.81
	Basoliben	0	1776	0	0	150109	1.18
	D/Elias	0	3116	0	0	89783	3.47
Awi	Dangila	0	3729	0	0	128921	2.89
	Ankesha	0	8506	0	0	217938	3.90
	Jawi	0	13658	0	0	86453	15.80
	total	0	33855	0	2	1078221	3.14

Table 7.3 Emergency drugs and supplies at visited zonal level and estimation of beneficiaries

Item		Stock at hand visited Zonal level				
		North Shoa	East Gojjam	Awi	total	Beneficiaries
Drugs , Laboratory and other supplies	ORS sachets	0	400	0	400	
	Ringer Lactate 1 liter	0	30	0	30	
	Doxy cyclin 100 mg	180pk	0	0	0	
	Tetracycline ointment	0	0	0	0	
	Amoxacilin suspention	0	1000	0	1000	
	Vit A	0	1733	65	1798	
	Coartem	6570	10560	6240	23370	
	oily caf	4	0	0	4	
	RDT for malaria	1600	6400	3070	11070	
	Pastorex for meningitis	0	0	0	0	
	AWD CTC kite	90beds	36beds	0	0	
	Cotrimoxasole suspenssion	0	0	0	0	

Chapter VIII- Protocol/Proposal for Epidemiologic Research Project:

8.1. Retrospective assessment of Dog bite injury in Assosa and Surrounding kebeles, Benishangul Gumuz Regional western part of Ethiopia from 2007-2010.

ADIS ABABA UNIVERSITY FACULTY OF MEDICINE SCHOOL OF PUBLIC HEALTH

MASTER OF PUBLIC HEALTH RESEARCH PROJECT SUBMISSION FORM

Name of investigator	Zekarias Adamu Garno
Name of Advisor	Dr Mer' Awi Aregaw
Full title of the research project	Retrospective assessment of Dog bite injury in Assosa and Surrounding kebeles, Benishangul Gumuz Regional western part of Ethiopia from 2007-2010.
Duration of project	1 month
Study Area	Assosa
Total Cost of the project	29,956.50 birr
Address of investigator	Tel:0912091383 E-mail:adamuzekarias@yahoo.com

8.1. Executive summary:

Background: Dog bites in humans are a public health problem worldwide due to risk of rabies transmission and physical, psychological trauma and wound infection. Dogs are the source of 99% of human rabies deaths. Of all rabies deaths, 99% occur in the tropical developing world.

In Ethiopia the burden According to 5 year data of FMOH (1996-2000), dog bite injuries attribute to 91.6% of rabies cases in the country. In 2008 to 2009, dog bite to human was 2994 cases in Ethiopia.

The burden of dog bite injuries in Assosa Town and its surrounding outweighs from all reporting sites of Benishangul Gumuz Regional State. In 2011, of 256 dog bite injuries reported by Assosa Hospital, 243 (94.9%) were from Assosa town and its surrounding.

Objective: The study aimed at describing the burden of dog bite injuries in Assosa Town and its surrounding from 2007 to 2010G.C.

Method: Retrospective review of records will be conducted and descriptive analyses of data will be employed. The study frames will be health centers and hospitals that served the community at least for the last 8 years in the study area in order find well documented records.

Work plan and Budget: The data collection will be conducted from March 1st to 30th 2012 G.C but it will be modified depending timely release of fund and having of ethical clearance. To carry this study, 29956.50ETB is needed.

8.2. Introduction:

8.2.1. Back ground:

Animal bites and scratches represent the most important public health issue related to dogs and cats because of the risk of rabies transmission, associated with physical, psychological trauma and wound infection (1).Dog bites in humans are a public health problem worldwide (2, 3). Worldwide >90% of rabies exposures are from dogs. This makes about 15 million people receive rabies prophylaxis annually (3) It disproportionately affect children under 15 years of age, which took 40% of all age groups suspect to be bitten by rabid animals(4).Rabies occurs in more than 150 countries and territories (5). More than 55 000 people die of rabies every year throughout the world (5,6 and 7) and dogs are the source of 99% of human rabies deaths (5,6).

In Africa, 24,000 people die annually by rabies with a rate of 23 per million populations. Dog bite is the main source of rabies in Africa (5, 7, and 8). Ninety nine of human deaths arising from rabies occur in the tropical developing world (9). About 24,000 to 70,000 people are estimated to die of rabies each year in Africa and Asia (10, 11)

In Ethiopia dog bite injuries were reported at least since eighteenth century (12), usually after the dog breeding season (13). Rabies in dogs is a well known serious public health problem in Ethiopia with documented epidemics back in 1903 (13). According to 5 year data of Federal Ministry of Health, Ethiopia (FMOH) (1996-2000), 91.6% of rabies cases in the country were attributed to dog bite injuries (14). In 2008 to 2009, dog bite to human was 2994 cases in Addis Ababa, Ethiopia which took 4.95 per10,000 populations/year (15).

In Benishangul Gumuz Region, dog bite injuries are not documented well. Reports are mainly from Assosa Hospital, because of its better service and its post exposure rabies prophylaxis services.

In 2011, of 256 dog bite injuries reported by Assosa Hospital, 243 (94.9%) were from Assosa town and its surrounding (16).

8. 2.2. Statement of the Problem:

In Assosa town and its surrounding kebeles, the total dog population is unknown, but dogs are owned for security, hunting and for friendship purpose like other parts of region. However, being found everywhere, uncontrolled domestic and stray dogs are becoming concern of the community and Assosa Hospital due to frequent report of dog bite injury mainly from Assosa town and its surrounding kebeles.

From this area, human dog bite injuries visited Assosa Hospital for wound care or Post-exposure prophylaxis were 206 and 256 cases in 2010 and 2011 respectively. The burden of human dog bite injuries reported from Assosa Hospital is predominate one from all reporting sites of Benishangul Gumuz. But regional figure is not available for other reporting sites. Therefore as this study is first in the region, the finding will be compared with national and with other regions findings or reports.

In Assosa town and its surrounding kebeles even though there is no well study done about wild life and stray dog population the town and surrounding kebele is near to forest called “Ambasa Chaka” and Mountain called Enzi Mountain. The two areas were home for wild animals. Uncontrolled domestic and stray dogs emigrate from different areas of peasant association villages when the owner came for market to town and the dog remain in the town without turning back with their owners. This event increases the population of dogs in the town. Wildlifes from nearby forest and Mountain have chance of contact with dogs in the town. From wild animals dog might be exposed to rabies virus. To prevent the infection of dogs with rabies virus, dog vaccination is recommended. However in Assosa town and its surrounding kebeles, even in the region dog vaccination to rabies are not carried out. Therefore dog bite injuries are important public health problem that has to be given attention in those areas since dogs are the main reservoirs of rabies virus.

The other problem is coordination between Agricultural Bureau, Health Bureau and other stakeholders is weak to take action on preventive measure or killing of dog or vaccinating dogs to prevent risk of rabies in animal as well as in human. Due to Weak coordination, even if dog killing Campaigns were carried out in the Assosa town each year, is not successful. However, despite the above mentioned concerns, there is no

systematic study on the burden of dog bite injury in the study area; nor consistent response given both from the health and agricultural sectors in the region. Therefore, this study is to describe the existing burden of dog bite injuries in the study area and strengthen the collaboration among stakeholders.

8.2.3. Significant of the Study:

Studying the burden of dog bite injuries in Assosa town and its surrounding will help to identify important public health interventions, and to pull up consorted efforts of different stakeholders; it also encourages documentation and improves surveillance. Moreover, Benishangul Gumuz regional State Policy makers can use the findings to set rules and regulation for dog management and initiate the dog vaccination program. This study may also be a baseline resource for further study.

8.2.4. Scope of the Study:

The study is limited to dog bite injuries in Governmental health facilities of Assosa town and its surrounding kebeles, which are within 10 km radius from the Assosa town and restricted to only descriptive epidemiologic variables.

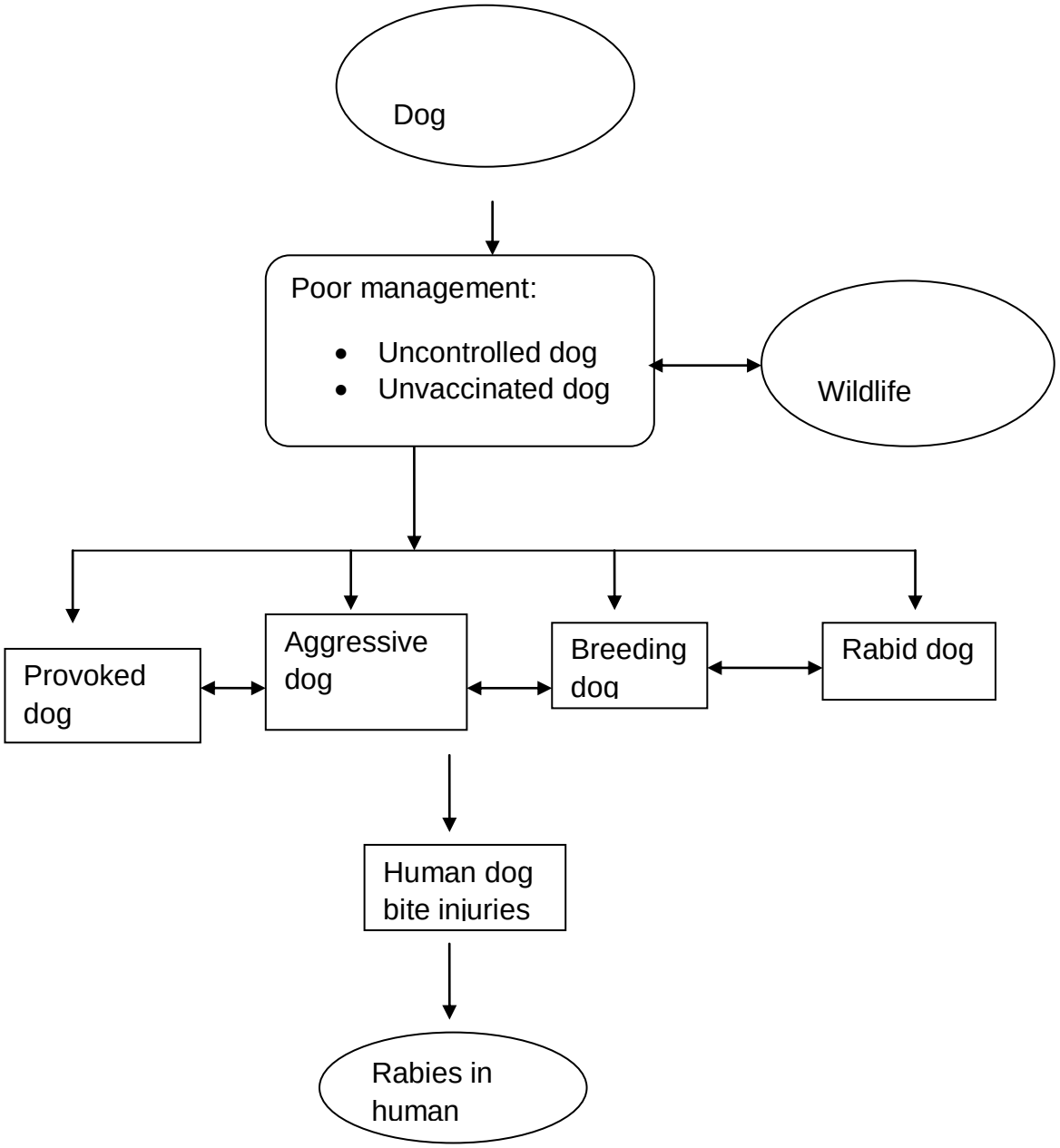
8.2.5. Limitation of the Study:

Since the study is designed to review secondary data from facilities, it may be difficult to found all intended variables and all dog bite injured/scratched patients records. Some dog bite injured/scratched patients may prefer to be treated at home by using traditional healer rather come to health facilities.

8.2.7. Literature Review:

Dog bites are a serious public health problem that causes considerable physical and emotional damage on victims. When the number of dogs increases and poor management remain the same the attack is also going over. Peoples may be bitten by stray dog or house hold dog.

Figure 1: Conceptual frame work of dog bite injuries in human and it consequence:



American Humane organization reported “children under 15 years of age are the most common victims, making up approximately70% of all dog bite victims (17).” A survey conducted during 2001–2003 in the USA estimated 4.5 million dog bites each year (an incidence rate of 16.6/1000 in adults and 13.1/1000 in children), an increase of 3% in adults and a decrease of 47% in children (3, 18). Dog bites send nearly 368,000 victims to hospital emergency departments per year (1,008 per day) in USA (19). In USA there were 33 deaths in 2007, 23 in 2008, 30 in 2009, and 34 in 2010(19).

In Ethiopia according to the retrospective study done from September 2008 to August 2009 in Addis Ababa, a total of 1299 animal bite were reported of these 1225 were dog bite(1).

A hospital-based survey conducted during 2009-2010 in Bhutan the annual incidence of dog bites differed between the hospital catchment areas. Males (62%) at risk than females in Bhutan and Children aged 5-9 years bitten more than other age groups.

In Bhutan 71% of victims were bitten by the stray dogs. The annual incidence of death from rabies was 3.14(95%CI: 1.57-6.29) per100, 000 population. Dog bite incidents were reported throughout the year with more bite incidents during the spring months (March–May) (129/324; 40%) followed by winter months (December–February) (90/324; 28%) and autumn (September–November) (72/324; 22%). The reported incidents were lowest during the summer months (June–August) (33/324; 10%) (3).

Analysis of Dog bites in Children who are younger than 17 years was conducted in Austria department of Pediatric Surgery, Medical University of Graz, in 2005. In the study the annual incidence of dog bites was 0.5 per 1000 children between 0 and 16 years of age. The highest incidence was found in 1-year-old children, with the incidence decreasing thereafter with age. A total of 73% of all affected children were younger than

10 years. A seasonal fluctuation was detected: a majority of the children were injured in the summer months, and peak incidence occurred during August. There was an almost equal distribution of dog attacks between the days of the week (20).

In a 3-year annualized study of new dog bite injuries seen in US emergency departments, the highest incidence rate (60.7 bites/10,000 people) was for boys age 5 to 9 years (21).

The study conducted in US on dog bite indicates victims less than 1 year of age accounted for 10.9% of deaths. Victims less than 10 years of age accounted for 55.6% of the cases, while individuals 65 years or older accounted for 24.0% of the cases. The highest number of deaths occurred in children aged 1 to 4 years of age, which accounted for 29.9% of the total deaths. Infants less than 1 year in age had the highest age-specific death rate (22)

8.3. Research Objectives:

8.3.1. General Objective:

The objective of the study is to describe the burden/status of dog bite injuries Epidemiology in Assosa town and surrounding kebeles.

8.3.2. Specific Objectives:

To describe the burden of dog bite injuries by place, time and person at Assosa town and Surrounding kebeles

To assess the existence of collaboration between concerned stakeholders bureaus to avert the burden of dog bite injuries.

To assess the existence of legal frames for proper management and accountability for dog owners,

To assess presence of guideline/ manual for prevention and control of dog bite injuries;

8.4. METHODS AND MATERIALS:

8.4.1. Study Design: A retrospective cross sectional review of records of dog bite injured patients seen at outpatient department and inpatient department from 2007 to 2010 will be conducted in Assosa Town and Surrounding kebeles.

8.4.2. Study Area: According to Oral evidence from elder people, Town has been had established at the turn of 20th century. The first master plan of the town prepared in 1979G.C by Ministry of urban Development and housing and it has served the development of the town until it became out date in 1993. Now the town has master plan developed in 1995 G.C.

Assosa town is the capital of Benishangul Gumuz Regional State (BGRS), According to information obtained from municipality of the town, Assosa is a town founded in 1984. It is located at the Western part of the country, 678 km away from Addis Ababa.

The town could be taken as one of the border towns in the country. It is located at 90Km away from the Ethio-Sudanese border. It lies on an area of about 982.5 ha. It is surrounded by resettlement villages: in the North by Amba 8 and Amba 3, in the East by Amba 4 and in the South by Amba 38 (National Urban Planning Institute, 1995: 12).Assosa town is located in the 'Kola' climatic zone. The maximum temperature varies between 23.8^0c to 33.7^0c. While the minimum shuttles between 11.6^0c to 19.0^0c. The mean annual rainfall is about 991.5mm.The rainy season extends from April to November, but the maximum rainfall occurs in summer season, between June and August.

Nearby town the Bamboo forest which is called "Ambessa Chaka" and the mountain Called Enzi Mountain are the home for Wildlife.

It has 34,313 total population of which 17,661 (51.5%) are males. The Town divided in to 4 kebele Administrative. In the town 1 hospital, 1 health center and 8 private clinics are serving the Communities.

In the town, dogs are common in every direction wherever you go at night time. Households own the dogs for different purposes like for security, hunting, or as friendly

enjoying with them. Stray dog are seen in the towns whether they came from the towns household or from surrounding kebeles. However the population of dogs is not estimated yet.

8.4.3. Study Populations: All the patients who visit Assosa hospital due to injury will be the study population while the study subject will be all patients who visit Assosa hospital due to dog bite during 2007 to 2010.

8.4.4. Study Duration: data collection will be conducted from February, 15 to 30 March, 2012 G.C

8.4.5. Sample size and sampling: In this study the whole dog bite injuries data seen from 2007 to 2010 G.C will be included.

8.4.6. Data Collection Tools and Procedures: Health facilities (only health centers and a hospital) that serve in the area for at least 8 years will be identified in order to have records. Then study subjects/dog bites injuries/ Statistics and their Medical record number will be identified from those selected Health facilities Statistics registration book. Accordingly identified lists of Medical records of cases of dog bite/ scratch patients who visited the health facilities to receive anti-rabies vaccine injections or wound care records will be retrieved from card room during specified period of time. Then data will be collected using prepared structured checklist.

In addition qualitative data will be collected from concerned stakeholder's bureau of Benishangul gumuz regional state. Coordination status, Responsible sectors, Existence of Guidelines, reason for not vaccinating dogs and about rules and regulation will be asked.

8.4.7. Data Collectors: Data collectors/reviewers will be 3 diploma health workers, 2 IT or Statistician and 1 record keeper. All of them will be given intensive orientation on the questionnaire how to fill the checklist and review patient cards or registration.

8.4.8. Data Collection Instruments: Data collection instrument is questionnaire which contains descriptive variables and will be pre-tested before normal data collection carried out. The questionnaire consists variables like Age, sex, address, occupation,

clinical signs and symptoms, Type of injuries, relationship of dog with patient, outcome of patient and other qualitative variables.

8.4.9. Data quality assurance: The principal investigator will check quality by randomly selecting 15% of questionnaires filled by the data collectors/reviewers on daily bases at the end of each day. And remedial action will be taken for the next morning if any discrepancy exists.

8.4.10. Data Entry and Analysis: The checklist data will be entered, cleaned and analyzed using Epi-info 7; and presented using tables and figures. Dog bite incidence will be calculated and will be expressed as the number of bite cases per 100,000 populations at-risk. Cases will described by age, sex, injuries site and demographic characteristics. The qualitative data will be narrated and presented in summarized form in the way that it shows the possible gaps.

8.4.11. Ethical consideration: In this study subjects identify records like name will not recorded in the checklist to guarantee confidentiality of the information. Permission request will be acquired from the AAU-SPH to the RHB and Health Facilities.

8.5. Work plan:

Table-8.1. the detail work plan of retrospective study of dog bite injuries in Assosa Town, Benishangul Gumuz regional state, Western Ethiopia,2007-2010G.C.

S.No	Major activities	December		January				February				March				April				May			
		Wk3	Wk4	Wk1	Wk2	Wk3	Wk4	Wk1	Wk2	Wk3	Wk4	Wk1	Wk2	Wk3	Wk4	Wk1	Wk2	Wk3	Wk4	Wk1			
1	Preparing research proposal draft																						
2	Final proposal preparation																						
3	Final Submission																						
4	Ethical clearance and Budget securing																						
5	Questionnaire duplication																						

S.No	Major activities	December		January				February				March				April				May			
		Wk3	Wk4	Wk1	Wk2	Wk3	Wk4	Wk1	Wk2	Wk3	Wk4	Wk1	Wk2	Wk3	Wk4	Wk1	Wk2	Wk3	Wk4	Wk1			
6	Orientation and Demon-stration of questionnaires to data collectors																						
7	Data collection																						
8	Data entering																						
9	Draft document writing																						
10	Draft document submission																						
11	Writing Final Document																						
12	Submission of Final result																						

8.6. Budget breakdown:

Table-8.2.The detail budget breakdown of retrospective study of dog bite injuries in Assosa Town, Benishangul Gumuz regional state, Western Ethiopia,2007-2010G.C.

S.No	Budget category	Costs to be payee	Multiplying factor	Total cost	Remark
1	Personnel	Daily wage (including perdiem)	Number of staff days(number of staff *number of working days)		
	Principal investigator subsistence allowance	400	1*20	8,000	
	Data collectors per diem	135	6*20	16,200	
	Secretarial work	50	1*5	250	
	Sub total		Personnel total	24,450	
2	Transport of the investigator	Single trip	Number of staff*Round trip		
	Bahir dar to Assosa	550	1*1100	1100	

	Sub total		**Transport total**	**1100**	
S.No	**Budget category**	**Costs**	**Multiplying factor**	**Total cost**	**Remark**
3	Supplies	Cost per item	Number		
	Printing paper(pack)	120	4	480	
	Toner	2500	1	2500	
	Sub total		**Supply total**	**2,980**	
4	**Total**		**(Total 1+2+3)**	**28,530**	
5	**Contingency 5%**		**5%*Total**	**1426.50**	
	Grand total		**(Total 4+5)**	**29,956.50ETB**	

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8.8. Annex:

8.8.1. Data collection tool for research protocol:

Demographic information:

1. Patient address :
    A. Region: _____
    B. Zone: _____
    C. woreda: _____
    D. Kebele: _____
    E. Goti_____
2. Age in years: _____
3. Sex of the patient:
    A. Male
    B. Female
4. Occupation:
    A. Farmer
    B. Housewife
    C. Student
    D. Child, if others Specify: _____
5. Relationship of injured patient with dog:
    A. Owner
    B. Owner's family(son, wife or those living together in house)
    C. Owners Neighbors
    D. Unknown dog
    E. relation is Unknown
6. Recorded clinical Signs and symptoms?

3.1.1. _____
3.1.2. _____
3.1.3. _____
3.1.4. _____
3.1.5. _____
3.1.6. _____

7. Biting/Scratching animal:
   A. Dog
   B. Cat
   C. Others, Specify_____

8. Date of dog bite/Other Animal occurred_____DD/MM/YYYY E.C
9. Site of injuries/bite_____
10. What was the type of injury occurred?
    A. Laceration
    B. Puncture
    C. Tearing of flesh, others specify: _____
11. Patient outcome (if information available):
    A. A live
    B. Dead
    C. Unknown
12. Treatment given for the bitten patient:
    A. anti rabies virus
    B. rabies immunoglobulin
    C. tetanus toxoid
    D. antibiotics
    E. analgesics
    F. Anti-inflammatory drug
    G. others

I. **Dog information**

. 1. Address of the dog:
    A. Stray dog
    B. Household dog
    C. Unknown
2. Immunization Status of the dog:

A. Immunized
B. Not Immunized
C. Unknown

3. Did the dog have contact history with stray dogs or other wild Animal?
   A. yes
   B. No
   C. Unknown
4. Sex of dog:
   A. Male
   B. Female
   C. Unknown
5. Does the dog have any sign of rabies diseases?
   A. Yes
   B. no
   C. Unknown

II. Preparedness:

1. Is there any System to detect rabies in Animal?
   A. Yes
   B. No
   C. Unknown
2. If answer for question "1'' under "II" is ''yes'' specify the system_____and How it detect?

   _____

   If answer is "No" Why not?

   _____
3. Have you ever heard rabies outbreak in Assosa town and its surrounding?

   If "Yes" when? _____any records about it?

   _____
4. Was there any dog immunization in Assosa town and its surrounding during the last five years:

   A. Yes

B. No

C. unknown

4.1. If not vaccinated why? _____

5. Which organization is responsible for dog bite injuries in Animal? _____ Why?

   _____

6. Which organization is responsible for dog bite in human? _____Why? _____

7. Is there any Guideline for prevention and control of rabies outbreak? _____Yes/No If yes Specify Name of Guideline?

   _____

8. Is there any rule for dog owners to keep their dogs properly?_____Yes/No if ‘’yes” is it functional?_____Yes/NO

   8.1 If dogs bite someone what is expected from owner?

   _____

   _____

   8.2

9. Does the health facility/district have enough anti rabies vaccine for 3months?_____Yes/No

10. Does the hospital/district have enough anti tetanus for months?_____Yes/No

8.9.1. Data Dummy table:

Table 1:Distribution of dog bite human cases by sex, age group and occupation in Assosa town and surrounding Kebeles, Benishangul Gumuz regional state from 2007-2010 G.C

Demographic Variable of cases		**Number of cases**	**Proportion per 100**
Sex	Male		
	Female		
Age group	<1		
	1-4		
	5-14		
	15-44		
	≥45		
Occupation	Farmer		
	Housewife		
	Student		
	Child		

Table 2: Distribution of dog bite human cases by year in Assosa town and surrounding Kebeles, Benishangul Gumuz regional state from 2007-2010 G.C

S.No	**Year**	**# cases**	**# cases per 10,000population**	**Remark**
1	2007			
2	2008			
3	2009			
4	2010			
	Total			

Table 3 Relationship of dogs with bitten person in Assosa town and surrounding Kebeles, Benishangul Gumuz regional state from 2007-2010 G.C.

S.No	**Relationship**	**# Cases**	**Remarks**
1	Owner		
2	Owner's family		
3	Owners Neighbors		
4	Unknown dog		
5	relation is Unknown		
*	Total cases		

Table 4: Distribution of dogs by address that bitted human in Assosa town and surrounding Kebeles, Benishangul Gumuz regional state from 2007-2010 G.C

S.No	**Address of dog**	**# of dogs**	**Proportion per 100**
1	Stray dog		
2	Household dog		
3	Unknown		
*	Total		

Chapter IX – Other Additional Output Reports (If any)

9.1. Training on Malaria:

9.1.1 Malaria Training for Health workers:

I was given malaria training from January 2-6 at Finote Selam Town with Amahara regional malaria officers. At that time I was train for trainees Etymology of malaria and how to differentiate malaria vectors from other vectors. The intention of training was to make the trainees competence to identify the mosquitoes from other vector.

The presentation was on the burden of malaria in the region for the last 18 year since 1986 E.c.

9.1.2 Public health emergency Management training:

Public health emergency management training was conducted at Woreta Town and I was participated as trainee on that training. The training was on the topics Measles, AFP, AWD and Bacillary dysentery surveillance and burden of the diseases in the region. In addition to these there was also reporting and recording issue discussion.

9.2 Conference Participation:

9.2.1 EPHA 22nd Annual Public Health Conference

As the President of EPHA explained the Association was established in 1989. The aim of the association was to bring the highest possible standards of health care for all Ethiopians and Maintain professional standards through advocacy, active involvement and networking. The association has been conducted 21 Conferences and in this year as usual the 22nd conference was held in UNCC, Addis Ababa on 1-3 November 2011. The main theme was on Alcohol, Tobacco and Substance Abuse.

To participate on the conference I was registered by e-mail and on 31, October 2011 afternoon I peak my ID card from UNECA. On 1, November 2011 morning I was registered entered to conference center.

The EPHA executive director was provided welcome remark for participants then the EPHA president and Vice president provided welcome address and introduction on program respectively. The Federal ministry deta was open the conference. After this

Award ceremony was done for senior and young researchers and also organizations those have perform best. Then it was tea break.

After tea break, Legal aspects of Alcohol and substance abuse, Araque production and consumption, Multi Media communication strategies and implementation on Alcohol and substance abuse, and Government strategies on alcohol and substance abuse was presented by senior researchers. Panel discussions on presentations were made. On the discussion and on presentation I understand that Araque production and consumption increase from Gov't to Gov't and also substance abuse similarly increasing. Therefore the researchers recommended the legal frame on those issues. Similarly young researcher presented paper on topics:

1. Prevalence and predictors of Chet chewing among School going Adolescents,

2. Determinants of Tobacco Use among school adolescents in Eastern Ethiopia

3. Prevalence and correlation of Tobacco use in a rural population

4. Sexual and Substance use risk Behavior for HIV transmission among students,

5. Effect of Khat (Catha Edulis) on Bronchial Asthma in Jimma University specialized Hospital

6. Prevalence of substance use and Determinants among high school students in Addis Ababa

On Second day issue of maternal Health was addressed with related to MDG5 and The presenters Emphasized New born infant mortality is the challenging for the country for achieving MDG but for the rest MDGs there is hope to be achieved.

Morning after tea break the session divided into three place and some of the attendants participate on Maternal health where as the rest attend HIV Issues and also some of attends attend the Nutrition session depending on individual interest.

I was attended the nutritional session papers on nutritional issue both on Obesity and Under Nourished were addressed by young researcher.

From this session I understand that HIV patients were on the risk of Under Nourished those patients have no enough income to feed themselves and their families.

Obesity is more prevalent in the private schools and stunting is also prevalent in Government schools.

Afternoon I also participate on Environmental and Communicable diseases here the presentation on Typhoid test of wedal and blood culture, and Injury in textile factories were presented.

Here I also captured that Wedal test mostly done in our health facilities were very low specificity than Blood Culture. Therefore the patients were taking mistreatment.

Injury figure injuries are common in the textile factory and most of you those who do not take safety precautions and trainings were mostly affected.

A fortunately I did not participate on third day session and last decision on the next work that EPHA should Focus.

9.2.2. 13th world congress:

Narrative Report on 13th World Congress on public Health From 23-27April, 2012 in Addis Ababa, Ethiopia

The 13th World congress on public Health was held in Addis Ababa Millennium Hall on April 23-27.The main theme was “Towards Global Health Equity**:** opportunities and Threats” . The congress was officially opened by H.E Prime Minister Meles Zenawi in the Presence of high officials, heads of various partner organizations and public health professionals coming from 168 countries. During the opening speech the prime minister was said that 11% growth GDP per year in Ethiopia increased for the past eight years. In discussing about global health issues on his part, Dr.luis sambo, said although major advances have been made in the health field, more than a billion of the poor have not benefited. He recommended that achieving global health equity requires a new health’s systems thinking which are subject to social, political and economic issues and policies.

Dr. Tedros Adhanom emphasized the needs for integrated and holistic approach to improve the maternal and child Health program. He also mentioned Ethiopian effort to introduce Health insurance to ensure Health equity.

The congress pointed out that a total of 40 papers for special sessions, 134 for oral presentations, 550 for poster presentation plus 16 for panel presentations have been reviewed and accepted for the 13th world congress.

From the oral presentation I was attend the Tobacco Dependence treatment presented by using pharmacotherapy; non-Nicotine, Nicotine replacement and combination therapy.

Oral presentation also presented on law: A public health Tool indicated some laws in terms of public health Act, occupational health and safety Act, mental Treatment Act (mental health Bill in process of development), food and Drug Act, Traffic and Road safety Act, worker's compensation Act and local government Act. Another session also presented on Environmental health in terms of sustainable health care: Mercury and waste, children's Environmental Health availed by using critical role of public health in terms take history of childhood exposures, do research and publish results, Diagnose and treat ,Educate, Advocate and provide good role model. Conclude that New understanding Environmental health that chemical exposure at critical windows, chemical exposure in incredibility small doses impacts the hormonal system and disrupt normal development. Another session also presented on multidisciplinary investigations to unravel the cause for unidentified liver disease in NW and central zones of Tigray. The diseases transmitted by the contamination of food product by Ageratum weeds. But 80% don't' know about the linkage between ULD and Ageratum. It affects both humans and animals .another presentation also breast feeding and public health introduction for the effect of intervention for improvement child survival and also important of mother health by measuring of exclusive breast feeding be a kangaroo-not a tiger. In general such kind of conference be prepared to indicate capacity building of health professional.

Narrative summary Report on investigation finding/interventional efforts on hepatic-VOD Congress o from 29-30April, 2012 in shire, Tigray region, Ethiopia

The presentation of investigational findings/interventional efforts on hepatic-VOD was officially opened by Dr.Tedrose Adhanom at the Gebar shrie Hotel in the Presence of high officials, heads of various partner organizations and public health professionals. He gives Recognition and Award of contributors. Investigational partners. This Investigational approaches: - assess Epidemiological investigation, Clinical investigation of human cases, Physical and pathological examination of livestock, Agro-ecological investigation and Toxicological and various laboratory experiments. *Ageratum* weeds release Pyrrolizidine alkaloid (PA) hepatotoxic compounds found in plants. A disease called Unknown Liver Disease (ULD) by local authorities was first investigated in 2005 in the rural Tahtay-Kororo district in the Northwestern (NW) Zone of the Tigrayregion in Ethiopia.

The hepatic- VOD was the best example of the concept of one health approach asses human, plant and animal through the environment.

Finally discuss on the direction on implementation of interventions by concerned sectors such as review case definition, strength public health surveillance system, publication or dissemination, adequacy and quality of pasture /grazing and asses anthropological and cultural issue.

Declaration:

I, declare that this is my original work and has never been presented by another person in this or any other University and that all the source materials and references used for this thesis have been acknowledged.

Name: Zekarias Adamu

Signature: _____

Place: AAU, Addis Ababa

Date of Submission: _____

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

Name of advisor: Dr Mer'Awi Aragaw

Signature: _____

Date: _____