ADDIS ABABA UNIVERSITY SCHOOL OF PUBLIC HEALTH DEPARTMENT OF FIELD EPIDEMIOLOGY

ADDIS ABABA ETHIOPIA

COMPILED BODY OF WORKS

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ADDIS ABABA UNIVERSITY SCHOOL OF PUBLIC HEALTH

Compiled Body of Works in Field Epidemiology

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ADDIS ABABA UNIVERSITY School of Graduate Studies

Compiled Body of Works in Field Epidemiology

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Abbreviations

AR	Attack rate
CI	Confidence interval
FGTC	Female genital tract cancer
AFI	Acute febrile illness
UTI	Urinary tract infection
URT	Upper respiratory tract
MAM	moderate acute malnutrition
SAM	Severe Acute malnutrition
SC	stabilizing center
PLW	Pregnant and lactating women
HIV	Human immunodeficiency virus
IDP	internally displaced people
TB	Tuberculosis
OR	Odd ratio
OPD	outpatient department
POP	population
CBR	Case based reporting format
CDC	Centers for disease control
HEW	Health extension workers
EPHI	Ethiopian public health Institute
HC	Health center
HP	Health post
RRT	rapid response team
PHEM	Public health emergency management
WHO	World health organization
WRRT	Woreda rapid response team
ZHO-	Zonal health office

Executive summary

The Ethiopia Field Epidemiology Training Program (EFETP) is a two year an in-service training program in field epidemiology adapted from the United States Centers for Disease Control and Prevention (CDC) Epidemic Intelligence Service (EIS) program. The program is designed to build capacity of Public health professionals through on -job mentorship and training. The EFETP program has two main components, each of which contributes to the award of the Masters degree (MPH) in Field Epidemiology. A classroom-teaching component (25%) and practical attachment or field placement component (75%) consisting of disease investigations, surveillance evaluations, Disaster situation management risk and need assessments and operational research on national health problems. Residents have the opportunity for public health practice in the real world.

These training started October 10, 2016 and end on Jun, 2018, I stayed in Field Epidemiology Training Program for the 25 % theoretical part, at Addis Ababa University, School of Public Health and practical attachment at Ethiopia Public Health Institute (EPHI) field base**.**

This draft body of work has seven chapters:

Chapter One: **Outbreak investigation reports.** Three outbreak investigations were conducted. Descriptive and Analytic Epidemiology was used for two **Malaria outbreak investigations** conducted in Gelana and Abaya Districts of West Guji Zone, Oromia Jan, and Feb 2018 and one case report on **Cutaneous Anthrax outbreak investigation** in Waghemra Zone of Amhara, Jul, 2017 . We identified several factors that contributed to Cutaneous Anthrax and Malaria outbreaks occurred in these two zones **Chapter Two ;Data analysis**: Pathology laboratory data on female Genital Tract cancer analyzed and the pattern was described in person and time.**: Chapter Three**: **Surveillance system evaluation:** Anthrax Surveillance system evaluation of Waghemra zone found in Amhara regional state. **Chapter Four**: **Health profile assessment** on Shashemene Administrative town health profile was assessed. **Chapter Five: Epidemiologic project Chapter six Disaster situation report** of Somali region conducted on post disaster need Assesment on Internal displaced People by conflict **Chapter seven:** Scientific papers **Chapter Eighth**: Manuscript for peer reviewed Journal and **Additional output AWD Sample collection protocol TOR** for laboratory professionals.

CHAPTER ONE

OUTBREAK INVESTIGATION REPORT

1.1. Malaria outbreak investigation in Gelana woreda, West Guji Zone Oromia, Jan, 2018

Abstract

Background: Malaria continues to be the most significant mosquito-borne disease globally but it holds a particularly heavy burden across many countries in Africa where in 2015. Malaria is the leading public health problem in Ethiopia where over 75% of the land surface is at risk with varying intensities depending on altitude and season .Gelana woreda is frequently attacked by malaria outbreak .We investigated the outbreak to identify risk factors undertake and recommend proper public health action .

Method: We conducted descriptive and case control study in Gelana woreda. We interviewed PHEM staff's on the prevention and control program, used outbreak investigation questionnaire to asses' risk factor for both cases and controls. We collected 65 cases and 65 controls matched with age group, sex and residence .We analyzed the data with Epi Info. Version 7.2 and SPSS.V 23. Results are presented in analytic statistics and characterized in Time, Place and Person.

Result: We identified that the outbreak was in three clusters and investigated in two clusters. Males are more affected than Females (37:28) and the younger Age group of the 0-4, 33(50%) followed by 5-9, 11(16.9 %) are more affected .The overall attack rate of the 32/1000. We compared the sociodemographic variable Sex and Age group the risk factors Indoor Residual Spray (IRS) home, staying out door in the evening and at night, living around intermittent river, stagnant water irrigation and type of home among cases and controls. We found significant association in bivariate analysis at 95% CI on Intermittent River, Stagnant water and irrigation. In multivariate analysis Intermittent river and stagnant water have significantly associated with the Gelana malaria outbreak (P=0.001)[AOR (7.003)=,95% CI (2.23-22.03)]and (P=0.001)[AOR (4.303)=,95% CI (1.7-10.358)], 3.2 (1.9-6.3) respectively.

Conclusion: Malaria outbreak is confirmed in Gelana woreda .The risk factors for the outbreak was intermittent river and stagnant water. Prevention and control programs were not properly functioning.

Introduction

Malaria is caused by one or more of the five species of plasmodium species that can infect by the bite of female Anopheles **[1].**Humans are infected by malaria through the bite of a female Anopheles mosquito. Once in the human body the parasites multiply rapidly, first in the liver, followed in the blood. Then the parasites are passed back to female Anopheles mosquitoes when they suck blood from an infected human. The parasites multiply again in the stomach wall of the mosquito and then migrate through her body to infect the salivary glands. When the mosquito feeds again she injects saliva containing the parasites into another human and the cycle starts again. In the malaria life cycle, asexual reproduction occurs in humans and sexual reproduction occurs in the mosquito **[2].**

At the present time there are a limited number of methods for the diagnosis of malaria. Conventional methods include clinical diagnosis by history and physical examination, empirical/syndromic diagnosis (mainly the presence of fever in endemic areas), and use of light microscopy to examine stained peripheral blood smears. Histopathology plays a limited role, but although it is useful in some situations, it is not useful in malaria control programs. Nucleic acid amplification tests play almost no role in malaria diagnosis, as these assays are limited to a few large public health laboratories and are not available commercially. As with other common infectious diseases, a number of rapid diagnostic tests have been developed and marketed. Referred to as MRDTs, they potentially could have the most impact on malaria diagnosis and treatment programs of all the available diagnostic techniques; MRDTs have additional performance characteristics that are of importance. Most important is the ability to distinguish among species, both because of the prognostic importance of distinguishing between falciparum and other forms of malaria and because of the therapeutic importance of identifying cases of Plasmodium. Ovale or Plasmodium .Vivax malaria. **[3, 4, 5]**.

In most endemic areas, microscopic slide examination of peripheral blood remains the most widely used test as well as the gold standard for detecting malaria parasitemia. Microscopy is based on examination of both thick and thin films made from the same sample of peripheral blood. Thin films are prepared in the same way as for any peripheral blood smear **[3, 6,].** A number of different stains can be used, but it is important to remember that not all stains allow detection of some of the characteristic features of malaria (e.g. Sch¨uffner dots). The diagnostic advantages of microscopy are it permits definitive identification of infecting species as well as mixed infections; can be used to determine the magnitude of parasitemia;

can be used for serial examinations to monitor the efficacy of therapy, requires little laboratory infrastructure and is comparatively inexpensive**[7].**

Since 2007, there has been a major shift from clinical diagnosis to confirmatory diagnosis following the wide-scale use of RDTs in peripheral health facilities. To improve the quality of malaria diagnosis and treatment at peripheral health facilities (health posts) pan specific RDTs are now being introduced. HEWs trained on the use of multi-species RDTs in the integrated refresher training (IRT).

The WHO malaria control strategy has 2 key components. The first is vector (mosquito) control, which itself has two components: indoor residual spraying and the widespread use of long-lasting insecticide-treated mosquito nets, both of which have been used widely and successfully in Africa. The second component is to improve diagnosis and treatment, with a specific emphasis on the increased use of diagnostic tests, particularly malaria rapid diagnostic tests (MRDTs) **[3, 8].** As with vector control efforts, there has been substantial progress in this area during the past few years, as described in the WHO's World Malaria Report 2011.1 Effective malaria diagnosis is important first for the obvious reason that it is necessary to identify cases to treat patients effectively, but also to limit treatment to patients who have malaria and not other febrile illness **[8].**

Malaria is considered endemic in regions of stable Plasmodium transmission but malaria outbreaks often also arise in regions of unstable transmission (1500–2500 meters above sea level .which are characterized by climate that is marginally suitable for mosquitoes. In such regions, outbreaks of malaria might be irregular, but higher than normal rates of malaria transmission often occur, and symptoms are exacerbated due to the low immunity of human populations inhabiting these areas [9].

All national malaria strategies across Africa implement interventions aimed at reducing human exposure to infectious malaria vectors. These include insecticide treated nets, applications of residual insecticides on household walls, or the targeting of larval stages of vectors to reduce vector abundance, survival and/or human-feeding frequency. However, the distribution of vector compositions linked to their intrinsic behavioral bionomics and their resistance to currently available insecticides remains largely unknown or under-emphasized when planning vector control at national scales **[6].**

In 2010, the second five-year National Strategic Plan (NSP) for Malaria Prevention, Control and Elimination (NSP 2011–2015) was developed, which itself was embedded in the health sector's overarching framework, the Government of Ethiopia Health Sector Development Plan four (HSDP IV). Its main goals were to achieve malaria elimination within specific geographical areas with historically low malaria transmission and achieve near zero malaria death in all malarious areas of the country by 2015.To sustain the achievements of the previous strategic plans, further reduce the mortality and morbidity related to malaria and initiate the elimination strategy, a new NSP was developed **[4, 9].**

The NSP aims for robust coverage of high quality diagnostic and treatment services universally; especially at public sector health facilities in rural areas .The national treatment guidelines have recently been revised to include both single dose Primaquine to reduce transmission of P. falciparum, and radical cure Primaquine to reduce the relapse of P. vivax malaria **[7].** The planning and implementation of a malaria control programme must be based on epidemiological analysis and application of interventions suitable to specific local malaria situations **[8].**

Statement of the problem

Malaria is one of the most common and serious life threatening tropical diseases worldwide **[9].**Malaria is deadly infectious diseases and one of the main health problems facing developing countries like sub-Saharan Africa and Asia .Globally 3.4 billion people are at risk of new malaria infections and around one million deaths annually**[1].** In 2016, 91 countries reported a total of 216 million cases of malaria, an increase of 5 million cases over the previous year. The global tally of malaria deaths reached 445 000 deaths, about the same number reported in 2015. Although malaria case incidence has fallen globally since 2010, the rate of decline has stalled and even reversed in some regions since 2014. Mortality rates have followed a similar pattern **[2].**

Malaria continues to be the most significant mosquito-borne disease globally but it holds a particularly heavy burden across many countries in Africa where in 2015, 88% of global cases and 90% of global deaths due to malaria were recorded **[1].** One country suffering a substantial burden of disease due to malaria is Ethiopia. Prior to 2005, malaria was Ethiopia's number one communicable disease, causing 5–10 million cases and approximately 70,000 deaths per annum. Following the disastrous malaria epidemic of 2003–2004 that resulted in 3,143,163 reported cases in 2003, and in 5,706,167 cases in 2004 **[3].**

The World Health Organization (WHO) African region continues World Malaria 2017es to account for about 90% of malaria cases and deaths worldwide. Fifteen countries – all but one in sub-Saharan Africa carry 80% of the global malaria burden. Clearly, if we are to get the global malaria response back on track, supporting the most heavily affected countries in this region must be our primary focus **[2].**

Oromia has a wide malaria endemic districts and Gelana Woreda is one of the Malaria endemic woredas experiencing outbreak frequently in West Guji Zone. Despite the recurrence of outbreak the villages in the rural part of west Guji are very wide and In addition, the villages of these kebeles are distant from each other and some clusters have health service access provided at health posts and other distant localities did not get the access to the service. As a result, timely diagnosis and treatment delayed. Malaria prevention and control programs need efficient coordination, properly planned resources and timely decision. Moreover, prevention programs and timely investigation of outbreaks by using surveillance data are the main purposes of Integrated Disease Surveillance (IDSR).The

purpose of this study is to verify the existence of the outbreak, identify gaps and risk factors contributed to the existence of the outbreak and provide proper public health intervention the outbreak and in Abaya woreda.

Literature review

A systematic review of risk factors of malaria outbreak in China indicated that there were three main themes of risk factors were for contracting malaria in china .The identified factors are Migration, environmental factors, operational problems of health service and vector and host factors were described .Migration contributed to outbreak that population moved from endemic to non -endemic and from low to endemic. ‘’In the environmental theme, heavy rain, irrigation and flooding were the environmental factors that favors mosquito breeding and the availabilability mosquito in a given area facilitates malaria transmission .The problems of health service were poor case management, weakening of surveillance and poor or ceased vector control measures**[10].**

A matched case -control study conducted in Bengal, India investigated an outbreak and found that environmental factors, like vector breeding in abandoned wells and sleeping out -doors was associated with contracting malaria whereas the use of Bed nets and insect repellents were associated as protective factor **[11].**

A cross sectional study conducted in 2012 in 20 clusters (Villages) of Madagascar found out that malaria outbreak was significantly associated with fail to use bed nets regularly ,being age group 6-14,lower socioeconomic status ,living in rural area ,stock outs of treatments and increased rainfall **[12].**

A study on epidemiolocal analysis of malaria outbreak in Amhara regional state Ankesha district of Awi Zone found out that multiple factors contributed to the outbreak. The availability of dam near to residential area, deficit of rainfall, improper use of bed nets and Impediment IRS operation were contributing factors of the malaria outbreak in the district **[13].**

A study of Malaria outbreak investigation in Mecha, Dera and fogera districts of Amhara region indicates there were mosquito breeding stagnant waters available at districts with the outbreak and lack timely vector control are contributors of the risk of malaria outbreak **[14].**

A Malaria Outbreak in Ameya Woreda, South-West Shoa, Oromia, Ethiopia, 2012 showed that the most protective factors with lower odds ratio were ITN use and Insecticidal sprayed home .This is different from our finding that it has no significant association **[15].**

Objectives

General objective

To investigate the risk factors for the Malaria outbreak and Gelana woreda of West Guji zone, Oromia Jan, 2018.

Specific objectives

- To verify the existence of outbreak in Gelana Woreda
- To investigate the risk factors for the Malaria outbreak in Gelana Woreda
- To characterize Malaria outbreak in terms of Person, Place and Time in Gelana Woreda
- To conduct proper public health intervention for malaria outbreak in Gelana Woreda

Methodology

Study design

We conducted descriptive and matched case- control study on the active patients in Gelana woreda .We reviewed weekly 2016/2017 year PHEM data established threshold level for 2017/18 level. We used a structured and semi structured questionnaire to conduct interview from cases and controls on the risk factors. We also interviewed the health office and health cluster (HCs) PHEM officers on control and prevention program in the woreda.

Study area

The study area is Gelana woreda of West Guji found in Southern of Oromia regional state. It is situated to North Abaya, South to AmaroWoreda, South West Abaya Lake & Arbaminch East of Yirgachefe and South East of Bulehora. Gelana woreda has 19 kebeles with a total population of 65,856population. The town of Gelana woreda is Tore. Gelana woreda is found 400km to South and 60 km to the North far from Addis Ababa and Bule Hora zonal city respectively.

Study period

We conducted the study from Jan 11-30, 2018.

Study population

The study population are peoples living in Gelana woreda of West Guji Zone and at risk of malaria.

Source population

The source populations for case are any febrile patient which fulfills the case definition from Jan 11-30, 2018 in Gelana woreda. The source population for controls is non febrile apparently healthy person with same sex, age –group, neighbor or family living in the same village with the active case patient during the study period.

Study subject

The specific study subjects were febrile patients which are positive for malaria parasites by the rapid diagnostic tests in Shamole-shida, Shamole-Oda, and Bore and Metteri kebeles of Gelana from Jan 11-30, 2018. Study subjects for control was non febrile apparently healthy person with same sex, age –group, neighbor, family or who is living in the same village with the active case patient from Jan 11-30, 2018.

Inclusion criteria

All febrile patients which fulfills the case definition during the epidemic period at the time of investigation.

Exclusion criteria

We excluded suspected patients with negative Rapid Diagnostic Tests (RDT) for Malaria from the analysis.

Sample size determination

The sample size was calculated based on power requirements at both cases and control. It is done by using two by two tables by adjusting two sided confidence level at 95%, power (percentage chance of detecting) was 80 %, ratio of control to case at 1, hypothetical proportion of controls with exposure at 50% and least extreme Odds Ratio to be detected was 2.8 (calculated from Epiinfo7).The total number of people included in the study were 130 individuals, 65 were cases and 65 were controls. Nobody refused to be interviewed.

Sampling procedure

Kebeles selected for cases- control study and community diagnosis based on the high weekly Malaria case report and the villages were selected by distance from health facility to get diagnosis and treatment services .All RDT positive active cases in Metteri, Shamole Shida, Shamole oda, and Bore who were provided community diagnosis and treatment were enrolled . Controls were selected as non-febrile apparently healthy peoples selected from the same village of the active case patient, either family member or neighbor with same sex and Age group.

All Case subjects, were active cases and controls were selected for each case in 1:1 ratio basis from the same Community family or neighbor from controls were at the same time

Variables

Dependent Variables

Multispecies Malaria Rapid Diagnostic Test positive

Independent variables

Sex

Age category (<5: >5)

Use of Insecticide treated Bed nets (ITNs)

Type of Home; Traditional Screen or caved window

Indoor Residual Sprayed home (IRS)

Not Staying/working outdoors in the evening or at night

Environmental: Intermittent River, Stagnant water, Irrigation

Case definition

A case of Malaria was defined as an acute febrile illness with a rapid diagnostic test (RDT) positive for malaria or a positive rapid antigen test in a resident of Abaya between Jan 11 – 30, 2018.

Controls; Non febrile apparently healthy individuals which are same (village) neighbors or family of cases are matched to same age group, sex at the time of data collection

Data analysis

We used Epi InfoV.7.2 for data entry, cleaned and analyzed with SPSS, and Epi InfoV.7.2. The results are presented in descriptive and Analytical statistics.

Ethical clearance since outbreak is a public health concern exempt type of ethical clearance needed. We received and provided official letter from national, regional and Zonal PHEM office written to concerned level accordingly. Oral informed consent was obtained from participants or

/2017 from their parents to participate in the study. Confidentiality was assured and no personal details were recorded or produced in this documentation

Result

Descriptive Epidemiology

Description of the overall epidemic situation

Five years woreda data was not available thus, the outbreak was detected by doubling the 2016/17 PHEM weekly report and using the threshold level for 2017/18 of same week as per the national guideline. Gelana woreda Weekly malaria case crossed threshold level on WHO Week 41 (WK 16E.C) and the health office has detected the outbreak on Week 43 based on the established threshold and reported the outbreak to Zonal Health offices on Week 44.The Zonal health office reported to Oromia Regional health bureau on Week 45 .There was no death reported. The number of cases were high mainly in villages which are far from health post and health centers. At woreda and Zonal level no investigation was done until the national team conduct investigation.

The investigation team enrolled a total of 65 active cases in four kebeles of Gelana woreda. There were hard to reach Villages in two kebeles who contributed to the outbreak however, the team was unable to provide intervention in theses kebeles.

Description of cases by Time

Epidemic threshold of malaria in Gelana Woreda

The number of cases crossed the threshold level in week 41 (15)continued consistently increasing and reached peak on week (25)with sharp decrease on week and steadily decreasing from week 31 stayed up to Week 6 of the following year. The outbreak started on Week 41 (16E.C) of the epidemiologic week by crossing the threshold and reached peak on week (25E.C) 25.The intervention was started lately by mass treatment provided by Ethiopian Red Cross (ERC) on week 24 at some part of the woreda (Hoitu,Meteri shamole)and followed by the national team on Week 28.

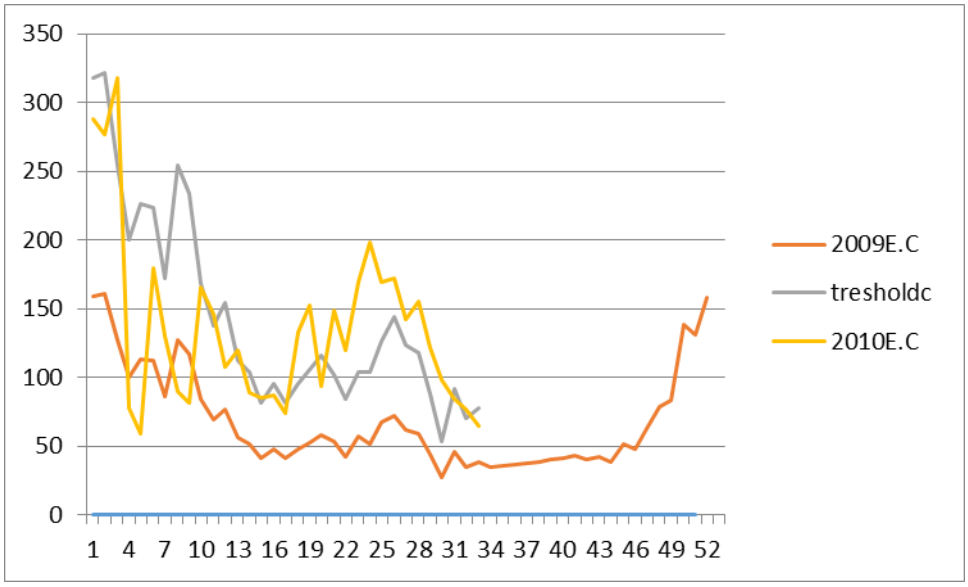


Fig -1 Epidemic threshold of malaria in Gelana Woreda week in E.C 2009(2016)

Epi curve of Gelana woreda

Week 42 and the outbreak stayed up to Week 6

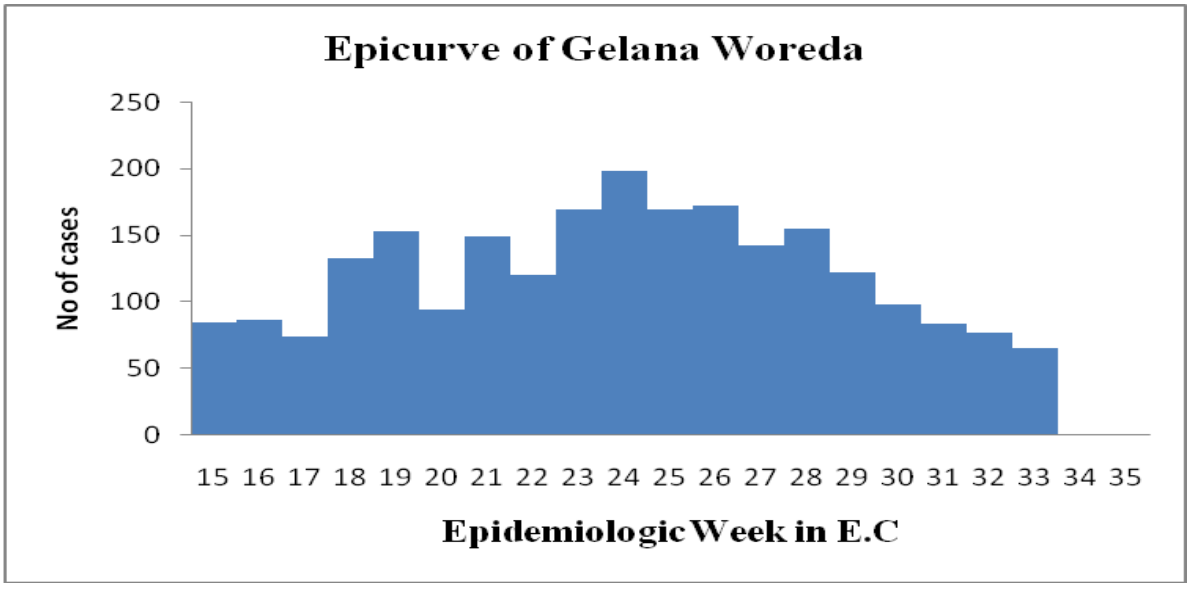


Fig - 2 Epicurve of Gelana woreda based on PHEM weekly data Oromia, Ethiopia Jan, 2018

Between weeks 42- 6,a total of 4,250 RDT test 2,119 were positive, Positivity Rate (49.8%)cases from woreda reported during the Epidemiologic weeks 42 -6,. From the active case out of these SPR (65%) PF 38% PV (22%) Mixed (5%). Gelana woreda health office has reported the outbreak to Zonal Health offices on Week 45 and no intervention conducted since national team arrives. No death reported.

Clinical features of cases

A total of 65active cases from Shamole Shida, Shamole oda, and Bore and Metteri kebeles of Gelana woreda enrolled in the study from Jan 11-30, 2018.

The most frequently manifested clinical feature among the cases were fever, shivering, vomiting, headache and loss of appetite 55%, 44%, 41, 38, and 36, respectively. No complications reported.

Description of Cases by person

Gelana Woreda has a total population under surveillance of 65,856 out of this 62,387 are at risk of malaria. The overall attack rate (AR) for Gelana woreda was 32/1000.From the

cases Males are more affected than females (37: 28) .The most affected age group is 0-4, 27 (54%) followed by > 25, 14(28%). The educational status of the study participants were illiterate (101) and 29 attended school at primary level. Regarding Marital status of study participants, 73% were underage, 26% Married and 1% single.

Table.1Proportion Cases by Age- group of Gelana Woreda Oromia EthiopiaJan,2018

S.N	Age group	Frequency (%)	Case	Control
1	0-4	66 (50%)	33 (50%)	33 (50%)
2	5-9	24 (18.4%)	11 (16.9)	13 (20%)
3	10-14	7 (5.38)	4 (6.15)	3 (4.61%)
4	15-19	1 (0.7%)	1 (1.5%)	0
5	20-24	4 (3.07 %)	1 (1.5 %)	3(4.6%)
6	≥ 25	28 (21.5 %)	15(23%)	13 (20.08 %)
7	Total	130(100%)	65 (%)	65 (%)

Table .2 Sociodemographic Characteristics of Gelana Woreda Oromia Ethiopia Jan,2018

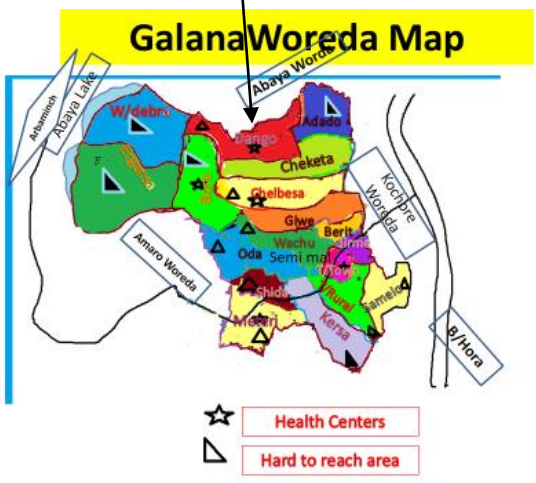
S.N	Variables	Cases	Controls	Total
	Sex			
1	Male	37	38	75
	Female	28	27	55
	Age group			
	Median	4	4	
2	range	0-70	0-61	
	<5	33	33	66
	>= 5	32	32	64
	Education Formal education			
	No	13	16	29
3	Yes (primary level)	52	49	101

4	**Occupation**			
	Agro pastoralist	11	12	23
	Underage (children)	33	40	73
	House wife	6	8	13
	Student	9	10	20
	Government employee	1	0	1
5	**Marital status**			
	Single	0	1	1
	Married	17	17	34
	Underage	48	47	95

Description of cases by place

Most active cases were from Bore .The number of cases were high mainly in villages which are far from health post and health centers. Gelana has 6 clusters in which a cluster has three to four kebeles .Bore and Mettari clusters are included in case controls study however Ergansa has high malaria case but it is hard to reach area. We interviewed 65 active cases from Mettari cluster, (shamoleshida, and shamole odakebeles) and Bore cluster. .The investigation team treated a total of serologically confirmed 65 active case and 30suspected febrile children

Map-1Guji zone in oromia region Jan, 2018 oromia Ethiopia



Map-2 kebeles of Gelana Woreda in West Guji Zone Oromia Ethiopia Jan, 2018

Analytical Epidemiology (Case -Control)

A total of 65 active malaria cases and 65 apparently healthy controls were included into this analysis. Participants were matched by age group, sex and residence as shown in Table below. The median age of both cases and controls were 4 years ranging from Five months up to seventy 0-70 .We assessed possible risk factors that contribute to contracting malaria. Socio demographic variables like sex and Age category have no association in our finding in bivariate analysis. The list of risk factors analyzed and result showed in Table 2 and 3. In bivariate analysis Intermittent river, Stagnant water and irrigation have significant Association (0.009) OR= 3.267[(OR) =95% CI (1.34- 7.93)], (0.001) [OR (6.97) =, 95% CI (2.23-21.7)], and (0.002) [Odds Ratio (3.76) =95% CI (1.617-8.75)], respectively. The significant variables were analyzed in multivariate to control confounding effect .The Adjusted odds ratio of two variables were presented in table .3 Intermittent river and stagnant water have significantly associated with the Gelana malaria outbreak (0.001)[AOR (7.003)=,95% CI (2.228-22.03)]and (0.001)[AOR (4.303)=,95% CI (1.7-10.358)].

Living in areas attacked by intermittent river has 7 times chance of contracting malaria than residents of villages without intermittent river. Residential houses surrounded with stagnant water has 4 times chance of acquiring malaria than other residents without the water.

Table-4 Bi-variate analysis of Gelana woreda Oromia, Ethiopia Jan, 2018

S.N	Variables	Total frequency	Case	Control	CI 95% L	U	OR	P. value
1	Sex M F	75 55	37 28	37 27	0.29	1.622	0.693	0.398
2	Age category <5	66	33	33	0.624	3.303	1.43	0.395
	>5	64	32	32				
3	Use ITN	Y= 127 N=3	64 1	63 2	0.225	43.834	3.14	0.396
4	IRS	Y= 84 N=46	33 32	51 14	1.643	7.596	3.532	0.001**
5	Not staying /working outdoors in the evening or night	Y= 45 N=85	23 42	22 43	0.293	1.629	0.691	0.398
6	Intermittent	Y= 103 N=27	44 21	59 6	1.346	7.934	3.267	0.009**
7	Stagnant water	Y= 54 N=76	16 49	38 27	2.231	21.779	6.971	0.001**
8	Irrigation availability	Y= 80 N=50	12 29	28 21	1.617	8.752	3.76	0.002**
9	Type of home Use Local screen	Y= 130	65	65	0.854	0.934	0.543	1.00

		N= 0						
	Caved Window	Y= 130 N=0	65	65	0.487	2.755	1.159	0.739

Table 3 Multivariate Analysis of Gelana woreda Oromia, Ethiopia Jan, 2018

S.N	Variables	P. value	OR	95%CI	
				L	U
1	Intermittent river	0.001	7.003	2.228	22.013
2	Stagnant water	0.001	4.303	1.788	10.358

** - significantly associated

Public health action taken

Action plan for health ITN distribution was conducted

WRRT team also conducted mass diagnosis by malaria rapid test kit (RDT) after verification and provided mass treatment to distant villages which do not have nearby health post or health center. The investigation team identified and characterized the malaria outbreak along with the provision of treatment to around 100 peoples including febrile suspected under five children. Health education on risk factors and prevention methods was provided along with the mass diagnosis and treatment.

Prevention of health office assessment

The woreda was not provided replacement LLITN.

The Indoor residual sprayed in all woredas of West Guji Zone was Acetic which is currently under Evaluation of efficacy and did not officially approved for program implementation.

Some part of the community (summary from interviewed people) moves in the winter season from summer residential area and was not leaving in their sprayed home during the data

collection of the outbreak season. Possible Mosquito breeding sites were found in the localities visited. All residential homes of the villages have no insect protective

Discussions

The study participants were 130, 65 cases matched with 65 apparently healthy controls. In our study finding Males are more affected than females. This may be due to the habit of males in rural area stay or sleep outdoor for farming, cattling and other activities in the evening and night also sleep in the field around farming areas.

The proportion of age group affected was high in younger age group 0-4 (54%) followed by >25, 15 (23%).The reason for lower age group more affected than the may be immunity to respond to the infection .For the adult age group they possibly work or sleep outdoor than the children . This is also supported by a study conducted in Madagascar that being under 14 age was significant with the malaria outbreak **[11].**

Intermittent river and stagnant water are the risk factors identified in our study this is may be due to the fact that following high rainy season there will be flooding as a result, in lowland areas the water stays as stagnant water facilitating mosquito breeding result in malaria infection .On the other hand ,the a vailabilility of intermittent river prohibits the usual movement which may be a challenge for public health professionals to remove mosquito breeding, provide treatment and contribute to persistent transmission in the community which increase the number of malaria cases .This is supported by a study conducted in Ankesha district of Amhara Zone that the increment of rain fall and availability of dam were the contributing factors of the malaria outbreak in the district **[12].**

The common personal and risk factors like spraying home, use of long lasting ITN have no significant association in the Abaya woreda malaria Outbreak .This may be due to the fact that there was no ITN at the time of outbreak in the woreda and none of the community member are utilizing it. Thus, there is no difference between the cases and controls. The spraying of IRS known to be protective factor however, in the case of Gelana Woreda the IRS sprayed has no significant association with outbreak. This may be either due to type of home to contain the sprayed insecticidal chemical or quality of the sprayed insecticide. This is different from study of Dera district that interruption of the programs on IRS and ITN was associated with the outbreak. **[13].**

A Malaria Outbreak in AmeyaWoreda, South-West Shoa, Oromia, Ethiopia, 2012 showed that the most protective factors with lower odds ratio were ITN use and Insecticidal sprayed home.9 This is different from our finding that and the reason we could not find significant Association of ITN use among cases and controls may be there is no difference among the community in utilizing the ITNs since they do not have the ITN to utilize **[15].**

Limitations

Mosquitos larva investigation could not be done due to lack of entomologist in the investigation team.

Conclusion

Malaria outbreak existence verified in Gelana Woreda. Intermittent River and stagnant water are the risk factors for the malaria outbreak is surround flooding and intermittent river due to high rainy which favors Mosquitoes breeding .The timely control and prevention programs were weak in Abaya Woreda.

Recommendation

We recommended timely ITNs replacements in the malarious kebeles to FMOH and Oromia regional Health Bureau. We recommend the use of validated IRS for the zonal health office and monitoring and follow up for ORHB and MOH.

We also recommend regular environmental investigation and timely Mosquito larval removal woreda, Zonal and regional health offices for areas which have stagnant water.

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1. 2 Malaria outbreak investigation in Abaya woreda, West Guji Zone Oromia, Feb 2018

Abstract

Background: Malaria is a life-threatening diseases caused by Plasmodium species parasite infection through a bite of female Anopheles Mosquitoes Abaya a woreda is one of the malaria endemic woredas which are experiencing outbreak regularly in West Guji zone of Oromia regional state .We investigated to verify the existence of outbreak, identify risk factors and conduct public health action.

Method: We conducted descriptive and case control study in Abaya woreda .We interviewed PHEM staff's on the prevention and control program, used outbreak investigation questionnaire to asses' risk factor for both cases and controls. We collected 68 cases and 68 controls matched with age group, sex and residence .We analyzed the data with Epi. Infoversion7.2and presented in descriptive and analytic statistics. We presented our finding in Time, place and person

Result: We identified that the outbreak was in Ledokebele. Males are more affected than Females (27: 23) and the younger Age group of the 0-4, 54% (27) followed by 5-9 28% (14) are more affected .The overall attack rate of the 15/1000 and for Ledo 134/1000. We compared the sociodemographic variable Sex and Age group the risk factors IRS sprayed home, staying out door in the evening and at night, living around intermittent river, stagnant water among cases and control. We Found non-significant association in IRS, Staying out door and irrigation with 95% Confidence Interval respectively in bivariate and in Multivariate analysis .Intermittent river has significant association in both Bivariate and Multivariate analysis (OR=2.455, 1.8-5.2) (AOR=3.2 (1.9-6.3) respectively.

Conclusion: Malaria outbreak is confirmed in Abaya woreda and most of the Abaya woreda kebele are Malarious. Timely coordinated prevention and control programs were not implemented to manage the outbreak

Introduction

Malaria is a life-threatening diseases caused by infection of red blood cells with protozoan parasites of Plasmodium species through a bite of female Anopheles Mosquitoes during feeding a human host [1,2].The Five human species transmitted from person to person by the mosquito bite are Falciparum, P.vivax, P.malariae and P. ovale (two species).Increasingly ,human infections with the monkey malaria parasite species P.knowlesi are reported from the forest regions of south East Asia particularly, the islands of Borreno. The first symptoms of malaria are nonspecific and similar to those of a minor systemic viral illness. They comprise symptoms headache, lassitude, fatigue, abdominal discomfort, Muscle and joint aches, usually followed by fever, chills, perspiration, and anorexia, vomiting and worsening Malaise. Delayed or untreated malaria especially in case of falciparum, may usually threaten life and could be fatal. Severe malaria can accompany one or more of the symptoms of complications coma, severe anemia, hypoglycemia and acidosis [2].

Humans are infected by malaria through the bite of a female Anopheles mosquito. Once in the human body the parasites multiply rapidly, first in the liver, followed in the blood. Then the parasites are passed back to female Anopheles mosquitoes when they suck blood from an infected human. The parasites multiply again in the stomach wall of the mosquito, then migrate through her body to infect the salivary glands. When the mosquito feeds again she injects saliva containing the parasites into another human and the cycle starts again. In the malaria life cycle, asexual reproduction occurs in humans and sexual reproduction occurs in the mosquito. The human cycle takes 36-48 hours in P. falciparum and 48 hours in P. vivax. Often these waves of release produce periodic fevers. The cycle in the blood cells is repeated until either the patient's immunological responses reduce the severity of the infection, or the patient is successfully treated with anti malarial drugs, or the patient dies. The mosquito cycle begins when the gametocytes are ingested by a female Anopheles mosquito during a blood meal. In P. falciparum malaria, all the liver cells rupture at more or less the same time and no parasites persist in the liver. In P. vivax, some cells do not rupture for months (sometimes years) after the initial infection; these latent forms - hypnozoites - cause relapses of malaria when they rupture months later [3].

Plasmodium falciparum and P.vivax are the most dominant malaria parasites in Ethiopia. They are prevalent in all malarious areas in the country with falciparum representing about two-thirds to three-quarters of the cases, although their relative composition can be variable. P. malaria and P. ovale are rare and account for < 1 % of all malaria cases. The major malaria incriminated vector in Ethiopia is Anopheles arabiensis.in some areas Anopheles Pharoensis, A. funestus and A, nil [4].

Since 2007, there has been a major shift from clinical diagnosis to confirmatory diagnosis following the wide-scale use of RDTs in peripheral health facilities. To improve the quality of malaria diagnosis and treatment at peripheral health facilities (health posts) pan specific RDTs are now being introduced. HEWs will be trained on the use of multi-species RDTs in the integrated refresher training (IRT). One of objectives of the National Malaria Strategic Plan (NSP) component are: 1) 100% of suspected malaria cases are diagnosed using RDTs and or microscopy within 24 hours of fever onset; 2) 100% of positive malaria diagnosis is treated according to national guidelines and 3) 100% of severe malaria cases are managed according to national guidelines[5].The NSP aims for robust coverage of high quality diagnostic and treatment services universally; especially at public sector health facilities in rural areas .The national treatment guidelines have recently been revised to include both single dose Primaquine to reduce transmission of P. falciparum, and radical cure primaquine to reduce the relapse of P. vivax malaria [6].

The two main major vector control activities implemented in the country are Indoor residual Spray (IRS) and long lasting insecticide treated nets (LLINs). The 2007 Malaria Indicator Survey (MIS) showed significant improvements in LLIN ownership in malaria risk areas from 3.5% in 2005 (DHS 2005) to 65.6% [7].While the national malaria control program struggles to control malaria in Ethiopia, outbreaks occurred in some areas of Oromia region and also in SNNPR and Amharic regions[8].

Abaya Woreda is one of the Malaria endemic woredas experiencing outbreak frequently in West Guji zones. In addition, the villages of these kebeles are distant from each other and some clusters have health service access provided at health posts and other distant localities did not get the access to the service. As a result, timely diagnosis and treatment were delayed and seven community deaths were reported to the woreda health office. Malaria prevention and control programs need efficient coordination, properly planned resources and timely decision. Moreover, prevention programs and timely investigation of outbreaks by using surveillance data are the main purposes of Integrated Disease Surveillance (IDSR).The purpose of this study is to verify the existence of the outbreak, provide the intervention needed to the outbreak and identify gaps and risk factors contributed to the existence of the outbreak in Abaya woreda.

Literature review

A study on Imported Falciparum Malaria in Europe indicated that the risk factor to imported malaria in Europe was mainly as a result of traveling to West Africa malaria endemic countries [9].

A systematic review of risk factors of malaria outbreak in China indicated that there were three main themes of risk factors were for contracting malaria in china .The identified factors are Migration, environmental factors, operational problems of health service and vector and host factors were described .Migration contributed to outbreak that population moved from endemic to non -endemic and from low to endemic. In the environmental theme, heavy rain, irrigation and flooding were the environmental factors that favors mosquito breeding and the availabilability mosquito in a given area facilitates malaria transmission .The problems of health service were poor case management, weakening of surveillance and poor or ceased vector control measures [10].

A matched case -control study conducted in Bengal, India investigated an outbreak and found that environmental factors, like vector breeding in abandoned wells and sleeping out -doors was associated with contracting malaria whereas the use of Bed nets and insect repellents were associated as protective factor [11] **.**

A cross sectional study conducted in 2012 in 20 clusters (Villages) of Madagascar found out that malaria outbreak was significantly associated with fail to use bed nets regularly ,being age group 6-14,lower socioeconomic status ,living in rural area ,stock outs of treatments and increased rainfall [12].

In a descriptive study conducted in 2012 in Mecha, Dera and Fogera districts of Amhara region of Ethiopia malaria outbreak was significantly associated with disrupted prevention programs, ITN use IRS sprayed home and the mosquito breeding stagnant waters available at districts with the outbreak and lack timely vector control are contributors of the risk of malaria outbreak. The Both programs were interrupted at Dera district during the study period. [13]

A case –control study conducted by Shamble Habebe, Meshach Ayele; Malaria outbreak investigation in Abaya Woreda showed that Mar, 2016 being under 15 age,

Objectives

General objective:

To verify the existence, investigate the risk factors and intervene for the Malaria outbreak in Abaya woreda of West Guji, Oromia Feb, 2018.

Specific objectives

- To verify the existence of outbreak in Abaya Woreda .
- To investigate the risk factors for the Malaria outbreak in Abaya Woreda .
- To characterize Malaria outbreak in Abaya Woreda in terms of Person, Place and Time
- To conduct intervention for malaria outbreak in Abaya Woreda

Methods

Study design

We conducted descriptive and case- control study on the active patients in Ledo kebele of Abaya woreda. We reviewed weekly 2009 PHEM data and verified the established threshold level. We used a structured and semi structure questionnaire to conduct interview from cases and controls on the risk factors. We also interviewed the health office and health cluster (HC) PHEM officers on control and prevention program

Study area

The study area is Abaya woredas of West Guji Zone. West Guji is found in Southern part of Oromia regional state .Abaya Woreda is located at latitude of $6^0$14'N and longitude of 30º10'E and has an estimated land area covering of 185.064km2. Abaya woreda is found 365km to South and 80 km to the North distance of Addis Ababa and Bule hora zonal capital city respectively. Abaya Woreda shares border with Sidama Woreda of SNNP in North, Dilla town of Gedeo Zone in North east, Wanago Woreda of SNNP in East, Yirga Chefe woreda of SNNP in East west, Gelana Woreda of West Guji Zone in South and Lake Abaya in West and South west.

Study period

We conducted the study from Feb8-24, 2018.

Study population

The study population were peoples living in Abaya woreda of West Guji Zone.

Source population

The source populations was any febrile patient which fulfills the case definition from Feb 8-24, 2018 in Abaya woreda for case and for control neighbor, family or person with similar age group ,sex who was been living in the same village with the case in the study period .

Study subject

The specific study subjects were febrile patients which are positive for malaria parasites by the rapid diagnostic tests in Ledo kebele Abaya woredas from Feb 8-24, 2018.

Inclusion criteria

All febrile Patients who fulfills the case definition during the epidemic period at the time of investigation.

Exclusion criteria

We excluded suspected patients with negative Rapid Diagnostic Tests for Malaria.

Sampling procedure

Ledo Kebele was selected for case- control study and community diagnosis based on high weekly malaria case report and the villages were selected by distance from health facility to get diagnosis and treatment services .All community diagnosed RDT positive active cases during the and treatment at Ledo kebele of Abaya woreda were enrolled .

Controls were selected as non-febrile apparently healthy peoples selected from the same village of the active case patient, either family member or neighbor with same sex and Age group.

Sample size determination

The sample size was calculated based on power requirements at both cases and control. It is done by using two by two tables by adjusting two sided confidence level at 95%, power (percentage chance of detecting) was 80 %, ratio of control to case at 1, hypothetical proportion of controls with exposure at 78% and least extreme Odds Ratio to be detected was 0.09 (calculated from Epiinfo7).The total number of people included in the study were 100 individuals, 50 were cases and 50 were controls. All Case subjects, were active cases and controls were selected for each case in 1:1 ratio basis Community family or neighbor from controls were at the same time and of woreda health office and active case searching

Variables

Dependent variables

Multispecies Malaria Rapid Diagnostic Test positive

Independent variables

Use of Insecticide treated Bed nets (ITNs)

Type of Home: Traditional Screen or caved window

Indoor Residual Sprayed home (IRS)

Not Staying/working outdoors in the evening or at night

Environmental Breeding site: Intermittent river stagnant water, irrigation

Case definition

A case of Malaria was defined as an acute febrile illness with a rapid diagnostic test (RDT) positive for malaria or a positive rapid antigen test in a resident of Abaya between Jan 11–24, 2018.

Controls; Non febrile apparently healthy individuals matched to which are neighbors or family of cases, same age group and Sex of cases at the time of data collection

Data analysis

We entered the data with Epi InfoV.7.2, and Cleaned analyzed with the Epi InfoV.7.2 and IBM SPSS V.23 the results are presented in descriptive and Analytical statistics

Ethical clearance

Since outbreak is a public health concern exempt type of ethical clearance needed. We received and provided official letter from national, regional and Zonal PHEM office written to concerned level accordingly. Oral informed consent was obtained from participants.

Result

Descriptive Epidemiology

Overall description of the woreda Epidemic situation

In 2008 E.C the woreda has encountered outbreak as a result, five years data cannot be used for action threshold. Thus, action threshold established based on the 2009 E.C data by doubling and disaggregating the weekly data for each kebele and compared with current year as per the national guideline. We identified Malarious and non Malarious kebeles in the woreda

Description of cases by Time

Epidemic threshold of malaria in Abaya Woreda

The number of cases crossed the threshold level in week 45 continued consistently increasing and reached peak on week 50 with sharp decrease on week 51 and steadily decreasing from week 52 stayed up to Week 6 of the following year.

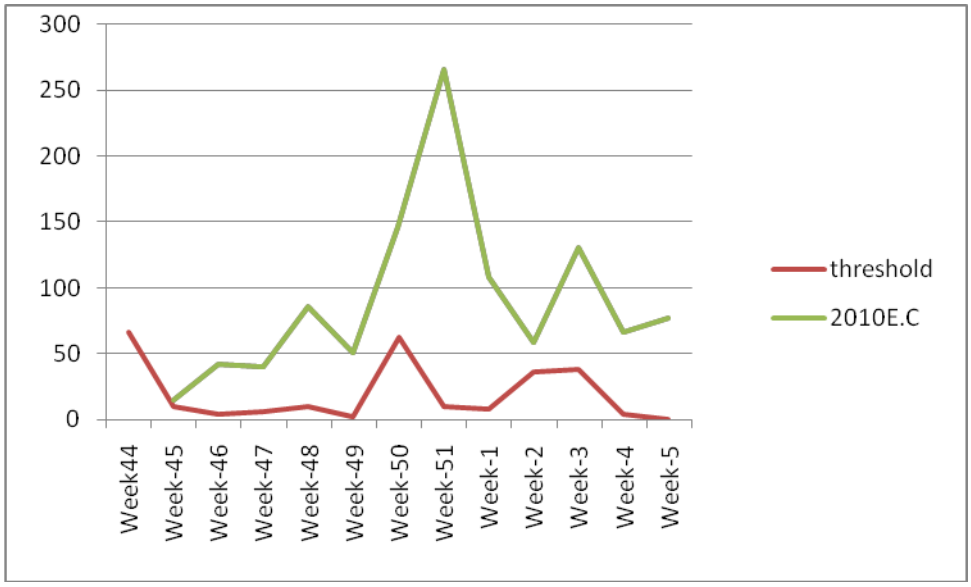


Fig: 3 Threshold of malaria in Abaya woreda Feb, 2018Oromia, Ethiopia

Epicurve of Abaya Woreda

Outbreak verification was done by WRRT on week 47 and reported to the next higher level Zonal Health office. The threshold on WHO, Week 45 and the outbreak stayed up to Week 5.

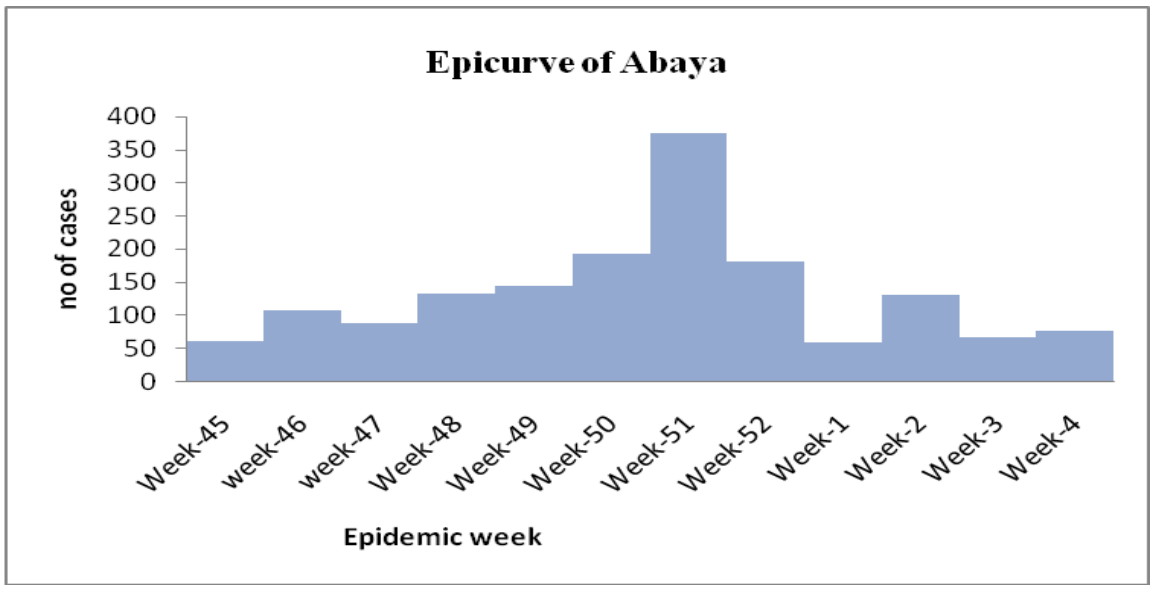


Fig - 4 Epi-curve of Abaya woreda based on PHEM weekly data Oromia, Ethiopia Feb, 2018

A total of 1890 cases from Abaya woreda reported during the Epidemiologic weeks 45 -4, out of these 1120(59.2%) were from Ledo kebele Between week 45-5, a total of Out of these1, 120 were from Ledo kebele 63.2%.Abaya woreda health office WRRT has verified, declared and reported the outbreak to Zonal Health offices on Week 47and regional Health offices on Week 49.There was seven community death reported before the WRRT response.. The number of cases were high mainly in villages which are far from health post and health centers. Ledo kebele is the main source of the outbreak in Abaya woreda .We interviewed 50 active cases from Ledo kebele of two villages. The investigation team treated a total of 50 serologically confirmed active cases and 30suspected febrile children and elders in Ledo kebele of Gombo and Koricha villages.

Clinical features of cases

The most manifested clinical feature among the active cases were fever 98% (49)**,** headache78% (39), shivering 70% (35) and vomiting &nausea 64% (32), No complications reported from the cases interviewed.

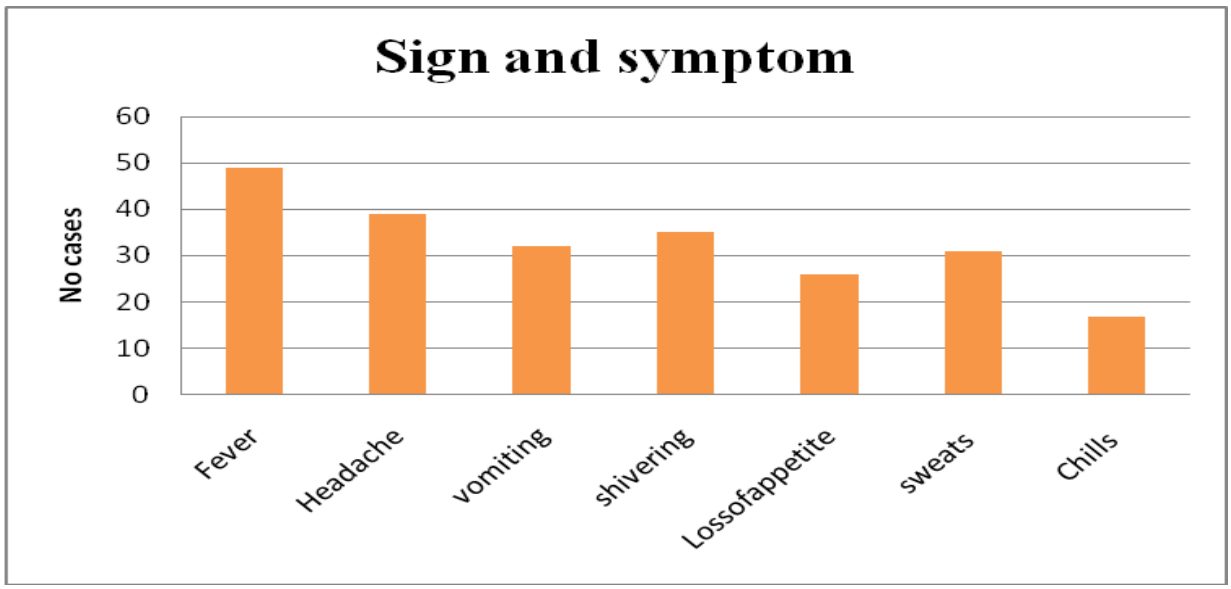


Fig. 5 clinical sign and symptoms in Ledo cases of Abaya woreda

Description of Cases by person

Abaya woreda has a total population of 139,714, with 110,945 at risk of malaria. Among the Fifty cases interviewed twenty seven 27 (54%) were Males and twenty three 23(46%) were Females. Males are more affected than Females (27; 23). The most affected age group is 0-4 27(54%) followed by5-914(28%).The attack rate (AR) for Abaya woreda15/1000 population and134 /1000 for Ledo kebele .The proportion of age group for study participants is indicated in table 8**,** marital status of 73% were underage, 26% Married and 1% single. The educational status of the study participants were illiterate (79%) and 21% attended school at Primary level.

Table .8- Proportion of Age group in Abaya malaria outbreak Oromia, Ethiopia Feb 2018

S.N	Age group	Case N (%)	Control N (%)	Total frequency =N (%)
1	0-4	27(54)	27(27)	54(54)
2	5-9	14(28)	14(14)	28(28)
3	10-14	2 (4)	2 (4)	4(4)
4	15-19	2(4)	2(4)	4(4)
5	20-24	2(4)	2(4)	4(4)
6	≥ 25	3 (6)	3 (6)	6(6)

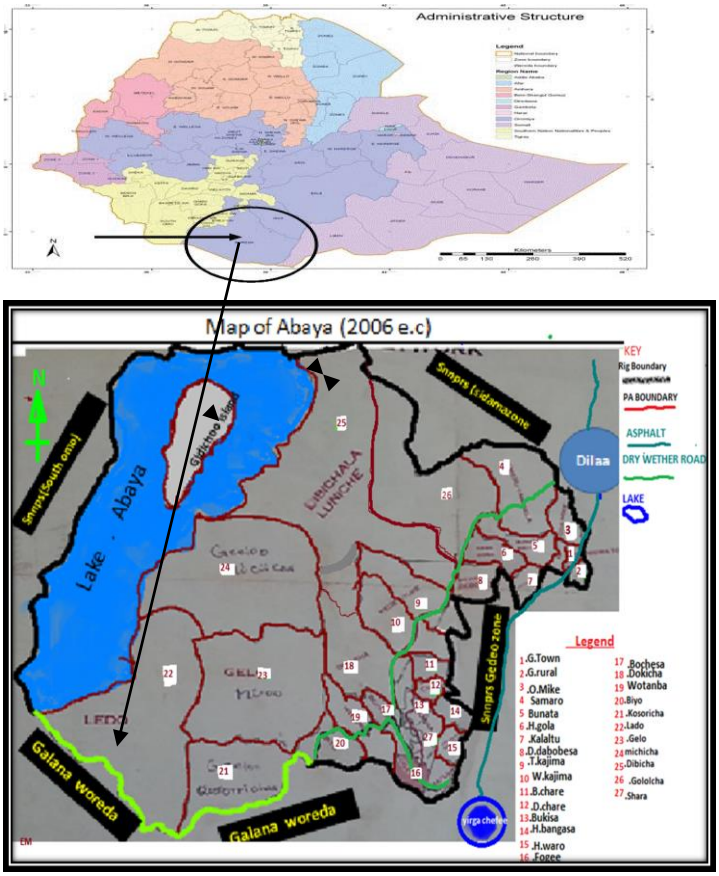
From study participants 27 cases and controls are Males and 23 were Females. The median age in years was 4 for both cases and controls. Refer table below for more information.

Table -9 Sociodemographic characteristics of Abaya Woreda Oromia, Ethiopia Feb, 2018

S.N	Variables	Cases n = (%)	Controls N = (%)	Total
1	**Sex**			
	Male	27 (27)	27 (27)	54(54)
	Female	23(23)	23(23)	46(46)
2	**Age- group**			
	Median	4	4	4
	range	1-65	1-64	
	<5	28(28)	28(28)	56(56)
	>= 5	22(22)	22(22)	44(44)
3	**Education**			
	Illiterate	42 (42)	37 (37)	79(79)
	Literate (Primary level)	8(8)	13 (13)	21(21)
4	**Occupation**			
	Agro -pastoralist	16(16)	10(10)	26(26)
	House wife	2(2)	1(1)	3 (3)
	Student	6(6)	6(6)	12(12)
	Underage	26(26)	33(33)	59(59)
5	**Marital status**			
	Single	6(6)	2(2)	8(8)
	Married	6(6)	6(6)	12(12)
	Underage	38(38)	42(42)	80(80)

Description of cases by place

Abaya Woreda has 26 kebeles and 6 health centers (clusters) a total of 32 reporting units. From this 22 are malarious kebeles with a population at risk of 110,945. .Ledo kebele is one of the most frequently affected malarious kebele .It surrounded by free flowing and stagnant water and also regularly affected by intermittent river.



Map 3-Map of Ledo kebele of Abaya Woreda in West Guji Zone Feb 2018 oromia Ethiopia

Prevention and control programs assessment

Long-lasting Insecticide Treated bed net was not provided since 2007 E.C fiscal year. To Abaya woreda .Indoor Residual Spray was provided to, however, the type of the chemical and its concentration was assessed for validity and

quality. The IRS provided was acetic. It's under process to be evaluated and not permitted or approved for program implementation.

Environmental assessment

During the investigation we assessed the environments for possible mosquito breeding sites. In some villages intermittent river stagnant water and irrigations are available. After rainy season, usually attacked with flooding.

Analytical Epidemiology

A total of 50 active malaria cases and 50 non febrile, apparently healthy controls were included in this analysis. The participants were matched in Sex, Age group and residence .The age range is 0-65, Median age of cases and controls were 4.We assessed possible risk factors that contribute to contracting malaria.

Sociodemographic variables like sex and Age category have no association in our finding (OR =1) for both variables. The list of risk factors analyzed and result showed in Table 10 and 11. In bivariate analysis intermittent river have significant association (0.012) OR= 2.4[Odds Ratio (OR) = 95% CI (1.8 -5.2-)], with lower Association not working/staying outdoor in the evening or night has [Odds Ratio (OR) =2.30, 95% CI (1.98-4.23). In Multivariate analysis intermittent river significantly associated with the outbreak of Ledo in Abaya woreda.

Table 10: Bivariate analysis of risk factors for malaria outbreak in Abaya woreda, West Guji Zone, Oromia, Ethiopia Feb, 2018

S.N	Variables	Total frequency of participants	Cases n= (%)	Controls n= (%)	P. Value	OR	95%CI	
							L	U
1	Sex M	54	27	27				
	F	46	23	23	1	1	0.455	2.196
2	Age category <5	56	28	28	0.841	1	0.4	2.384
	≥5)	44	22	22				
3	ITN use	Y =3	2	1	0.565	0.4	0.4	5.582
		N =97	48	49				
4	IRS sprayed home	Y =49	18	31	0.29	2.455	1	5.496
		N = 51	32	19				
5	Not Staying(working) outdoor in the evening and night	Y= 33	23	10	0.007**	0.293	0.121	0.714
		N= 67	27	40				
6	Intermittent river	Y= 96	46	50	0.012**	2.4	1.8	5.2
		N= 4	4	0				
7	Stagnant water	Y= 78	36	42	0.125	2.042	0.769	5.419
		N= 22	14	8				
8	Availability Irrigation near residential area	Y= 89	43	46	0.343	1.872	0.512	6.848
		N= 11	7	4				
9	Type of home Local screen	Y =3						
		N= 97	1	2	0.67	0.34	0.172	5.61
			47	40				
	Caved Window	Y = 0	50	50	0.56	0.49	0.78	6.23
		N =100						

** - significantly associated

Table 11: Multivariate analysis of Risk factors for malaria outbreak in Abaya woreda, Oromia, Ethiopia Feb, 2018

S.N	Variables	P. Value	OR	95%CI	
				L	U
1	Intermittent river	0.009	3.2	1.9	6.3

Discussions

In our study finding Males are more affected than females. This may be due to the habit of males in rural area Stay outdoor for farming, cattling and other activities in the evening and night also sleep in the field around farming areas.

The proportion of age group affected was high in younger age group 0-4 (54%) followed by 5-9(28%).This reason for the lower age groups may be insufficient immunity to respond to infection. This finding is also supported by a finding of Malaria outbreak investigation conducted by Shamble in 2016, in Abaya woreda indicates that being in 15 years or above is a protective factor which was explained that immunity is the reason behind protected from infection [13]. .Another study conducted in Amhara region of Ankesha district indicated that under 14 age children are more affected than the adults

The common personal and risk factors like spraying home, use of long lasting ITN have no significant association in our study of Abaya woreda Outbreak. This may be due to the fact that there was no ITN in the community at the time of outbreak in the woreda and none of the community member are utilizing it. Thus, there is no difference between the cases and controls .The spraying of IRS known to be protective factor however, in the case of Abaya Woreda the IRS sprayed has no significant association with outbreak. This could be both cases and controls used the same insecticidal spray which may not have the standard effective insecticidal action .This may not have a difference in being living unsprayed home. On the other hand, eventhogh quality Insecticidal spray provided the type of ceilings and roof is not suitable to contain the sprayed chemical. This is different from a case control study of malaria outbreak of Abaya woreda in 2008[8]. ITN utilization and utilization of mosquito repellent were protective factors in this study.

Environmental investigation like, Intermittent River, stagnant water, availability of irrigation around or near residential area are the most environmental risk factors for contracting malaria and existence of outbreak. In Abaya woreda, all this environmental risk factors were available however, only intermittent river has significant association. The reason behind this risk factor may be some of the community members live in other home during the rainy season and return back to the second home during winter .Thus, the change in residence may be protective factor for the effect of seasonal change result in favoring mosquito breeding .

Environmental factors like availability of breeding sites near residential area has no significant association in this study which is similar to our finding. Occupational status like farming and the pastoralist have the habit of staying out door in the evening and night is one possible risk factor for malaria outbreak as a result of having great chance of bitten by mosquitoes however, in our finding, it has no significant association this could be due to the fact that there is no difference between cases and controls in life style [9].

A Malaria Outbreak in Ameya Woreda, South-West Shoa, Oromia, Ethiopia, 2012 showed that the most protective factors with lower odds ratio were ITN use and Insecticidal sprayed home .This is different from our finding that it has no significant association [9].

Public health action taken

WRRT team also conducted mass diagnosis by malaria rapid test kit (RDT) after verification and provided mass treatment to distant villages which do not have nearby health post or health center The investigation team identified and characterized the malaria outbreak along with the provision of treatment to around 150 peoples including febrile suspected under five children.. Health education on risk factors and prevention methods was provided along with the mass diagnosis and treatment .ITN distribution done to three woreda.

Conclusion

Malaria outbreak existence verified in Abaya and mainly in Ledo Kebele has two peak seasons Woreda. The woreda frequently affected by flooding and intermittent river due to high rainy which favors Mosquitoes breeding .The timely control and prevention programs were weak in Abaya Woreda.

Limitations

Mosquito's larval investigation could not be done due to lack of entomologist in the investigation team.

Gaps &challenges

The woreda was not provided replacement LLITN since2008E.C. The Indoor residual sprayed in all West Guji Zone was acetic which is currently under Evaluation of efficacy and did not officially approved for program implementation. Some part of the community (summary from interviewed people) moves in the winter season from summer residential area and were not leaving in their sprayed home during the data collection of the outbreak season. Possible Mosquito breeding sites were found in the localities visited. All residential homes of the villages have no personal insect protective items like ITN and insect repellent

Recommendation

We recommend the use of validated IRS for the zonal health office and monitoring and follow up for ORHB and MOH. We also recommend regular environmental investigation and timely Mosquitoes larval removal for areas which have stagnant water for woreda, Zonal and regional health offices.

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1.2. Cutaneous Anthrax out Break investigation, case report at Waghemera Zone, Amhara, Ethiopia-July 2017

Back ground: Anthrax is a zoonotic disease caused by B. anthrax. It is one of the immediate reportable diseases in Ethiopia. Suspect cases have been reported from Amhara region since 2015.There was no considerable epidemiological investigations and proper public health action taken. We investigated to identify source of infection and propose public health action.

Method: We defined cases as an acute illness, of a painless skin lesion developing over 2 to 6 days from a papular through a vesicular stage into a depressed black eschar with surrounding edema, Fever, malaise and with or without lymphadenopathy woredas of the Waghemra Zone. We reviewed the health facility record and conducted active case search using standard case investigation check list.

Result: We identified 2 suspect cases started treatment before the team arrival and 2 active cases visiting health facility. Community death was also reported from hard to reach area of the visited kebeles before the team arrived. The Median age was 8.5Yrs (3-20) range. 3 of the cases are under 10. The symptoms reported was skin lesion with black eschar, samples were taken from the two active cases .The Laboratory report was presumptive positive for Anthrax species by G. stain and culture for One case and negative for the other case .We confirmed the Presence of Bacillus Anthrax **DNA** in a bacteriologically positive isolate by Conventional PCR test .The case patient of positive result has direct contact with the dead animal product .All l the suspect and confirmed cases have contact with animal skin.

Conclusion: B**.** anthrax is found in Waghemra zone and related with the use of sick and dead animal products .We recommend enhanced regular animal vaccination and health education to Amhara health bureau and Veterinary .

Key: Anthrax, Cutaneous, eschar

Introduction

Anthrax is a serious infectious Zoonotic disease caused by gram-positive, rod-shaped bacteria known as Bacillus anthracic. Anthrax can be found naturally in soil and commonly affects domestic and wild animals. Contact with anthrax can cause severe illness in both humans and animals. Domestic and wild animals such as cattle, sheep, goats, antelope, and deer can become infected when they breathe in or ingest spores in contaminated soil, plants, or water [1].

The Anthrax organism exists in two life-cycle forms, the bacterium itself (the 'vegetative form') occurring in the infected animal, and a very resistant 'spore form' which may remain viable in the soil for decades or even centuries [2]**.**

Anthrax bacteria develop into spores after exposure to oxygen, which is why the opening of an infected carcass is the cause of environmental contamination Infection with anthrax occurs when spores enter the body, they can be "activated." When they become active, the bacteria can multiply, spread out in the body, produce toxins and cause severe illness. This can happen when people breathe in spores, eat food or drink water that is contaminated with spores, or get spores in a cut or scrape in the skin [1]**.**

Geographic differences determine the species most affected in any one locality. In livestock, it is most commonly reported in cattle, sheep, goats, donkeys and horses, while it is rarer in pigs. Carnivores are generally not readily affected but can succumb to very high challenge and it is not a disease of poultry. Unexpected sudden death is characteristic of anthrax in animals. External bleeding from the nose, mouth and anus is common but not invariable. The history of the area may give vital clues because recurrent anthrax is associated with certain defined soil types [3].

Anthrax is most common in agricultural regions of Central and South America, sub-Saharan Africa, central and southwestern Asia, southern and Eastern Europe, and the Caribbean. Anthrax is more common in developing countries and countries that do not have veterinary public health programs that routinely vaccinate animals against anthrax [1].

Anthrax is globally distributed disease, reported from all continents that are populated heavily with animals and humans. Animal anthrax outbreaks have been recorded in nearly 200 countries by The World Anthrax Data Site, a World Health Organization Collaborating

Center for Remote Sensing and Geographic Information Systems for Public Health in 1996-19974.

Animal anthrax is an endemic disease in Ethiopia which occurs in May and June every year (anthrax season) in several farming localities of the country, although suspected cases of livestock anthrax are reported from several districts, few of those are officially confirmed [4]. Previous studies indicate that the disease is well recognized by rural communities but little is known about its prevalence, epidemiology and public health significance [5]**.**

A study conducted by Getahun et al, in 2003E.C, a total of 1,096 suspected human anthrax cases and 16 deaths with a Case Fatality Rate (CFR) of 1.5% were reported from four regions through IDSR (Tigray, Amhara, Oromia, and SNNPR) [6] **.** Previous studies indicate that the disease is well recognized by rural communities but little is known about its prevalence, epidemiology and public health significance [**7**].

Rationale for the study

Amhara regional state is one of the four highly reporting Anthrax endemic regions in Ethiopia .In 2017, a total of 371 suspected Anthrax cases and 4 deaths were reported to national PHEM. From this figure 262, which is70.6% accounts to Waghemra Zone. Based on the national PHEM guide line, a single case is an outbreak and immediately reportable .Although, high number of cases have been reported, and human Anthrax was not investigated in waghemra zone.

The purpose of conducting this study is to verify or confirm that the suspected cases are actual Anthrax cases, identify the Anthrax risk factors that plan for coordinated prevention and control programs.

Objectives

General objective:

To investigate the existence of Anthrax outbreak, activate response and develop action plan for prevention and control in Waghemra Zone, Amhara Jul 2017.

Specific objectives

- To Verify the existence of Anthrax outbreak in Waghemra Zone .
- To activate immediate response on the affected areas of the Waghemra zone .
- To develop action plan for prevention and control of Anthrax outbreak in Waghemra Zone

Methods

Study area

The study area is Waghemra Zone found at the Northern part of Amhara region. It is 600Km far from the capital city Addis Ababa.

Study design

We presented the case by reviewing clinical registers, using standard case investigation checklist and active case search in the community.

Study period

The study period was categorized in to two phases. Sample collected from Jul 13 -30, 2017 and transported to EPHI for Bacteriological examination .The write up was done from Dec – Jan, 2018 after Laboratory analysis and consultation with Veterinarian and laboratory experts.

Study population

The source population were people who were living in Zikuala, Sahila, Abergelle, Dehina, Sekota Town and Sekota Zuria woredas of the zone .Target population of the investigation was all patients with Anthrax cases or /death reported from community , in the health facilities and fulfills the case definition of suspected Cutaneous Anthrax cases in the affected Woredas .

Source population

The study population was people who have cutaneous lesion and were living in the affected woredas of Waghemra Zone.

Study subject

The study subjects were patients who fulfills the case definition of Anthrax in visited Tsisika health center, Tsisika hospital of Zikuala and Sahila health center of Sahila Woredas.

Inclusion criteria

We included People with cutaneous lesion which have contact history with sick or dead animal, consumed raw meat, in the stated woredas

Exclusion criteria

We excluded a suspect case which did not fulfill the standard case definition and negative by the presumptive diagnosis.

Sampling Method

We visited the affected case patients and interviewed their family and Neighbors on the risk factors and the developed sign and symptoms .we also reviewed clinical registers and interviewed the physicians. We conducted active case search in these reporting woredas. We collected Sample from two suspected active cases with cutaneous lesion.

Laboratory method

We collected swab from pus on the wound area. We collect the samples and prepared direct smear from fresh sample Smear from isolate was also done the result is as described below. We collected from the wounded skin using sterile swab. We Prepared direct smear on as slide and inoculated for bacteriological culture on Amies transport media, Packed with standard safety precaution, triple package and transported in a cold chain with in48 hrs for confirmation to EPHI bacteriology laboratory.

Sample size

We found four suspected Cutaneous Anthrax cases .Two of them were already on medication before the team arrival .We visited these cases and interviewed their family and Neighbors. We conducted active case search in these reporting villages of the woredas.

Study variables

Contact history with dead or sick animal
Consuming uncooked product of sick animal
Working with animal's product
Development of Sign and symptoms of the diseases
Gram stain, Culture and or Molecular test positive for Bacillus .Anthrax

Case Definitions

Anthrax is categorized in to **Localized and systemic form**.

Localized form

Cutaneous: skin lesion evolving over one to six days from a popular through a vesicular stage, to a depressed black Eschar invariably accompanied by edema that may be mild to extensive Systemic forms:

Systemic forms

Gastro-intestinal: abdominal distress characterized by nausea, vomiting, anorexia and followed by fever.

Meningeal: acute onset of high fever possibly with convulsions, loss of consciousness, Meningeal signs and symptoms; commonly noted in all systemic infections and has an epidemiological link to confirmed or suspected animal cases or contaminated animal products

Pulmonary (inhalation): brief prodrome resembling acute viral respiratory illness, followed by rapid onset of hypoxia, dyspnea and high temperature, with x-ray evidence of meditational widening

Data Analysis

We described exposure and clinical features of all suspected cases and laboratory result of confirmed cases.

Ethical clearance

Since outbreak is a public health concern exempt type of ethical clearance needed. We received and provided official letter from national, regional and Zonal PHEM office written to concerned level accordingly. Oral informed consent was obtained from participants.

Result

As per PHEM guide line one case of B. anthrax is an outbreak. Based on this principle, we conducted assessment on the indicators of the presence of anthrax cases in Waghemra Zone. We investigated conducting veterinary assessment, case verification and confirmation.

Case presentation

A case report of suspected Cutaneous Anthrax

All cases were presented to health facility and two of them were treated before the team's arrival we compiled the report based on the interview of the health professionals, family and clinical register review.

Case 1: The first suspected case was reported from Sahila health center .It is found in the SahilaWoreda and the case patient is **a female of age 10** presenting cutaneous lesion on the left hand. The case and her family has exposure to animal hides, living with sheep's and other animals like Donkey which all were not vaccinated for Anthrax.

Case 2: The second suspected case was reported from Sahila health center .It is found in the Sahila Woreda and the case patient is a **female of age 3** presenting cutaneous lesion on the Left thigh. The case has exposure with animal hides for sleeping.

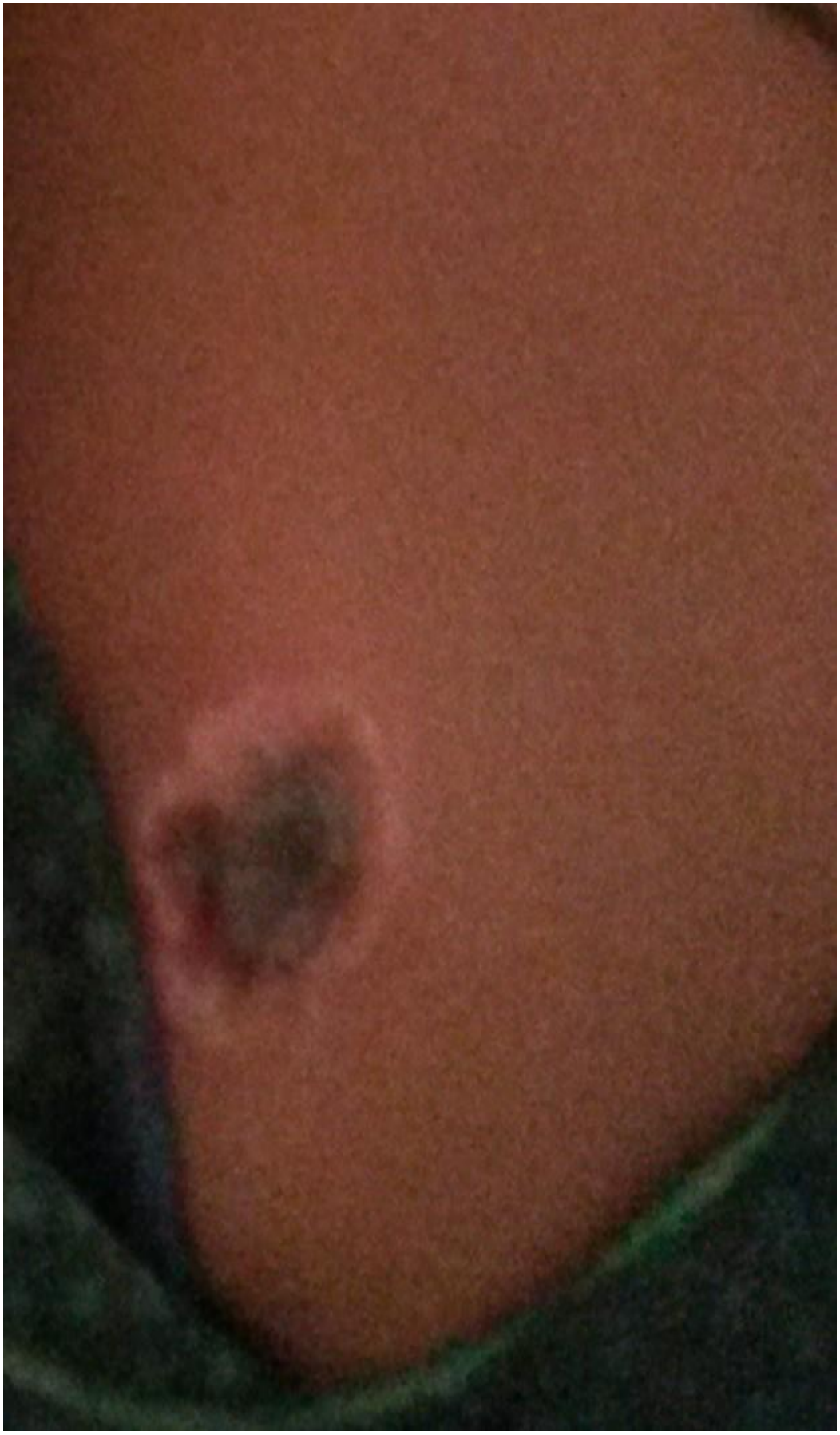
Case 3: The third suspect case from Zikuala Woreda, Tsisika health center was a female **of age 20** developed a lesion on her cheeks .The lesion was black at the center and surrounded with pus .She visited the health center on the 6 day of onset of the disease .The test result of bacteriological examination of case 3 showed that S.aureus.

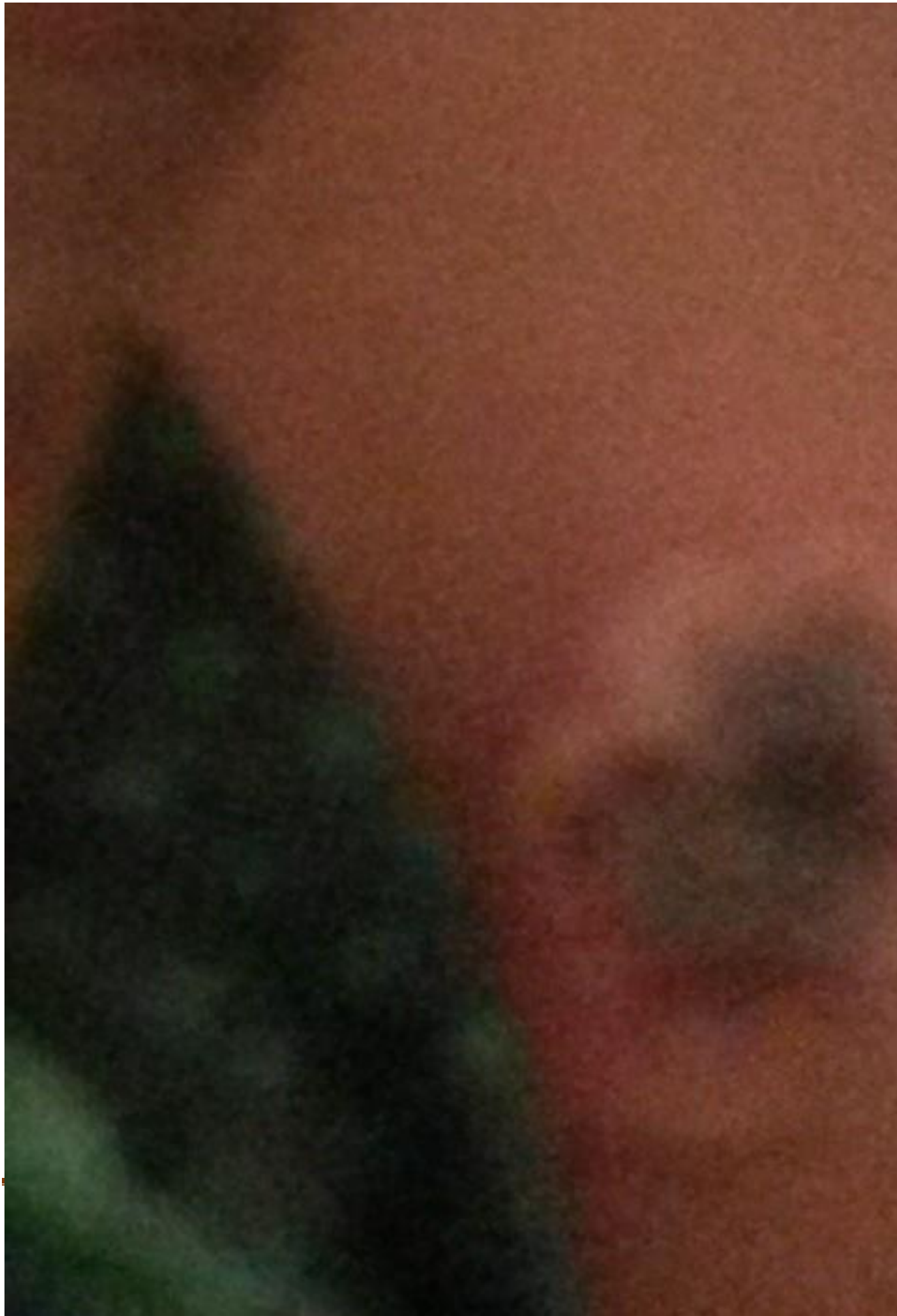
Laboratory result: S.aureus

Case 4

The fourth case patient was female aged 5 years presented in a lesion on the left chest. The case was from Zikuala woreda, and visted Tsisika Hospital after 6 days of onset of the disease. The case was presented with fever, fatigue, chills and regional lymph adenoma .The lesion was a vesicle, depressed black eschar accompanied by edema.

Exposure: She and her family consumed a dead goat meat and also use animal skin for sleeping. The goat was sick, developed abdominal distension before dead .Their cattle's and the goats were not vaccinated for Anthrax.





Laboratory result

Procedure

Samples collected from case four for bacteriological culture and gram stain from the lesion.

Table 12- Bacteriological laboratory test result of case suspected for Anthrax

S.N	**Description of results by test category**	
1 **1.1**	**G stain** Gram reaction	Gram positive
1.2	Morphology	**Rods,**
2 2.1	**Culture** Growth type Phenotype	growth is ++ (2 quadrants)
3	**Biochemical**	
3.1	Catalase	Positive
3.2	Motility	Negative
3.3	Hemolysis	Negative

Diagnosis: Presumptive B. anthrax

Molecular test result presentation

Test Method Conventional PCR

Assay Type – Quingen

Diagnosis type: Qualitative:

Confirmed the Presence of Bacillus. Anthrax **DNA** in a bacteriologically positive isolate by the presumptive diagnosis**.**

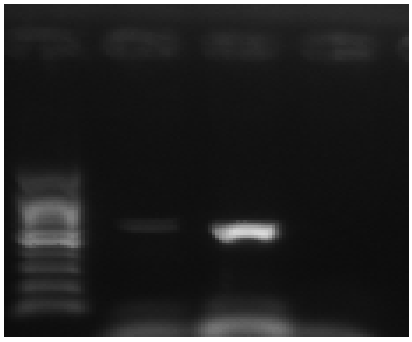


Fig. 6 Dectection of B.Anthrax in electrophoresis

Public health action taken

Action plan developed and provided to Zonal, regional, and National PHEM on the gaps identified and risk factors. (**Annex is attached below).** Family of cases were provided health education on risk factors Communication with Veterinary office at local for collaboration was also done.

Limitation

Associated factors could not be analyzed due to small sample size. Professionals in these suspected localities can be mis-confused with other bacterial infection as the other suspect sample bacteriological indicated S.aureus but treated and reported as cutaneous anthrax

Discussions

Our study confirmed the presence Human Cutaneous Anthrax in Zikuala woreda of Waghemra Zone. We used a confirmatory test identify the family bacillus cereus from Anthrax by a Molecular test called conventional PCR (polymerase chain reaction) identified the organism identity from the genetic material DNA of the bacteria .

Assessment from affected areas indicated that the habit of consuming uncooked, dead animals and using animal skins and hides .This may be the risk factor for contracting the cutaneous Anthrax.

we could not find previous local human Anthrax study for Comparison that used laboratory diagnosis to verify the presence of the B. Anthrax that confirmed the existence of the organism .How a ever, there was a case report study from Jimma University hospital by Gelaw and Asaminew on periocular cutaneous Anthrax[8] **.** The study suggests the cases fulfill the case definition and have history of contact with Anthrax infected animal.

Another study in Desses Zuria district by G. Shiferaw was confirmed bacteriologic ally the presence of Animal Anthrax in veterinary lab in samples collected from Animals as a cause of death and animal Anthrax outbreak in the village [9]**.**

Major Gaps identified

PHEM

- For more than 2 years although the anthrax cases reported ,there was no public health action done from regional PHEM as well as National to control the problem
- As understood from interviewing some peoples from the community, they leave with animals in their home and also process hides (animals skin)
- There is a habit of using animal skin for sleeping and even dead animals skin usually used.
- Due to lack of support on the control of Anthrax, the zone considered as endemic disease and it is reported weekly
- Lack of awareness on the prevention of Anthrax ,by the community to vaccinate cattle ,Goats and Sheep.

Veterinary Assessment

Anthrax is a Zoonotic disease and coordinated human and veterinary programs are mandatory to control the diseases distribution. Based on our assessment finding there is a vaccination at zonal level however, there are a challenge that affects the effectiveness of the Anthrax vaccination program

- The vaccination incur a cost and this is tough for the farmers to vaccinate all cattle's and other animals.
- The vaccine needs Storage temperature at 4^{o}c
- Shortage of refrigerators and lack continuous electric power supply to store at woreda and kebele level.
- The vaccine cannot be provided for pregnant animals
- The peoples cannot be vaccinate all animals due to cost of the price
- Lack of balanced animal feed in vaccination time
- Veterinary professional and veterinary clinics are not available in all kebeles
- Lack of transport

- No Coordinated program enhanced with Zonal health office.
- the soil is alkaline and at this PH is favaroubale for long term survival of anthrax spores

Conclusions

The suspected Cutaneous Anthrax in waghemra Zone and surrounding woredas of Amhara region is confirmed that caused by B. Anthracis . Ccooked, uncooked sick or healthy animal's product consumed in all suspected and confirmed cases. Animals are not regularly vaccinated in both woreda.

Recommendation

We recommend the National and Regional PHEM regular Health education program with other stakeholders in Waghemra Zone community on the prevention of cutaneous Anthrax. We recommend enhanced regular animal vaccination program to the ministry of Agriculture and Fishery.

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Summary of activities conducted at Waghemera zone

S .N	Activities done	Time	Remark
1	Communication with zonal PHEM officers	Jul14,2017	
2	Translation of case definitions and related documents for distribution	Jul15,2017	
3	Visited Zikuala Hospital and reviewed medical record of Anthrax cases reported Traveled to SahilaWoreda ,health center and communicated the manager and provided documents (guide line, check list and case definition) Visited one village with the local HEW and contacted two families with cases reported, interviewed exposure and illness	Jul16-17,2017	Recommended to be coordinated by Zonal PHEM after training the HEWs

	history Oriented overview of transmission mode, and prevention method to the family and neighbors Oriented the health HEW and provided translated case definition		
4	Traveled to Gazgibila woreda and communicated the manager, provided documents (guide line, check list and case definition) to PHEM officer Conducted Anthrax surveillance data from Woreda PHEM department, Asthma health center and health post	Jul 17,2017	
5	Conducted Anthrax surveillance data from Taba health center and health post	Jul 18,2017	
6	Traveled to Zikuala woreda Investigated Anthrax suspected case and Collected sample for laboratory diagnosis Collected Anthrax surveillance data from Tsitsika health center	Jul 19,2017	

7	Traveled to Mekele and Sent the first sample to National Bacteriology reference laboratory	Jul 20,2017	
8	Traveled to ZikualaWoreda Collected sample from the second case patient	Jul 21,2017	Proposed for national PHEM and
9	Collected Anthrax surveillance data from Zonal health office **C**ommunication Zonal health office manager Interviewed Zonal Veterinary officers on the vaccination program, laboratory diagnosis and related areas	Jul 23,2017	Proposed for national PHEM
10	Collected Anthrax surveillance data from Abergelle woreda ,health center and health post Provided written feedback to health office	Jul 24,2017	
11	Veterinary assessment questionnaire was sent back to reverify gaps on the area of collaboration of Health office and Veterinary office and animal vaccination program		waiting responses from the Zonal office

Major Gaps Identified

- For more than 2 years although the anthrax cases reported ,there was no public health action done from regional PHEM as well as National to control the problem
- As understood from interviewing some peoples from the community, they leave with animals in their home and also process hides (animals skin)
- There is a habit of using animal skin for sleeping and even dead animals skin usually used.
- As per the zonal Veterinary office report, the soil is convenient for long term survival of anthrax spores
- The vaccination program could not be regularly provided at all levels(Woreda-health post) due to lack of refrigerator

- Lack of awareness for some community members on the prevention of Anthrax ,by vaccinating cattle ,Goats and Sheep's
- Anthrax vaccination incur cost and it is tough to pay and vaccinate all animals for the farmers.
- Due to lack of support on the control of Anthrax, the zone considered as endemic disease and it is reported weekly.
- Lack of computers.
- Turnover and single PHEM officer at all levels of the Zone affects the efficiency of the system
- Lack of training on data management and Poor data handling and utilization for planning and intervention
- Lack of sufficient budget for both Public Health Emergency Management activities and veterinary office programs

Proposed recommendation and actions to be taken nationally and regionally

S.N	Activities	Responsible body	Time line	Remark
1	Initiating of Mass Animal vaccination	EPHI, Regional ,Zonal Health offices, Ministry of Fishery and Live stocks (National, Zonal) and Development partners	Aug-Oct, 2017	Searching for Financial support from Development partners and federal government since mass vaccination may require extra financial support logistically, technical experts of both sectors
2	Provision of Solar refrigerators to all animal clinics and health posts	Ministry of Fishery and live stocks (National ,Zonal),EPHI, Regional ,Zonal Health office, and Development partners	Sept –Dec ,2017	Communicating concerned federal government Bureaus and development partners for Financial support or provision of refrigerators
3	Training Health Extension Workers in all woredas of the Zone	EPHI/Regional, Zonal (PHEM) Health office	Aug-Sept,2017	
4	Sensitization of Health professionals on the prevention ,severity transmission mode, data utilization and reporting system	EPHI/Regional, Zonal(PHEM) Health office	Sept - Oct	Provision of Computers for PHEM department for proper data management trainings are crucial

5	Training additional PHEM officers	EPHI/regional, Zonal(PHEM) Health office		
6	Community training	Zonal (Waghemera) PHEM)health office	Sept, 2017	After sensitizing Health Professionals and training Health Extension workers the it is preferred to be coordinated by Zonal PHEM in all woredas
7	Allocate adequate budget for veterinary office programs and zonal PHEM	Zonal administrator	Aug,2017	

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CHAPTER TWO

SURVEILLANCE DATA ANALYSIS REPORT

2.1 The patterns and trends of Female Genital Tract cancer at Ethiopian Public Health Institute-St Paul Hospital Millennium Medical College(**SPHMMC**)Pathology Laboratory ,Addis Ababa , Ethiopia Nov ,2014

ABSTRACT

Female Genital Tract Cancers (FGTCs) are a group of different Malignancies of female reproductive organs. Based on previous studies on total cancer trends in Ethiopia, the most common malignancy in Female was gynecological malignancy (47%). Although the disease burden is significant, studies were not available on Female Genital Tract cancer by Diagnosis type and Tumor anatomical location. This study provides evidence on the pattern and trend by person and time to provide evidence on the public health importance of the diseases to be under surveillance.

Method: From pathology Laboratory result database between the specified period , data on FGTCs was extracted and a total of 4,759 results were found and Completeness of all information for the dependent and independent variables was checked for unique Identifier , Year of report, Tumor Location, Diagnosis, Age, and Description sections . 4,168 results were analyzed and presented using descriptive statistics

Result: From a total of pathologically diagnosed tumors 13,043 at the hospital (31.9%), 4,168 were Female Genital Tract Cancers and out of these Cervical 1279 (30. 6%) 4168 followed by Endometrium 1183 (28%) and Myometrium 960(23%) 4168. Fallopian Tube and Broad Ligaments362 (8.7%) 4168, Ovarian 260 (6.23%) 4168, others 106(vaginal, vulvar, 2.5%) 4168 Placental and Gestational Tumors were 17(0.4 %) 4168.The frequency is high among the age group betwe20-49.

Conclusion: The trend of FGTCs over years is increasing .Among Gynecological Cancers, Cervical, Endometrium and Myometrium are the major cite of tumors in females diagnosed at SPHMMC. Out of the FGTCs the proportion of malignancy is high for cervical and ovarian anatomical Cite .Further studies are considered to further investigate the associated factors to each anatomical cites of Tumors.

Keywords: Benign, Genital, Tumor, Malignancy, Trend

Introduction

Female genital tract is the most common site of tumors in females. Gynecological cancers are a group of different malignancies of the female reproductive system. The most common types of gynecologic malignancies are cervical cancer, ovarian cancer, and endometrial cancer. There are other less common gynecological malignancies including cancer of the vagina, cancer of the vulva, gestational trophoblastic Tumor and fallopian tube cancer [1, 2].

Cancer of the cervix is the second most common cancer among women worldwide about 470,000 new cases and 230,000 deaths every year .80% of cases of cervical cancer occur in developing countries where, in many regions, it is the most common cancer of women [3,4] The highest incidence rates are in South America and the Caribbean, sub Saharan Africa, and South and South Eastern Asia [2, 5]

Cancer of the uterus is the seventh most common cancer of women with 189,000 new cases and 45,000 deaths occurring worldwide each year; about 60% of these occur in more developed countries. Uterine cancer occurs primarily in elderly women, the median age of onset being around 60 years old; only 5% of cases develop before age 40 [5]. Endometrial cancer mainly affects postmenopausal women in developed countries; 188,000 new cases are diagnosed annually and obesity is a major risk factor. [6]

Ovarian cancers are carcinomas, which arise from the surface epithelium of the ovary. Cancer of the ovaries develops most often in women aged 50 to 70. It occurs in 190,000 cases each year, predominantly among postmenopausal women in developed countries. The risk of epithelial tumors increases with age, occurring predominantly in pre and postmenopausal women. Tumors of germinal or embryonic origin are more frequent in young adults [7].

Fallopian tube cancer develops in the tubes that lead from the ovaries to the uterus. Most cancers that affect the fallopian tubes have spread from elsewhere in the other parts of the body. It is usually diagnosed in women aged 50 to 60In the United State, fewer than 1% of gynecologic cancers are fallopian tube cancers. Cancer that starts in the fallopian tubes is rare. [8]

Gestational Trophoblastic Disease (GTD); Molar Pregnancy or A hydatid form mole is growth of abnormal fertilized egg or an overgrowth of tissue from the placenta. Broad variations in the distribution of GTD exist worldwide, with higher frequencies in some parts of Asia, the Middle East and Africa but the extent to which they can be attributed to methodological difficulties in obtaining accurate rates is unclear. For unknown reasons, moles are almost 10 times more common in Asian countries. [8, 9]

Statement of the problem

Cancer of the cervix is the second most common cancer among women worldwide about 470,000 new cases are diagnosed each year. Of about 230,000 deaths every year .80% of cases of cervical cancer occur in developing countries where, in many regions, it is the most common cancer of women. The highest incidence rates are in South America and the Caribbean, sub Saharan Africa, and South and South Eastern Asia However, very low rates are observed in China, and in Western Asia [2, 6].

Cancer of the uterus is the seventh most common cancer of women with 189,000 new cases and 45,000 deaths occurring worldwide each year; about 60% of these occur in more developed countries. The highest incidence rates are in the USA and Canada, while other regions with age-standardized rates in excess of 10 per 100,000 include Europe, Australia and New Zealand, the southern part of South America, and the Pacific Island nations.

Low rates occur in Africa and Asia some countries, such as the USA and Canada, are experiencing a clear decline in incidence and mortality from cancer of the uterus, particularly among young women. In Europe, rates appear stable in the south and to be decreasing in the north. Uterine cancer occurs primarily in elderly women, the median age of onset being around 60 years old; only 5% of cases develop before age 4 [6].

Endometrial cancer mainly affects postmenopausal women in developed countries; 188,000 new cases are diagnosed annually and obesity is a major risk factor [5].

About 190,000 cases of ovarian cancer occur each year, predominantly among postmenopausal women in developed countries; five-year survival rates are about 40%.The highest rates are reported in Scandinavia and Eastern Europe, the USA, and Canada. Low rates are found in Africa and Asia. The risk of epithelial tumours increases with age, occurring predominantly in peri and postmenopausal women. Tumours of germinal or embryonic origin are more frequent in young adults [10].

In the United States, less than 1% of gynecologic cancers are fallopian tube cancers. Cancer that starts in the fallopian tubes is rare [11].

Broad variations in the distribution of GTD exist worldwide, with higher frequencies in some parts of Asia, the Middle East and Africa, but the extent to which they can be attributed to methodological difficulties in obtaining accurate rates is unclear .Hydiated moles In the United States, occur in about 1 in 2000 pregnancies For unknown reasons, moles are almost 10 times more common in Asian countries [12, 13].

Literature Review

A retrospective review of the epidemiology of cancers at the University Teaching Hospital,(UTH) Lusaka, Zambia conducted from January 1997 to December 2005 to examine the pattern of malignancies and other cancers trend over 9 years period to compare the HIV related malignancies with the non HIV related showed that cancer of the cervix was among the five most common cancers detected in females 41.5% a high prevalence of HPV 16 and 18 subtypes at the UTH: 42% of all HPV strains isolated, The prevalence of HIV among random samples of female patients visiting the UTH was 39.2% and, of these, 56% were found to be positive for HPV. From the result observed here and other findings not mentioned in this text, concluded that a change in the pattern of mucosal cancers seen which may be related to HIV infection, HPV and HHSV8.6, 7 [**14]**.

Similar review of sixteen years total cancer trends in Ethiopia showed the most common malignancy in female was gynecological malignancy (47%) followed by breast carcinoma (26%) the study also confirmed that out of these gynecological malignancies cervical cancer took the primary. Despite this fact, very few women receive screening services in Ethiopia. Although there is no national cancer registry, reports from retrospective review of biopsy results have shown that cervical cancer is the most prevalent cancer among women in the country Followed by breast cancer. The study concluded that Low level of awareness, lack of effective screening programs, overshadowed by other health priorities are the main challenges of the health problem [15].

A systematic review of literatures conducted on HPV related cancers has shown that **a**bout 7,095 new cervical cancer cases are diagnosed annually in Ethiopia (estimations for 2012). Cervical cancer ranks as the 2nd leading cause of female cancer in Ethiopia. Cervical cancer is the 2nd most common female cancer in women aged 15 to 44 years in Ethiopia. On same study cancer Mortality was reported as About 4,732 cervical cancer deaths occur annually in Ethiopia (estimations for 2012). Cervical cancer ranks as the 2nd leading cause of female cancer deaths in Ethiopia. Cervical cancer is the 2nd leading cause of cancer deaths in women aged 15 to 44 years in Ethiopia [16].

Therefore, from the above stated findings burden of the diseases is increasing over time to time. In contrast, results of the above local studies reported that for further studies of different variables, finding a data was one of the challenges. In addition, Most of the local studies and health programs were not supportive to this specific health problem. Thus, assessing the trend of the diseases, identifying the pattern and risk group by place, time and person is a crucial step to identify the degree of significance of the disease as a public health problem and enables to hypothesize and further conduct a study for proper action plan. In summary, the analysis of the female gynecological cancer data will support the health program providing evidence of the pattern and magnitude that enlighten a direction of action. This study aims to show the trend of the Epidemiology of the diseases confirmed pathologically at EPHI-SPHMMC lab. The trend of the Female Genital Tract of a specific period can be a great evidence to support the Federal

Ministry of Health of Ethiopia to consider the disease as one of the public health important disease to be under surveillance.

Objectives

General Objective

To describe the Trend of Female Gynecological cancer investigated at St Paul Hospital Millenium Medical College (SPHMMC)–Ethiopian Public Health Institute (EPHI) pathology laboratory

Specific Objectives

- To describe the Trend and pattern of of Cervical Cancer
- To describe the Trend and pattern of Uterine (Endometrial &Myometrium) Cancer
- To describe the Trend and pattern of ovarian Cancer
- To describe the Trend and pattern of Fallopian Tube and broad Ligament Cancer
- To describe the Trend and pattern of placental and gestational Cancer

METHODs

Study design

We conducted facility based Cross sectional study design .We reviewed retrospectively the laboratory result database at the St Paul Hospital Millenium Medical College (SPHMMC)

Study area

We studied at the Ethiopian Public Health Institute (EPHI) -St Paul Hospital Millennium Medical College Pathology Laboratory. The laboratory is providing pathology examination service by the corporate agreement between EPHI and SPHMMC. Both EPHI and SPHMMC are a public Institutions situated at Gulele sub city, Northern suburb of Addis Ababa. EPHI is a Public Health research Institute, working as a Technical wing of FMOH on laboratory related programs, National reference Laboratory, operational Public Health Researches and Capacity building. SPHMMC is a federal Medical College Hospital Serving as Federal referral and Teaching Hospital

Study Period

We collected the data from November, 2014-Dec 2016 and reviewed from Jan11-28, 2017

Study population

Source population

All Female patients referred to St Paul Millennium Medical College Hospital for pathology examination.

Study subjects

Females suspected with genital tract cancer who has taken pathological examination at EPHI – SPHMMC pathology laboratory from 2014 -Nov2016

Sampling method and Sample size

We extracted all Female gynecological pathology report from 2014-2016 in the database.

Inclusion criteria

All females diagnosed by pathology examination for tumor presenting pathology with complete information on sex, age, tumor location, and type of tumor data as Benign or Malignant, unique patient Identifier and date of Examination was included.

Exclusion Criteria

We excluded a female case patient with unspecific result for both anatomical site and type of diagnosis. From the extracted 4,759 results 591 results excluded by the exclusion criteria

Operational definition

Female gynecology: the anatomical position of females from external genitalia to the internal reproductive organ breast is not included.

Pattern of female genital: description of the cancers by anatomical site, age group and diagnosis.

Trend: description of female gynecological cancer by year

Study variables

- Trends of Female Genital tract cancer
- Pattern of Female Genital tract
- Age
- Diagnosis

Data Analysis

After data completeness for all variables was checked, 4,168 results analyzed and described using descriptive statistics. We analyzed with Microsoft office Excel

Ethical clearance

Since the data is secondary, Official letter was written from field base to Hospital and laboratory management.

Result

Trends of Female genital tract cancers (FGTCs)

Description of Female Genital Tract Cancers by time

From a total of 13,034 Tumors pathologically confirmed tumors at SPHMMC -EPHI pathology laboratory between2014-2016, 4168 were (31.9%) female gynecological cancers accounts 18% As fig **1.** shows the trend of FGTCS diagnosed with in these three years period was increased. Specially, from 2015 to 2016 however the malignant one is constant there is a considerable increment in the trend of the frequency of the benign.

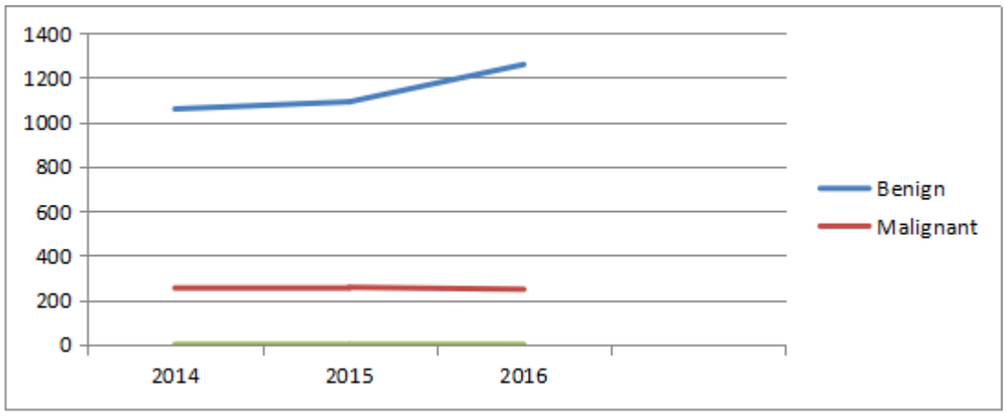

Fig 7 Trends of Malignancy in Female genital tract by Diagnosis 2014-2016, Addis Ababa, Ethiopia.

As it can be observed from Fig 1. 1there is an increase in frequency in overall volume of tumors however; the rate of increment in malignant between the years is almost constant. The frequency of FGTCs diagnosed also showed that among all sites, Cervices is the primary cite of Tumor accounting for about (30.7 %) followed by the (Uterine) subtypes Endometrium (28.3%) and Myometrium (23%). Fallopian Tube & Broad Ligament constitutes 8.7 % followed by ovary 6.23% and other gynecological tumors like vaginal and other External genitalia constitute 2.54% of the diagnosed FGTCS.

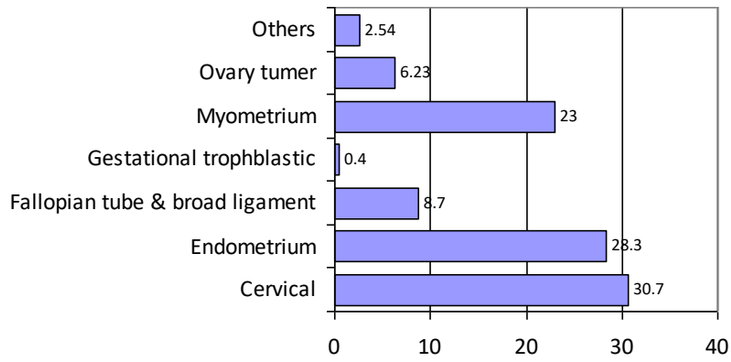

Fig 9: Frequency of FGTCs diagnosed at SPHMMC-EPHI pathology laboratory by tumor location from 2014-2016, Addis Ababa, Ethiopia

From a total of (4168) female genital Tumors analyzed 759(18%) were malignant and the rest 3409(82 %) were benign. The proportion of malignancy is indicated in Fig 3B and Leiomyioma is the commonest described benign type in the data base for for all anatomical cites of Tumors.

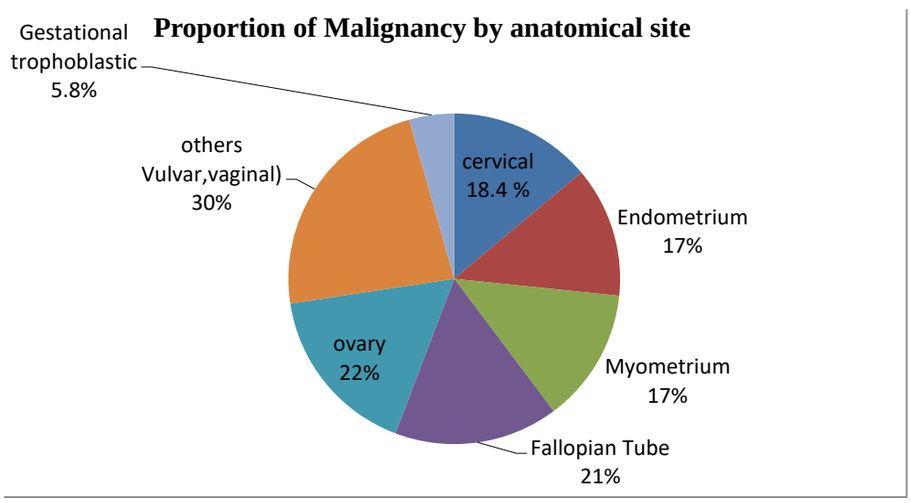

Fig. 10: Proportion FGTCs diagnosed at SPHMMC-EPHI pathology laboratory by Anatomical site from 2014-2016, Addis Ababa, Ethiopia

Among all sites malignancy is higher in ovary, fallopian tube and cervices.

Patterns of Female genital tract cancer

Cross tabulation of age group with the frequency of Tumors indicated that the most affected age group is 30-39 (31.4%) followed by 20-29 and 40-49, 22.1%, 20.3 % respectively. The least diagnosed frequency was observed in the two extreme age groups .This is illustrated in Table 2.

Table 13 Frequency of FGTCs cross tabulation with Age group from 2014-2016, Addis Ababa, Ethiopia

Age group	Total Frequency	Percentage (%)
< 20	81	1.94
20-29	922	22.1
30-39	1312	31.4
40-49	850	20.3
50-59	533	12.78
60-69	314	7.5
≥70	107	2.56
Unknown	49	1.17
Total	4168	100%

The comparison of Age group with cancers Fig4. As the figure shows the extreme age group ≥70 followed by 50-59 and 60-69, 64%, 38.2% and 37.2% are the most malignant age groups respectively. Percentage of Malignancy decreases as the females age group gets younger .Age group 40 – 49 accounts for 20.7% of malignant tumors with the < 20 (13.5 %) age group following and 30-39,20-29 and 11.2% and 5 % respectively.

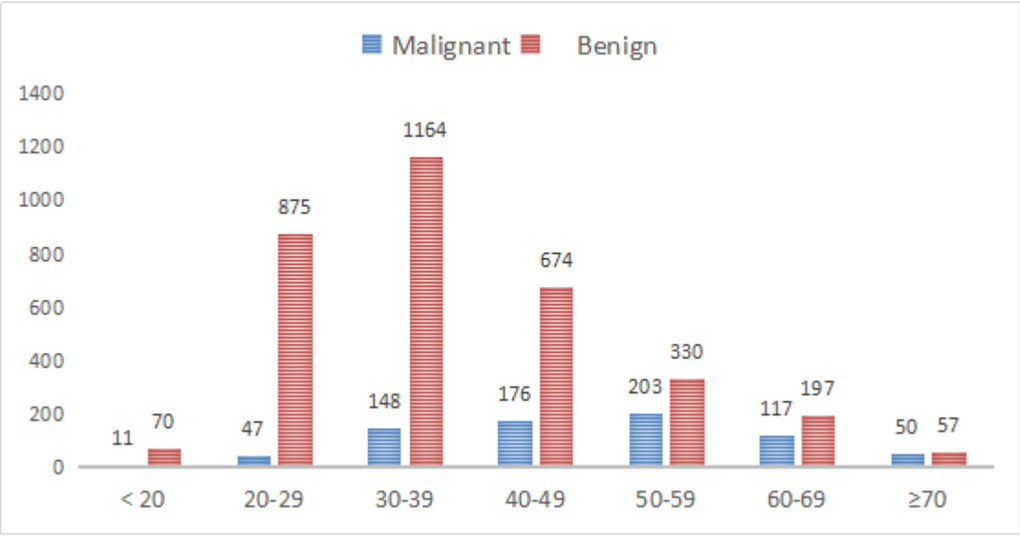

Fig11 Proportion of Malignancy with age group from 2014-2016 Addis Ababa, Ethiopia

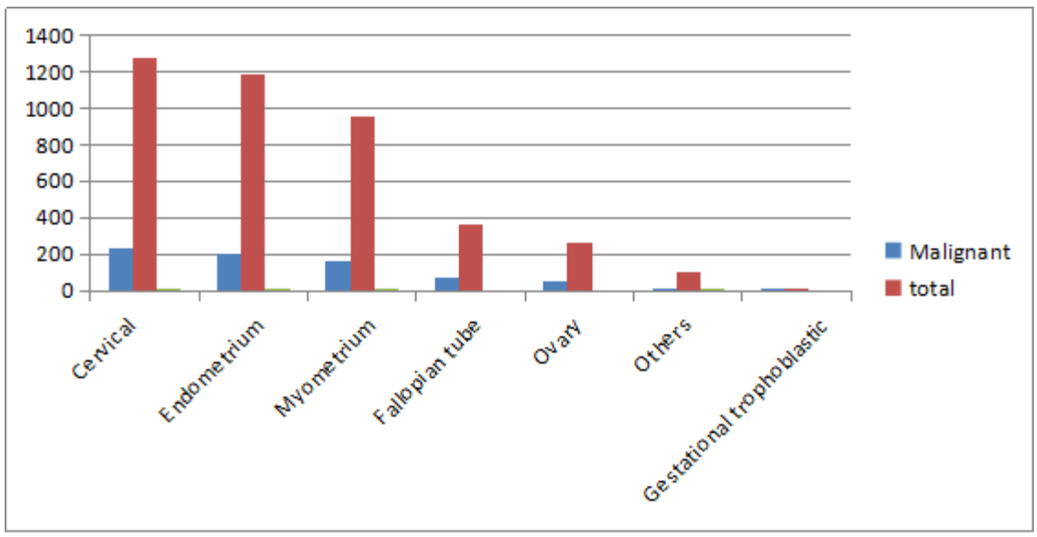

Fig. 12 - The pattern of Female Genital Tract Cancers by anatomical cite and type of tumor from 2014-2016Addis Ababa, Ethiopia

The patterns of the tumors illustrated by anatomical site and type of tumor indicates that there is a considerable variation with frequency and type of Tumor (diagnosis). Following Cervical, Endometrium, Myometrium, Fallopian tube and ovarian frequency is in a decreasing order respectively however, the proportion of malignant tumors is higher in Ovarian cancer next to Cervical than Uterine and Fallopian tube.

Patterns of Cervical cancers and Tumors

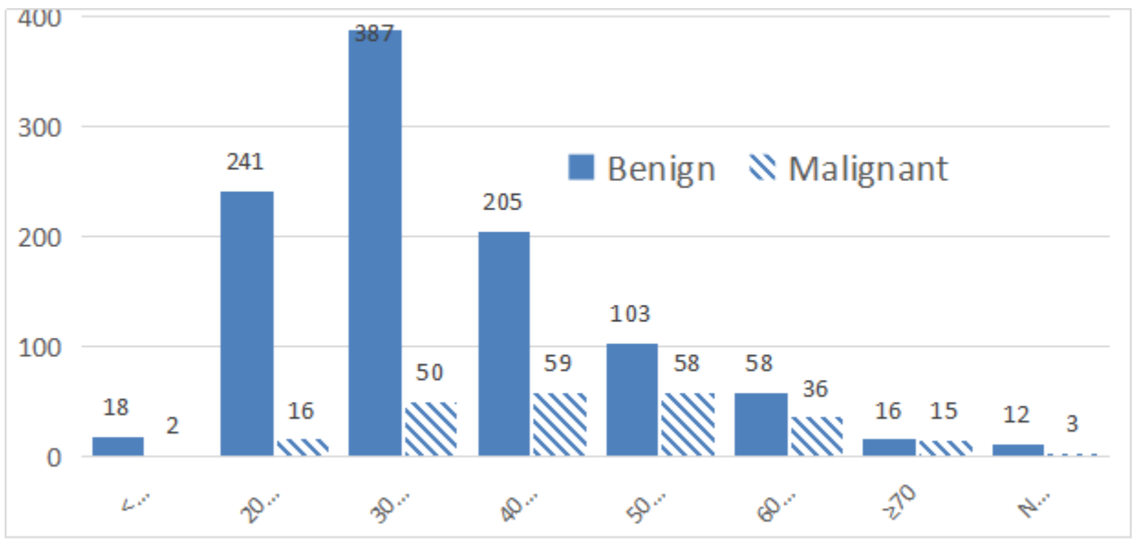

Fig. 13 Patterns of cervical cancer by age group from 2014-2016 Addis Ababa, Ethiopia

The frequency of cervical cancer is higher for the age group of 3rd (34%) decades followed by 4th (21%**)** and 2nd decades (20%) respectively. The 5th, (12.5 %**)** 6th (7 %**)** and 7th (2.4 %**)** follow the second decades in descending order respectively. The proportion of malignancy is higher in the age group of 4th (34% and 5th (21 %**)** the 3rd (20%) decades of life following and the two extreme group are relatively low in both frequency and proportion of malignancy.

Patterns of Endometrial cancer and Tumors

The frequency of third decade age group is highest of all 31.5% .The second decade age group is the second (24.5%) most high prevalent in Endometrial cancer followed by 4th ,(18.2 %) and 5th (12.9) decades of life . The two extreme age group is the least frequent of endometrial cancer with the younger extreme group greater than the older.

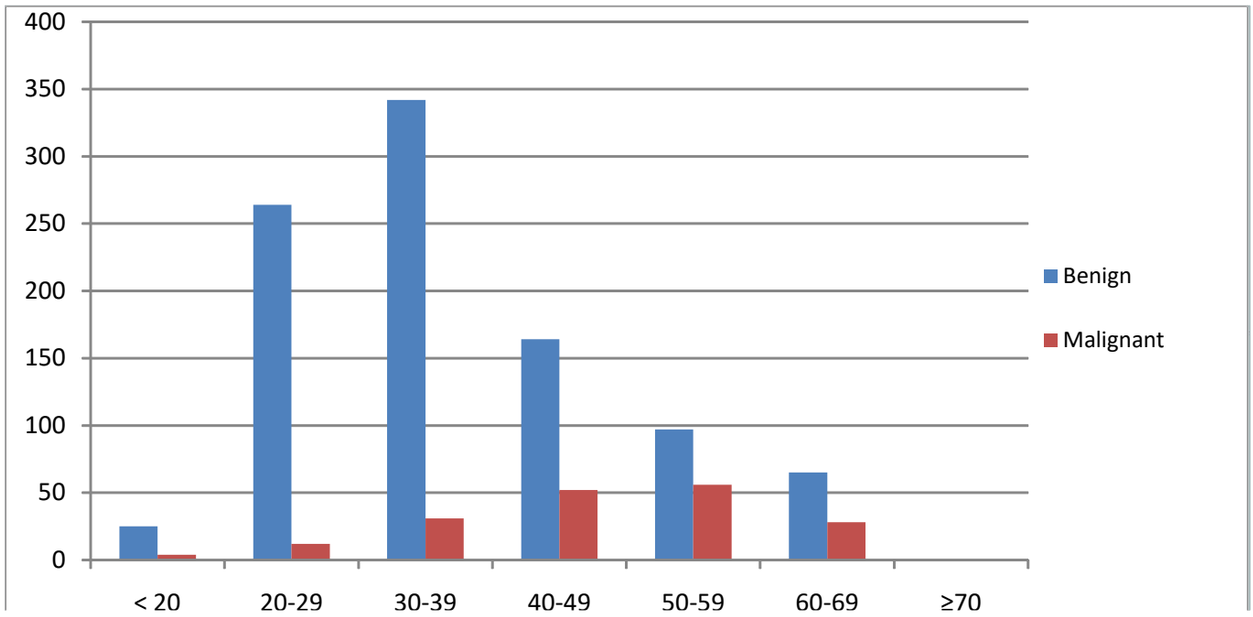

Fig 14 Frequency and patterns of Endometrial Cancers with Age group from 2014-2016 Addis Ababa, Ethiopia

Patterns of Myometrium Cancers and Tumors

In this study result, for the age group 30-39, frequency and is highest (30.9%) of all group with the age group 20-29 ,40-49,and 50-59, 23.3 %,20 % ,12.6 % following with descending order respectively . The proportion of malignancy is higher in later ages with the reproductive age group following.

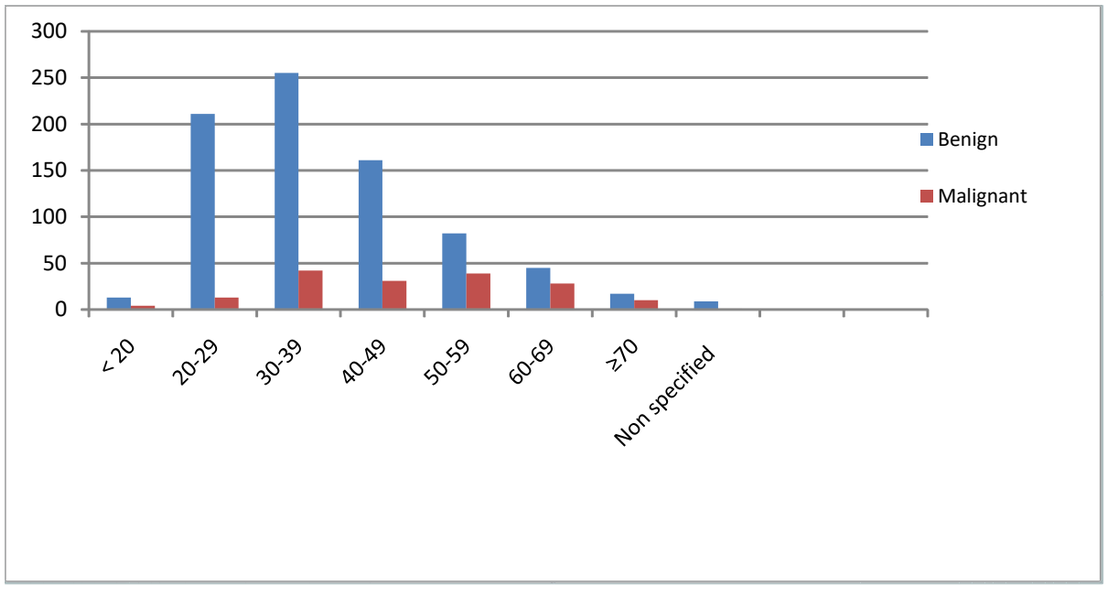

Fig.15 Frequency and patterns of Myometrial cancers with Age group 2014-2016, Addis Ababa, Ethiopia

Patterns of Fallopian Tube and broad ligaments

Our study shows that the frequency of cancers and proportion of malignances for fallopian tube is not uniform that frequency is higher in third ,fourth and second decades of life in a descending order 27.2,25.8,19.7 respectively however , the distribution of malignant tumors is higher in the older ages ≥70 (85%) with the sixth and fifth decades of life Age groups following in 48% and 47% respectively. The distribution of malignant tumors of fallopian tube and braod ligament is higher in older age.

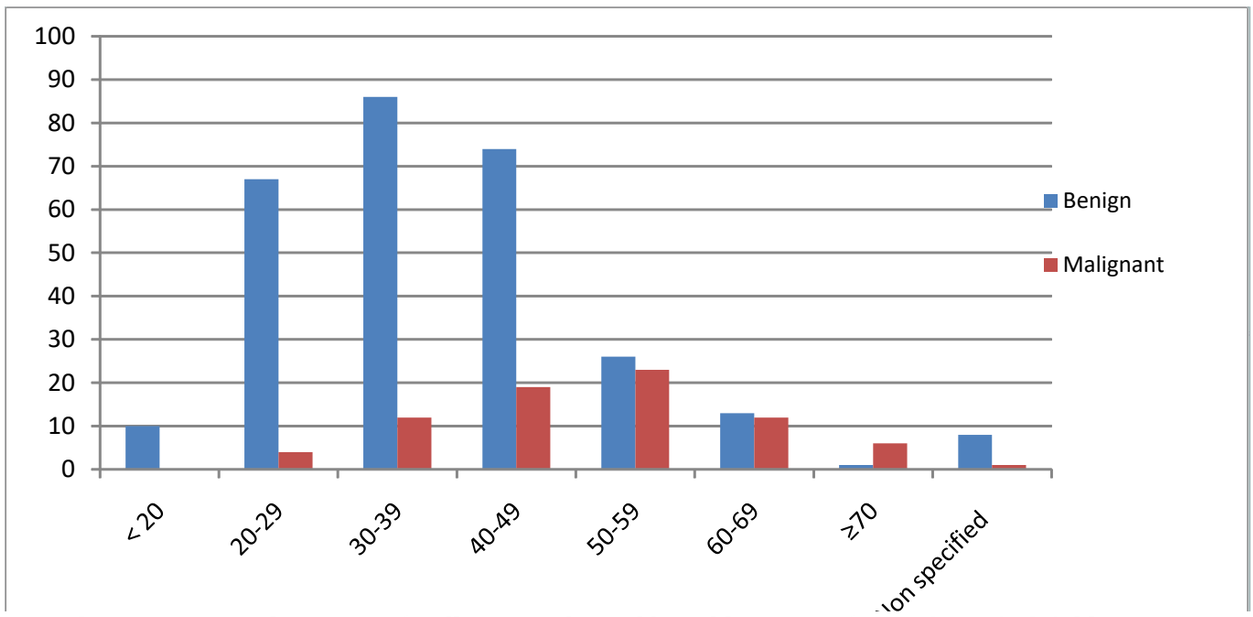

Fig. 16 -Frequency and patterns of Fallopian Tube and broad ligaments from 2014-2016 Addis Ababa, Ethiopia

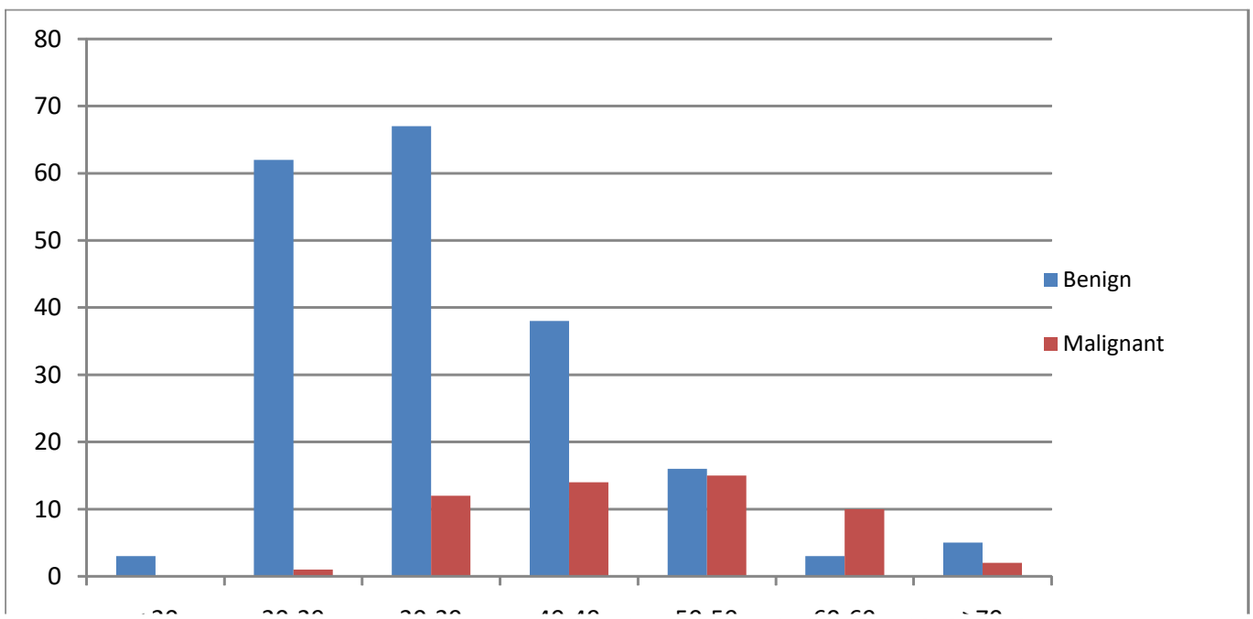

Fig. 17- Frequency and patterns of F Ovarian cancer from 2014-2016 Addis Ababa, Ethiopia

As the result is indicated on the table10 and chart 9 the frequency of ovarian cancer is high among the reproductive age group 20-49, the proportion of malignancy is higher among the third, fourth and fifth decade's age group.The younger the female the lower the malignant Tumors. There was no malignancy detected among the lower extreme age group as well as low frequency observed. Although the higher extreme age group has relatively low frequency the proportion of Malignancy is almost similar with the benign type.

Patterns of Gestational trophoblastic

From this study result, Gestational trophoblastic(hydatid mole) is very rarely diagnosed type of FGTC with the prevalence higher in the younger age 20-29 (41.1%) ,following in descending order for the older age groups .The finding indicated that it is the least malignant type of tumor

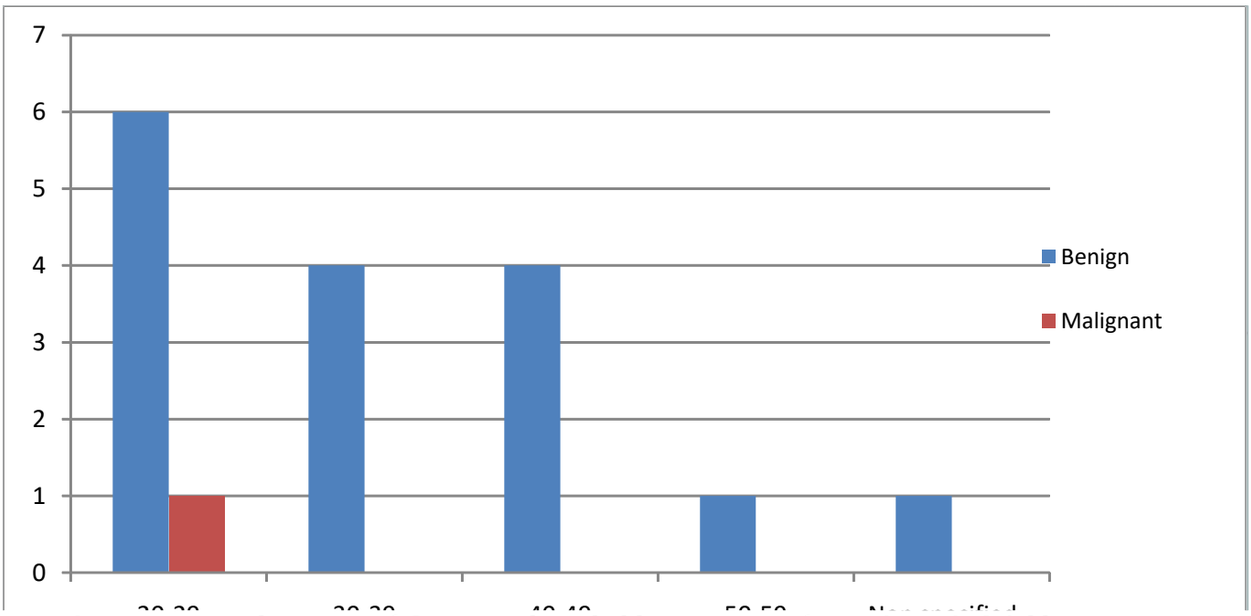

Fig .18 Frequency and patterns of Gestational trophoblastic cancers from 2014-2016 Addis Ababa, Ethiopia

Patterns of (Vaginal, vulvar, labia) cancers

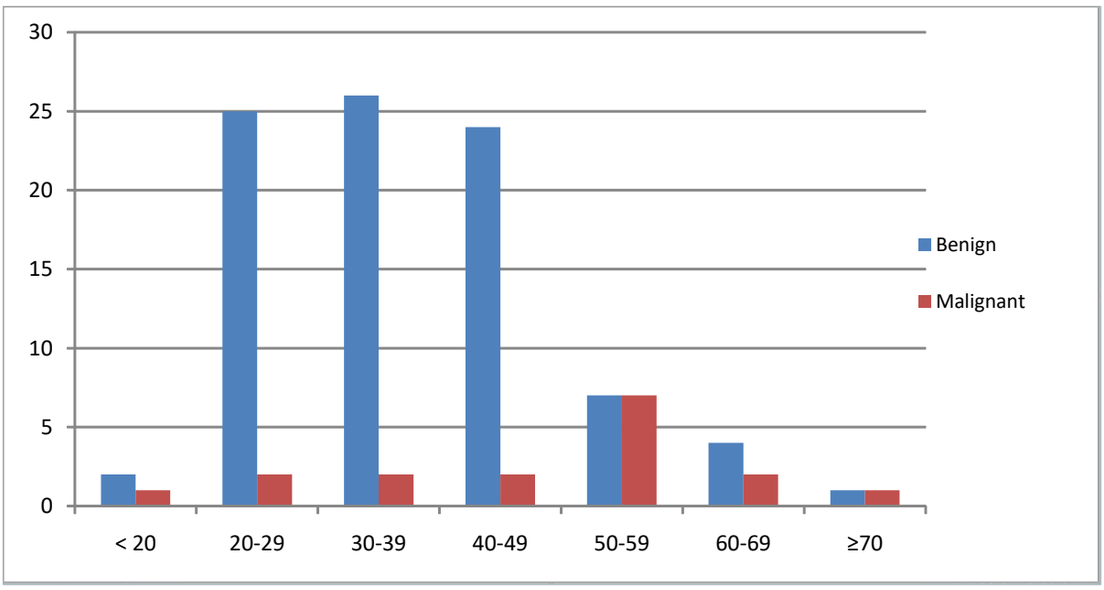

Fig 19 - Frequency and patterns of (Vaginal, vulvar, labia) cancers) from 2014-2016 Addis Ababa, Ethiopia

Discussions

The main findings of this study indicates that the trends of FGTCs with in this three years period is increasing with the prevalence of (32 %) and the patterns indicate that FGTCS needs considerable attention. There is also a contrary finding to our result on the patterns of FGTCs that except Cervical, Uterine cancers (Endometrium 28.3 % and Myometrium23 %), Ovarian and Fallopian tube distribution is higher in developed Western countries than developing world. **[6]** A regional study finding conducted at Botswana on FGTCs and previous National results on prevalence of FGTCs supports our finding with similar result on the patterns and frequencies of the FGTCs **[17] [15]**

As the finding of this study showed, out of the female gynecological cancers the Cervix is the primary cite of which constitutes 30.7 % of the Tumors.

Similar regional study of the Ghana reveals that although the frequency of the finding is different the prevalence of cervical carcinoma is predominant among FGTCs **[17]** .There is also a local study conducted at Tikur Anbessa Specialized Hospital (TASH) indicated that out of new cases of cancer patients registered at National cancer registry, Cervical constitutes 31.8 %. **[15]**

A study conducted at Enugu, Nigeria indicates that following Cervical, Ovarian cancer is the second most predominant cancer of FGTCs and Fallopian tube was not found during the study period in Nigeria **[19]** This is different from our study finding that Following Cervical and Uterine cancer the Fallopian tube and ovarian cancers were detected with a frequency of 8.7% 6.23 % respectively.

As different studies indicated placental and Gestational Tumors were the least prevalent in developing countries and with low malignancy type of Tumor .This is also confirmed by our

study finding that there was 0.4% frequency among the gynecological tumors and the younger 20-29 age group are the most affected both in frequency and malignancy distribution.

Conclusions

From this study result, Among Gynecological Cancers, Cervical, Endometrium and Myometrium are the major cite of tumors followed by Ovarian Fallopian Tube and Broad Ligaments Cancers. Despite the global studies result on the distribution of Uterine and Ovary high frequency is observed. Despite the prevalence and the pattern there was no considerable attention given to the health problem at Ministry level to monitor under surveillance .No sufficient studies were found to compare the pattern

Limitation of the study

The geographical location of the patients could not be described because Address was not registered on the result database as well as not traceable by the Medical Record Number.

The pathology report lacks consistency in histologyic classification thus it could not be described

We could not describe other associated factors due to lack of variables other than age and diagnosis .like marital status, body mass index.

Recommendations

- Further studies should be conducted at a national and regional level to identify the associated factors of the pattern of the tumors
- Female gynecological malignancies should be given emphasis and monitored under Sentinel surveillance system

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CHAPTER THREE

SURVEILLANCE SYSTEM EVALUATION REPORT

3.1 Anthrax surveillance system Evaluation in Waghemra Zone, Amhara 2009

Abstract

Background: Public health surveillance systems should be evaluated periodically and the evaluation should include recommendations for improving quality, efficiency and usefulness. The purpose of evaluating public health surveillance systems is to ensure that problems of public health importance are being monitored efficiently and effectively. Although Anthrax is an immediately reportable it has been reported as endemic in Waghemra zone. The purpose of this study is to evaluate Anthrax surveillance system in Waghemra zone.

Methods: We conducted document review, relevant observation and used standard surveillance questionnaire for interview of focal persons. We described the system structure, component, and resources used to operate the system .We used CDC and WHO surveillance MNE guideline and described the finding.

Result: A total of 12 sites from Zonal health office to health post level were evaluated .One Zonal office, three woreda offices (3) 42% ,four health centers and four health posts were assessed on system structure, core and support functions and system attributes . The core functions: case detection, registration, confirmation are in place at the facility level but the From 8 visited health facilities the standard case definition was found in 3/4 HPs, 2/4 HCs, at their OPD as well as office and 2/3Woreda and 1 Zonal health offices; Clinical register availability and proper utilizations of the health facilities were also assessed. All facilities responded that they use both phone and paper to communicate upper level. From the document review, the health centers did not evaluate the timelines and completeness of the surveillance reports of the health posts of their catchment .On the other hand, woreda health offices also expected to do timeliness and completeness of the health centers and zonal office for the woreda HOs. We found that Zonal Ho and only one Woreda Ho from three Hos has done timeliness and completeness for their respective catchment .Since Sensitivity, Specificity and predictive values need standard investigation method to confirm suspected cases ,we could not evaluate these attributes .

Conclusion: Anthrax Surveillance quality and control strategy is poor, report timeliness is was not measured. Community awareness is poor on transmission mode of Anthrax .Animal vaccination is Costly for farmers vaccinate all .Lack of computers and proper data management training, Turnover and single PHEM officer at all levels of the Zone, Poor data handling and utilization for planning &intervention, Lack of sufficient budget for both Public Health Emergency Management activities and veterinary office programs are major gaps of the surveillance e system affects the efficiency of the system,.

Key words: surveillance, Anthrax, attributes, core, support

Introduction

Public health surveillance is an ongoing systematic collection, analysis, interpretation and dissemination of data regarding a health related event for use in public health action to reduce morbidity, mortality and to improve health. This is carried out through a system which has legal support and extending from the central health authorities down to the peripheral health facilities and community level through sets of communication channels. These sets include upward and down ward reporting and feedback mechanism [1, 2]**.**The final link in the surveillance chain is the application of these data to prevention and control. [3]**.** To generalize findings from surveillance data to the population at large, the data from a public health surveillance system should accurately reflect the characteristics of the health-related event under surveillance. These characteristics generally relate to time, place, and person [4]**.**

Several types of surveillance are used in national programs. The choice of method depends on the purpose of the surveillance action. In general, types of surveillance methods describe a focused location for surveillance (such as health facility-based surveillance or community-based surveillance), a designated or representative health facility or reporting site for early warning of epidemic or pandemic events (sentinel surveillance) and Surveillance conducted at laboratories for detecting events or trends not necessarily evident at other sites. Disease-specific surveillance involving activities aimed at targeted health data for a specific disease. Regardless of the type of surveillance, the important issue is that the health data is used for public health action**.**

Disease control and prevention programs have been successful when resources were dedicated to detecting a targeted diseases, obtaining laboratory confirmation of the disease, and using thresholds to initiate action at the district level. Accordingly, the World Health Organization (WHO) Regional Office for Africa (AFRO) proposed an Integrated Disease Surveillance (IDSR) and six response approach for improving public health surveillance and response in the African Region linking community, health facility, district and National levels.

IDSR promotes rational use of resources by integrating and streamlining common surveillance activities. Surveillance activities for different diseases involve similar functions (detection, reporting, analysis and interpretation, feedback, action) and often use the same structures, processes and personnel. Additionally, IDSR takes into account the One World-One Health perspective which is a strategy that addresses events at the intersection of human, domestic animal, wildlife, and ecosystem health.

The specific objectives of IDSR are to strengthen the capacity of countries to conduct effective surveillance activities, train personnel at all levels, develop and carry out plans of action, advocate and mobilize resources, Integrate multiple surveillance systems so that forms, personnel and resources can be used more efficiently, Improve the use of information to detect changes in time in order to conduct a rapid response to suspect epidemics and outbreaks and monitor the impact of interventions.

African States adopted integrated disease surveillance (IDS) as a regional strategy (resolution AFRO/RC48/R2) for early detection and efficacious response to priority communicable diseases for the African region in September 1998, during the 48th Regional Committee for Africa meeting in Harare, Zimbabwe [2]. Ethiopia as member state also endorsed this initiative and is using it with frequent revision of the list of priority diseases (Laboratory-based surveillance is the key part of the overall surveillance as the detection and control of outbreaks requires rapid identification of the pathogens and their source of of34 infection [3, 4]**.** Starting from the national level to the health post level, suspected outbreaks should be confirmed by laboratory investigation. In Ethiopia, networking of regional laboratories with the National Laboratory and involvement of the different levels in the investigation of the identified diseases is emphasized. The purpose of the public health laboratory network is to improve the performance of laboratories in support of disease surveillance and response [4]**.**

Since 2008 the Federal Ministry of Health launched a reform and restructuring of the health sector in to different core processes and in particular the disease surveillance and response with the concept of BPR. This helps the surveillance of priority disease to be a dependable system as Public Health Emergency management (PHEM) center. This new structure is extended down to the district level in their capacities. This is designed as a cutting edge for better tracking and monitoring of diseases of public health concerns. Moreover, as member state of the WHO, Ethiopia is on preparatory phase to implement the International Health Regulation (IHR) which was declared by member states in 2005. These all are good opportunities to strengthen surveillance [5].

Based on PHEM guideline, the Ethiopian surveillance approach is divided in to 3. The Event based surveillance, Laboratory based surveillance and Integrated disease surveillance (IDSR). Ethiopia public health surveillance system used different strategies to have functioning and effective surveillance system. Too often, however, surveillance data for communicable diseases are neither reported nor analyzed on time. As a result, the opportunity to take action with an appropriate public health response and save lives is insignificant. However, in cases where adequate information is collected, it is often not available for use at the local level [6].

Public health surveillance systems should be evaluated periodically and the evaluation should include recommendations for improving quality, efficiency and usefulness. The goal of these guidelines is to organize the evaluation of a public health surveillance system. Broad topics are outlined into which program-specific qualities can be integrated. Evaluation of a public health surveillance system focuses on how well the system operates to meet its purpose and objectives.

The evaluation of public health surveillance systems should involve an assessment of system attributes, including simplicity, flexibility, data quality, acceptability, sensitivity, predictive value positive, representativeness, timeliness, and stability. An important result of evaluating the representativeness of a surveillance system is the identification of population subgroups that might be systematically excluded from the reporting system through inadequate methods of monitoring them. This evaluation process enables appropriate modification of data collection

procedures and more accurate projection of incidence of the health- related event in the target population [4].

The purpose of evaluating public health surveillance systems is to ensure that problems of public health importance are being monitored efficiently and effectively

Rationale for conducting the evaluation

Suspected Anthrax cases have been reported in Amhara regional state zones for a long period of time. For more than three years, despite its public health concern neither field assessments nor verification of cases done regionally or nationally. Although Anthrax is an immediately reportable it has been reported as endemic (weekly) in Waghemra zone. The purpose of this study is to evaluate Anthrax surveillance system in Waghemra zone.

Objectives

General objectives

To describe the surveillance system for Anthrax and evaluate the key system attributes of Waghemra Zone, Amhara region-July 2017.

Specific Objectives

- To describe the existing structure and operation of the Waghemra zone Anthrax surveillance system.
- To assess the core activities (case detection, reporting, data analysis and response) of the surveillance system in Waghera zone.
- To evaluate the support functions of the Anthrax surveillance system in Waghemra zone
- To evaluate the key attributes of surveillance system

Methods

Study area

The study area was Waghemra zone found at the Northern part of Amhara. Waghemra has six woredas and one Town administrative reporting independently. The zone has 7 district reporting health offices.

Study design

We conducted document review, and used standard surveillance questionnaire for interview of focal persons, reviewed relevant observation for on some specific areas.

Study period

We conducted the data from Jul 13-30, 2017 and laboratory analysis, consultation of experts and write up was done up to Dec, 2017.

Study population

The study population is people who are living in the Waghemra Zone.

Source population

Study subject

The study subjects were zonal health office, woreda health offices and health facilities (health centers and health posts) which lay in the zone

Sampling method

We selected the zone purposively and the woredas were randomly selected. We reviewed weekly PHEM report and interviewed PHEM focals. From the selected woredas,We selected one health center and health post randomly

Sample size

The sample size was determined based on CDC guide line standard .We included(3/7) 42.8 % of woredas randomly from anthrax reporting and non reporting woredas, one Zonal office and 4 health centers and health posts under the selected woredas.

Variables

We described the system component and structure, evaluated the standard variables by category according to the WHO and CDC Monitoring and evaluation guide of the surveillance system.

Core functions

- Case detection
- Case registration
- Case confirmation
- Data analysis

Support functions

- Availability Standards and Guideline CBR and other Formats
- Training on surveillance /PHEM
- Supervision
- Feedback
- Lab capacity
- Coordination

System Attributes

- Simplicity
- Acceptability
- Usefulness
- Flexibility
- Representativeness
- Stability:
- Completeness &
- Timeliness
- Sensitivity
- Specificity
- Predictive value positive

Operational definition

Simplicity The simplicity of a public health surveillance system refers to both its structure and ease of operation. Surveillance systems should be as simple as possible while still meeting their objectives.

Usefulness a public health surveillance system is useful if it contributes to the prevention and control of adverse health-related events, including an improved understanding of the public health implications of such events. A public health surveillance system can also be useful if it helps to determine that an adverse health-related event previously thought to be unimportant is actually important. In addition, data from a surveillance system can be useful in contributing to performance measures, including health indicators that are used in needs assessments and accountability systems.

Timeliness reflects the speed between steps in a public health surveillance system.

Representativeness is a public health surveillance system that is representative accurately describes the occurrence of a health-related event over time and its distribution in the population by place and person. 2

Data quality reflects the completeness and validity of the data recorded in the public health surveillance system

Stability refers to the reliability (i.e., the ability to collect, manage, and provide data properly without failure) and availability (the ability to be operational when it is needed) of the public health surveillance system

Acceptability reflects the willingness of persons and organizations to participate in the surveillance system.

Sensitivity The sensitivity of a surveillance system can be considered on two levels. First, at the level of case reporting, sensitivity refers to the proportion of cases of a disease (or other health-related event) detected by the surveillance system Second, sensitivity can refer to the ability to detect outbreaks, including the ability to monitor changes in the number of cases over time.

Flexibility A flexible public health surveillance system can adapt to changing information needs or operating conditions with little additional time, personnel, or allocated funds. Flexible systems can accommodate, for example, new health-related events, changes in case definitions or technology, and variations in funding or reporting sources. In addition, systems that use standard data formats (e.g., in electronic data interchange) can be easily integrated with other systems and thus might be considered flexible

Predictive Value Positive Predictive value positive (PVP) is the proportion of reported cases that actually have the health-related event under surveillance.

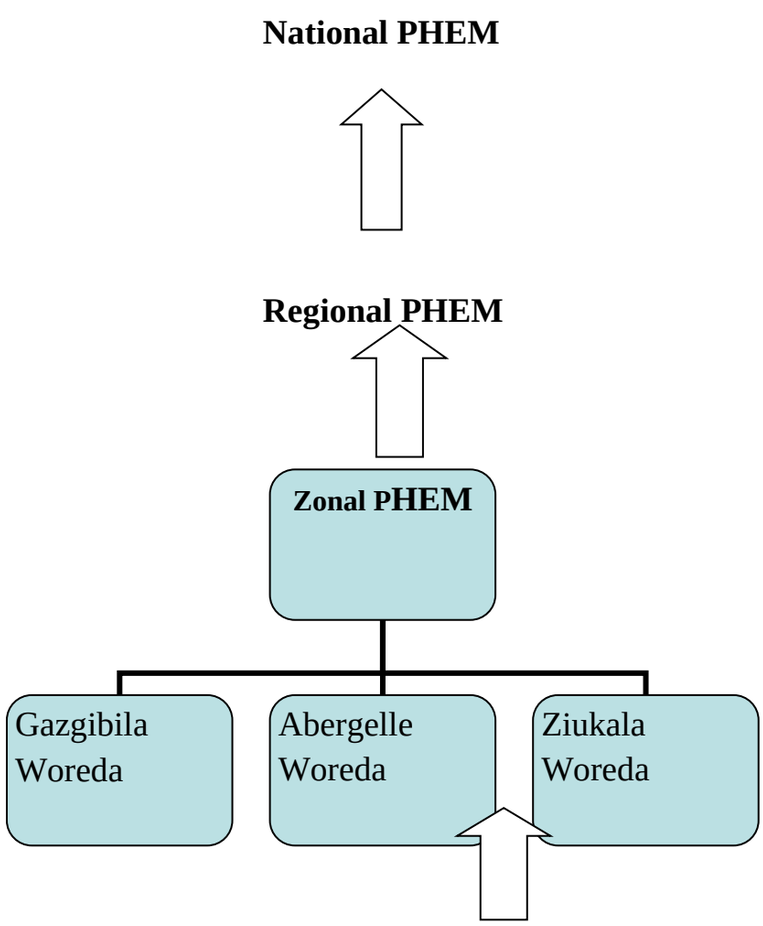
Result

System structure and component

Description of the surveillance system

Waghemra zone is one of the zones found in Amhara regional state of Ethiopia. It has 6 woredas and one Town administrative a total of seven (7)reporting units .The Ethiopian Public health Emergency (PHEM) Guideline states 21 priority public health important diseases of which thirteen are daily reportable and 8weekly reportable diseases whereas ,the Amhara regional state IDSR has one additional endemic and 22 Priority reportable diseases. Leshimaniasis is the additional endemic weekly reportable disease in the region.

Anthrax is under IDSR and expected to be reported immediately when suspected .The immediately reportable diseases will be reported as zero when absent. The reporting units in Waghemra Anthrax surveillance system are public institutions and the lower level data flow is from health post to national level through the health system hierarchy as indicated in fig 20



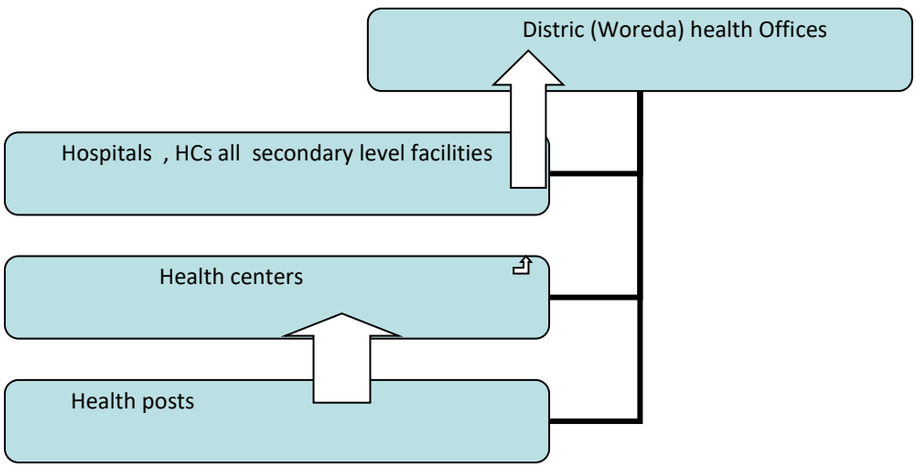


Fig 20 Reporting units

Table - List of priority reportable diseases in Ethiopia and the additional in Amhara regional state, Ethiopia

S.N	**Immediately reportable**		**Weekly reportable**
1	Measles	14	- Malaria
2	Acute Flaccid Paralysis (AFP) /Polio	**15**	Meningococcal Meningitis
3	Yellow Fever	16	Typhoid fever
4	Anthrax	17	Epidemic typhus
5	Guinea warm/ Dranculculiasis	18	Relapsing fever
6	Viral hemorrhagic fever (VHF)	19	Sever Acute Malnutrition
7	Avian Human influenza	20	Dysentery
8	Rabies	21	Maternal death
9	Neonatal Tetanus	22	Leishmaniasis (reported only in Amhara)
10	Pandemic influenza (H1N1)		
11	Cholera Small pox		
12	Sever acute respiratory syndrome (SARS)		
13	Rabies		

The Amhara regional state has two regional referral and public health research lab for diagnosis of public health important disease and the other responsible referral laboratory for some advanced tests of the diagnosis of diseases like Polio, Influenza and Rabies for all regions is EPHI. Although the professionals and other facility is able to confirm by laboratory, Anthrax diagnosis have been challenging for the biosafety level due to its high contagiousness, as a result it is recommended to be contained in biosafety Level III.

Public Health importance of the Disease

Anthrax is a disease of international public health important due to its high epidemic potential, severity and mode of transmission. It is immediately reportable .In Ethiopia, suspected cutaneous anthrax reported from Amahra regional states of two Zones Waghemra and North Gondar**.** All the reporting units in the Wag zonal surveillance system evaluation were public Institutions.

The evaluation design was focused on the standards of monitoring and evaluation guide lines of WHO and CDC. It describes the system structure and component operation, core functions of the system, support functions and quality attributes. The specific purpose of the evaluation is to assess the system functionality in respect to standard operation and component level, to indicate the gaps at each level and propose action plan for the improvement.

Resources used to operate the system

Including human power there was a minimum level of resources needed to operate the system. In visited districts and health centers , all assigned surveillance focal persons and they are trained on PHEM basic level training .however, there was staff turnover who were familiar with the system and this may affect efficiency of the system until new staff trained and familiarized with the system

Power supply was assessed in four health centers and 3 of them have secured power supply but one HC has no electric power, the HC uses solar refrigerator and generator for whole system of the HC.

In a surveillance system transportation is a basic resource to supervise lower level, verify diseases outbreaks and conduct other prevention and control activities .Thus, at health center at least Motor bicycle is expected however, out of four HCs three of them do not have any logistics for transportation.

Table 15 List of resources reported in Waghemra phem system required for surveillance system at all levels Jul, 2017

		HOs including Zonal		HCs		HPs
S.N	**Materials needed**	**Zone office**	%		%	%
1	Electricity	4/4	Under 2 woredsa 3/10fac ilities	3/4		NA
2	Motor Cycle		3/4	1/4		NA
3	Vehicle		1/4	0/4		NA
4	**Communication**					NA
	Telephone (office,Cell)		4/4 office 1	3/4		Cell 4/4
	Fax		1/4	0/4		0
	Radio		0/4	0/4		0/4
	Computer with modem		0	0		0
5	**Education & communication material**					
	Posters		3/4		3/4	NA
	Mega phone		1/4		1/4	NA
	Flip chart		1/4		0/4	NA
	Projector		1/4		0/4	NA
	Screen		1/4		0/4	NA
6	**Data managrement**					NA
	Computer at PHEM office		3/4		0/4	NA
	Printer		4/4		4/4	NA
	Statistical package		3/4		0/4	NA
	Calculator		3/3		2/4	NA

Case definition

Case defininitions are basically used in different levels to Standard and community case definitions.

Anthrax; Any person with acute onset characterized by several clinical forms which are:

Community case definition: is sensitive than the standard and used to detect from community by health extension workers (HEWs)

Standard case definition

Cutaneous: skin lesion evolving over one to six days from a popular through a vesicular stage, to a depressed black Eschar invariably accompanied by edema that may be mild to extensive Systemic forms:

Gastro-intestinal: abdominal distress characterized by nausea, vomiting, anorexia and followed by fever pulmonary (inhalation): brief prodrome resembling acute viral respiratory illness, followed by rapid onset of hypoxia, dyspnea and high temperature, with x-ray evidence of meditational widening

Meningeal: acute onset of high fever possibly with convulsions, loss of consciousness, Meningeal signs and symptoms; commonly noted in all systemic infections and has an epidemiological link to confirmed or suspected animal cases or contaminated animal products.

Core functions

Case detection

Case detection is the first and crucial step of a surveillance system .This requires having and properly utilizing the case definitions of each priority diseases in the national and regional surveillance system .The case detection may have various steps and require multi level and team depending on the type of health event.

From 8 visited health facilities the standard case definition was found in 3/4 HPs, 2/4 HCs, at their OPD as well as office and 2/3Woreda and 1 Zonal health offices

Case registration for case registration, Clinical register availability and proper utilizations of the health facilities were assessed. All facilities responded that they use both phone and paper to communicate upper level .from the interviewed officers report, due to lack of phone network and transport reports delayed. Anthrax is a daily portable diseases but it is observed that the reports sent to next higher level weekly. The regular reporting means are phone and paper

Case confirmation

Three out of four (¾) of the Health center responded that the facility lab can handle biological specimens until referral to the next higher level however; materials need for transporting samples were not found in all health centers and also at the hospitals level.

Data management

As per the PHEM guide line data should be analyzed at all levels on a regular basis. The described in to time, Person and Place, trends monitored to detect out breaks, evaluate responses and effective prevention and control**.**

Table -16 Core functions of the Waghemra surveillance system Waghemra Amhara Jul2017

S.N	Variables	Health Offices				Health centers				Health posts				Total
		Gaz	Abergelle	Zikuala	Zonal Ho	Asketema	Nerwag	Tsitsika	Taba	Asketema	Marinet	Addisfire	Taba	
1	**Case detection**													
1.1	Case definition availability	**N**	**Y**	**Y**	**N**	**Y**	**N**	**Y**	**Y**	**Y**	**N**	**N**	**Y**	**(7/12)**
1.2	Proper used/posted	**Y**	**Y**	**N**	**N**	**Y**	**N**	**Y**	**N**	**Y**	**N**	**N**	**Y**	**6/12**
2	**Case registration**													
2.1	Clinical reg avail/Rumor log book	**N**	**N**	**N**	**N**	**Y**	**Y**	**Y**	**Y**	**Y**	**Y**	**Y**	**Y**	**(8/12)**
2.2	properly filled/rumor documented	**N**	**N**	**N**	**N**	**Y**	**Y**	**Y**	**Y**	**Y**	**Y**	**Y**	**Y**	**(8/12)**

3	**Lab capacity** * Sample collect & transp ,media and packaging availability bility	**N**	**N**	**N**	**N**	**N**	**N**	**N**	**N**	**NA**	**NA**	**NA**	**NA**	**0/8**
4	**Data analysis** *surveillance focal assigned	**Y**	**Y**	**Y**	**Y**	**Y**	**Y**	**Y**	**Y**	**NA**	**NA**	**NA**	**NA**	**8/8**
	*computer avail at PHEM office	**Y**	**N**	**Y**	**NF**	**Y**	**N**	**N**	**N**					**3/8**
	***Computer skill /training**													**8/8**
	***Data analysed & interpreted**	**N**	**N**	**N**	**N**	**N**	**N**	**N**	**N**	**NA**	**NA**	**NA**	**NA**	

Table 17 - Support functions of the surveillance system in waghemra zone Jul, 2018 Amhara Ethiopia

		HOs				**HCs**				**HPs**				
S. N	Support functions of the system	Zonal	Aber gelle	Gazgibi la	Zikua la	Asket ema	Nerw ag	Tsit sika	Taba HC	Asket ema	Marin et	Addis fire	T ab a	Total(H f,HO)
1	Availability Standards and Guideline	Y	Y	Y	Y	N	N	Y	Y	N	Y	Y	N	9/12
	CBR and other Formats	N	Y	N	Y	Y	Y	Y	N	Y	Y	Y	N	7/12
2	Training on surveillance /PHEM	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	N	11/12
3	Supervision *By higher level	N	Y	Y	Y	Y	Y	Y	Y	Y	N	Y	N	9/12
4	Feedback *Received from	N	Y	Y	N	N	N	N	Y	Y	N	Y	N	5/12
6	**Coordination** *****RRT & Epidemc control committee avail(Written plan)	**Y**	**N**	**N**	**N**	**N**	**N**	**N**	**N**	**NA**	**NA**	**NA**	**N A**	**1/8**

*key: N- not available

Y- available, NA –NOT applicable

System (Quality) attributes Assessment

The quality of the surveillance system are majorly evaluated in to Qualitative and Quantitative attributes. The attribute evaluation incorporated only the HCS and HOs .

Qualitative Attributes

The qualitative attributes are those parameters which cannot be assessed and expressed in numbers or cannot be quantified but described in terms of their respective standards however, subjected to the respondents' level of understanding and opinion.

Simplicity: The simplicity of the surveillance system was described by assessing the easiness of reporting formats to fill data for all health professionals, the time to fill the formats and the easiness of case definition (Anthrax) to detect cases.

At both facility and Health Offices level, we found that the case definition of Anthrax and priority diseases are simple to detect outbreak ,fill data on the formats of the system without complication with in10-15 minutes except 1 HC reported that < 5 minutes.

Acceptability: Health professional's awareness and willingness to use reporting formats and existing case definition to detect diseases is an indicator for acceptance of the system. All HOs and HCs use standard case definition to detect outbreaks of priority diseases. All 10 units except 2 health posts use standard outbreak reporting format however, awareness of the surveillance system of health professionals is believed as poor at 2 health centers and one district health office .

Usefulness: The usefulness of the surveillance system was assessed by the ability to early detect outbreaks, estimate the magnitude of morbidity & mortality with associated factor permit accurate prevention and control programs.

From the 4 HCs and 4 HO PHEM focal staff's ',4 of them evaluate the system as accurate for outbreak detection , is efficient in estimating the magnitude of disease morbidity, mortality and its associated factors and permit effective prevention and control assessment however, 4/8 them believe the opposite. The district office focals evaluated the usefulness of the system as poor.

Flexibility: Surveillance formats are described as flexible to accommodate other variable or use for other disease or new.

All Health Centers and HO focal staff's, of the surveillance system staffs of all 4 HCs, 4 HOs (8) responded that the formats used and the surveillance system can be adapted to any change whereas, all the HCs (4) believe these regardless of change in technology.

Representativeness: The representativeness of surveillance system was assessed by health service coverage, health service utilization (seeking behavior), enabled to follow health events, Urban VS Rural beneficiary, presence of all the socio demographic variables .As per the HCs and HOs focal response, the formats used in the surveillance system do not have sex and Age variables except for malaria reporting format .Health service coverage is also one of the main element which indicate the surveillance system represented the population under the system is by its service coverage based on this all HCs and woreda HOs were assessed and except one health center (86%)all of the respondents do not know the health service coverage of their catchment .

Stability: The existing surveillance system is not affected by restructuring or any other changes needed rather lack of resources interrupted the expected level of operation of the system.

Quantitative Attributes

These variables are those which can be expressed in number

Completeness & Timeliness: As per the guide line timeliness and completeness of the surveillance reports should be done regularly by all levels however, from the document review during the assessment the health centers did not evaluate the timelines and completeness of the surveillance reports of the health posts of their catchment .On the other hand, woreda health offices also expected to do timeliness and completeness of the health centers and zonal office for the woreda Hos. We found that Zonal Ho and only one Woreda Ho from three has done timeliness and completeness for their respective catchment

Sensitivity, Specificity, Predictive value positive since there was no laboratory diagnostic service to confirm the suspected cases sensitivity, specificity and predictive values need standard investigation method to confirm yet these variables was not evaluated in this study

Discussions

The main purpose of surveillance system is to timely respond to health events based on routinely collected data ,this can be achieved through coordination, availability of basic resources for operation and trained manpower .Moreover ,the understanding of the standard component and ease of operation of the system at all levels is not the same, resources availability also play a vital role .Especially, lack of resources like vehicle, budget, staff turnover, lack of training affected the efficiency of the surveillance system. The health centers have assigned focal person for every health posts to supervise weekly or bimonthly.

Resources/communication/ communication is the essential part of routine Communication channel is established with in the surveillance system.

Supervision and Feedback supervision and provision of feedback on the finding is one of the support functions that strengthen the surveillance system. At least Quarterly independent or joint supportive supervision to the system is expected to be conducted however, the regularity is compromised and also in some supervised sites feedbacks were not sent thus, the facilities or districts could not improve gaps identified.

Coordination At all level coordination for outbreak response and epidemic control is expected to be established as Rapid Response Team at both office and facility level and Epidemic committee

Case registration case registration is one of the core functions of surveillance system. In woreda health offices, rumor logs were not found as a result, rumor verification and outbreak investigation may be compromised since information documentation was not in place.

Case confirmation after case detection and registration confirmation is the third vital step core function of surveillance system .To confirm cases different approaches or steps is followed depending on the health event. For Amhara, the case confirmation by lab diagnosis is the responsibility of a national PHEM and national laboratory however, before lab confirmation with in facility a group of experts or RRT from higher level can verify the suspected cases with the standard case definition.

Timeliness: Timeliness is a crucial surveillance quality attribute to respond to emergencies and save life**.** Except Zonal and one Woreda health office timeliness of their respective catchments report was not done in the assessed other 3 offices and 4 HCs. Eventhoguh, it is immediately reportable diseases, timely s report was not found. In all reporting units, Anthrax cases have been reported weekly which is substandard to the national guide line that a single suspected/confirmed Anthrax case as an outbreak.

Completeness: As per the national guide line at HC and health offices completeness of the surveillance report should be regularly monitored and if gaps available through supervision and feedback the concerned body

Data analysis It is obvious that the purpose of surveillance data collection is to monitor trends of diseases and detect outbreak, respond control and prevent further distribution and recurrence this can be achieved through data analysis, interpretation and description to time, person and place. The case confirmation, sensitivity, specificity and positive predictive value are the major quality attributes.

Conclusion

Based on our assessment the Anthrax surveillance system of waghemra zone is weak that supervision and feedback are not conducted regularly. Case reporting is weekly and longer for distant facilities, case confirmation not available nationally. Timeliness and completeness of surveillance reports are not monitored at woreda and health center level.

Recommendation

We recommend the region and Zonal health office to supervise and provide feedback that gaps can be early improved. We also recommend RHO &ZHO to train the district focal persons on

monitoring of timeliness and completeness the surveillance system are essential parts of the system quality.

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CHAPTER FOUR
HEALTH PROFILE REPORT

4.1 Shashemene city Administration Health profile assessment Oromia, Ethiopia 2009 E.C

Abstract

Back ground: Community health assessment is a systematic examination of the health status indicators for a given population used to identify key problems and assets in a community. The assessment includes information on risk factors, quality of life, mortality, morbidity, community assets, and forces of change, social determinants of health and health inequity and the level of the public health system's essential services**.** The rationale to conduct Shashemene health profile was based on three months surveillance data on diarrheal diseases and malaria case trends increment.

Objective: To identify, prioritize and plan proper intervention action for prioritized major health problems of Shashemene Town.

Methods: We conducted cross sectional study design. We used standard checklist components composed of variables of status of community health service, available health services and service utilization .We reviewed published documents of the city, activity reports of different offices and interviewed key informants. We also conducted information on the town's historical background, Ethnic composition, Climate, Geography, Economic mainstay, available community health programs and major public health problems. We used Microsoft Excel to analyze quantitative data and presented in descriptive statistics.

Result: Shashemen city was established in 1911.It is politically administered under Oromia regional state and is the first grade cities in Oromia. Shashemene is 280 Km far from Addis Ababa, has 8 kebeles and 190,689 residents. The town has secured electric power supply in all villages and health facilities. The main income source of the town is trade and urban agriculture. We found 6 public, 3NGO, 120 private health Institutions. We found lack of Blood bank, Intensive Care Unit equipments, Beds for labouring mothers and Solid and liquid Waste Disposal system.

Conclusion: Essential health services and Sanitation are major public health problems identified. We recommend strong support and follow up for the basic health services to the health Bureau.

Key words: shashemene, assessment, profile, indicators, utilization

Introduction

Community health assessment is a systematic examination of the health status indicators for a given population that is used to identify key problems and assets in a community. It is a process that uses quantitative and qualitative methods to systematically collect and analyze data to understand health within a specific community. The assessment includes information on risk factors, quality of life, mortality, morbidity, community assets, forces of change, social determinants of health and health inequity and information on how well the public health system provides essential services [1]**.**

The ultimate goal of a community health assessment is to develop strategies to address the community's health needs and identified issues. A variety of tools and processed may be used to conduct a community health assessment; the essential ingredients are community engagement and collaborative participation.

Community health assessments use such principles as, multisector collaborations that support shared ownership of all phases of community health improvement, including assessment, planning, investment, implementation and evaluation ,Proactive, broad, and diverse community engagement to improve results. Community health assessment data inform community decision-making, the prioritization of health problems and the development, implementation and evaluation of community health improvement plans.

Rationale of the study

Eventhoghu health profile for Shashemene Town and the surrounding Woreda have been conducted earlier there the surveillance report showed that diarrheal diseases and malaria cases trends was increased within three months. In addition, Nutritional deficiency is one of the major problems frequently reported from West Arsi Zone[2]. Thus, based on this evidence it was mandatory to describe the current health status to identify major factors contributed to this problem .The purpose of this Assessment is to provide evidence and propose proper intervention program for the public health problem in shashemne Town.

Back ground of shashemene Town

Historical back ground

Shashemen city was established in 1911.The city administration acquired its name from a woman whose name was shashe .The woman settled in shashemene in the early 20th century. Her house was situated around the today's upper Alelu Shashe Museum**.** The woman provided catering service of Foodstuff's, Tella and Boka for the traders passing to through the city .It's from this woman name "mana shashe " in afan Oromo meaning house of shashe[3]**.**

Geography and climate

It is located at 7^0North and 38^0 south -37^0 east longitude in the main rift valley of Ethiopia at a distance of 250 KM south Finfinnee (Addis Ababa).It is surrounded by Towns in the North Arsi - Negelle, East kofale ,west Aje and south Hawasa. The land of the town stretched over 1858hectars.The climate of Shashemene falls in to three zones Dega, Kolla and Woynadega .It is altitude ranges from 1672 to 2722 meters above sea level. The temperature level ranges 12-28^0c .The yearly rainfall varies from 1500-2000mm.It also experience moderate temperature and rainfall.

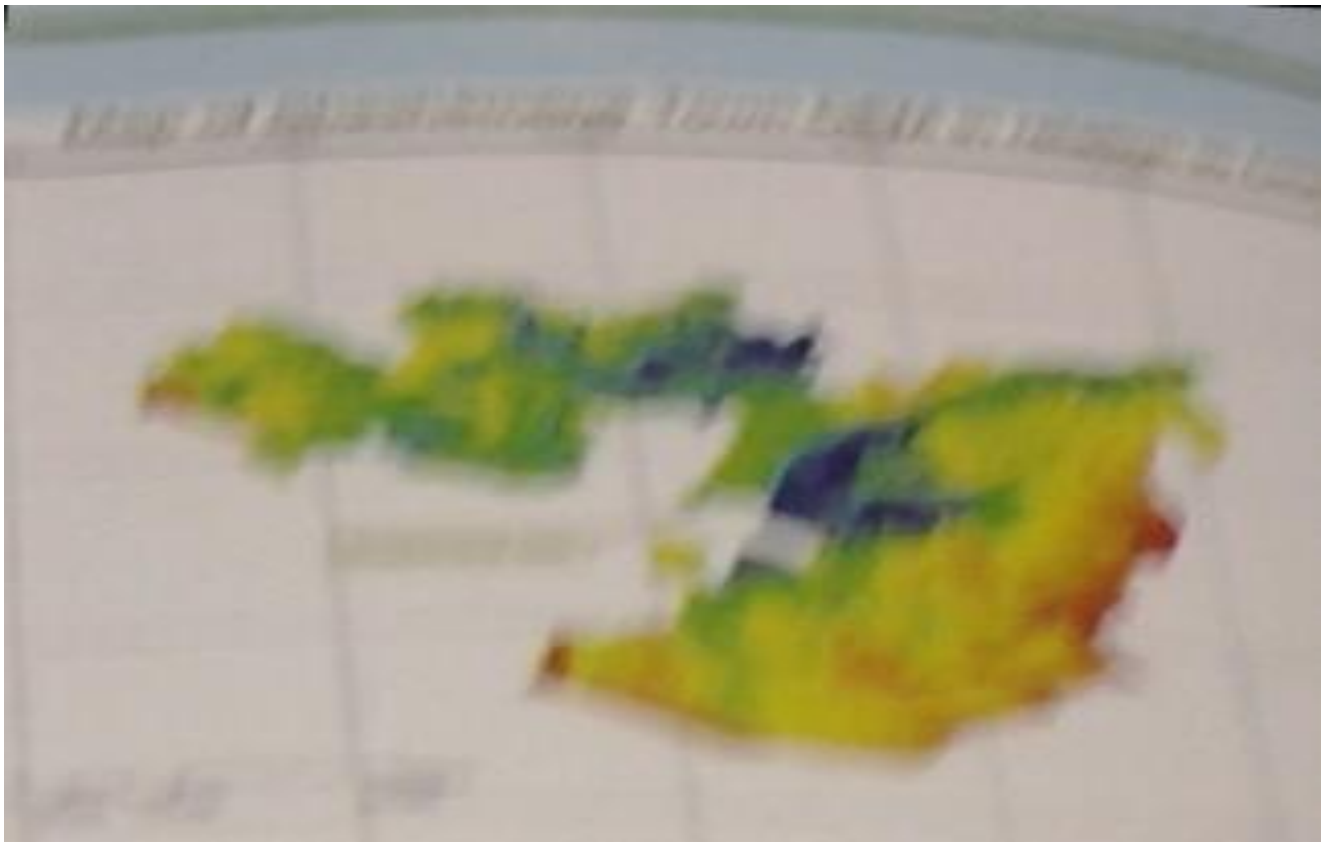

Fig 21 Map of Shashemene Town

Political and Administrative structure

Shashemene is politically it is administered under Oromia regional state. The town has taken reform and is the first grade cities in Oromia National state due to infrastructures like TVET implementation with government strategy.

Demographic back ground of shashemene Town

According to reports from the city Administration the number of residents in Shashemene town in 2009 is about 190,689 .It has 8 kebeles and the number people living in each kebele showed by the following Figure. There are five large ethnic groups namely Oromo, Amhara, Welayita, Kambat and Soddo Gurage.

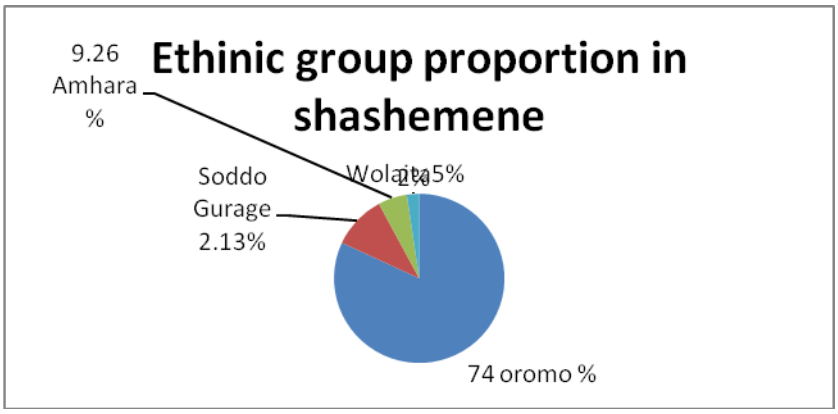

Fig 22- Proportion of Ethnic groups in shashemene Town 2009 E.C Oromia, Ethiopia

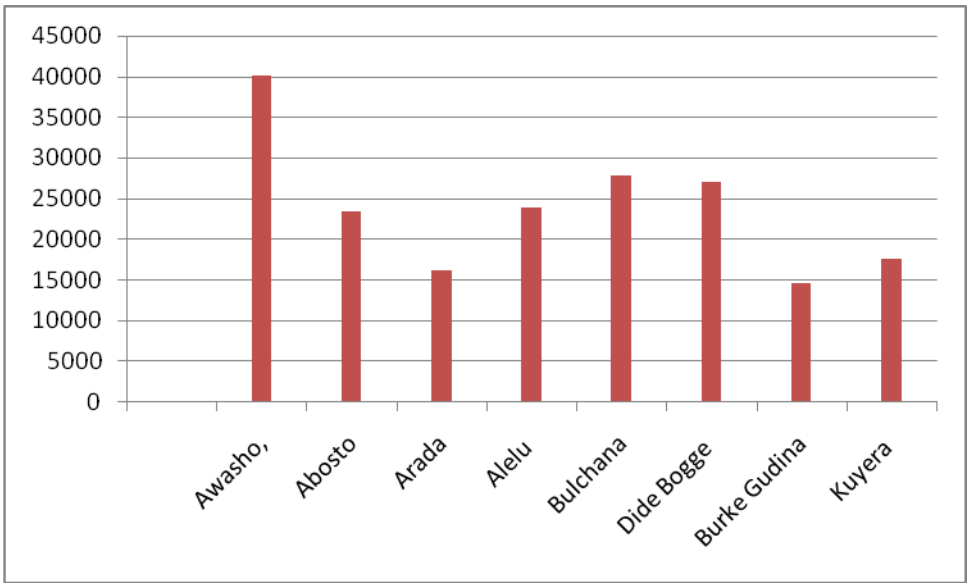

Fig 23 population distribution of Shashemene Town by kebele 2009 E.C Oromia, Ethiopia

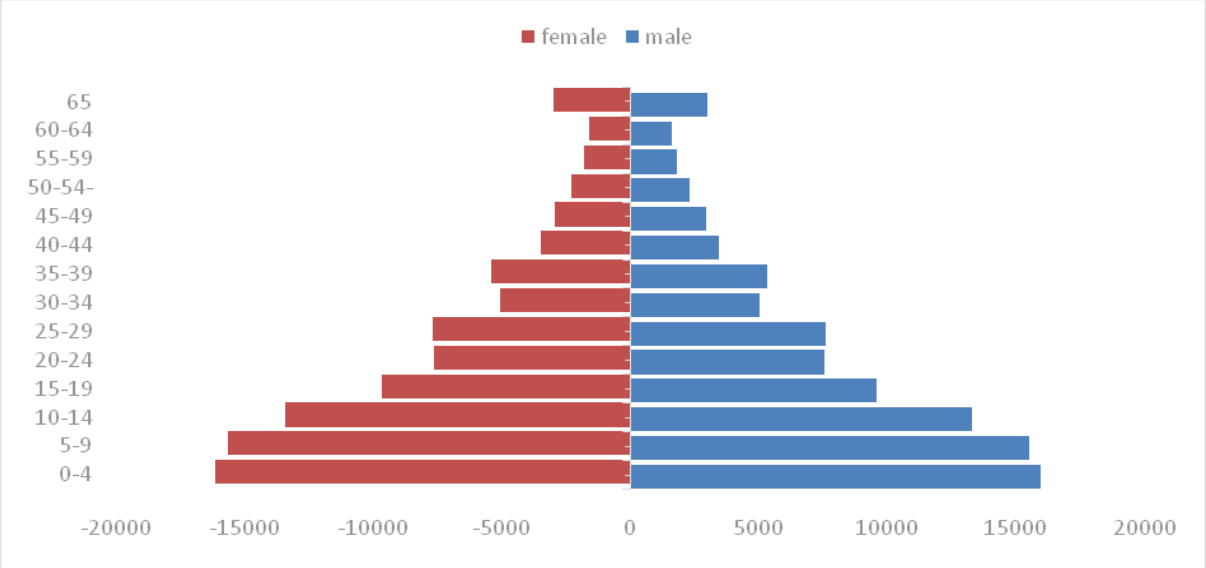

Fig 24 -population Pyramid of Shashemene Town Oromia, Ethiopia Mar, 2017

Infrastructure and main stay of Economy

Infrastructure

Main Road is Asphalt and the other roads between the villages are coble stone.

Power supply: the town has secured power supply in all villages and health facilities.

Education and School

Table Types and level of school in Shashemene Town administrative oromia, Ethiopia Mar, 2017

	Level of school	**KG**	**Elementary**	**High school**	**TVET school**
1	Private	**62**	**53**	**13**	**10**
2	Public	**0**	**11**	**6**	**1**
3	total	**62**	**64**	**19**	**11**

Total number of students at TVET level was **4106**

Educational level data could not be found but the number students in the school in 2009 can be described.

Economy main stay

The main income source of the town is trade and urban agriculture.

Objectives

General Objective

To assess the health profile of Shashemene Town

Specific objectives

- To describe the health status of Shashemene Town
- To identify major public health problems of Shashemene Town
- To prioritize health problems in Shashemene Town
- To plan proper intervention action for prioritized community health problems

Methodology

Study area

Shashemene town which the back ground is described in the introduction part.

Study design

We used Cross sectional study design will be used by reviewing documents and interviewing officers from health facilities, health offices and other concerned organizations to assess the health status of the town by using standard health indicators for the health profile.

Study period

The study period is from Mar 15- May, 2017

Study population

The study population is people who are living in the Shashemene town and use health service in the shashemene town.

Source population

All people who visited the health facility and used the health services in the health facilities of shashemene town

Study subject

The study subjects were shashemene town health office, health facilities (Hospitals and Health centers

Sampling method and Sample size

We collected all relevant reports, published data and other sources which indicate the health status and contributing factors for the health status of the community in shashemene town.

Variables

Health system indicators

Health Services

- Types and numbers of health institutions
- Types and numbers of health professionals
- Health institution to pop ratio
- Health professional to pop ratio
- Health service coverage
- Top and leading causes of OPD visit
- Top and leading causes of Admission and death
- Health budget allocation

Health service utilisation status of Primary health care

- Contraceptive Prevalence rate
- ANC rate
- Health facility delivery
- Post Natal Service Utilization
- Immunisation Coverage

Status Community Health care

CHWs, TBAs HEW/HEPs responsibility

Data Analysis

We used Descriptive statistics to present the health status of Shashemene Town

Result

Health services

Table 18- Types and numbers of health institutions in Shashemene town 2009 E.C

S.N	Types of health Institutions	Public	private	NGO	Beds
1	Hospital	2	1	0	233
2	Health Center	4	0	1	
3	Clinics all types	0	52	2	15
4	Drug store Pharmacy		64		
5	Diagnositic lab	0	1		

Health Institution to pop ratio

Health Institution to pop ratio for the Referral Hospital is 1.5-2million, for District Hospital 1.5 million and for Health Center40, 000.

Health professionals to pop ratio

In shashemene town Doctor to pop ratio is **1:40,000**, Nurse to pop **1:5,000** and Health extension professionals to pop ratio is **1:500**

Health service coverage

The Health service coverage report from the Town health office is based on health centre and 71. 7%

Top and leading causes of OPD visit

Table 2.3 Top causes of Morbidity in Adult Shashemene town from 2008-2009 E.C Shashemene Oromia, Ethiopia

S.N	Diseases	2008 Number of people affected	Diseases	Number of people affected 2009 6 (months)
1	**AFI**	1, 9071 (23.89%)	**AFI**	13,608 (31.86%)
2	**UTI**	9586 (12%)	**Dyspepsia**	7709 (12.38%)
3	**Dyspepsia**	8673(10.86%)	**UTI**	6848 (11%)
4	**Pneumonia**	7781 (9.75%)	**Pneumonia**	5637 (9.05%)
5	**Trauma**	6820 (8.54%)	**Acute URT**	5612 (9.01%)
6	**Mental and behavioral disorders**	5942 (7.44%)	**Trauma**	5472 (8.79%)
7	**Acute URT**	5615(7%)	**Skin and subcutaneous tissue infection**	5068(8.14%)
8	**Epilepsy**	5500(6.89%)	**Epilepsy**	4332(6.96%)
9	**Helminthiasis**	5452(6.83%)	**Mental and behavioral disorders**	4108(6.6%)
10	**Skin and subcutaneous tissue infection**	5396 (6.76%)	**Helminthiasis**	3861(6.2%)

Table-19 Top causes of Morbidity in under 5 2009 E.C shashemene, Oromia Ethiopia

S.N	Diseases	2008 Number of people affected	Diseases	2009 Number of people affected
1	Pneumonia	4179 (19.24%)	Pneumonia	3852 (20.92 %)
2	Acute URT	4139 (19.05%)	Diarrhea (non bloody)	3517(19.1%)
3	Diarrhea (non bloody)	3979(18.32%)	Acute URT	3018(16.39%)
4	AFI	2778(12.79%)	AFI	2948(16.01%)
5	Skin and subcutaneous tissue infection	1783 (8.21%)	Skin and subcutaneous tissue infection	1580(8.58%)
6	Helminthiasis	1289(5.93%)	Otitis	1300(7.06%)
7	Otitis	1214(5.859%)	Helminthiasis	666(3.62%)
8	Diarrhea with dehydration	833(3.83%)	Diarrhea with dehydration	566(3.07%)
9	Severe acute Malnutrition	804(3.7%)	Severe acute Malnutrition	487(2.64%)
10	Other unspecified disease of the eye & adnexa	725(3.34%)	Trauma	482(2.62)

Admission and death

Table. 20 Top causes of Mortality in 2008-2009 E.C shashemene Town, Oromia, Ethiopia

S.N	Name of diseases	2008	Name of diseases	2009(6month)
1	Neonatal sepsis	21(27.63%)	Neonatal sepsis	13 (28.89%)
2	AIDS	13(17.11%)	TB	7 (15.56%)
3	TB	9(11.84%)	Diabeteus Mellitus	5 (11.11%)
4	Pneumonia	7 (9.2%)	Prematurity	5 (11.11%)
5	Anemia	5 (6.58%))	Cirrhosis	3(6.67%)
6	Cirrhosis	5 (6.58%)	Intestinal Obstruction	3(6.67%)
7	Diabetes Mellitus	4 (5.26%))	Peptic ulcer	3(6.67%)
8	Hypertension	4 (5.26%))	Congenital malformation	2(4.44%)
9	Intestinal Obstruction	4 (5.26%))	AIDS	2(4.44%)
10	Prematurity	4 (5.26%)	Hypertension	2(4.44%)

Health budget allocation

From a budget allocated for Shashemene Town in 2009 E.C 157,275,912.00 from government and 13,123,313.00 from Non-Governmental Organization. The budget allocated for Shashemene referral Hospital is 29,049,118.00from government and 405,709+610,526 from NGO and for Melka Oda hospital is 22,425,516.00.Atotal of 222,890,094 ETB was allocated for health in 2009E.C .The programs for which the budget allocated was:

- Anti Malaria school club
- Promotion and provision of health education for Commercial Sex Workers
- STI and Behavioral change
- AWD active case search
- VCT catch up campaign

- Training on life skill
- Measles vaccination

Disaster situation in the town

There was a land slide in Shashemene town in the past one year .No severe injury or death reported .In 2009, AWD 187 cases outbreak was reported with one death. Most cases are residents from surrounding west Arsi woreda and SNNP.

Status of Primary health care (Health service Utilization)

ANC Utilization

We found from the 6 months report that 7559 pregnant mothers at least visit once for Antenatal Care and 3128 used at least four visits of the ANC.

Postnatal utilization

Postnatal utilisation in shashemne town in 2009 was 2,904 mothers visited within 0-2 days, 238 from 2-3 days and 4-6 days 101 mothers visited.

Family Planning

We were not able to calculate Contraceptive prevalence but Contraceptive acceptance rate was 28803 in 2008 and in 15241 in 2009(6 Months)

Immunization coverage

As per the report from the zonal health office, the immunization coverage for the 2008 is 100% .and for 2009(6 months) report was 99 %.

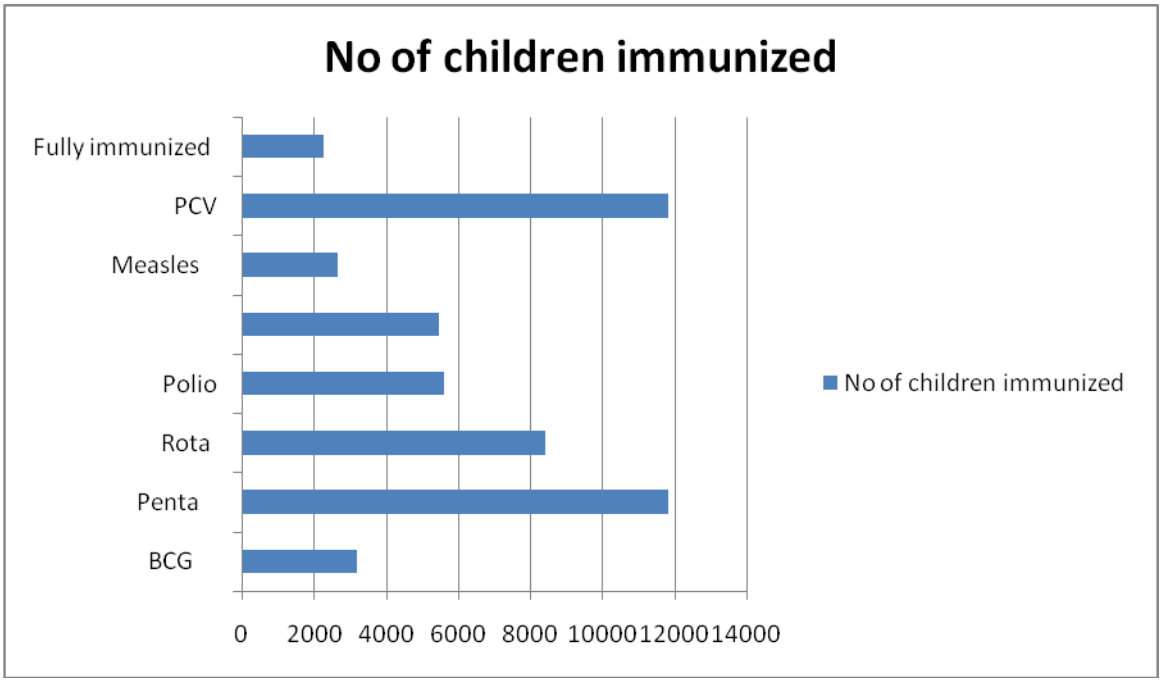

Fig 24- All ages immunized at shashemene Town health facilities 2009 E.C Oromia Ethiopia

The achievement of planned target for each of the above antigens of vaccine is > 100 in the midyear 2009 E.C.

Environmental Health and sanitation

Shasheemene town health office Environmental and sanitation program has reported a

Latrine coverage 98% in the shashemene town and utilisation rate was not assessed in 2009 E.C. The mail source of water supply to the town is Usha river, well water, Jigessa and seasonal to rain fall Essa river.

Safe water coverage

According to the Water service authority shasheemne district report total safe water coverage for the town is approximately 40-50%.The quality of water provided for the area under coverage is 98-99%.

Health Education,

Health education has been carried out as one of the prevention program and the topics were family program, solid and liquid waste management TB, STI, HIV/AIDS, latrine usage and construction.

Endemic diseases (Malaia, TB HIV)

TB is one of the endemic diseases reported in Ethiopia however, in the health office complete and detail information on the Types and forms of TB cases was not found.

Malaria

From the Town, 4 kebeles are malarious and 19,800 people are at risk of acquiring malaria from their locality. Based on this factor the office had conducted ITNS distribution and the coverage was 100 %

HIV/AIDS

Table.26 Testing Services and reports available for HIV AIDS in Shashemene Town Administration in 2009 E.C

Programs	2008	2009 (6months) N	Achievement (%)
VCT	1146	3124	>100
PICT	9293	8296	>100
PMTCT	18176	7034	>100
HIV PREV	1.48	Unknown (midyear)	
INC/NEW	1.3	Unknown(midyear)	
PREART	384	157	81
ON ART	3762	3783	>100

Nutrition

From the nutrition packages the health office of shashemene town is undergoing two programs one is tablisisation (SC) centre and two outpatient therapeutic centre (OTP).The SC is found in the referral hospital .the referral hospital is a catchment for West Arsi woreda and surrounding SNNP woredas but the size of SC is not sufficient to accommodate the cases.

Essential drugs

There were minimum essential drug stocks found at the Shashemene health office during the assessment period .In addition, Hospitals have also their own stock of but data could not be found.

Table 27 list of essential drugs at Shashemene health office 2009 Oromia Ethiopia.

Essential drug availability	Quarter 1	Quarter 2	2009 total (6months)
Amoxicillin Tablet /pk of 500	18	18 pk of 500	36 pk of 500
Oral Rehydration Salt / sachet100	19	19 sachet100	38 sachet100
Artemisia / Lumphantrine /pk/100	15	16 pk/100	31 pk/100
Mebendazole Tablets / pk of 100	15	15 pk of 100	30 pk of 100
Tetracycline Eye Ointment/pk of 100/pieces or tube	19	18 pk of 100/pieces or tube	37 pk of 100/pieces or tube
Paracetamol /Pk 1000	18	18/pk 1000	36/pk 1000
Rifampicin / Isoniazid / Pyrazinamide / Ethambutol /pk 500	19	17/ pk 500	36/ pk 500
Medroxyprogesterone (depo)Injection /pk of ampule /100	16	16/pk of ampule	32/pk of ampule
Ergometrine Maleate Tablets /pk1000	12	17/100	29/100
Ferrous Sailt plus Folic Acid / pk of 200	12	11 pk1000	23 pk1000
Pentavalent DPT-Hep-Hib Vaccine /pk of 10bottles	18	18 pk of 200 bottles	36 pk of 200 bottles
Zinc	17 pk 10	18 pk 10	35 pk 10
Gentamycin injection	14/pk 100	16/pk 100	30/pk 100

Community health service (HEP)

From community health service components the Shashemene town uses the Health extension professionals package .They are responsible for health education community based surveillance and environmental health sanitation activity promotions.

Summary of Assessment finding and discussion

After assessment finding we summarized, rated by using list of criteria as resources cannot allow all to do at the same time .The health office team has discussed and rated based on their

plan and priority. After comparing our rate and the HO team we reviewed and used average of both and public health importance and severity of the problem by professional judgment.

Criteria for prioritizing problems

S.N	List of Criteria's	Rating scale		
		1	**2**	**3**
1	Relevance	Not relevant	Relevant	Very -relevant
2	Avoidance of duplication	Sufficient information already available	Some information available but major issues not covered	No sound information available on which to base problem-solving Urgency
3	Urgency of data needed (timeliness)	Information not urgently needed	Information could be used right away but a delay of some months would be acceptable	Data very urgently needed for decision-making
4	Political acceptability of study	Topic not acceptable to high level policymakers	Topic more or less acceptable	Topic fully acceptable
5	Feasibility of study	Study not feasible, considering available resources	Study feasible, considering available resources	Study very feasible, considering available resources

6	Applicability of results	No chance of recommendations being implemented	Some chance of recommendations being implemented	Good chance of recommendations being implemented
7	Ethical acceptability	Major ethical problems	Minor ethical problems	No ethical problems

The team from concerned sectors of the problems were presented with the finding and oriented for rating with the following procedures. After discussion with the team

Nominal group tools (NGT) to prioritize identified problems

- Individual listing of ideas on paper.
- Display of lists produced, followed by discussion.
- Voting and ranking.
- Summarizing the results and ranking.
- Discussion of the results.
- Second vote and re-ranking.

We based on priority setting criteria's and used the NGT tool. Major health problems identified as priority and developed action plan with responsible person

Conclusion and recommendations

Conclusions were summarized as major problems and recommendations were included in the summary of action plan presented.

Conclusions (Identified problems)

Theme	Type	Specific gaps identified	Place	Rate/Remark
Sanitary	Facility /Infrastructure	1 Liquid and solid waste management (collection-Disposal/Septic tank of two Keble's found at Condominium 2Latrine leakage of West Arsizone Prison 3-upgrading of B-type Health center to A-type	Focal persons at Health Office	
Service		4No sufficient Bed for laboring mothers at all Health Centers 5Blood transfusion service and demand imbalance at both Hospitals 6 Oxygen concentration Trained man power for premature neonates and malnourished children Orthopedic service	HO by Focal person Both hospitals Ref. hos Melka Oda Hos	
Endemic diseases /health event	Prevention programs	7 HIV transmission prevention /Behavioral change programs by religious leaders 8- Dysentery 9-referred case Injury of car accident /violence	Focal persons at HO Melka Oda Hos	

Nutrition		9- Screening centers(SC)SAM children are not sufficient 10- Supplies and drugs supplied by Unicef are not sufficient patients are obliged to buy (antibioticsGenat, Ceftriaxone (Vit A, Iron, Folic Acid) are insufficient for	Referral hospital	
Equipment		11- Neonatal ICU upgrade /equipment's Adult ICU ,NG tubes		

Prioritized and rated by Nominal group discussion by HO team

Theme	Type	Specific gaps identified	Place	Rate/Remark from health office
1-Sanitary	Facility /Infrastructure	1 Liquid and solid waste management is poor (collection-Disposal/ Septic tank of two Keble's found at Condominium was not sufficient to accommodate the disposals 2 Latrine leakage of West Arsi Prison 1 zone 3- Neonatal ICU upgrade 4-upgrading of B-type to A- type	Focal persons at Health Office	3
2-Service		5Bed for laboring mothers at all Health 2 Centers 6Blood transfusion service and demand imbalance 7 Oxygen concentration Trained man power for premature neonates and malnourished children Orthopedic service	Health Office By AtoArarsa Both hospitals CEO and medical director of Ref. hospital and Melka Oda	**2**
3- Endemic diseases	Prevention programs	8 HIV transmission prevention /Behavioral change programs by religious	Focal persons at Hospital	**5**

/health event		leaders 9- Dysentery 10-referred case Injury of car accident /violence	Melka Oda Hospital	
4- Nutrition		11- Screening centers(SC)f SAM children are not sufficient 12- Supplies and drugs supplied by Unicef are not sufficient for patients are obliged to buy but they are not capable economically. (antibiotics Gentamicin, Ceftriaxone (Vit A, Iron, Folic Acid) are insufficient for severe malnourished cases	Referral hospital nutrition focal person	**4**
5- Equipment		13-NICU and Adult ICU equipment ,NG tubes	Ref Hosp medical director	1

Gap Identified: 1 West Arsi Zone Prison Latrine leakage with in the compound and surrounding rural kebeles

Note: This is a very serious public health problem risk to Outbreak of AWD thus, it needs immediate action.

2-Insufficient Septic tank of two Keble's found at Condominium cannot accommodate the disposals from the village.

Poor Liquid and solid waste management (From Collection to Disposal)

Table 2.8 Action plan for gaps identified Shashemene Oromia, Ethiopia Mar, 2017

S. N	Theme Intermediate goal	Objectives	Tasks	Responsibility	Timeline	Evaluation
1	Improving Environmental sanitation at west Arsi Zonal prison	To construct new latrine with standardized sewage disposal system	Communication of concerned persons (bodies) Writing Proposal for finance Requesting for Budget Constructing the Latrine	Federal and Oromia Prisons management, Oromia Health Bureau with development partners and MOH WASH team	Oct - Dec,2017	Communication with OHB,ZHO and West Arsi prison about the accomplishment of the proposed project
2	**2.1**Improving Environmental sanitation at condominium by standard liquid waste disposal system	Providing appropriate size Septic tank waste disposals for the two Keble's found at Condominium	Construction of proper sewage system and provision of appropriate size septic tank in the localities (condominium) identified to have a	Shashemene Town Municipality (Administration) ,Oromia Health Bureau, Any organization with WASH project development	Oct-Nov,2017	Sufficient size of septic tanks after November at condominiu

			problem	partners		m sites
	2.2 Insufficient tank for solid waste disposal	Providing appropriate number of solid waste disposal containers				Sufficient number of solid waste disposal tanks after November
	2.3 Poor Liquid and solid waste management	-Segregation of liquid and solid wastes	-Zonal health office will plan for the nd responsible person to coordinate training	Shashemene Town Municipality (Administration) ,Oromia Health Bureau,	Oct-Nov,2017	
	2.4 Insufficient manpower for collection and disposal of solid wastes	To assign sufficient manpower for waste disposal in shashemene Town	-Training health extension workers on waste segregation -Providing training and/or orientation through HEW to the community solid and liquid waste segregation	Any organization with WASH project development partners		Proper waste disposal after November

			Communication (discussion)of zonal and regional Health Bureau Assessing the number of manpower needed Request for budget for hiring sufficient manpower			On time collection and disposal of wastes at shashemene town November

Gap Identified: Lack of Blood bank service the town and Blood for donation are coming from Adam, Woliso and Goba Hospitals. It is not balanced with the services provided in the Melka Oda Hospital. Referrals in the hospital are laboring mothers and injured orthopedic service needy cases .Laboring mothers which can safely deliver in the Hospital will be referred to Hawasa due to insufficient blood donation service.

Action plan

	Theme **Intermediate goal**	**Objectives**	**Tasks**	**Responsibility**	**Timeline**	**Evaluation**	
3	**Expansion of blood bank Service**	To provide Blood transfusion service at Shashemene Town	Proposal writing for constructing the Center Requesting for budget Constructingthe Blood Bank Center	Oromia Health Bureau National Blood Bank, FMOH, with development partners	**Oct – June, 2018**		

References

1 Community health assessment for population health improvement an introductory guide for the family health nurse in Europe

2 Shasemene Administrative Bullet: Shashe

3 Shashemene Town Health office HMIS report2016, 2017

4 Interview from respective offices

5 Review of Annual reports (2008 and 2009 E.C) 2017

CHAPTER FIVE

EPIDEMIOLOGIC PROJECT PROPOSAL

5.1 Evaluation of accuracy of malaria laboratory surveillance in Gambella region of Ethiopia by comparing rapid test kits reports against Microscopic and Molecular Methods

Abstract

Back ground: Malaria is a life-threatening diseases caused by Plasmodium species parasite infection through a bite of female Anopheles Mosquitoes. Malaria is under National Integrated Disease surveillance System in Ethiopia. Malaria has been diagnosed with different laboratory diagnostic methods in different levels of health facilities. The Health post level malaria diagnosis quality is not monitored as other laboratory diagnosis with External quality Assessment. In Gambella, Malaria transmission is throughout the year .We selected Gambella for the stable sample and parasite availability. The purpose of this study is to evaluate the accuracy of malaria diagnosis at health post level.

Methods: We will conduct Institutional based cross sectional study design by collecting blood samples of patients tested at health post level and compare with Gold standard Microscopic and Molecular LAMP by experts .We also use standard checklist to assess the three cycles of testing process and personnel competency of Health extension workers .

Result: result will be presented in dummy tables in Two phases: **Phase I**- Comparison with microscopic Method, personnel competency .**Phase II**: Comparison with molecular method LAMP.

Introduction

Malaria is a life-threatening diseases caused by Plasmodium species parasite infection through the bite of a female Anopheles Mosquitoes **[1**].It is a leading cause of morbidity and mortality in Ethiopia, and therefore reportable under Integrated Diseases Surveillance System (IDSR) with weekly reporting within the Public Health Emergency Management (PHEM) System. Treatment and diagnostic guide lines were developed to provide quality service at all level. Currently, Ethiopia has targeted to eliminate malaria in 2030.The aim of the elimination phase is to stop local transmission of malaria, in contrast to the control phase, in which the objective is to reduce the number of cases to low levels but not necessarily interrupt local transmission. **[2**].Responsive surveillance systems are critical for the success of malaria control and elimination].Improved surveillance for malaria cases and deaths helps to determine which areas and/or population groups are most affected and enables effective monitoring of changing disease patterns. Strong malaria surveillance systems also help countries design effective health interventions and evaluate the impact of their malaria control programmes **[3**]. The objective of malaria surveillance system in the elimination phase is to detect all malaria infections, whether symptomatic or not, and ensure that they are radically cured so early that they do not generate secondary cases **[2**].

Rapid and effective malaria diagnosis not only alleviates suffering but also decreases community transmission. The nonspecific nature of the clinical signs and symptoms of malaria may result in over-treatment of malaria or non-treatment of other diseases in malaria-endemic areas, and misdiagnosis in non-endemic areas **[4].**WHO recommends that malaria case management be based on parasite-based diagnosis in all Cases **[5]** Prompt and accurate diagnosis is critical to the effective management of malaria**. [6].** The global impact of malaria has spurred interest in developing effective diagnostic strategies not only for resource-limited areas where malaria is a substantial burden on society, but also in developed countries, where malaria diagnostic expertise is often lacking **[7, 8]** Malaria diagnosis involves identifying malaria parasites or antigens/products in patient blood. The use of antigen detecting rapid diagnostic tests (RDTs) forms a vital part of this strategy, forming the backbone of expansion of access to malaria diagnosis by providing parasite-based diagnosis in areas where good quality microscopy cannot be maintained**.** In the laboratory, malaria is diagnosed using different techniques. conventional microscopic diagnosis by staining thin and thick peripheral blood smears **[9],** other concentration techniques, quantitative Buffy coat (QBC) method **[10],** rapid diagnostic tests and molecular diagnostic methods, such as polymerase chain reaction(PCR) **[11,12]**

The Conventional microscopic or parasitological diagnosis using stained thin and thick peripheral blood smears (PBS)using Giemsa, Wright's, or Field's stains **[13]**used at health center and hospitals where trained Microscopist and laboratory science professionals operate. This method remains the gold standard for malaria diagnosis although it requires a trained professionals, sensitivity and specificity vary compared with recent technical advances, it is inexpensive and reliable **[10]**.

Rapid diagnostic tests (RDTs) since the World Health Organization (WHO) recognized the urgent need for new, simple, quick, accurate, and cost-effective diagnostic tests for determining the presence of malaria parasites, to overcome the deficiencies of light microscopy, numerous new malaria-diagnostic techniques have been developed**.** This in turn, has led to an increase in the use of RDTs for malaria, which are fast and easy to perform and do not require electricity or specific equipment **[14]**.

The Loop Mediated Isothermal Amplification (LAMP) technique is simple and inexpensive molecular malaria-diagnostic test that detects the conserved 18S ribosome RNA gene of P. falciparum. Other studies have shown high sensitivity and specificity, not only for P. falciparum, but also P. vivax, P. ovale and P. malariae. These observations suggest that LAMP is more reliable and useful for routine screening for malaria parasites in regions where vector-borne diseases, like malaria, are endemic. LAMP appears to be easy, sensitive, quick and lower in cost than PCR. However, reagents require cold storage, and further clinical trials are needed to validate the feasibility and clinical utility of LAMP **[15]**.

The health service delivery system in Ethiopia is organized in a four tier system. The most peripheral level is the health post staffed by frontline health workers. Laboratory based diagnostic facility is available at all levels of the health care delivery system except at health posts.**[11]**.Access to microscopy services for diagnosis of malaria is very limited in rural areas of Ethiopia. For this reason, the use of rapid diagnostic tests (RDTs) by health extension workers (HEWs) at community level has been common practice since 2005**[12].** Diagnoses with RDTs, Related guidelines on diagnosis quality assessment and quality control for both malaria microscopy and RDTs have been developed but have not been rolled out **[13].**

Statement of the problem /rationale

Treatment and diagnostic guidelines were developed to provide quality service at all levels. The verification of quality laboratory services is broadly addressed by LQMS and specific to testing by the internal and external quality assessment program .The EQA program is currently expanded for 27 tests to over165health facilities from national reference lab to Health center as National External Quality Assessment (NEQAS) and Regional External Quality Assessment (REQAS) program. The parasitological Malaria diagnostic test is one of the EQA included laboratory tests however, the serological malaria diagnostic RDT, conducted at health post level was not included in the program.

Despite the absence of lack of accuracy of monitoring program (EQA) at health post level, the personnel competency of HEWs to provide the test service, availability of the service and the performance characteristics of the RDTs all determine the accuracy of malaria surveillance system **[13].**

The health post level diagnosis of malaria surveillance system is functioning with health professionals which do not have laboratory science back ground .In addition, the undergoing External Quality Assessment (EQA) in a Laboratory Quality management system (LQMS)

program was not included at the health post level .As a result, the accuracy of the malaria diagnostic service was not evaluated and status is not known. Evaluating the quality of RDTs only indicate the accuracy level of the devices however, the accuracy of the laboratory surveillance system can be affected by the comprehensive diagnostic service of the health post which include the resources, facility , training, and competency of the HEWs.

Gambella is one of the highest malaria endemic regions with consistent transmission throughout the year .We selected the region for its high volume of malaria and it enables to collect sufficient malaria positive sample size in all seasons.

This study evaluates the laboratory based malaria surveillance at the health post level by measuring the accuracy of the diagnostic service. The purpose of conducting the study is based on the evidence that comprehensive evaluation of malaria diagnostic service is representative of the laboratory based malaria surveillance system evaluation at the health post level .This study result will provide evidence to the national EQA program on the type of EQA program to be implemented and to PHEM accuracy level of malaria surveillance at the health post level. These evidence will help the decision makers to the type of EQA to be employed, gaps on the service

Literature review

A study at Bhutan Nigeria from July to December, 2013,used microscopy as the 'Gold Standard' showed that Seventy (70%) of the subjects tested malaria positive for stained film microscopy while the RDT kits- SD-Bio line, First Response, Care Start Pf/pan and AconPf/pan showed positive results of 72 (72%), 72 (72%), 67 (67%) and 67 (67%) respectively. The Performance characteristics of the RDT kits, SD Bio line, First Response, Care Start Pf/ pan and AconPf/pan kits were sensitivity- 98.6%, 98.6%, 92.9% and 92.9%, specificity- 90.0%, 90.0%, 93.3% and 93.3%; test accuracy 97%, 97%, 92% and 92%; positive predictive value- 95.8%, 95.8% , 97.0% and 97.0%; Negative predictive value96.4%, 96.4%, 84.4% and 84.4**% [16] .**

A study conducted to evaluate Paracheck-pf® Test Versus Malaria Microscopy in Arbaminch Zuria Woreda of South Ethiopia by Hussein .M, Moges .K, Amha K, showed that out of 1293 examined blood films, 400(31%) were found to be malaria positive. Considering microscopy as the gold standard, Paracheck-pf showed sensitivity of 94.1 %(95%CI: 89.9–98.3%) and specificity of 80.0% (95%CI: 67.6–92.4%). The positive and negative predictive values were 93.3 %(95%CI: 88.8–97.8%) and 82.1% (95%CI: 70–94.1%), respectively **[17].**

A study conducted on the laboratory capacity assessment for the diagnosis of malaria to diagnose Malaria in Oromia region of Ethiopia on microscopy and RDTs for malaria diagnosis. The assessment also incorporated Quality assurance and showed that None of the surveyed laboratory facilities had formal QA or QC protocols for either microscopy or RDTs ,in assessed health posts, registers or record books for recording malaria RDT test results were available in eight (73%), the mean monthly number of clinical malaria cases seen was 75 per health post, of which a mean 57 (76%) were tested by RDTs**,** Standard Operating Procedure (SOPs) for malaria blood film preparation and reading was observed in four (7%) facilities and none had SOPs for use of RDTs, Bench aids for malaria microscopy were available in eight (14%) facilities; none had bench aids for RDTs, QA protocols were lacking in all health posts surveyed, but in four health posts, HEW's re-read each other's RDTs for QC. No samples tested by RDT were submitted to a RRL for QC in any form nor were records kept at health posts showing internal QC. External supervision (done by ZHO and DHO) in the last 6 months was reported by all health posts; visits included review of RDTs in seven (64%) health posts, of which 4 received feedback on their performance from the supervisor. None of the health posts had SOPs or bench aids **[18].**

A study on Evaluation of light microscopy and rapid diagnostic test for the detection of malaria under operational field conditions done by Tekola Endeshaw et.al indicated that the prevalence blood slide microscopy overall was 4.1% (95% CI 3.4 – 5.0%) and by Para Screen RDT was 3.3% (95% CI 2.6–4.1. The prevalence of malaria parasites by blood slide microscopy was higher than prevalence by ParaScreen RDT in Amhara (P = 0.001) and lower than RDT in Oromia (P < 0.001). There was no statistically significant difference between the two diagnostic methods in SNNP (P = 0.3) **[19].**

Objectives

General objective

To evaluate the accuracy of malaria laboratory based surveillance at health post level in Gambella region. The performance of RDTS compared against gold standard by assessing sensitivity, specificity, Positive Predictive Value, Negative Predictive Value and rapid test performance skill of Health professionals

Specific Objectives

- To evaluate the performance characteristics of malaria RDTs at the health post level in Gambella region .
- To evaluate the malaria testing process at health post level in Gambella region
- To evaluate the personnel competency of malaria RDT of Health Extension Workers in Gambella region.

Methods

Study area

The study area will be in Gambella region. Gambella has six Zones and 19 woredas .The controls will be from non Malarious region area Addis Ababa

Study design

Institutional based cross sectional study design will be used**.** The study site will be randomly selected **.**The study will be conducted in two phases. The skills demonstrated for performing the RDTS test by Health Extension Workers (HEWs) will be assessed onsite by laboratory experts using standard operating procedure (SOP) and standard check list. The testing process will also be assessed by the standard checklist .The control will be randomly collected from Non Febrile volunteer patients in Addis Ababa health facilities. The microscopic examination and molecular will be conducted by Laboratory experts at EPHI.

Study period

We will conduct the study from April-Sept, 2018.

Study population

The study population is Health posts and all people in Gambella region.

Source population

The source populations is malaria suspected febrile patient and HEWs from randomly selected Zones, Woredas and health facilities of Gambella region.

Study subject

Facility: The study subjects are HEWs in health posts which lay in the selected Zones.

Inclusion criteria

All febrile patients suspected for malaria infection based on the community case definition will be included

Exclusion criteria

Facility: No functional health posts which are not currently providing routine service to the community because of any reason will be excluded

Patients/controls: Children under one year of age, pregnant and or Immune- compromised patients, with chronic illness will be excluded from the study.

Sampling procedure

Multi stage random sampling will be used.

Facility: We will use standard checklist for evaluating RDT performance skill of the HEWs and the testing processes.

Patient: We will collect blood samples from 300 febrile patients suspected for malaria requested blood examination at the selected health post during the study period and 100 non febrile apparently healthy patients from Addis Ababa for control.

Sample size

Facility: The sample size for study sites is based on the standard surveillance Guide line .50 % of the zones and 50 % of woredas with in the selected Zones will be

Variables

Performance characteristics of RDTs

Personnel Competency of Health Extension Workers

Operational definition

Accuracy: Closeness to the standard /true value. Accuracy of the surveillance system will be described by measurements of the

Negative predictive value: is the proportion of reported cases that actually have the health-related event under surveillance

Performance characteristics: of malaria RDT measured by Sensitivity, Specificity, Predictive value positive (PPV) Negative Predictive Value (NPV)

Personnel competency of Health Extension Workers: the ability of HEWs to demonstrate Malaria RDT test as per Standard operation of the test .This will be

Predictive value Positive (PVP): is the proportion of reported cases that actually have the health-related event under surveillance

Sensitivity: Sensitivity of a surveillance system can be considered on two levels.

First: at the level of case reporting, sensitivity refers to the proportion of cases of a disease (or other health-related event) detected by the surveillance system (case definition)

Second: the ability of the surveillance system to confirm the suspected case

Specificity: the ability to detect outbreaks, including the ability to monitor changes in the number of cases over time

Testing process: the three testing cycles (process), pre analytic, analytic and post analytic phase of a laboratory diagnosis.

Project management

Phase I, staffing: The Principal Investigator is responsible for all data processing, analysis and write up of the report with the support of Field supervisor

Table.25 Activity plan and staffing for malaria laboratory surveillance Gambella, EthiopiaSept, 2018

S.N	Activity	Responsible body/person	Comment
1	Proposal writing	Principal Investigator (PI)	
2	Submission to EPHI IRB and EFLTP RAs	PI	
3	Comment from IRB	EPHI IRB	
4	Including the comment and resubmission	PI	
5	Conduct training at EPHI and Gambella for data collectors	PI	
6	Data collection		
6.1	Blood sample collection	Lab professionals ,regional PHEM focal	
6.2	Slide reading	Lab experts	
6.3	Supervision	PI	
7	Data entry and analysis		
7.1	Data entry	PI, data clerks	
7.2	Data analysis	PI with statistician	
8	Report writing and result dissemination	PI ,Mentors	
8.1	Report writing draft	PI	Comment by RAs
8.2	Final result dissemination	PI,RAs	

Table 27 Time and activity plan for malaria laboratory surveillance Gambella, Ethiopia Sept, 2018

S. N	List of activities	May		June				Jul				Aug				Sept
		3rd week	4th week	1st week	2nd week	3rd week	4th week	1st week	2nd week	3rd week	4th week	1st week	2nd week	3rd week	4th week	1st week
1	Proposal writing															
2	Submission to EPHI IRB															
3	Comment from IRB															
4	Including the comment and resubmission															
5	Conduct training at EPHI and															
6	Conduct training at Gambella & Data collection															
7	Data entry and analysis															
8	Report writing and result dissemination															

Financial Plan

Ministry of Health FELTP through PMI mini grant and EPHI are responsible for the financial support of the study.

Table .28Proposed budget break down indicated by activity and items for malaria laboratory surveillance Gambella, Ethiopia Sept, 2018

S. N	Activity /Item	Unit	Proposed cost by unit	Total cost per Proposed cost by ETB	Comment
1	RDT	20Pieces /box	20 boxes	To be covered by EPHI	already supplied by the system Phase 1
2	Fuel	1lit on average used for 6km 2 cars 2270/6km= 378 Within AA +supervision =1900km	Total km to be traveled =2270km 1Lit =16.56 ETB 16.56*378lit=6259.68 378lit*16.56=6259.68 1900km/6lit =316.6 lit	2cars *6259= 12,519 + 1car 316.67*16.56=5,244	Phase 1 and 2
3	Per dime	30Days/ 6persons	300*30=9000	54,000.00	Phase 1 and 2
4	Slides	1Box=50 slides 1Box*200birr	10 Boxes =500slides 10*200	2000.00	Phase 1
	Reagents/supplies (Gloves,Gimesa &Methanol)	Gloves=50Box Methanol =2 lit	50*50ETB=2500 2lit*100=200	3900.0	Phase 1

5		Gimesa = lit Distwater = lit	3lit*200=600 6 lit*100=600		
6	Stationary (Paper) & Communication Print+ Copy	Box Cell card	2boxes*500=1000 100*5 =500 500	2000.	Phase 1
7	Professional fee	500/5day	3persons *500*5 days =	7500.	
8	Regional Training & coordination	2persons /10days	210*10*2=4200	4200	
9	Summation of all Contingency	10%	91363.00	9136.30	
10	Total budget needed Previously permitted PMI budget		100,499.3ETB	100,499.3ETB -23,600= 76,899 -	Budget covered by EPHI 23,600 covered
11	Additional budget needed		100,499ETB	48,898.00	

Phase II

Comparison of RDT report with Molecular Method

Table 28 Proposed budgets break down indicated by activity and items

S. N	Activity /Item	Unit	Proposed cost by ETB and USD	Comment
1	DBS kit	Box	20 boxes	To be covered by EPHI
2	**LAMP KITS**			
2.1	Equipment and consumables needed			will be obtained from EPHI laboratory/University of Calgary
2.2	Extraction buffer	1pk for 500 samples	200 USD	
2.3	Primers set for 500 samples	1pk for 500 samples	946 USD	
2.4	Fluorescence dye 1000X Gel green dye:	1pk for 500 samples	500 USD	**2.2-2..4** To be covered by University of Calgary

3	Per dime	500/Person * 5 days	2,500*2= 5000ETB	
4	Total phase II		5000ETB +	1646 USD
5	Total Phase I & II		100,499ETB +5000ETB =105,499 **105,499 ETB**	

Result

Phase I

Comparison of RDT report with Microscopic (Gold standard) method

1 Results will be presented in Tables for each of the following variables

1.1 Sensitivity = A/ **A+C**

1.2 Specificity =B/ **B+D**

1.3 Positive predictive value = A/ **A+B**

1.4 Negative predictive value = **C/ C+D**

Table- 5.5Dummy table of results

	Microscopic test positive	**Microscopic test negative**	**Total**
RDT +ve	**A**	**B**	**A+B**
RDT-ve	**C**	**D**	**C+D**
Total	**A+C**	**B+D**	**A+B+C+D**

Evaluation of RDT Performance skill of HEWs

2.1 Training

Having formal onsite or off site training on malaria test Testing. This will be presented by Demonstration from patient preparation up to sample addition, result reading, interpretation and reporting

3 Evaluation of Testing processes

3.1 Pre- analytic

- Patient orientation
- Sample volume
- Labeling

3.2 Analytic

3.3 Post - analytic

Phase II

Comparison of RDT and Microscopic examination with LAMP Method

Dummy table of results

Results will be presented in tables

Table -29 Comparison of RDT report with Molecular (LAMP) method

	Microscopic test positive	**Microscopic test negative**	**Total**
LAMP (+ve)	A	B	A+B
LAMP (- ve)	C	D	C+D
Total	A+C	B+D	A+B+C+D

Table .30 Comparison of LAMP and Microscopic Method

	LAMP +ve	**LAMP-ve**	**Total**
RDT +ve	A	B	A+B
RDT-ve	C	D	C+D
Total	A+C	B+D	A+B+C+D

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CHAPTER SIX

DISASTER SITUATION REPORT

6.1 Post displacement damage and risk assessment at Ethio-Somali regional state, Ethiopia 2018.

Abstract

Introduction: In Ethiopia, most people are displaced in the 2017 year. The causes were climate and internal conflict .Conflict is the primary cause of displacement. Ethio- Somali regional state is one of the internal conflict affected regions in Ethiopia. Currently, it has 11 zones and 6 of them are affected by the conflict. There are numerous living sites for internal displaced people called IDPs. The main purpose of the assessment is to prepare rehabilitation plan based on evidence.

Objective: To assess loss, damage of the public and private properties and current health status of the displaced people for preparing rehabilitation plan

Methods: We interviewed key informants, reviewed documents of Regional Health Bureau plans, reports and Published data by partners and the Regional government. We described the finding in terms of infrastructure loss and damage basic needs and routine health services

Result: We found 37.8% (131/388) conflict IDPS**.** 71,657 households and 488,154 peoples affected **.**The shelters are made of plastics and cotton dresses**.** The shelters were very close to each other. 9 health posts completely destroyed 17 health posts and 1 health center partially damaged, and 156 Health Extension Workers and other health professionals are affected physically, displaced and left their job. No clean water source, antibiotic of any form stock outs, No drugs provided for chronic diseases, lack of routine immunization service and delivery and postnatal service is by referral. No gender based violence services were found at sector offices and sample assessment sites (IDPs).Integrated diseases surveillance system (IDSR) not established at all IDPs.

Conclusion: Sub standardized Placement of houses, insufficient number of Latrine and insufficient essential drugs contribute for diseases outbreak and transmission. We recommend primarily establishing of IDSR, standardized spacing of houses and provision of clean water sources for all IDPs to regional, national stakeholders and partners.

Introduction

Conflict is a natural part of human interaction and is necessary for social change. However, if societies have no effective ways to manage disputes, conflict may become violent and destructive **[7].** Conflicts and disasters often cause large-scale displacement of people due to destruction of homes and environment, religious or political persecution or economic necessity**[1]** .These internally displaced persons (IDPs) are 'persons or groups of people who have been forced or obliged to flee or leave their homes or places of habitual residence, in particular as a result of, or in order to avoid the effects of armed conflicts, situations of generalized violence, violations of human rights or natural or human-made disasters and who have not crossed an internationally recognized state border **[2].**They are distinct from refugees who are displaced outside their national borders **[3, 4].**

Disasters caused by natural hazards and violent conflicts affect many people worldwide. These separate crises have significant political, economic and social implications that can reverse development gains, further entrench poverty and inequality and thereby increase the risk of future crises **[6].** Complex emergencies, including conflict, continue to affect tens of millions of people, causing displacement of people both inside and across borders **[7].**

Internal displacement has significant effects on public health and the well-being of the affected populations. These impacts may be categorized as direct due to violence and injury or indirect such as increased rates of infectious diseases and malnutrition **[7-10]** .Several risk factors, which promote communicable diseases, work in synergy during displacement. These factors include movement of mass populations and resettlement in temporary locations, overcrowding, economic and environmental degradation, poverty, inadequacy of safe water, poor sanitation and waste management **[7]** .These conditions are further compounded by the absence of shelter, food shortages and poor access to healthcare.

The most common types of infections observed in refugee camps include diarrhea, acute respiratory infection (ARI), measles, and malaria, which are called the 4 major killers **[5, 6].**In addition, increases have been reported in various infections, such as the epidemic of tuberculosis due to crowded living conditions, tetanus arising from unsanitary treatment of injury and childbirth, various parasitic infections,7 and scabies due to the shortage of water.

In 2010, there were an estimated total of 27 million persons who remained internally displaced by armed conflict across the world **[5].** Disaster is a serious disruption of the

functioning of a society, causing widespread human, material, or environmental losses which exceed the ability of the affected society to cope using its own resources **[1].**

In Ethiopia, most people are displaced in the 2017 year. The causes were climate and internal conflict .Conflict is the primary cause of displacement **[8].** Ethio- Somali regional state is one of the internal conflict affected regions in Ethiopia. There are numerous living sites for internal displaced people called IDPs. Currently, the conflict affected IDPs are found in 6 of the 11 zones. The main purpose of the assessment is to prepare rehabilitation plan for needs and gaps of peoples displaced by the Oromia and E -Somali border conflict.

Objectives

General objectives

To assess the loss and damage magnitude , severity and likelihood of risks and the potential risk factors for the anticipation of occurrence of health problems and food insecurity for ensuring appropriate and effective rehabilitation humanitarian planning and responses for reducing morbidity and mortality in the region .

Specific Objectives

- To prepare rehabilitation plan for gaps identified based objective evidence .
- To assess the adverse health impact of the displacement.
- To assess the existing capacity of the health system to address health risks .
- To determine gaps in the capacity of the health system to address anticipated health risks and existing threats .

Methods

Study design

We conducted descriptive cross sectional study .National Disaster Response Management Commission (NDRMC) has selected the Visited Zones based on regional need and the districts were selected by regional DPP Bureau .We reviewed documents (reports, plans of the RHB and Published data by partners and Regional government), interviewed focal and team leaders on the activities done and confirmed by Observation (Nutrition, PHEM and WASH staffs).

Study area

The study area is Ethio - Somali regional state. It is situated in the Eastern Part of Ethiopia. Jigjiga is the capital town of the region and 630Km far from the capital city Addis Ababa. E-Somali has 11 zones. Conflict affected IDPs are found in six zones of the region.

Study period

The study period was from Mar 10-22, 2018.

Study population

The study populations are people which are living in refugee camp of Ethio –Somali regional state.

Source population

The source population are internally displaced people in refugee camp Ethio –Somali regional state.

Study subjects

The specific study subjects are peoples in the internal conflict affected IDPs.

Data collection tool

We used Checklists composed of general information, demographic, health, and WASH and Nutrition component sections to collect information.

Data Analysis We described major findings using descriptive statistics.

Result

General

We find results mostly on school and education, total households of displaced people health and nutrition. Other assessments reports or organized raw data on livelihoods, agriculture, social and humanitarian services, development institutions like water and power could not be found.

In Ethio- Somali regional state IDPs are found all over the zones however, conflict induced is found in six zones. In some areas the conflict induced IDPs were started during 2017 and the majority after Sept 2017.

Since the conflict is political, for confidentiality the number of death and injury was not permitted to report except for specific officials,

Table- 31 Type of IDPs and number of displaced people

S.N	Cause of displacement	Households displaced	Total number of people	No of IDPs
1	Conflict induced in E-Somali reg	71,657	488,154	131
2	Climate induced in E-somali reg	56,263	344,498	207
3	E- Somali total	127,920	832,652	338
4	Total Conflict induced in Ethiopia	197,610	1,215,599	568
5	Climate induced in Ethiopia	81,416	494,256	313
6	**Grand total**	**283,910**	**1,739,411**	**916**

Loss and damage

As per the RHB report, a lot of public and private properties damaged during the conflict. List of Zones and woredas in which the health facility damaged showed on Table 2. 9 health posts completely destroyed.17 health post and 1 health center partially damaged .156 HEWs and other health professionals are affected physically, displaced and left their job.4 communal latrines were also collapsed .As a result, the displaced people settled in IDPs do not have health facility and health professionals proportional to the number of people . Routine immunization, delivery and postnatal services are by referral .In some IDPS the

facility which provides referral service is not within the standard distances and emergency situations are handled by office cars.

Table 32 Health facility damage in 4 woredas of Ethio- Somali region Mar, 2018

S.N	Zones	Woredas	Fully destroyed	Partially damaged	Type of Health facility
1	**Dawa**	Moyale	2	3	HP
		Hudet	4	1	HP
2	**Liben**	Guradhamole	1		**HC**
		Qarsadula		1	HP
		Dekasuftu		1	HP
3	**Fafan**	Gursum	**6**	**1**	HP
		Tulu Guled	**3**		HP
		Babile		**1**	HP
4	**Siti**	Mieso	**1**		HP
		Gota-bike	**1**		HP
	Total		**18**	**8**	

Health

PHEM: Outbreaks affected conflict affected IDPs

As per the TOR of the assessment, the report should also include sample IDPs and overall regional representative data .However, due to safety issue we visited three IDPs and two clinics of one Zone.AWD outbreak was persisted more than a year throughout the region and since last 3 months the report shows 0 cases. One of the gaps observed in this assessment was lack of IDSR for the people at IDPs as a result, outbreaks in IDPS, any diseases trend specific to IDPs could not be reported .In general, there was no organized data or report

specific to IDPs was not found. Dysentry at Koloji started with in the past three months and still exists. Koloji 1 was established in 2017 for conflict induced displaced people and koloji 2 opened in Sept 2017.

Table 3.3 Top Diseases in visited IDPs (Koloji 1 and 2

S.N	Disease	Koloji 2	Koloji 1	Overall reg IDP	Comment
1	AWD	42	386	Data not found	Before three months Two community death
2	Malaria	100		Data not found	
3	Dysentry	540		Data not found	
4	Scabies	70	0		
5	Measels			79	Raso , Salahad ,Lagahida

Nutrition

As per the report from RHB Malnutrition case is very high in all IDPS.

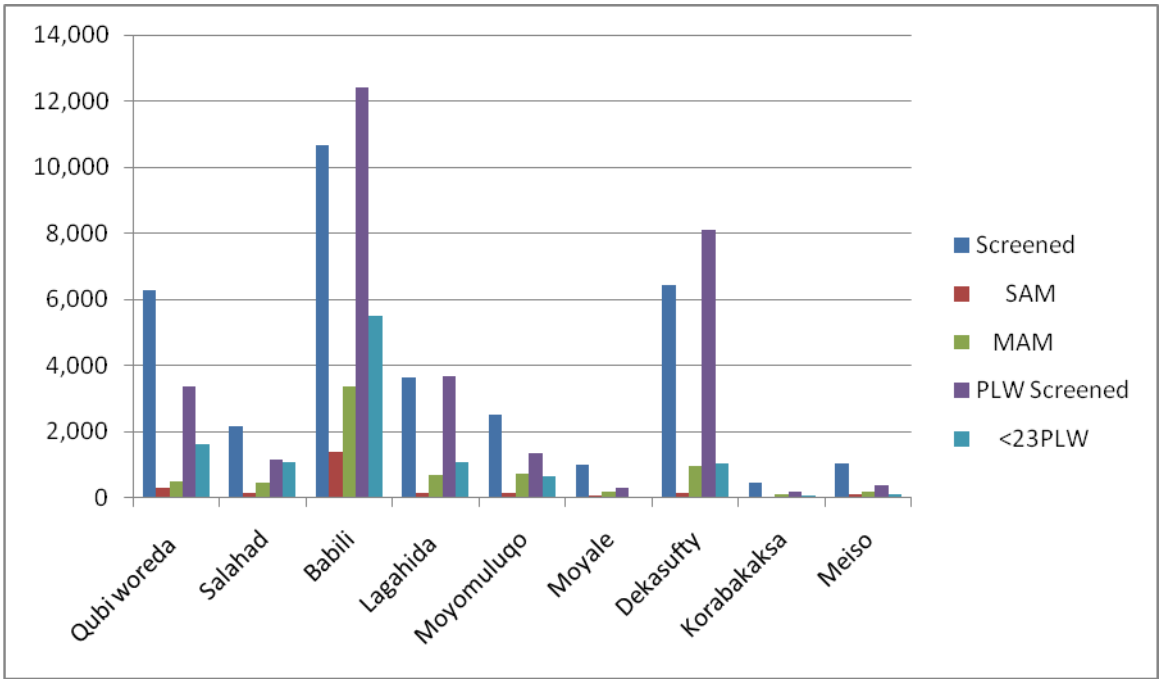

Fig 25 Nutrition programs conducted in IDPs

Key: SAM: severe acute malnutrition **MAM**: Moderate acute malnutrition **PLW**: pregnant and lactating women

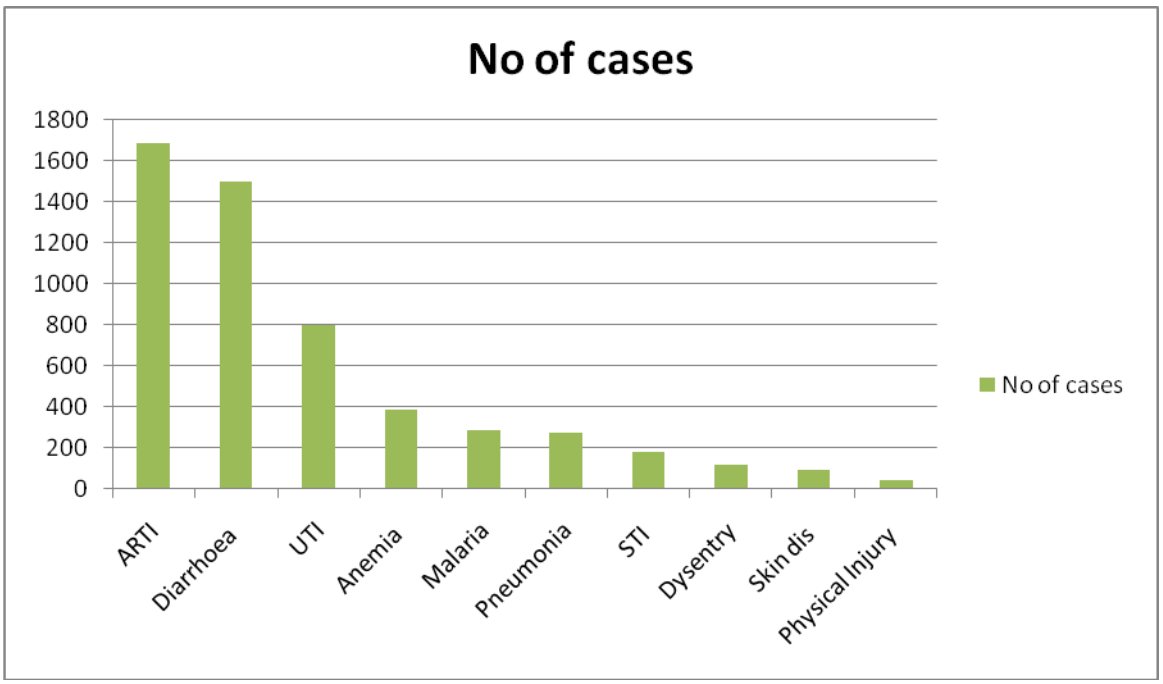

Fig – 26 Top Ten Diseases at Koloji 1of Babile woreda Mar, 201

WASH

Based on minimum requirements of WASH programs Potable water availability, quality of water and distance of water source were assessed and we found that there was no clean water source at the visited IDP (kolojii1 and 2),reported by the bureau also in other IDPs however, water provision is by Water trucker supported through partners .Water purifiers, and Jerricans were also supplied to IDPs . Emergency latrines that composed on 6 rooms with one block were constructed

Limitations of the assessment

- All areas to be assesses lacks representative data for all IDPs .Reports on nutrition found on some

Conclusion (Major gaps identified)

- Insufficient Essential drugs for all IDPs (Ex - Ciprofloxacin ,Cotrimoxazole ,Metrindazole) stock out at Koloji 1 and 2)
- No drugs available for Chronic diseases like Diabetes, Hypertension.
- BCC materials are not available
- Latrine shortage
- Ambulance was not assigned for IDPs (Normal cars serving as ambulance)
- Delivery and postnatal service is by referral
- Routine immunization service was not established at IDP
- Health professionals are temporarily assigned /no permanent staff for IDPs
- shortage of water tanks and clean source water
- Non food Items such as Body soaps, water treatment chemicals and other essential items should also be availed for minimizing current situation crises.
- Shortage of access schools in IDPs.
- Lack of waste disposal areas prepared yet in the IDPs.
- Lack of trash, garbage and dust bines for collecting and managing to minimize outbreak disease in the IDPs jut people are residing in closed shelters that can easily possible to contamination contact to happen.
- Shortage of hand washing basins (Jerri cans) in the IDPs.
- Shortage of body and laundry soaps for marginalized individuals such as pregnant, lactating and under five children which are the most needed
- As number of malnourished cases is high SC is not established

Recommendation

Based on assessment finding and major gaps .We recommend the following to RHB, MOH NDRMC and collaborating partners:

- All necessary Drugs including chronic diseases to be Available permanently at all IDPS
- Permanent health facilities and health professionals assignment to IDPS
- Government Health facility Ambulances better to be assigned at IDPS
- Equipments for Vaccine management and routine immunization service provision
- Preparing Sufficient latrines at all IDPs
- IDSR is not established at all IDPs
- Water truckers should also be increased based on the number of population
- Shortage of enough medical supplies especially routine supplies and essential drugs.
- Establishing Centers(SC) in the IDPs
- Establishing MCH service
- Distribution of WASH supplies

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CHAPTER SEVEN

MANUSCRIPT

7.1 Manuscript for peer reviewed Journal The pattern and trends of Female Genital tract cancer Nov 2014

Introduction

Female genital tract is the most common site of cancers in females. Gynecological cancers are a group of different malignancies of the female reproductive system. The most common types of gynecologic malignancies are cervical cancer, ovarian cancer, and endometrial cancer. There are other less common gynecological malignancies including cancer of the vagina, cancer of the vulva, gestational trophoblastic Tumor and fallopian tube cancer [3, 4].

Cancer of the cervix is the second most common cancer among women worldwide about 470,000 new cases and 230,000 deaths every year .80% of cases of cervical cancer occur in developing countries where, in many regions, it is the most common cancer of women. The highest incidence rates are in South America and the Caribbean, sub Saharan Africa, and South and South Eastern Asia [2, 6]

Cancer of the uterus is the seventh most common cancer of women with 189,000 new cases and 45,000 deaths occurring worldwide each year; about 60% of these occur in more developed countries. Uterine cancer occurs primarily in elderly women, the median age of onset being around 60 years old, only 5% of cases develop before age 40.[6]Endometrial cancer mainly affects postmenopausal women in developed countries; 188,000 new cases are diagnosed annually and obesity is a major risk factor. [5]

Ovarian cancers are carcinomas, which arise from the surface epithelium of the ovary. Cancer of the ovaries develops most often in women aged 50 to 70.It occurs in 190,000 cases each year, predominantly among postmenopausal women in developed countries. The risk of epithelial tumors increases with age, occurring predominantly in pre and postmenopausal women. Tumors of germinal or embryonic origin are more frequent in young adults. [10]

Fallopian tube cancer develops in the tubes that lead from the ovaries to the uterus. Most cancers that affect the fallopian tubes have spread from elsewhere in the other parts of the body. It is Usually diagnosed in women aged 50 to 60 .In the United States, fewer than 1% of gynecologic cancers are fallopian tube cancers. [11]

Broad variations in the distribution of GTD exist worldwide, with higher frequencies in some parts of Asia, the Middle East and Africa, but the extent to which they can be attributed to methodological difficulties in obtaining accurate rates is unclear. Hydiated moles In the United States, occur in about 1 in 2000 pregnancies .For unknown reasons, moles are almost 10 times more common in Asian countries. [12, 13]

Methods

Study design

We conducted facility based Cross sectional study design .We retrospectively reviewed the laboratory result database at the St Paul Hospital Millennium Medical College (SPHMMC)

Study area

We studied at the Ethiopian Public Health Institute (EPHI) -St Paul Hospital Millennium Medical College Pathology Laboratory. The laboratory is providing pathology examination service by the corporate agreement between EPHI and SPHMMC. Both EPHI and SPHMMC are a public Institutions situated at Gulele sub city, Northern suburb of Addis Ababa. EPHI is a Public Health research Institute, working as a Technical wing of FMOH on laboratory related programs, National reference Laboratory, operational Public Health Researches and Capacity building. SPHMMC is a federal Medical College Hospital Serving as Federal referral and Teaching Hospital

Study Period

We collected the data from November, 2014-Dec 2016 and reviewed from Jan11-28, 2017

Study population

Source population

All Female patients referred to St Paul Millennium Medical College Hospital for pathology examination.

Study subjects

Females suspected with genital tract cancer who has taken pathological examination at EPHI – SPHMMC pathology laboratory from Nov2013-Nov2016

Inclusion criteria

All females diagnosed by pathology examination for tumor presenting pathology with complete information on sex, age, tumor location, and type of tumor data as Benign or Malignant, with Unique patient Identifier and date of Examination was included .

Exclusion Criteria

We excluded a female case patient with unspecific result for both anatomical site and type of diagnosis. From the extracted 4,759 results 591 results excluded by the exclusion criteria.

Study variables

Patterns and Trends of Female Genital tract (Gynecological) cancer
Age
Type of Tumor (Diagnosis)

Data Analysis

After data completeness for all variables was checked. We analyzed 4168 results and described using descriptive statistics .We analyzed with Microsoft office Excel.

Ethical clearance

Since the data is secondary Official letter was written to Hospital and laboratory management from EPHI field base .confidentiality of the patients are secured and no personal details found in this document .

Result

Trends of Female genital tract cancers (FGTCs) Frequency of Female Genital

From a total of 13,034 Tumors pathologically confirmed 4168 were (31.9%) female gynecological Tumors and 18% was cancer (FGTCs). As Fig 1.Shows the trend of FGTCS diagnosed with in these three years period was increased. Specially, from 2015 to 2016 there is a considerable shift in the trend of the frequency of the Tumor.

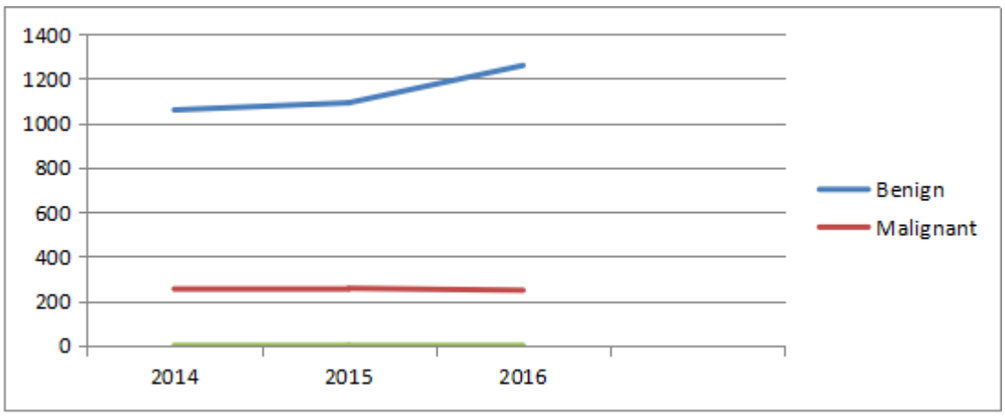

Fig 27- Trends of Female genital tract Tumors FGTT SPHMMC-EPHI pathology laboratory Addis Ababa, Ethiopia 2014-2016

The frequency of FGTTs diagnosed also showed that among all cancer sites, Cervices is the primary site of Tumor accounts about (30.7 %) followed by Endometrium (28.3%) and Myometrium (23%). Fallopian Tube & Broad Ligament constitutes 8.7 % followed by ovary 6.23% and other gynecological tumors like vaginal and other External genitalia constitute 2.54% of the diagnosed FGTCS. The least diagnosed tumor was Gestational Trophoblastic Disease 0.4%. This is indicated in Fig 2

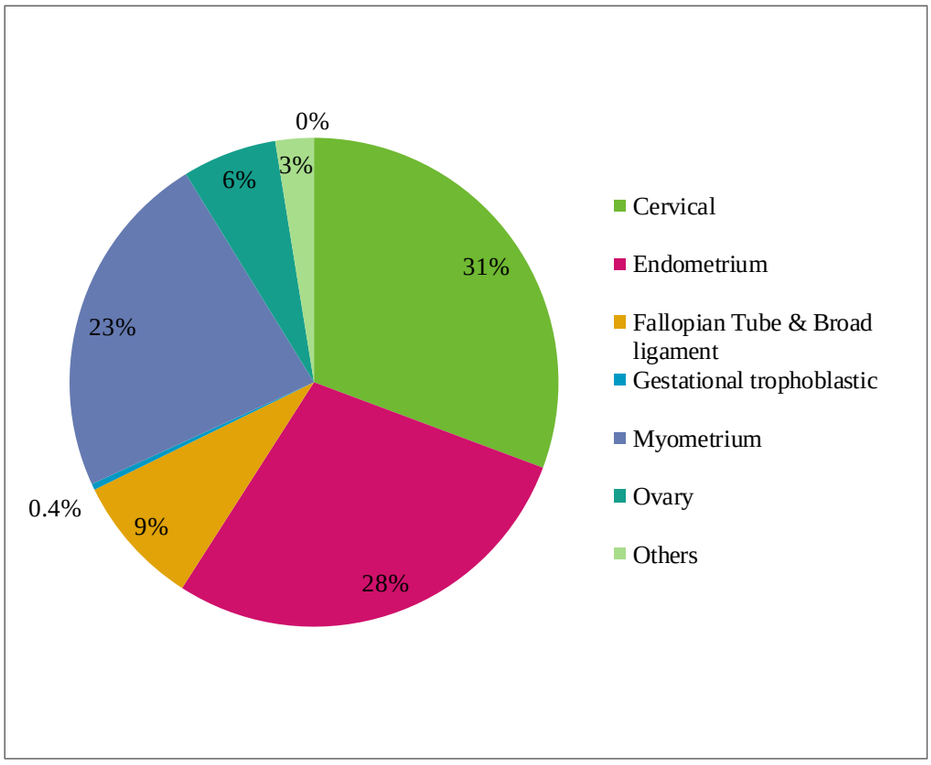

Fig .28 Frequency of FGTCs diagnosed at SPHMMC-EPHI pathology laboratory by tumor location Addis Ababa, Ethiopia 2014-2016

The comparison of Age group with Malignant Tumors is indicated in Table and Fig 2. As the figure shows the extreme age group ≥70 followed by 50-59 and 60-69, 64%, 38.2% and 37.2% are the most malignant age groups respectively. Percentage of Malignancy decreases as the females age group gets younger .Age group 40 – 49 accounts for 20.7% of malignant tumors with the < 20 (13.5 %) age group following and 30-39,20-29 and 11.2% and 5 % respectively.

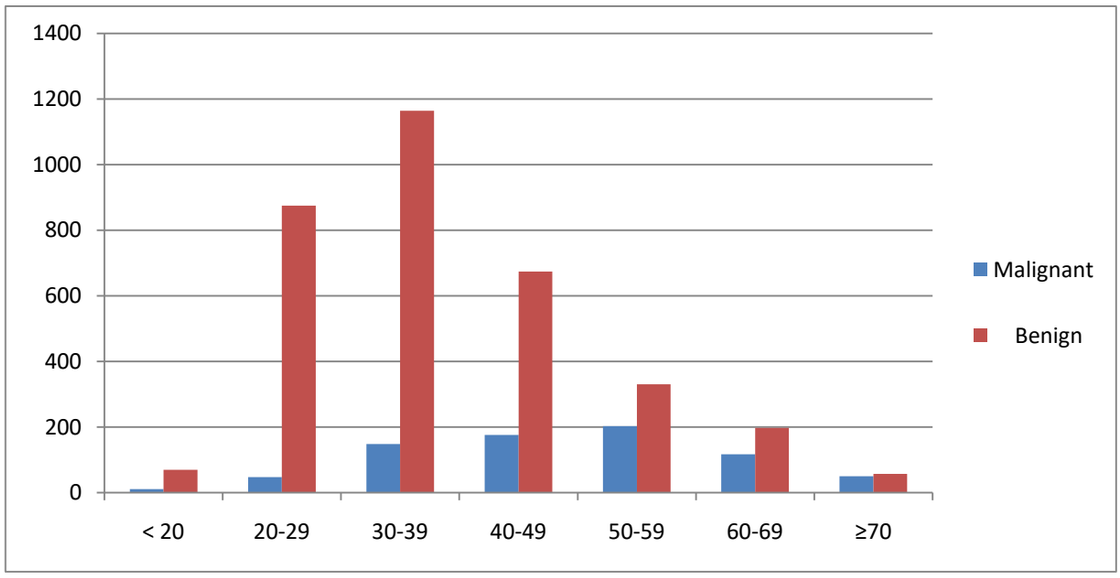

Fig .29 Proportion of Malignancy with age group Addis Ababa, Ethiopia 2014-2016

As it can be observed from chart 3 there is an increase in frequency in overall volume of tumors however, the rate of increment in malignant tumors between the years is almost constant. Among all cites malignancy is higher in cervices and ovary. This is illustrated in fig 30.

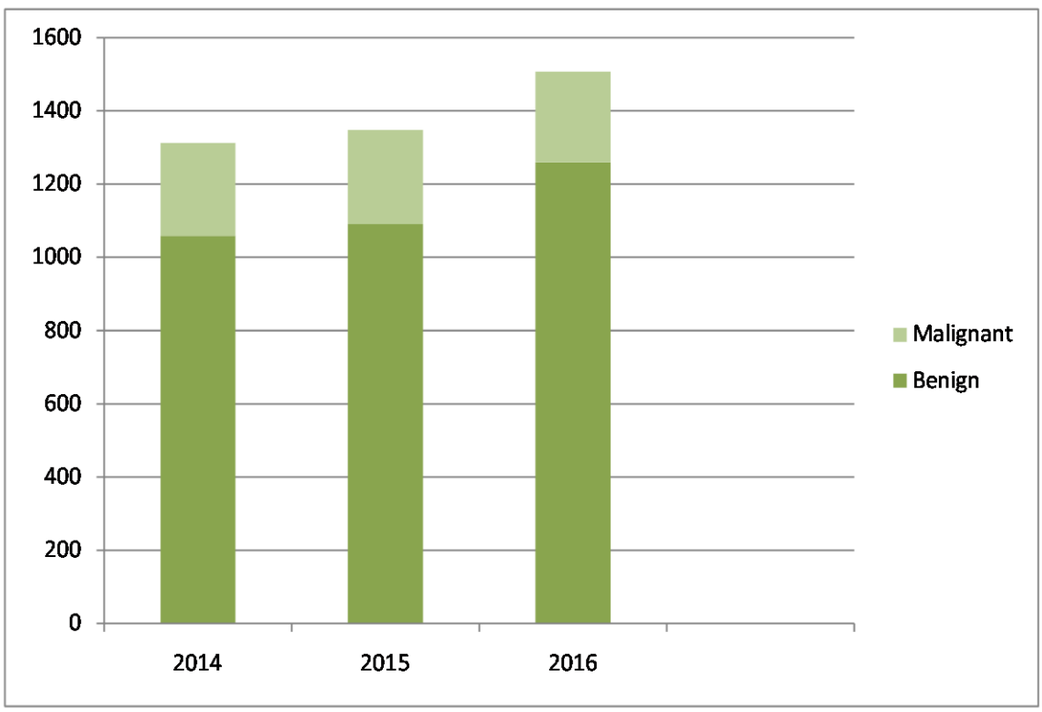

Fig -30 Frequency and Trend of Tumor types Addis Ababa, Ethiopia 2014-2016

From 4,168 female genital Tumors analyzed 759(18%) were malignant and the rest 3409(82 %) were benign. The proportion of malignancy is indicated in chart 4 and Leiomyoma is the commonest described in the data base foe the benign type of all anatomical sites of Tumors.

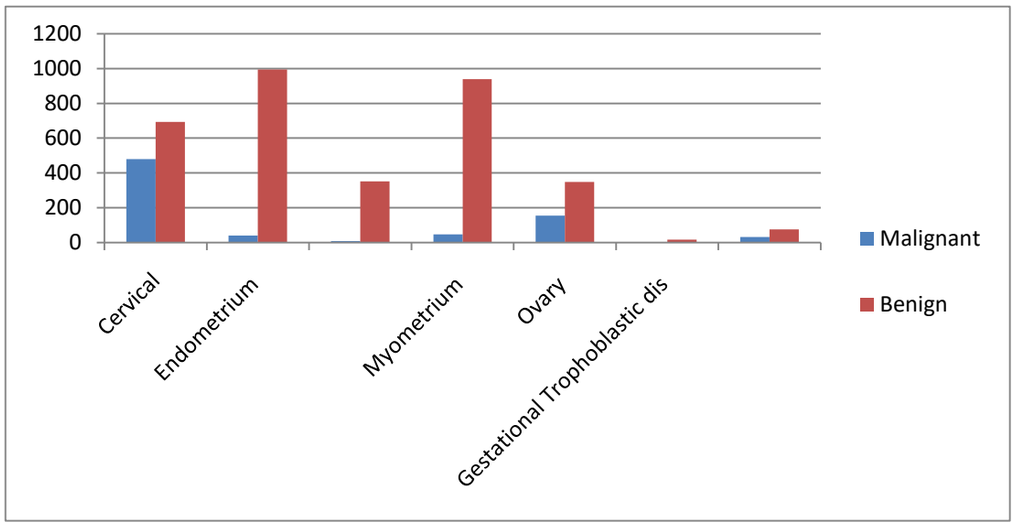

Fig31 -The pattern of Female Genital Tract Cancers by anatomical cite and type of Addis Ababa, Ethiopia 2014-2016

The patterns of the tumors illustrated by anatomical Site and type of tumor indicates that there is a considerable difference with frequency and type of Tumor (diagnosis). Following Cervical, Endometrium, Myometrium, Fallopian tube and ovarian frequency is in a decreasing order respectively however, the proportion of malignant tumors is higher in ovarian cancer next to Cervical than Uterine and Fallopian tube.

Frequency and patterns of Cervical Tumors

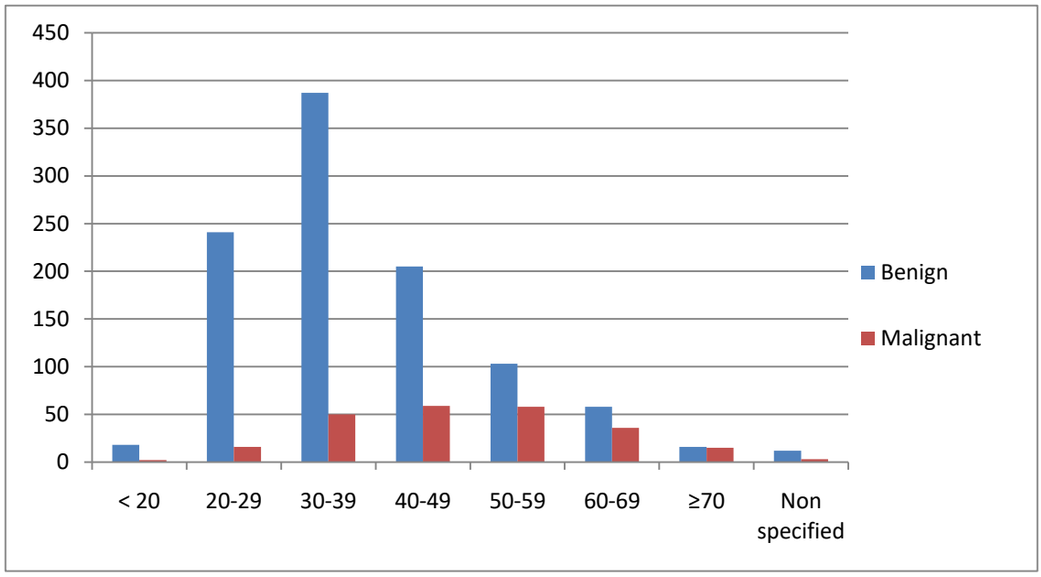

Fig 32.Patterns of cervical Cancer with age group Addis Ababa, Ethiopia 2014-2016

The frequency of cervical cancer is higher for the age group of 3rd (34%) decades followed by 4th (21%**)** and 2nd decades (20%) respectively. The 5th, (12.5 %**)** 6th (7 %**)** and 7th (2.4%**)** follow the second decades in descending order respectively. The proportion of malignancy is higher in the age group of 4th (34% and 5th (21 %**)** the 3rd (20%) decades of life following and the two extreme group are relatively low in both frequency and proportion of malignancy.

Frequency and patterns of Endometrial Tumors

The frequency of third decade age group is highest of all 31.5% .The second decade age group is the second (24.5%) most high prevalent in Endometrial cancer followed by 4th ,(18.2 %) and 5th(12.9) decades of life . The two extreme age group is the least frequent of endometrial cancer with the younger extreme group greater than the older.

Frequency and patterns of Myometrium Cancers

In this study result, for the age group 30-39, frequency and is highest (30.9%) of all group with the age group 20-29 ,40-49,and 50-59, 23.3 %,20 % ,12.6 % following with descending order respectively .The proportion of malignancy is higher in later ages with the reproductive age group following .

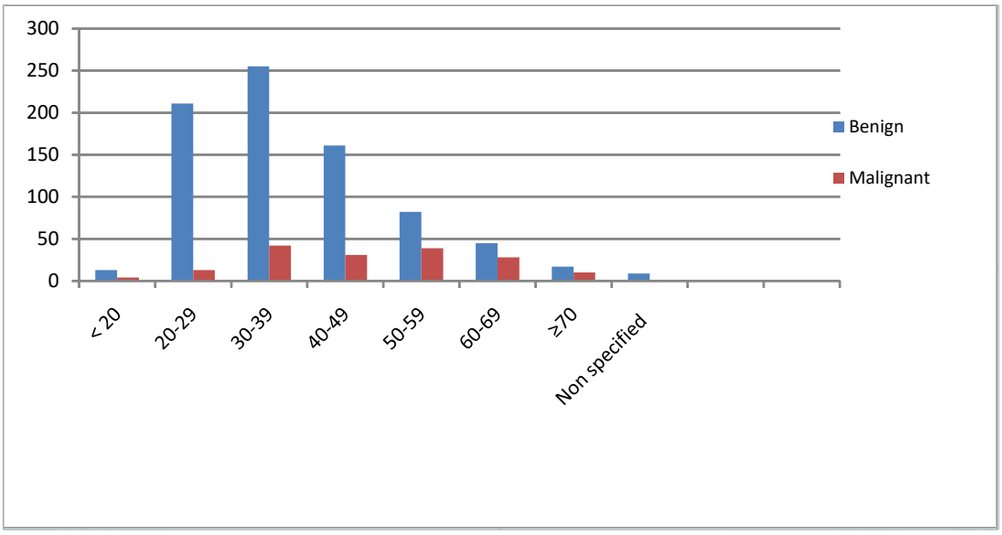

Fig.33 Frequency and patterns of Myometrium cancers with Age group, Addis Ababa, Ethiopia 2014-2016

Frequency and patterns of Fallopian Tube and broad ligaments

Our study shows that the frequency of cancers and proportion of malignances for fallopian tube is not uniform that frequency is higher in third ,fourth and second decades of life in a descending order 27.2,25.8,19.7 respectively however , the distribution of malignant tumors is higher in the older ages ≥70 (85%) with the sixth and fifth decades of life Age groups following in 48% and 47% respectively. The distribution of malignant tumors of fallopian tube and broad ligament is higher in older age.

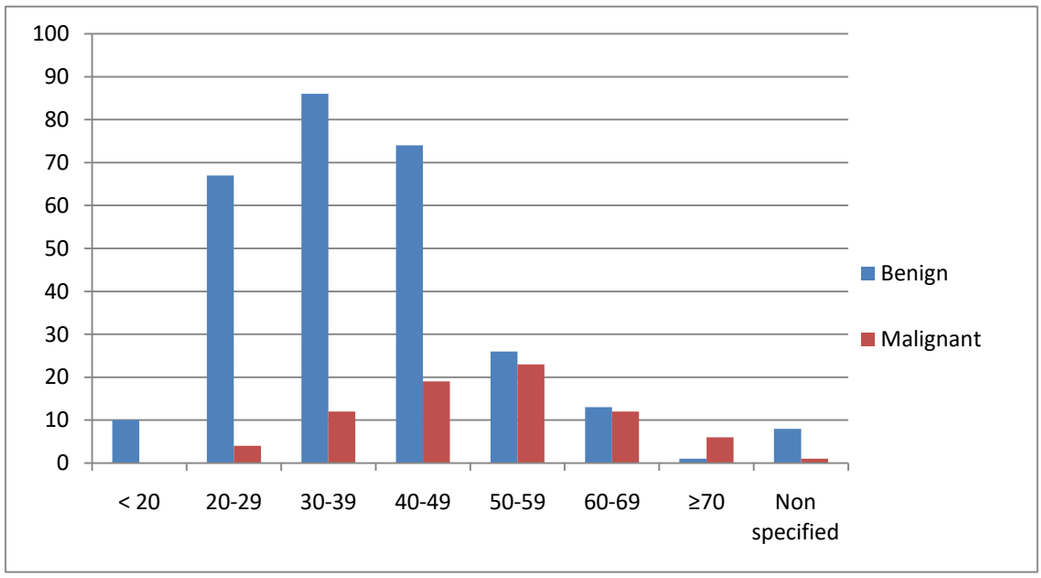

Fig 34 -Frequency and patterns of Fallopian Tube and broad ligaments Addis Ababa, Ethiopia 2014-2016

Frequency and patterns of ovarian cancer

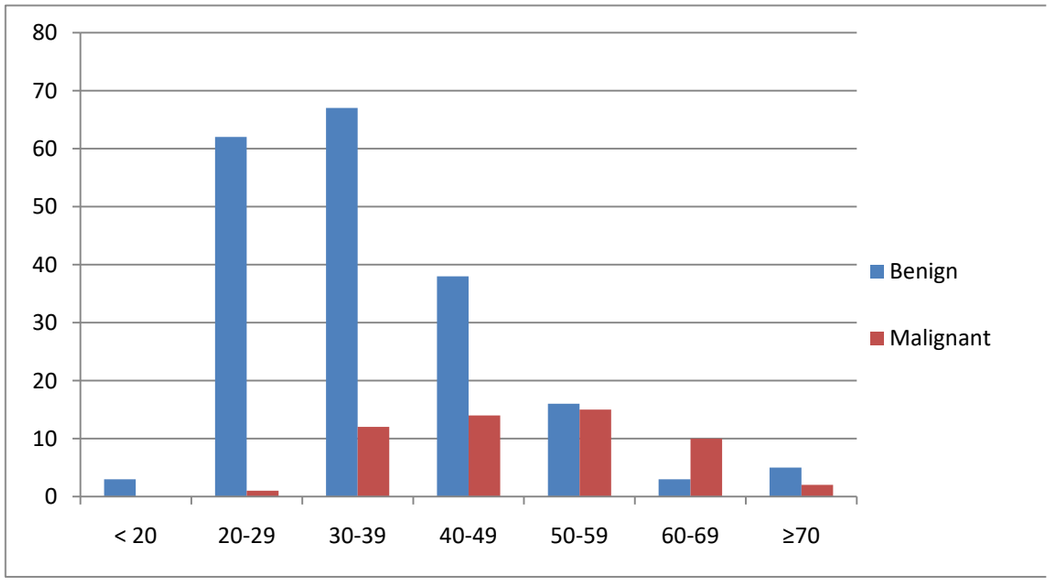

Fig.35- Frequency and patterns of Ovarian cancer Addis Ababa, Ethiopia 2014-2016

As the result is indicated on the table10 and chart 9 the frequency of ovarian cancer is high among the reproductive age group 20-49, the proportion of malignancy is higher among the third, fourth and fifth decade's age group. The younger the female the lower the malignant Tumors. There was no malignancy detected among the lower extreme age group as well as low frequency observed. Although the higher extreme age group has relatively low frequency the proportion of malignant tumors is almost similar with the benign type.

Frequency and patterns of Gestational trophoblastic

From this study result, Gestational trophoblastic(hydatid mole) is very rarely diagnosed type of FGTC with the prevalence higher in the younger age 20-29 (41.1%) ,following in descending order for the older age groups .The finding indicated that it is the least malignant type of tumor

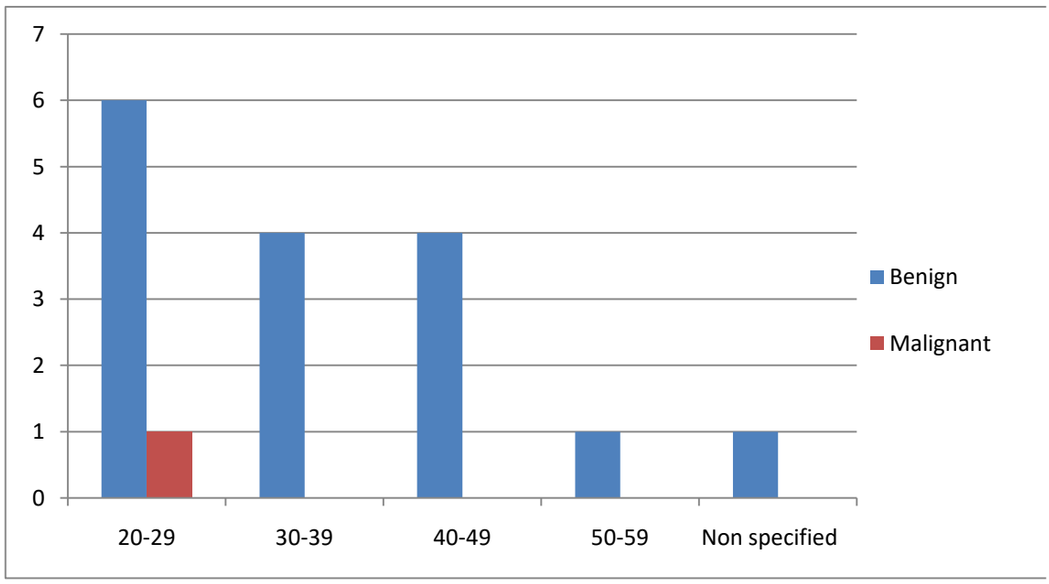

Fig .36-Frequency and patterns of Gestational trophoblastic cancers from 2014-2016 Addis Ababa, Ethiopia

Frequency and patterns of (Vaginal, vulvar, labia) cancers

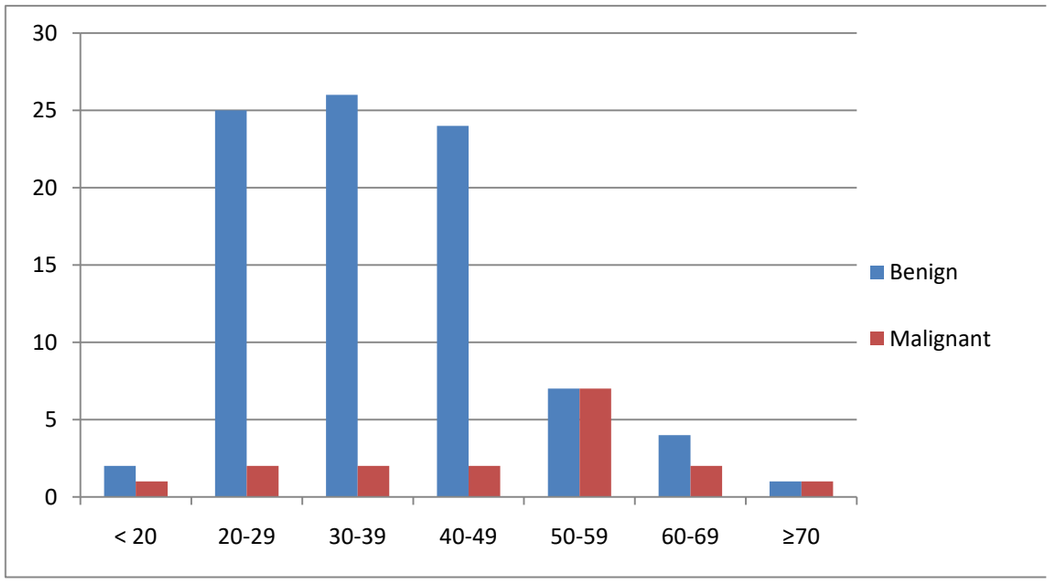

Fig. 37- Patterns of (Vaginal, vulvar, labia) cancers by age group from 2014-2016 Addis Ababa, Ethiopia

Limitation of the study

The geographical location of the patients could not be described because the result database did not captured as well as not traceable by the Medical Record Number.

Marital status was not found on the report thus, unable to describe the marital status

Discussions

The main findings of this study indicates that the trends of FGTCs with in this three years period is increasing with the prevalence of (32 %) and the patterns indicate that FGTCS needs considerable attention. There is also a contrary finding to our result on the patterns of FGTCs that except Cervical, Uterine cancers (Endometrium 28.3 % and Myometrium23 %), Ovarian and Fallopian tube distribution is higher in developed Western countries than developing world. **[6]**A regional study finding conducted at Botswana on FGTCs and previous National results on prevalence of FGTCs supports our finding with similar result on the patterns and frequencies of the FGTCs **[17][15]**

As the finding of this study showed, out of the female gynecological cancers the Cervix is the primary cite of which constitutes 30.7 % of the Tumors. A study of Iran Similar regional study of the Ghana reveals that although the frequency of the finding is different the prevalence of cervical carcinoma is predominant among FGTCs **[17]** .There is also a local study conducted at TikurAnbessa Specialized Hospital (TASH) indicated that out of new cases of cancer patients registered at National cancer registry, Cervical constitutes 31.8 %. **[15]**

A study conducted at Enugu, Nigeria indicates that following Cervical, Ovarian cancer is the second most predominant cancer of FGTCs and Fallopian tube was not found during the study period in Nigeria **[19]** This is different from our study finding that Following Cervical and Uterine cancer the Fallopian tube and ovarian cancers were detected with a frequency of 8.7% 6.23 % respectively.

As different studies indicated placental and Gestational Tumors were the least prevalent in developing countries and with low malignancy type of Tumor .This is also confirmed by our study finding that there was 0.4% frequency among the gynecological tumors and the younger 20-29 age group are the most affected both in frequency and malignancy distribution.

Conclusions

From this study result, among gynecological Cancers, Cervical, Endometrium and Myometrium are the major Site of tumors followed by Ovarian Fallopian Tube and Broad Ligaments Cancers. Despite the global studies result on the distribution of Uterine and Ovary high frequency is observed. Despite the prevalence and the pattern there was no considerable attention given to the health problem at Ministry level to monitor under surveillance .No sufficient studies were found to compare the pattern

Recommendations

- Further studies should be conducted at a national and regional level to identify the associated factors of the pattern of the tumors
- Female gynecological malignancies should be given emphasis and monitored under Sentinel surveillance system

CHAPTER EGIHT

ADDITIONAL OUTPUT

Sample Collection, Packaging, Transportation and Communication TOR

EOC Surveillance and Laboratory Subcommittee

31st August 2017

EOC, EPHI

Prepared by: Ebise Abose

Veronica Nwankpa

Nega Asamnene

Samson Girma

Introduction

The surveillance/laboratory subcommittee of the EOC is saddled with the responsibility of surveillance and developing standardised and upgraded Standard Operating procedures (SOP) for sample collection, packaging, transportation and communication during suspected Acute Watery diarrhoea outbreak.

The SOPs developed applies to all the laboratories within the country. Doing this will establish a standardised method for performing field collection of samples, packaging, transportation and communication which will result in improved uniformity, reproducibility, defensibility and verifiability of data as well as increase the committee's credibility.

The credibility of any laboratory findings is dependent upon the quality of samples collected packaged and delivered to the laboratory. This is why sample collection serves as the backbone of any surveillance/laboratory system and disease control programs.

However the collection, packaging, transportation of samples is dependent upon certain criteria:

i. **What**: What is the case? :Acute Watery Diarrhoea

ii. **Who**: Who is responsible for sample collection, transportation and communication?

Well-trained Laboratory Professionals (Technologist, Microbiologist, and Laboratory technician)

iii. **When**: When to collect samples

- When the patient is having diarrhoea, as soon after onset of illness as possible
- When there is a sudden occurrence of Acute Watery Diarrhoea (AWD) in the community
- When there is a sudden increase in the number of patients with AWD
- When there is deaths recorded as a result of suspected AWD case
- When case is confirmed and a follow up of the outbreak management
- When the outbreak is declared over

Note:

- Samples must be collected before antimicrobial treatment is started.
- Stool specimens must be taken from 5- 10 cases that meet the suspect case definition to declare existence of AWD outbreak

iv. **Where**: Where is the suspected outbreak identified?

- Rumour from the Community, or
- Suspected Patient presented at ahealth facility

v. **What**? What types of samples are collected during AWD suspected outbreaks?

Two types:

- Clinical Samples
- Environmental samples

vi. **How**: How is the sample collected, packaged, transported and communicated to the laboratory?

See detailed procedure for how samples are collected and transported to the laboratory below:

Sample collection and transportation

Clinical sample:

These are Human samples collected from AWD suspected cases. There are two types:

- Watery Stools from patients
- Rectal swabs from very ill patients / children / community deaths.

Direct watery Stool samples collection procedures:

- Directly collect fresh watery stool into clean sterile dry container
- Insert a sterile swab into the stool container:
- Rotate the swab to ensure that enough stool specimen is absorbed on the swab
- Introduce the swab into Cary Blair transport medium
- Or alternatively inoculate in 1% Alkaline Peptone Water (APW);
- Replace the cap and screw tightly
- Place the sample in a water proof bag and seal
- Place the above in the tertiary container with cold chain
- Ensure to label the samples with patient name, and identification number,
- Transport the samples within two hours to the testing laboratory or put under cold chain if delay is anticipated (48 hrs maximum)

Rectal swabs collection:

Rectal swabs are collected when fresh and direct stool sample is not possible to collect. This is therefore suitable for:

I. All suspected AWD deaths from the community
II. All suspected patients/ children with AWD who are very ill, weak and cannot pass stool

Procedure:

- Label the container with patient name, sex, age, date, location and time of collection
- Moisten a sterile swab in physiological saline
- Insert the swab 2-3 cm through the rectal sphincter and rotate once.
- Withdraw the swab and examine to make sure it carries visible fecal material.

- Immediately insert the swab into Cary-Blair transport media, or 1% APW pushing it right to the bottom of the tube.
- Break off and discard the top of the swab stick touching the fingers.
- Replace and tightly screw the cap in place
- Place the sample in a water proof bag and place it in the cooler box with ice pack to maintain cold chain 2-4^{o}C
- Dispatch the sample to the laboratory within 24hrs
- Refrigerate swabs in transport media at 4°C. When possible, test within 48 hours after collection; otherwise, freeze samples at -70°C

Note: Watery Stool or swab Samples can be sent directly to the laboratory in the absence of cold chain or media within 2hrs of sample collection. Ensure to package properly (Triple packaging)

Environmental samples

One objective of this surveillance is to assess the quality of the water, food and sewage within the locality during a suspected case of AWD outbreak. Environmental samples must be collected appropriately. Environmental Samples are samples collected to assess for possible sources of infection from the environment.

There are three types of environmental samples to be analysed during suspected AWD outbreaks:

- Water
- Sewage
- Food

Water samples

Surface water collection:

Surface water collection:

- Label all bottles with date, time of collection and location
- Hold the bottle at the base and completely immersing the sample bottle nozzle down (0.5meters) elbow length below the surface and slowly allowing sample container to be filled or about 100mls avoiding bubble generation. Cap the bottle immediately.
- This is done at several other location of the water to give a good representation
- Place the sample in an ice pack and transport to the laboratory immediately within 2 hours.
- Alternatively, the sample can be introduced into already prepare Cary Blair or Alkaline peptone water
- Place the specimen in sealed plastic pack placed in an ice pack and transport to the laboratory within 2hrs (Maximum 48hrs)

Well water collection:

- Attach a sterile weight to the base of bottle to be used for the sample collection
- Tie a string unto the bottle and gently dip the bottle into the well and carefully withdrawing.
- Replace the cap immediately and place in an ice pack and transport to the laboratory.

- **Tap water collection:**

- Wear latex gloves and change between specimens to prevent cross contamination.
- Collect sterilized sampling bottles with added sodium thiosulphate for chlorinated water
- Avoid collecting samples from leaking taps that allow water to flow over the outside of the tap
- Disinfect the tap by flaming the tap for few seconds or 70% ethanol
- Flush the tap for an additional two (2) or three (3) minutes then reduce to a gentle flow to permit filling the bottle without splashing.
- When the sample is collected, leave ample air space in the bottle (at least 2.5 cm) to
- Facilitate mixing by shaking

- Label the containers with collection site and date. Samples should be transported as quickly as possible to the laboratory within 3 hrs or with cold chain within 48hrs

Sewage sampling using Moore swabs:

Surveillance using the Moore swab method is a practical and effective technique for detecting V. cholera in sewage. The swabs can be easily assembled, and when suspended in the intake lines of a municipal sewage system, they can detect V. cholera infections in areas where surveillance of diarrheal illness has failed to detect cholera. Using this method to sample major intake lines of a community sewage system is a simple way to determine whether V. cholera infections are occurring in an area.

Procedures:

- Prepare Moore swabs by cutting pieces of cotton gauze 4 feet long by 6 inches wide (120 cm by 15 cm) and Folding or rolling the gauze length-wise several times,
- Firmly tie the center with fishing line.
- Sterilization by wrapping in heavy paper and autoclaving before use
- Place Moore swabs in all main intake lines at the sewage plant or other central locations in the sewage system.
- The site for swab placement must be carefully evaluated for conditions that could inhibit the recovery of the V. cholera organism.
- Place the swab upstream of any septic waste dump sites or partially treated recycled sewage to avoided possible contamination with toxic waste.
- Suspend the swab manhole; a piece of wire should be attached to the end of the line to prevent cutting the line when the manhole cover is replaced.
- The swab should be left in place for 24-48 hours.

- Wear a latex gloves to Collect specimens and ensure tochange gloves between specimens to prevent cross contamination.
- When Moore swabs, including their attachment lines, are removed from the sampling site, they should be placed in securely-closing containers of a suitable size.
- Label the containers with collection site and date.
- Samples should be transported as quickly as possible to the laboratory in a cold chain with triple packaging
- If it will be longer than 3 hours between collection of swabs and arrival at the laboratory, the swabs should be placed in APW at the collection site before transport to ensure optimal recovery of V. Cholera.
- APW (300 to 500 ml) should be added to the specimens immediately upon arrival at the laboratory if it was not added at the site.
- The Moore swab and the associated sample water should make up approximately 10% to 20% of the total volume of the sample with APW added to obtain the optimal ratio of sample to enrichment broth for recovery.

Food sample collection/ transportation:

Food samples are collected when food consumed is the suspected source of infection.

Processed or canned food:

Processed or canned food should be dispatched to the laboratory in its original container in an ice pack if delay is anticipated and directly without cold chain within 2hrs

Food Samples from homes or public eateries or restaurants:

Approximately 500gms of suspected food should be collected in a wide mouth sterile container using a sterile spatula.

Carefully replace the cap and screw properly to avoid spillage

Carefully place sample in a water proof bag and place in an ice pack and transported immediately to the laboratory for analysis.

All samples should be properly labelled with date, time, location and other necessary information

Note:

- All samples must be accompanied with a fully completed standard laboratory investigation form and RDT results if tested by RDT
- Viability of transport media Cary-Blair transport medium or Alkaline Peptone Water (APW) allows better conservation of samples
- All cholera samples should be packaged using a triple packaging system and transported to reference laboratories using the existing operational national specimen referral and transport network system

Communication

all samples collected during suspected AWD outbreaks must be communicated to the laboratory or National reference facility and the surveillance team as soon as possible

This document reflects the communication channel from the place of sample collection to reference lab and National EPHI, EOC surveillance, laboratory coordination section

- The RRT team/laboratory personnel's collecting environmental or clinical sample refer the specimen to regional or National reference laboratory
- The reference lab ensures that the sample is received in good condition with complete information attached to the sample
- The bacteriological test result will be delivered to the referring team , referring laboratory , respective PHEM and EPHI ,EOC surveillance lab section
- E mail and telephone numbers of concerned focal persons of national EOC will be communicated while declaring each out break
- The EPHI ,EOC, surveillance lab section will communicate respective regional labs on laboratory reports, laboratory reagents and supplies in collaboration with National laboratories capacity building(NLCBD), Emergency Laboratory services Coordination team (ELSC)
- Notify the reference laboratory in advance (Regional Laboratory, UNHLS disease surveillance and outbreak investigation laboratory Case Investigation Form (CIF) is properly filled Proper ADDRESS "To and From" on the outer box is clearly written

Cholera Standard Laboratory Investigation Form

Laboratory Form for Suspect Cholera

Clinical Specimens Date Form Filled: ____/____/_____ (DD, MM, and YY) each specimen should be labelled with Case/specimen ID #, date of collection, and patient name. Specimens should preferably be collected in Cary Blair medium and kept at 4°C until time of processing. Specimens should be packaged appropriately and sent to the laboratory using cold chain

District: _____ Health Care Facility: _____

Patient Information

Patient Surname: _____ Other Name:

_____

Father's/Family Name:

_____

_____

Age: _____ Years Months Date of Birth: ____/____/_____ (DD/MM/YY) Gender:

If child less than age 18 years, name of responsible adult (Surname, Other Name):

_____ Type of sample Date of sample collection

Whole stool: Yes No _____/_____/____ (DD/MM/YY) Sent to laboratory: Yes No

Rectal swab: Yes No _____/_____/_____ (DD/MM/YY) Date _____/_____/_____ (DD/MM/YY)

Specimen Collecting Staff Member

Surname: _____ Other Name: _____ Title: _____

Place of Work: _____Phone: (____) _____ E-mail: _____

Reception of Specimen at Laboratory

Name of laboratory: _____ Name of technician performing test: _____

Local Lab ID#:

Check which of the following tests were performed in the laboratory and record the results for each test.

YES NO NAME OF TEST RESULTS

RDT test (after 6 hrs enrichment in 1%APW) Positive O1 Positive O139 Negative Invalid

Culture Positive Negative

Oxidase test Positive Negative

Indole test (SIM) Positive Negative

Pathogen suspected: .....

Isolates sent to reference lab? Yes No If yes, Date: ____/____/_____ (DD, MM, YY)

Reference Laboratory: Date: ____/____/_____ (DD, MM, YY)

Name of Technician: _____ Phone: _____ E-mail:_____

Pathogen identified: …… None confirmed

Sero-group 01 0139 Not done

Serotype Inaba Ogawa Not done

Biotype El Tor Classical Not done

Antibiotic sensitivity

Please indicate for each antibiotic tested: (sensitive=S, intermediate=I, resistant=R)

Tetracycline: ____ Ampicillin: _____ Ciprofloxacin: _____ Cotrimoxazole: _____

Chloramphenicol: _____ Nalidixic Acid: _____ Azithromycin: _____

Other: _____

Isolates stored in reference lab? Yes/No Date: ____/____/_____ (DD, MM, and YY)
ID#:_____ Position: _____

Supplies or materials required for sample collection and transportation

Personal Protective effects: Gloves, Laboratory coats

Sterile wide mouth bottles

Sterile swab sticks

Spatulas

1% alkaline peptone water in tubes

Cary Blair transport medium in tubes

Absorbent paper/cotton wool

Water proof bags

Cooler box

Ice packs

Labelling tapes

Markers/ Pen

Disinfectant (70% alcohol and Hypochlorite)

Physiological saline

RDT kits

Sterile Moore swabs

Calibrated sterile and clean 100mls bottles

Gloves

Transport pack

Water proof pens/markersScrewed cap tubes

Annexes

Annex -1 Outbreak pictures

Possible mosquito breeding site around residential area in Gelana woreda Jan, 20 2018

Annex 2

INFORMED ASSENT FORM (for giving biological specimen)

Code No. ----------

Childs name. ----------

Hello, how are you doing? My name is _____. I came from Ethiopian Public Health Institute. We are collecting blood from patients coming to Health post for testing malaria and your child has been selected to join a research study of malaria surveillance system evaluation for accurate testing service. Please take whatever time you need to discuss the study with your family and friends, or anyone else you wish to. The decision to let you child participate or not, is up to you. In this research study, we are evaluating malaria surveillance system evaluation for accurate testing service .To do that we will take 20µ blood from your child. Your child will feel slight pain during finger prick to collect blood sample. Your child will be part of the evaluation study and your child will get medical treatment coverage for malaria if become positive for this test during this study. All the information about your child will be kept confidential.

I the undersigned parent/guardian have been informed about the objectives of the project malaria surveillance system evaluation for accurate testing service that will contribute for the wellbeing of the public. I am aware that biological specimen mainly blood that the collected specimen will be used only for the planned activities of malaria surveillance system evaluation project. The laboratory results of my child will be also disclosed to me when the results are ready. I have the right to withdraw my child from the study at any time and decline to take part in the study. With the full understandings of the above clarification and explanation, I therefore decided to let my child to participate on this study voluntarily for the investigators to give blood.

Signature	Signature
(Participant)	(Investigator)
Date	Date

Annex-3

INFORMED Consent FORM (for giving biological specimen)

Code No _____

Patient

Hello, how are you doing? My name is _____. I came from Ethiopian Public Health Institute. We are collecting blood from patients coming to Health post for testing malaria and you are selected to join a research study of malaria surveillance system evaluation for accurate testing service. Please take whatever time you need to discuss the study with your family and friends, or anyone else you wish to. The decision to let you child participate or not, is up to you. In this research study, we are evaluating malaria surveillance system evaluation for accurate testing service .To do that we will take 20µ blood from you. You will feel slight pain during finger prick to collect blood sample. You will be part of the evaluation study and your child will get medical treatment coverage for malaria if become positive for this test during this study. All your personal information about child will be kept confidential.

I the undersigned patient informed about the objectives of the project malaria surveillance system evaluation for accurate testing service that will contribute for the wellbeing of the public. I am aware that biological specimen mainly blood that the collected specimen will be used only for the planned activities of malaria surveillance system evaluation project. The laboratory results will also be disclosed to me when the results are ready. I have the right to withdraw from the study at any time and decline to take part in the study. With the full understandings of the above clarification and explanation, I therefore decided to participate on this study voluntarily for the investigators to give blood.

Signature	Signature
(Participant)	(Investigator)
Date	Date

Annex-4 Malaria outbreak investigation and response Check list

Ethiopian Public health Institute (EPHI) Public health Emergency Management Directorate

Instruction: Multiple answers are possible

1. Data collector information: Name: _____ Phone number: _____
2. Date of Data collection: _____ Region_____ Zone_____ Woreda_____ Kebele _____ Got _____ House: Longitude: _____ Latitude: _____

3. Who is answering the questionnaire?

3.1 Parent/ guardian of sick person 3.2 Sick person 3.3 other (please specify) _____

4. Respondent category: **4.1** case **4.1.1** Active case: Yes No **4.1.2** treated and recovered case

4.2 control

II. Socio-demographic information

1. Patient Name/code _____

2. Patient phone number: _____

3. Age in year's _____

4. Sex: 4.1 Male 4.2 Female

5. What is your occupation? 5.1 Farmer 5.2 Merchant 5.3 Housewife

5.4 Unemployed 5.5 Government employee 5.6 Pastoralist 5.7 Student
5.8 Other (specify) ____

6. What is your marital status? 6.1 Single 6.2 Married 6.3Widowed 6.4 Divorced 6.5 Not applicable

7 . Have you ever attended school? 7.1 yes (go to question 8) 7.2 No (go to question 11)

8. What is the highest level of education you have completed? (Read answers):

8.1 KG 8.2 Primary 8.3 Secondary 8.4 Tertiary 8.5 Not applicable

9. Parents' of case/control's education

9.1 - .Mother: 1 Illiterate 2 Primary 3 Secondary 4 Tertiary (circle the highest level attended) Dip, BSC/BA, MSC/MA, PHD

9.2- Father: 1 Illiterate 2 Primary 3 Secondary 4 Tertiary (circle the highest level attended) Dip, BSC/BA, MSC/MA, PHD

Clinical manifestation

10- What symptoms/signs of the diseases did you have? (**Only for cases)**

Choose from list (multiple response is possible)

10.1 Fever 1 Yes 2 - No

10.2 Headache 1 Yes 2 – No

10.3Chills 1 Yes 2 – No

10.4 Sweats 1 Yes 2 – No

10.5 shivering 1 Yes 2 - No

10.6 Nausea and /vomiting 1 Yes 2 - No

10.7 Body aches 1 Yes 2 - No

10.8 General malaise

10 .9 Loss of appetite 1 Yes 2 - No

11- Did you had/have one or more of the following complications

11.1 Convulsion/ coma, impairment of consciousness

11.2 Hypoglycemia

11.3 Seizures,

114 breathing complication (Acute Respiratory S syndrome)

1 Yes 2 - No

12 Did you visited health facility (HP, HC, and HSP)

1 Yes 2 No

When ----------

13 If yes, did your Blood sample taken and tested? 1 Yes 2 No
14 If yes , What was the result 1 Positive 2 Negative
15 What treatment given? if yes ,

15. 1 Paracetamol (anti pain) 1 Yes 2 No 15.2 Chloroquine 1 Yes .2 No

15.3 Quartem 1 Yes 2 No 15.4 Fansidar 15 .5 Other _____

16 How and where did you received the medication

1 Treated and go home 2 Admitted

17 Did you completely recovered 1- Yes 2 – No

Knowledge Assessment

18 What is malaria ----------?

19 Do you know how malaria is transmitted ? You can choose more than one response:

19.1 Through the air 1 Yes 2 no

19.2 Through insect bite 1 Yes 2 no

19.3 Close contact with an ill person 1 Yes 2 no

19.4 Other specify _____

20 Do you think malaria can be prevented? : 1 Yes 2 no

21 If yes, what are the prevention activities /mechanisms (multiple resp possible?)

21.1 removing pooled water /plants

21.2 Using ITN

21.3 Using IRS

21.4 using insecticide repellent

21.5 other specify ----------

III. Risk factors

22 Have you ever been sick with malaria? 1 Yes 2 no

23 .If yes, when (M/Y) ----------

24. Have you travelled outside of your village /Malarious area within the past 3-4Weks before the onset of illness? 1 - Yes 2 No

25 If yes, where and when did you travel to? District_____ Kebele_____ (DD/MM/YY)

26. Is there any other person with similar symptoms (fever, headache) in the place /district you traveled at the time? 1 - Yes 2 No

27. How long does it take you to walk to the health center from your house? ----------

28 Do you work / /out door in the evening or night 1 yes 2 No

29 if yes, what activities

29. 1 Sheered 1 yes 2 No

29.2 Irrigation 1 yes 2 No

29.3 Farming 1 yes 2 No

29.4 Other public /private /service (specify) ----------

30 Do you sleep in the outdoor 1 Yes 2 No

31 Did your home sprayed for (IRS) A Yes B No

32 If yes, which type 1Bendocard 2 Proxure 3 other_ (specify) (_____

33 - Do you use ITN while sleeping A- Yes B No

34 - How many people live in your house? ----------

35 -Do all family member use ITN while sleeping 1- Yes 2- No

Environmental investigation

36 Breeding site availability36.1 River / Intermittent River 1- Yes 2- No

36.2 Pooled water 1- Yes 2- No

36.3 Irrigation 1- Yes 2- No

36.4 Presence water containing Plants around home 1- Yes 2- No

39 Type of house/window: Caved door (window) 1 Yes 2- No

Local screen 1 Yes 2- No

Annex- 5 Check list Health profile Assessment

Annex-6 Health offices /facilities questionnaire for malaria outbreak

Region ----------

Zone ---------- Woreda----------

Facility/office name _____

Respondent name _____Address (phone) ----------

Position/responsibility ----------

Instruction Multiple answers are possible

1- What is the population under surveillance? ----------
2- Do you have a malaria monitoring chart? .1 Yes 2 No
3- Do you have malaria Action threshold for your catchment? 1 Yes 2 No
4- What was your action threshold?---------- receive five years surveillance data 2012-2017
5- Is there any new health facility /Laboratory /new professional in your district since Oct ,2017**?** 1 - Yes 2- No
6- Did you distribute ITN in your Zone /woreda /area in 2009/2010 E.C? 1 - Yes 2- No
7- If yes ,which type of ITN was distributed 1 LLITN 2 other
8- If No, who is responsible for the distribution?

   1-Partners (the responsible org name) ----------

   2 regional health office 3 Zonal health office 4 Woreda HO E- other

9- How long does the ITN can function ?
10- Did You provide IRS (Indoor residual spray) in 2009 for you catchment

   1 - Yes 2 No

11- Which type of spray are you currently using in this locality/kebele/ woreda/?

1 Propoxure 1 - Yes 2 No

2 Bendiocarb 1 - Yes 2 No

3 Delthametrine 1 - Yes 2 No

4 other (specify) _____

11 What is the concentration of the IRS type used ----------

12 Did the technicians/staff have training on the procedure for spraying ?

13 What prevention programs conducted in your catchment in 2009 E.C?

13.1 Indoor Residual Spray 1 - Yes 2 No

13.2 ITN distribution 1 - Yes 2 No

13.3- removal of mosquito breeding sites 1 - Yes 2 No

13.4 Health education 1 - Yes 2 No

13.5 Any other specify ----------

Annex-7 Surveillance system evaluation questionnaire

ZONAL LEVEL QUESTIONNAIRE

Identifiers:

Region _____ Respondent Zone _____Date Tele._____ General

Total pop._____ Male _____ Female_____

Rural pop._____ urban pop._____

Total Kebeles _____ Urban _____ Rural _____

Hosp._____ H.Cs_____HPs_____ All types of private clinics ____

OGA clinics _____ other private health facility _____ NGOs H.F._____

Total # of malarious Woreda ___Total # of malarious kebeles___ Total pop. A risk for malaria _

I. Availability of a National Surveillance Manual

1. Is there a national manual/ guideline for surveillance? Yes / No

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

_____

3. What is the objectives of surveillance? _____

4. What are the strengths of your surveillance system? _____

5. What are the weakness of your surveillance system?

_____

II. Case Detection and Registration

6. Do you have standard case definitions for the Country's priority diseases like AFP (polio), malaria, and measles? Yes / No / Unknown / Not applicable

7. If the answer is yes for Q #3, observe the presence of the standard case definition for each priority disease. Yes /No Unknown / Not applicable

III. Data reporting

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

8. Is the Federal/ Regional health bureau responsible for providing surveillance forms to the health facilities? Yes /No/ Unknown / Not applicable

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

10. 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_____ _____

11. Was there any report of the immediately reportable diseases in the past 1 month? Yes/ No what was the disease_____

12. If yes, for Q 8, with in what time is the report received after detection of the diseases? a. Less than 1 hour b. 2-24 hour c. 1- 2 days d. 3- 7 days e. After 1 week

13. Percent of districts that have means for reporting to next level by e-mail, telephone, and fax or radio_____ ____

14. How do you report weekly, monthly and other formations to higher level?

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

15. Did you have address of regional PHEM officers? Yes /No

16. How frequently are you communicating with the regional PHEM officers on emergencies and other daily activities? D) Monthly

E) Quarterly

F) Every 6 month

G) Yearly

H) Others_____

17. Did you have address of woredas /health facility PHEM officers? Yes/ No (if yes observe the lists and their address of woreda and H.F PHEM officers)

18. How frequently are you communicating with the woredas/health facility PHEM officers on emergencies and other daily activities? A) Daily B) Weekly C) Every 2 week D) Monthly E) Quarterly F) Every 6 month G) Yearly H) Others_____

19. When are you expected to send weekly report to the Regional PHEM unit? Every Monday Tuesday Wednesday Thursday Friday Saturday Sunday I don't know

20. When are you expected to receive weekly report from woredas /health facilities?

 Monday Tuesday Wednesday Thursday Friday Saturday Sunday I don't know 21. How is the Zone communicating the woredas/health facility PHEM officers in case of immediately reportable diseases? By e-mail By phone By fax Regular weekly report Others----------

22. Did you send summary or short report to the administrative /program leaders or other responsible organs on planning, prevention and control activities addressing important issues at community level that have arisen through the surveillance system? Yes/No

23. If answer for Q 19 is yes to whom did you send? _____

24. If you faced any problems on communicating and reporting, list them_____

25. How do you manage the problem you faced?

IV. Data analysis

1. Have you trained on surveillance system? Yes/ No

2. If answer for Q1 is yes a) when_____ b) Topic_____ c) For how long_____

3. Did you give any onsite training / orientation about surveillance system for the woredas or health facility PHEM focal persons? Yes/No (if yes observe any documents)

4. How many woredas have permanently assigned surveillance officer or focal person? ___

5. How many of them trained on surveillance and epidemic management? _____

6. If Q #4 is no, how surveillance activates were done at woreda level? _____ _____ _____

7. Was data compiled and registered? Yes/ No (if yes observe documents)

8. Did you have computer on your department (PHEM unit)? Yes/ No

9. What is the data entry and compilation instrument? A) Manual B) Computer C) Other_____ __

10. Did you have computer skill on A) Ms -word B) Ms- excel C)MS power point D) Epi-info

11. Did you analyze data of the surveillance system (cased based, routine, outbreak ….)?Yes/ No
12. If answer for Q 8 is yes, observe whether or not data is analyzed by time, place and person
13. If you analyze surveillance data how frequently? A) weekly B) every two week C) Monthly D)quarterly E) every 6 month F) annually G) No regular time

14. Did you perform trend analysis for priority diseases? Yes/ No

15. If yes for Q #10, observe and list the diseases which has line graph _____ _____

16. Did you have denominators for data analysis? A) T. population B) male C) female D) U5 E) pop. By woreda E) hard to reach area pop.

17. Did you notify the results of your analysis to the higher level PHEM? Yes/ No

18. Did you notify the results of your analysis to the lower level PHEM? Yes/ No

19. If answer for Q #8 is No, what is the reason? □ Lack of knowledge □Shortage of time □Less attention to data analysis □ Shortage of materials □Analysis is not familiar

□ Negligence □ Other----------

V. Outbreak Investigation

1. How many outbreaks were occurred in 2009 EFY? _____

2. How many of them were investigated _____list the diseases _____
3. Did you have outbreak investigation check list? Yes/No

4. If the answer no for Q #2, how did you know possible factors for the outbreak? _____ _____

5. Where was laboratory confirmation of cases done? □Regional laboratory □ Hospital □EPHI □ Health center □Contracted private laboratory □ Other----------

6. Who was responsible to investigate an outbreak? □ Rapid response team □ HEW □ staffs of woredas health office □ experts organized randomly □ health facility staffs □ other_____

7. Fill the table below for question #2

8. Had you faced any challenge in outbreak investigation in 2004/05 EFY? Yes/No

9. If answer for Q 8 is yes, a) list the challenges_____
_____ _____

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

VI. Epidemic preparedness (relevant for epidemic prone diseases)

1. Did you have plan for epidemic response and preparedness? Yes/No if yes observe)

2. was there emergency stocks of drugs and supplies at all times in the past 1 year? Yes/ No (if yes observe any document for evidence)

3. If answer for Q2 is No, how did you control epidemics? ----------

4. Had you experienced shortage of drugs, vaccines and supplies in 2004 EFY? Yes/No

5. Was an epidemic management committee established at zonal level? Yes/No

6. Did the epidemic management committee have regularly scheduled meeting time? Yes/No (if yes observe minute book)

7. How many woredas are established epidemic management committee and meet regularly? __
8. Was Rapid response team established at zonal level? Yes/No

9. Did the Rapid response team have regularly scheduled meeting time during epidemics? Yes/No (observe minute book or other document)

10. How many woredas have established Rapid Response Team? _____

11. Did you have case management protocol for epidemic prone diseases? Yes/No/Not applicable (check)

12. Do have multi sectorial emergency preparedness and response task force committee? Yes/No/Not applicable

13. In what frequency did the task force meet during outbreaks? _____

14. Were partners working together with your office on emergencies? Yes/No

15. If answer for Q 14 is yes, what type of supports did they give to your office?

_____

16. Was there a budget for epidemic response in the last year? Yes/No

17. Had you a car assigned for emergencies (PHEM)? Yes /No/Not functional

18. If answer for Q 17 is NO, how did you address emergencies?

_____

19. Had you faced any Challenges on epidemic response and preparedness in 2009 EFY? Yes/No 20. If answer for Q 19 is yes, a) List the challenges

_____

b) What measures did you take to tackle the challenges?

_____

VII. Response to epidemics

1) Does the zonal health office responded for epidemics within 72 hours of notification of most recently reported outbreaks? Yes /No (observe any documents)

2) Are epidemic management committee evaluate their epidemic preparedness and response activities during the past year? Yes/No (check written document)

3 If answer for Q2 is No, how did you control epidemics? ----------

4. Had you experienced shortage of drugs, vaccines and supplies in 2009 EFY? Yes/No

5. Was an epidemic management committee established at zonal level? Yes/No

6. Did the epidemic management committee have regularly scheduled meeting time? Yes/No (if yes observe minute book)

7. How many woredas are established epidemic management committee and meet regularly?

8. Was Rapid response team established at zonal level? Yes/No

9. Did the Rapid response team have regularly scheduled meeting time during epidemics? Yes/No (observe minute book or other document)

10. How many woredas have established Rapid Response Team? _____

11. Did you have case management protocol for epidemic prone diseases? Yes/No/Not applicable (check)

12. Do have multi sectorial emergency preparedness and response task force committee? Yes/No/Not applicable

13. In what frequency did the task force meet during outbreaks? _____

14. Were partners working together with your office on emergencies? Yes/No

15. If answer for Q 14 is yes, what type of supports did they give to your office?
_____

16. Was there a budget for epidemic response in the last year? Yes/No

17. Had you a car assigned for emergencies (PHEM)? Yes /No/Not functional

18. If answer for Q 17 is NO, how did you address emergencies?
_____

19. Had you faced any Challenges on epidemic response and preparedness in 2004 EFY? Yes/No

20. If answer for Q 19 is yes, a) List the challenges
_____

b) What measures did you take to tackle the challenges**?**
_____

VIII. Supervision and Feedback

1-Did you have supervision plan in 200 EFY? Yes/No (check documents)

2. If answer for Q1 is No, how did you supervise? _____
_____

3. If Q #1 is yes, did you supervise the woredas and health facilities? Yes/No

4. If Q #3 is No, what is the reason? _____

5. If Q #3 is yes, how many times did you supervise each woredas and health facilities in 2009 EFY? Woreda----------. Health facility----------

6. Had you received supervision from regional PHEM unit of FMOH in the past year or currently? Yes /No

7. If Q #6 is yes, how many times in 2004 EFY? ----------

8. Did you have regular supervision checklist? Yes/No

9. If Q #8 is No, how did you supervise the woredas and health facilities?
_____ __

10. Did you send feedback of your supervision findings to the woredas and health facilities which commenting/indicating their strong and weak sides? Yes /No (check)

11. If Q #10 is No, why? _____

12. If answer for Q #10 is yes, for how many woredas and health facilities and sessions did you send a feedback in 2004 EFY? Woreda_____ health facilities_____

13. Had you received feedback from higher level supervisors in 2009 EFY? Yes/No

14. If Q #13 is yes, how many feedbacks did you received in 2009 EFY? _____

15. Did you conducted active case search for health facilities in the past 1 year? Yes/No, if yes, how many times and for how many woredas and health facilities? _____ did woreda PHEM officers also conducted? Yes/ No (observe the document)

16. What did you get from active case search _____

17. Had you faced any challenge on supervision and feedback in 2009 EFY? Yes / No

18. If answer for Q #15 is yes, a) list the challenges_____

b) List the measures that you take to tackle the challenges_____

IX. Resources

Percent of sites that have: 26. Data management

Computer Printer Photocopier

Data manager Statistical package

27. Communications:

Telephone service

Fax

Radio call

Satellite phone

Computers that have modems

28. Budget line _____

29. Logistics

X. Surveillance

30. Do you have a computerized surveillance network at this level? Yes/No/Not applicable Budget for surveillance

31. Is there a budget line for surveillance in the zonal Health office budget?

Yes/No / Not applicable

32. If yes, what is the proportion: %?

33. How could surveillance be improved? _____

Questionnaire for Attributes and level of Usefulness:

1. Total population under surveillance_____ 2012

2. What is the incidence / Prevalence of 2012 -in your area/region Anthrax 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 priority diseases early on time to permit accurate diagnosis? 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): 1. interventions and diseases trends analyzed Available //Not available

II. Describe Each System Attributes:

Simplicity:

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

2. The surveillance system allow all levels of professionals to fill data? Yes/No

3. Does the surveillance system help to record and report data on time?

4. Does the surveillance system (Reporting format) have necessary information for investigation? Yes/No

6. How long it takes to fill the format? A, <5 minute B-10-15 minutes C- >15 minutes

7. How long does it take to have laboratory confirmation of A. Measles B. AFP (Polio)

C. Malaria D. Others _____

Flexibility

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

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

_____

4. Is the system easy to add new variables? Yes /No

5. Is the surveillance system easy to integrate with other systems? Yes /No

6. Is the surveillance system easy to add new disease on report? Yes /No

7. Is the system easy to add new information technology? Yes /No

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 including all private clinics)? __/__
3) If No for Q #1, 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: _____
_____ _____

F. Were all participants using the standard case definition to identify cases? Yes/ No

G. If yes, What is your evidence _____

H. Were all the reporting agents send their report using the current and appropriate surveillance reporting format? Yes/ No (if yes observe the documents)

I. Were all the health professionals aware about the surveillance system? Yes/No (if yes how they awarded)

Acceptability:

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

5) If yes, how many are active participants (of the expected including all private clinics)? __/__

6) If No for Q #1, 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:_____

7. Were all participants using the standard case definition to identify cases? Yes/ No If yes, what is your evidence _____

8. Were all the reporting agents send their report using the current and appropriate surveillance reporting format? Yes/ No (if yes observe the documents)

9. Were all the health professionals aware about the surveillance system? Yes/No

(If yes how they awarded) Representativeness:

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

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

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

13. If answer for Q 4 is no, who do you think is well benefited by the surveillance system?

□ Urban □ rural □both

14. If yes for Q 4, do you think that rural and urban communities are equally benefited in surveillance system? Yes/ No, if no why _____

15. Are all the Socio demographic variables included in the surveillance reporting format? Yes /No

16. If the answer for Q 7 is No, which is less represented

a) Sex---------- b) age group C) ethnic group d) religion?

Stability:

1. Was any new restructuring affected 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 if yes what was it and how do you solve it_____

3. Was there any time /condition in which the surveillance is not fully operating? Yes/ No

4. If the answer yes for Q #3 When/what is the condition that talks the system not to function properly?----------
---

5. Is there a surveillance officer or focal person (PHEM unit)? Yes/No Number

Timeliness:

1. Are all woredas /health facilities reporting on time? □ Yes □ No

2. Percent of woredas that report on time. ----------

3. Are all Hospitals reporting on time? □ Yes □ No

4. Percent of hospitals that report on time. ----------

DISTRICT (INTERMEDIATE LEVEL) QUESTIONNAIRE

Region_____ Zone _____ Woreda _____
Name of respondent_____

Tele_____ Date_____

General I. Availability of a National Surveillance Manual

1. Is there a national manual/ guideline for surveillance system? 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. What is the objectives of surveillance? 4. What are the strengths of your surveillance system?

5. What are the weakness of your surveillance system?

XII. Case Detection and Registration

1. Do you have standard case definitions for the Country's priority diseases like AFP (polio), malaria, and measles? Yes / No / Unknown / Not applicable

2. If the answer is yes for Q #3, observe the presence of the standard case definition for each priority disease. Yes No

3. If answer for Q 4 is No, for which disease(s) did you lack the case definition? _____

_____

XIII. Data reporting

4. Is the Federal/ Regional health bureau responsible for providing surveillance forms to the health facilities? Yes No / Unknown / Not applicable

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

6. 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_____

7. Was there any report of the immediately reportable diseases in the past 1 month? Yes/ No

8. If yes, for Q 8, with in what time is the report received after detection of the diseases? a. Less than 1 hour b. 2-24 hour c. 1- 2 days d. 3- 7 days e. After 1 week

9. Percent of health facilities that have means for reporting to next level by e-mail, telephone, fax or radio_____

10. How do you report weekly, monthly and other formations to higher level?

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

11. Did you have address of Zonal PHEM officers? Yes /No

12. How frequently are you communicating with the Zonal PHEM officers on emergencies and other daily activities? □ Daily □ Weekly □ Every 2 week □ Monthly □ Quarterly □ Every 6 month □ Yearly □ Others----------

13. Did you have address of HC/HP PHEM focal persons? Yes /No

14. How frequently are you communicating with the HC/HP PHEM focal persons on emergencies and other daily activities? □ Daily □ Weekly □ Every 2 week □ Monthly □ Quarterly □ Every 6 month □ Yearly □ Others----------

15. Did you have case based reporting formats for out breaks? Yes /No □ Not Applicable

16. Was there guide line for specimen collection, handling and transportation to the next level? Yes/No □ Not Applicable

17. Did you have line list for reporting outbreaks? Yes/No □ Not Applicable

18. Did you face shortage of surveillance reporting and recording formats? Yes/ No If yes, which form _____

19. When are you expected to send weekly report to the Zonal PHEM unit?

□ Monday □ Tuesday □ Wednesday □ Thursday □ Friday □ Saturday □ Sunday□ I don't know

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

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

2. 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 _____ ____

3. Are all woredas reporting (including late report)? □ Yes □ No

4. Percent of woredas that send report of each week in 2004 EFY. ----------

5. Are all hospitals reporting? □ Yes □ No

6. Percent of hospitals that send report of each week in 2004 EFY. ----------

20. When are you expected to receive weekly report from HCs/HPs?

□ Monday □ Tuesday □ Wednesday □ Thursday □ Friday □ Saturday □ Sunday

21. How is the woreda communicating the HCs/HPs PHEM officers in case of immediately reportable diseases? □ by e-mail □ by phone □ by fax □ regular weekly report □ others

22. Did you send summary or short report to the administrative /program leaders or other responsible organs on planning, prevention and control activities addressing Important issues at community level that have arisen through the surveillance system? Yes /No

23. If answer for Q9 is yes to whom did you send?
_____ _____

24. If you faced any problems on communicating and reporting, list them_____ _____

25. Mention the alternative solutions that you take to tackle the problems you listed on the above? _____

26. Do you have assigned surveillance officer for PHEM activities and working on? Yes /No If no, who is responsible for PHEM activities? _____

27. If yes for Q 28, did he trained on surveillance system? □ Yes □ No

28. If answer for Q 29 is yes

a) when---------- b) Topic----------c) For how long? ----------

29. Did you conducted any onsite training / orientation about surveillance system for the HC and HP PHEM focal persons? Yes/No

30. Was data compiled? Yes /No

31. Did you have computer on your office? Yes/No

32. Did you have computer on your department (PHEM unit)? Yes /No

33. What is the data entry and compilation instrument? □ Manual □ Computer
□ other----------

34. Did you have computer skill on □ MS word □MS excel □MS power point □ Epi-info
35. Did you analyze the data collected from surveillance system? Yes /No

36. If answer for Q 35 is yes, did you described data by, □ time □ place □ person

37. If yes for Q 36, for which disease _____

38. Did you have denominators for data analysis?

□total population □ male □ female □ under five

39. Please indicate the frequency of your data analysis.

□ Weekly □Every two week □ Monthly □ Quarterly □Every 6 month □Annually □ No regular time

40. Did you notify the results of your analysis to the higher level PHEM? Yes/No

41. Did you notify the results of your analysis to the lower level PHEM? Yes/No

42. If answer for Q 38 is No, what is the reason? □ Lack of knowledge □ Shortage of time □ Less attention □ Shortage of materials □ Analysis is not familiar □ Negligence □ Other

43. How can reporting system be improved? _____

44. Do you have an action threshold for any of the country priority diseases? Yes/ No

45. If yes, what is it? _____cases _____% increase _____ _rate

(Ask for 2 priority diseases)_
_____

I. Epidemic preparedness

46. Did you have plan for epidemic response and preparedness? Yes/No

47. Did you have emergency stocks of drugs and supplies? Yes/No

48. If answer for Q 49 is No, how did you control epidemics? _____

49. Had you experienced shortage of drugs, vaccines and supplies in 2009 EFY? Yes/ No

50. Was woreda epidemic management committee established? Yes /No

51. Did the epidemic management committee have regularly scheduled meeting time? Yes/No

52. Was Woreda Rapid response team established? Yes /No

53. Did the Rapid response team have regularly scheduled meeting time during epidemics? Yes /No

54. Did you have case management protocol for epidemic prone diseases? Yes /No

55. Did your PHEM have multi sectorial emergency preparedness and response task force committee? Yes /No

56. In what frequency did the task force meet during outbreaks? _____

57. Were partners working together with your office on emergencies? Yes /No

58. If answer for Q 59 is yes, what type of supports did they give to your office? _____ _____ _____

59. Was there a budget for epidemic response? Yes /No

60. Had you a car assigned for emergencies (PHEM)? Yes /No Not functional

61. If answer for Q

62 is NO, how did you address emergencies? _____ _____ _____

62. Had you faced any Challenges on epidemic response and preparedness in 2008 EFY?

□ Yes □ No

63. If answer for Q18 is yes,

a) list the challenges b) What measures did you take to tackle the challenges?

II. Outbreak investigation

64. Had you investigated any outbreak in 2004 EFY? Yes/No

65. Did you have outbreak investigation check list? Yes / No

66. If answer for Q 2 is No, how did you know possible factors for the outbreak? ----------

67. Where was laboratory confirmation of cases done? □Regional laboratory □ Hospital □ EPHI □ Health center Other--------

68. Who was responsible to investigate an outbreak? Rapid response team HEWs
Staffs of woreda H.O Experts organized randomly Health facility staffs
 Other----------

69. If answer for Q 66 is yes how many out breaks did you investigated in 2009 EFY

70. Had you faced any challenge in outbreak investigation in 2008/09 EFY? Yes/ No

71. If answer for Q72 is yes, a) list the challenges

_____

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

_____ _____

III. Responses

72. Has the district implemented prevention and control measures based on local data for at least one reportable disease or syndrome? Yes No Unknown Not applicable

73. Does the district responded within 72 hours of notification of most recently reported outbreak (from written reports) Yes /No /unknown / Not applicable

74. Does the district achieved an acceptable case fatality rate for most recent outbreak (Observe from outbreak report) Yes No Unknown Not applicable

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

IV. Supervision and Feedback

76. Did you have supervision plan in 2009 EFY? Yes/ No

77. If answer for Q 78 is No, how did you supervise?

_____

78. If answer for Q 78 is yes, did you supervise the health centers (HCS) and health posts (HPs) according to your plan in 2004 or 2005 EFY? Yes/ No

79. If answer for Q 80 is No, what is the reason?

_____

80. If answer for Q 80 is yes, how many times did you supervise each health center (HC) and health post (HP) in 2004 or 2005 EFY? Health center_____ health post_____

81. Had you reviewed about surveillance practice by higher level supervision? Yes /No

82. Did you have regular supervision checklist? Yes/ No

83. If answer for Q 84 is No, how did you supervise the health centers and health posts?

_____

84. Were you supervised by higher level officers in 2008 or /09 EFY? Yes/ No

85. If answer for Q 86 is yes, how many times in 2009? _____

86. Did you send feedback of your supervision to the health centers (HCS) and health posts (HPs) commenting/indicating their strong and weak sides? Yes /No (observe)

87. If answer for Q 88 is No, why_____

88. If answer for Q 88 is yes, for how many HCs and HPs did you send a feedback in 2009 or EFY? HC---------- and health post----------

89. Had you received feedback from higher level supervisors in 2009 EFY? Yes/ No

90. If answer for Q89 is yes, how many feedbacks did you received in 2009 EFY?

91. Did you conducted active case search for health facilities? Yes/No

if yes, how many times and for how many health facilities?

92. Had you faced any challenge on supervision and feedback in 2009? Yes/No

93. If answer for Q 93 is yes a) list the challenges_____
_____

List the measures that you take to tackle the challenges_____

V. Training

94. Have you been trained in disease surveillance? Yes No Unknown Not applicable

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

96. What percent of your personnel in the district have been trained in surveillance and epidemic management? _____

VI. Resources_____

97. I. Percent of sites that have: Logistics a. Electricity b. Bicycles

2. Motor cycles a. Vehicle s

98. Data management

a. Stationer y

b. Calculator

c. Computer

d. Printer e. Statistical package

99. Communication a. Telephone service b. Fax c. B radio d. Computers that have modems

100. 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:

VII. Satisfaction with surveillance system

101. Are you satisfied with the surveillance system? Yes No Unknown Not applicable

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

103. Opportunities for integration 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_____ 2009

2. What is the incidence / Prevalence of Anthrax 2009 -in your woreda/region ____cases ____ Deaths?

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

Does the surveillance system help?

4. To detect outbreaks of priority diseases early on time to permit accurate diagnosis? Yes/ No

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

6. Permit assessment of the effect of prevention and control programs? Yes/ No Observe (confirmation): 1. interventions and diseases trends analyzed ---Available //Not available

IV. Describe Each System Attributes:

Simplicity:

A. Is the case definition of Anthrax easy for case detection by all level health professionals? Yes/ No

B. The surveillance system allow all levels of professionals to fill data? Yes/No

C. Does the surveillance system help to record and report data on time?

D. Does the surveillance system (Reporting format) have necessary information for investigation? Yes/No

E. How long it takes to fill the format? A- <5 minute B-10-15 minutes C- >15 minutes

F. How long does it take to have laboratory confirmation?

Flexibility

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

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

_____

C. Is the system easy to add new variables? Yes /No

D. Is the surveillance system easy to integrate with other systems? Yes /No

E. Is the surveillance system easy to add new disease on report? Yes /No

F. Is the system easy to add new information technology? Yes /No

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

1) Are the reporting site / data collectors trained/ supervised regularly? Yes/No

2) Observe: Review the last months report of these diseases

3) Average number of unknown or blank responses to variables in each of the reported forms

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

5) Are all health facilities reporting (including late report)? □ Yes □ No

6) Percent of health facilities that send report of each week in 2009 EFY. --------

Acceptability:

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

8) If yes, how many are active participants (of the expected including all private clinics)?

9) If No for Q #1, 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;

C. i.e. no dissemination of the analysis data back to reporting facilities

D. Reporting formats are difficult to understand

E. Report formats are time consuming

F. Other: _____

G. Were all participants using the standard case definition to identify cases? Yes/ No

H. If yes, what is your evidence? _____

I. Were all the reporting agents send their report using the current and appropriate surveillance reporting format? Yes/ No (if yes observe the documents) J. Were all the health professionals aware about the surveillance system? Yes/No (if yes how they awarded)

Representativeness:

10) What is the health service coverage of the district? _____%

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

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

13) If answer for Q 3 is no, who do you think is well benefited by the surveillance system?

□ Urban □the rural □both

14) If yes for Q 4, do you think that rural and urban communities are equally benefited in surveillance system? Yes/ No, if no why _____

15) Are all the Socio demographic variables included in the surveillance reporting format? Yes /No

16) If the answer for Q 6 is No, which a) Sex---------- b) age group---------- C) ethnic group----- d) religion---------- is less represented?

Timeliness:

1. Are all health facilities reporting on time? □ Yes □ No

2. Percent of health facilities that report on time. ----------

3. What are the strengths of your surveillance system? _____

4. What are the weakness of your surveillance system? _____

I. Case detection and registration

5. Observe the existence of a clinical register Yes No Unknown Not applicable

6. Observe the correct filling of the clinical register during the previous 30 days Yes No Unknown Not applicable

7. Do you have a standard case definition for: (each priority disease) like Anthrax? Yes No Unknown Not applicable

8. Observe the standard case definition for: (each priority disease) Yes No Unknown Not applicable

9. Observe 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

10. Are you able to collect the following samples?

Sputum Y N U N/

Stool Y N U N/A

Blood Y N U N/A

CSF at this facility? Y N U N/A

Body fluids Y N U N/A

11. Observe the presence of materials required to collect

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

12. Do you have the capacity to handle sputum, stool, blood/serum and CSF until shipment at this facility? Yes No Unknown Not applicable

13. Observe presence of functional cold chain at health facility Yes No Unknown Not applicable

14. Observe presence of transport media for stool at health facility Yes No Unknown Not applicable

15. Observe presence of packing materials for shipment of specimens at health facility Yes No Unknown Not applicable

III. Data reporting

16. Which communication material did you have?

□ E-mail □ Wired phone □ Mobile □ Radio □ Fax □ Other----------

17. Did you have address of Zonal/woreda PHEM officers? □Yes □ No

18. How frequently are you communicating with the Zonal/woreda PHEM officers on emergencies and other daily activities? □ Daily □ Weekly □ Every 2 week □ Monthly □ Quarterly □ Every 6 month □ Yearly □ Others----------

19. When are you expected to send weekly report to the Zonal/woreda PHEM unit?

□ Monday □ Tuesday □ Wednesday □ Thursday □ Friday □ Saturday □ Sunday □ I don't know exactly

20. How is your facility communicating the Zonal/woreda PHEM officers in case of immediately reportable diseases? □ by e-mail □ By phone □ By fax □ Regular weekly report □Others

21. Did you send summary or short report to the administrative /program leaders or other responsible organs on planning, prevention and control activities addressing Important issues at community level that have arisen through the surveillance system? □ Yes □No

22. If answer for Q 18 is yes, to whom did you send? ----------
23. If you faced any problems on communicating and reporting, list them----------
24. Mention the alternative solutions that you take to tackle the problems you above? ----------
25. Have you lacked appropriate surveillance forms and records at any time during the last 6 months (rumor log book, epidemic reporting, weekly, case based, investigation… Yes No Unknown Not applicable

26. Observe 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

27. 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

28. On time (use national deadlines) Obs Number of weekly reports submitted on time:-_____

29. How do you report to higher level? a. Mail b. Fax c. Telephone d. Radio e. Electronic f. Other

30. Strengthening reporting how can reporting be improved?

IV. Data analysis

31. Is there assigned focal person for surveillance activities? Yes/ No

32. If no for Q 28 how do you do surveillance activities? _____
33. If yes for Q 28, did he trained on surveillance system? Yes/ No

34. If answer for Q30 is yes

a) when----------? b) Topic----------? c) For how long? ----------

35. Was data compiled? Yes /No 36. Did you have computer on your office? Yes / No

37. Did you have computer on your department (PHEM unit)? Yes /No

38. What is the data entry and compilation instrument?

□ Manual □ Computer □ other

39. Did you have computer skill on □ MS Word □MS excel □MS power point □ Epi-info
40. Did you analyze data of the surveillance system? Yes /No

41. If answer for Q 37 is yes, did you describe data by □ time □ place □ person

42. Did you have denominators for data analysis? □ Total population □ male □ female □ U5

43. Please indicate the frequency of your data analysis.

□ Weekly □ every two week □ Monthly □ Quarterly □Every 6 month □ annually

□ No regular time

44. Did you notify the results of your analysis to the higher level PHEM? Yes /No

45. If answer for Q 41 is No, what is the reason? □ Lack of knowledge □ Shortage of time

□ Less attention given □ Shortage of materials □ Analysis is not familiar □ Negligence □ Other----------

46. Did you perform trend analysis (Observe the presence of line graph of cases by time)

Yes No Unknown Not applicable

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

Yes No Unknown Not applicable

48. If yes for Q 44, what is it (Ask for at least 2 priority diseases)? _____cases ____ % increase _____rate

V. Epidemic preparedness

49. Did you have plan for epidemic response and preparedness? Yes/ No

50. Did you have emergency stocks of drugs and supplies? Yes/ No

51. If answer for Q 47 is No, how did you control epidemics? _____

52. Had you experienced shortage of drugs, vaccines and supplies in 2004 or 2005 EFY?

Yes No I don't know

53. Did you established epidemic management committee? □ Yes □ No □ Not Applicable

54. Did the epidemic management committee have regularly scheduled meeting time? Yes/ No

55. Did you established Rapid response team? □ Yes □ No □ Not Applicable

56. Did the Rapid response team have regularly scheduled meeting time during epidemics? Yes/No

57. Did you have case management protocol for epidemic prone diseases?

□ Yes □ No □ 58. Was there a budget for epidemic response? □ Yes □ No

59. Any Challenges on epidemic response and preparedness in 2009 EFY? Yes / No

60. If answer for Q 56 is yes, a) list the challenges_____ _____ b) what measures did you take to tackle the challenges?

VI. Epidemic response_____

61. Is there any outbreak occurred in your area in 2009 EFY? Yes/ No how money _____

62. If yes for Q 58, how many of them were investigated in 2009 EFY? _____

63. Did you have outbreak investigation check list? Yes/ No

64. If answer for Q 59 is No, how did you know possible factors for the outbreak? ----------
65. Where was laboratory confirmation of cases done?

□ Regional laboratory □ Hospital □ EPHI □ Health center □Contracted private laboratory □ Other----------

66. 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

67. Did they achieved acceptable case fatality rates (e.g. 10% for Meningococcal CSM 1% for Cholera) during the most recent outbreak Observe that the health facility achieved an acceptable case fatality rate for most recent outbreak Yes No Unknown Not applicable

VII. Supervision and Feedback

68. Were you supervised by higher level (regional, zonal or woreda) officers in 200 8/09EFY?

Yes /No (observe at least one feedback report)

69. If answer for Q 64 is yes, how many times in 2009 EFY? ----------

70. Had you received feedback from higher level supervisors in 2009EFY? Yes /No

71. If answer for Q 66 is yes, how many feedbacks did you received in 2009 EFY? ---------

72. Had you faced any challenge on supervision and feedback in 2009EFY? Yes /No

73. If answer for Q 68 is yes

a) List the challenges

b) List the measures that you take to tackle the challenges.

---

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

75. Logistics a) Electricity a) Bicycles b) Motor cycles c) Vehicles

76. Data management a) Stationery b) Calculator c) Computer d) Software e) Printer

77. Communication A. Tel. service B. Fax C. Radio call D. Computer with modem

78. 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)

79. Other: Protection materials (list)

Questionnaire for Attributes and level of Usefulness:

80. Total population under surveillance_____ 2009

81. What is the incidence / Prevalence of 2004 -in your area/region?

 Anthrax _____cases _____Deaths _____

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

Does the surveillance system help?

82. To detect outbreaks of priority diseases early on time to permit accurate diagnosis? Yes/ No
83. To estimate the magnitude of morbidity and mortality related to these diseases, including identification of factors associated with these diseases? Yes/ No

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

Describe Each System Attributes:

Simplicity:

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

2) The surveillance system allow all levels of professionals to fill data? Yes/No

3) Does the surveillance system help to record and report data on time?

4) Does the surveillance system (Reporting format) have necessary information for investigation? Yes/No

5) How long it takes to fill the format? a, <5 minute b-10-15 minutes c- >15 minutes 6) How long does it take to have laboratory confirmation of

i. Measles ii. AFP (Polio) iii. Malaria iv. Others _____

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 and reporting formats will be difficult to implement? Yes /No

Comment: _____

3. Is the system easy to add new variables? Yes /No

4. Is the surveillance system easy to integrate with other systems? Yes /No

5. Is the surveillance system easy to add new disease on report? Yes /No

6. Is the system easy to add new information technology? Yes /No

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

1) Are the reporting site / data collectors trained/ supervised regularly? Yes/No
2) 2) Observe: Review the last months report of these diseases
3) 3) Average number of unknown or blank responses to variables in each of the reported forms _____
4) Percent of reports which are complete(that is with no blank or unknown responses) from the total reports _____

Acceptability:

1. Were all health workers using the standard case definition to identify cases? Yes/ No

2. If Yes, What is your evidence _____

3. Were your health facility send your report using the current and appropriate surveillance reporting format? Yes/ No (if yes observe the documents)

4. Were all the health professionals aware about the surveillance system? Yes/No (if yes how they awarded)

Acceptability: 7) Do you think all the reporting agents accept and well engaged to the surveillance activities? Yes/No

8) If yes, how many are active participants (of the expected including all private clinics)? _____/_____

9) If No for Q #1, 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;

C.no dissemination of the analysis data back to reporting facilities

D. Reporting formats are difficult to understand

E. Report formats are time consuming F. Other: _____

G. Were all participants using the standard case definition to identify cases? Yes/ No

H. If yes, what is your evidence? _____

I. Were all the reporting agents send their report using the current and appropriate surveillance reporting format? Yes/ No (if yes observe the documents)

J. Were all the health professionals aware about the surveillance system? Yes/No (if yes how they awarded)

Representativeness:

10) What is the health service coverage of the district? _____%

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

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

13) If answer for Q 3 is no, who do you think is well benefited by the surveillance system?

 The urban the rural both

14) If yes for Q 4, do you think that rural and urban communities are equally benefited in surveillance system? Yes/ No, if no why _____

15) Are all the Socio demographic variables included in the surveillance reporting format? Yes /No

16) If the answer for Q 6 is No, which a) Sex b) age group-- C) ethnic group----- d) religion---------- is less represented?

Timeliness:

1. Are all health facilities reporting on time? Yes No

2. Percent of health facilities that report on time. ----------

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

Stability

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

_____ _____

8. Was there any time /condition in which the surveillance is not fully operating? Yes/ No

9. If the answer yes for Q #3 When/what is the condition that talks the system not to function properly?----------

10. How did you work with other departments and other sectors?_____

Health Post Level Questionnaire

Region _____ Respondent _____
Zone_____ Tele._____
Woreda_____ Date_____ Health C._____ Name of health Post_____

A. General overview

1. What is the objectives of surveillance? _____

2. What are the strengths of your surveillance system? _____

3. _____ ____

4. What are the weakness of your surveillance system? _____

5. _____ ____

B. Communication and reporting assessment

1. Which communication material did you have?

□ E-mail □ Wired phone □ Mobile □ Radio □ Fax □ Other----------

2. Did you have address of woreda or H.C PHEM officers? Yes /No

3. How frequently are you communicating with the woreda or H.C PHEM officers on emergencies and other daily activities? □ Daily □ Weekly □ Every 2 week □ Quarterly □ Every 6 month □ Yearly □ Others----------

4. When are you expected to send weekly report to the woreda or H.C PHEM unit? □ Monday □ Tuesday □ Wednesday □ Thursday □ Friday □ Saturday □ Sunday □ I don't know
5. How are you communicating the woreda or H.C PHEM officers in case of immediately reportable diseases? □ by e-mail □ By phone □ By fax □ Regular weekly □ others

6. If you faced any problems on communicating and reporting, list them----------
---

7. Mention the alternative solutions that you take to tackle the problems you above?

C. Assessment of availability of Surveillance Documentation, Registers, and Forms

1. Was there national manual for surveillance? □Yes □ No □ Not Applicable

2. Did you have standard case definition for all country priority diseases? Yes/ No

3. Was the case definition posted? □Yes □ No

4. If answer for Q2 is No, for which disease(s) did you lack the case definition? ----------
5. Did you have case reporting formats for out breaks? □Yes □ No □ Not Applicable

6. Was there guide line for specimen collection, handling and transportation to the next level? □Yes □ No □ Not Applicable

7. Had you line list format for reporting outbreaks? □Yes □ No □ Not Applicable

8. Was there a clinical register/logbook in your health post? □Yes □ No □ Not Applicable

9. Did you face shortage of surveillance reporting and recording formats? Yes/ No

10. If answer foe Q9 is yes, which form? ----------

D. Data analysis and training assessment

1. Had you trained on surveillance system? Yes/ No

2. If answer for Q1 is yes

a) when----------?

b) Topic----------?

c) For how long? ----------

3. Did you analyze data? □ Yes □ No

E. Outbreak investigation and case confirmation assessment

1. Was there any outbreak in your Kebele in 2009 EFY? Yes/ No

2. If your answer for Q1 is yes, what did you do? □ Reported to the woreda PHEM □ reported to administrative leaders □ we investigated □ Cases referred to health center/hospital □ Other----------

3. Where was laboratory confirmation of cases done? _____

4. Who was responsible to investigate an outbreak? _____

5. If answer for Q1 is yes how many out breaks were occurred in your Kebele in 2008 EFY?

Fill the table below

6. Had you faced any challenge in outbreak investigation in 2009 EFY? Yes/ No

7. If answer for Q 6 is yes, a) list the challenges ----------

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

F. Supervision and feedback

1. Were you supervised by higher level (regional) officers in 2003 EFY? □ Yes □ No

2. If answer for Q1 is yes how many times in 2008 EFY? ----------

3. Had you received feedback from higher level supervisors in 2008 EFY? □ Yes □ No

Declaration

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

Name: Ebise Abose

Signature: _____

Place: _____

Date of Submission: _____

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

Name of Advisor: Dr. Niguse Deyasa

Signature: _____

Date

Mr. Sefonias Getachew

Signature: _____

Date