ADDIS ABABA UNIVERSITY, COLLEGE OF HEALTH SCIENCES,

SCHOOL OF PUBLIC HEALTH

ETHIOPIAN FIELD EPIDEMIOLOGY TRAINING PROGRAM (EFETP)

Compiled body of work in field epidemiology

BY: - **SEYOUM WONDAFRASH MULUGETA**

Submitted to *the School of public health of Addis Ababa University in partial fulfillment for the degree of Master of Public Health in Field Epidemiology*

October, 2018
Addis Ababa, Ethiopia

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Mentors:

1. **Naod Ferdu (MD, MPH, assistant professor)**
2. **Abdulnaser Abagero (MPH)**

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Approved by examining board

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Chairman, school graduate committee

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Advisor

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Examiner

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Examiner

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Acknowledgment

First I would like to thank God for His mercy and secrets of my success and I would like to thank and appreciate my mentors Dr Naod Ferdu and Mr. Abdulnaser Abagero for their continuous support and guidance throughout the execution of my output.

I also want to sincerely appreciate our field base Kolfe Keraniyo sub city health office, woreda health office and other sectors, and health facilities PHEM focal persons for their unreserved cooperation while I was in field work for different surveillance activities and outbreak investigation. Finally I thank my family and friends for moral support.

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List Abbreviations and Acronyms

AAU	Addis Ababa University
AIDS	Acquired Immunodeficiency Syndrome
ANC	Ante-Natal Care
AR	Attack Rate
ART	Anti Retro viral Treatment
BCG	Bacillus Chalmette Guerin
BSC	Bachelor of Science
CDC	Center for Disease Control and Prevention
CDMA	Code Division Multiple Access
CFR	Case Fatality Rate
CHWs	Community Health Workers
CMR	Child Mortality Rate
COPD	Chronic Obstructive Pulmonary Disease
CPT	Cotri-moxazole Prophylaxis Treatment
DM	Diabetic Mellitus
DOT	Directly Observed Therapy
DOTS	Directly Observed Therapy Short Course
DST	Drug Susceptibility Test
EFETP	Ethiopia Field Epidemiology Training Program
EFY	Ethiopian Fiscal Year
EPI	Expanded Program on Immunization
EPHI	Ethiopia Public Health Institute

GISRS Global Influenza Surveillance and Response System

HAART Highly Active Anti Retro viral Treatment

HC Health Center

HEP Health Extension program

HF Health Facility

HIV Human Immunodeficiency Virus

HMIS Health Management Information System

HO Health Officer

HP Health Post

IGM Immunoglobulin M

ILI Influenza like Illness

IMR Infant Mortality Rate

INH **Is**oniazid

IUD Intra Uterine Device

KG Kindergarten

KOK Kolfe Keraniyo

MCH Maternal and Child Health

MPH Masters of Public Health

MD Medical Doctor

MDR TB Multidrug Resistant Tuberculosis

NGO Nongovernmental Organization

NIL National Influenza laboratories

OPD Outpatient Department

OPV	Oral Polio Vaccine
OTP	Outpatient Therapeutic Feeding Program
PCV	Pneumococcal Vaccine
PITC	Provider Initiated Testing and Counseling
PLHA	People Living With HIV/AIDS
PMTCT	Prevention of Mather to Child Transmission
PNC	Post Natal Care
PTB	Pulmonary Tuberculosis
PPE	Personal Protective Equipment
RDT	Rapid Diagnostic Test
RHB	Regional Health Bureau
RRT	Rapid Response Team
SC	Sub City
TBAs	Traditional Birth Attendants
TSF	Targeted Supplementary Feeding
TT2	Tetanus Toxoid two doses
TVET	Technical and Vocational Education Training
UHEWs	Urban Health Extension Workers
VCT	Voluntary Counseling and Testing
VTM	Viral Transport Media
WHO	World Health Organization
WHO CC	World Health Organization Collaborative Center
XDR TB	Extensively Drug Resistant Tuberculosis

Executive summary

Field epidemiology training program (FETP) is two years in service training program adapted from the United States centers for diseases control and prevention (CDC) epidemic intelligence service (EIS) program and curriculum. The program is designed to assist the federal ministry of health and regional health bureaus in strengthening health systems preparedness and response against major public health problems.

This compiled body of works has 8 main sections which all of them were done during the residency schedule of the program. This include outbreak investigation, surveillance data analysis, evaluation of the surveillance system, health profile report, writing of finalized scientific manuscript for peer review journals, abstracts submitted to scientific conferences, proposal of epidemiologic research project and other additional works, the document is organized in to eight chapters;

Chapter one deals with outbreak investigation, there were two outbreak investigations conducted: one was malaria outbreak investigation in siremerate cluster Dasenech District, South Omo zone, SNNPR with case control study. The second outbreak investigation was Scabies outbreak investigation conducted in woreda 13, kolfe keraniyo sub city, and Addis Ababa city Administration, with descriptive cross sectional study.

Chapter two explains about typhoid fever diseases surveillance data analysis which was conducted at sub city level, five year data, from 2012- 2016, was analyzed in the sub city by place, person and time.

Chapter three explains about ILI (influenza like illness) sentinel surveillance system evaluation conducted in Addis Ababa city Administration. In this chapter, purpose and objective of surveillance system, progress towards the objective and also attributes of the surveillance system were discussed.

Chapter four describes about health profile of Woreda 12, Kolfe Keraniyo sub city, Addis Ababa city Administration, where health and health related data were reviewed, analyzed and presented.

Chapter five is scientific manuscript for peer reviewed journal on ILI sentinel surveillance evaluation in Addis Ababa city Administration.

Chapter six is abstract on ILI sentential surveillance evaluation in Addis Ababa city Administration.

Chapter seven is project proposal entitled ‘determinants of MDR TB in all health facilities in Kolfe Keraniyo sub city, Addis Ababa city Administration.

Chapter eight is other output like public health emergency weekly bulletin. The bulletin is prepared on weekly basis and this chapter WHO week 16 bulletin is presented.

Chapter one: outbreak investigation

1.1. Malaria outbreak investigation and Response in Dasenech District, South Omo zone, SNNRP, 2018

Abstract

Introduction: Malaria is the highly prevalent tropical disease with high morbidity and mortality as well as high economic and social impact. According to World Health Organization report in 2016, an estimated 216 million cases of malaria occurred worldwide in which 90% was from African Region. In Ethiopia about 75% of landmass of the country is malaria-endemic and 65% (58.5million) of the population is estimated to be at risk of malaria infection. South omo one of the malarias land marks of Ethiopia because of the existence of different risky factors in the area. The purpose of this study was to investigate the malaria outbreak in siremerate cluster Dasenech District in 2018.

Methods: We used microscopic and Rapid Diagnostic Test investigation to confirm the disease. We reviewed the previous year's malaria data to establish a threshold level and to understand the trends of the disease. The magnitude of the disease was described by person, place and time. We conducted an unmatched case-control study with 109 randomly selected cases and 109 community controls.

Result: Among the total of 638 suspected cases, 530 (83%) confirmed malaria cases. The Total Attack Rate was 9.6 per 1000popn and no malaria related deaths were reported during May 2018. Slide positivity rate was 83%. Of the total suspected cases 54.7% were female and specific AR were 9.7%. Person ages 5 - 14 years were most affected with an attack rate of 11.8%. Having Number of treated bed net per house hold one or less were 6.6 times more likely to be exposed to malaria parasites than those who have more than one treated bed net per house hold. Staying outside during night time were 48.5 times more likely to be exposed to malaria parasite than those who not staying out side during night time.

Conclusion: Staying outside during night time, malaria infection in the family and number of bed net one and less per house hold has also contributing risk factors for occurrence of the outbreak.

INTRODUCTION

Malaria is the highly prevalent tropical disease with high morbidity and mortality as well as high economic and social impact. Even though it has no vaccination, it is an absolutely preventable and treatable vector-borne illness which is caused by protozoa parasite of the genus *Plasmodium*. People with malaria often experience fever, chills, and flu-like illness. Left untreated, they may develop severe complications and die [1].

According to World Health organization report, in 2016, an estimated 216 million cases of malaria occurred worldwide in which 90% was from African Region followed by South-East Asia Region (7%) and the Eastern Mediterranean Region (2%). Of the 91 countries that had an indigenous malaria case in 2016, a decrease in malaria cases of more than 20% compared with 2015 was estimated in 16 countries, while an increase of a similar magnitude was estimated in 25 countries. The WHO regions of the Americas and Africa accounted for nearly 70% of the countries that had increases of more than 20% in 2016 compared with 2015. It was estimated that 445 000 deaths due to malaria had occurred globally, of which 407 000 deaths (approximately 91%) were in the WHO African Region in 2016 [2].

In combating the high prevalence of Malaria through the world WHO and every country formulates different strategies in vector controls. The most commonly used methods to prevent mosquito bites are sleeping under an Insecticide Treated bed net and spraying the inside walls of a dwelling with an insecticide – an intervention known as indoor residual spraying(IRS). Use of ITNs has been shown to reduce malaria case incidence rates by 50% in a range of settings, and to reduce malaria mortality rates by 55% in children aged less than 5 years in sub-Saharan Africa. Between 2014 and 2016, a total of 582 million insecticide-treated mosquito nets (ITNs) were reported as having been delivered globally, of which almost 505 million ITNs (87%) were delivered to countries in sub-Saharan Africa [2]. In sub-Saharan Africa, 16 countries accounted for more than 80% of deliveries in the

period 2014–2016. These countries were Nigeria (78.0 million), Democratic Republic of the Congo (61.2 million), Uganda (35.6 million), and Ethiopia (33.0 million) [2].

In Ethiopia malaria constitutes a major public health problem and impediment to socioeconomic development where, about 75% of landmass of the country is malaria-endemic and 65% (58.5million) of the population is estimated to be at risk of malaria infection [3].

According to the national strategy for malaria control, areas lower than 2,000 meters in altitude were considered malaria-endemic, and targeted to receive key malaria control interventions including long-lasting insecticidal nets (LLINs), indoor residual spraying (IRS), and prompt diagnosis and effective case management. The strategy outlined an ambitious national goal of 100% household LLIN coverage in malaria-endemic areas, with a mean of two LLINs per household [4].

Statement of the problem

Worldwide, Malaria remains a challenging infectious disease resulting in death and economic crisis. To combat this, WHO has developed ***Global Technical Strategy for Malaria 2016-2030*** (GTS). The Strategy was adopted by the World Health Assembly in May 2015. It provides a technical framework for all endemic countries as they work towards malaria control and elimination. This Strategy sets ambitious but attainable goals for 2030, with milestones along the way to track progress. The milestones for 2020 include [5]:

- Reducing malaria case incidence by at least 40%;
- Eliminating malaria in at least 10 countries;
- Preventing a resurgence of malaria in all countries that are malaria-free.

To achieve this goal, Vector control using Insecticide- treated mosquito nets (ITNs) and indoor residual spraying (IRS)) are the main way to prevent and reduce malaria transmission. As per the National Malaria Control Strategic Plan 2014-2020, the FMOH conducted a mass campaign in

2015, distributing 29.6 million long-lasting insecticidal nets (LLINs) to protect all Ethiopians living in areas with ongoing malaria transmission, representing 60% of the total population [5]. Among Ethiopian malarias area, South omo the climatic condition for most places is temperate and low land. Dasenech District represents the most malaria epidemic-prone area of south omo. 40 villages100% of Dasenech District are malarias with populations are at risk for malaria. In May 7 of 2018, unusual increment of malaria cases was reported from siremerate cluster in Dasenech District, South Omo zone, SNNP Region.

Significance of the study

The main objective of malaria program is to stop local transmission of malaria, and proper use of vector control methods is very important. In different time national, or regional government in collaboration with different non-governmental stakeholder, distributes ITN/IRS for population at risk. But still now in different part of the Ethiopian region malaria transmission is continued and many populations are being affected by malaria. So, the aim of this investigation was to identify risk factors associated with this outbreak and to describe the magnitude of morbidity and mortality due to malaria outbreak and investigate factors associated with an occurrence of malaria outbreak in siremerate cluster, South Omo zone, SNNRP, 2018.

LITERATURE REVIEW

Worldwide, about 104 countries and territories are considered malaria endemic [3]. Malaria is an entirely preventable and treatable mosquito-borne illness. However, it remains a huge public health problem throughout the world. According to the annual global report of 2014, 97 countries and territories had ongoing malaria transmission with an estimated 3.2 billion people at risk of malaria and 1.2 billion are at high risk [6].

Malaria occurs mostly in tropical and subtropical areas of the world. In many of the countries affected by malaria, it is a leading cause of illness and death. The most vulnerable people for malaria are persons with no or little immunity against the disease. These are young children who have not yet developed partial immunity to malaria, pregnant women whose immunity is decreased by pregnancy especially during the first and second pregnancies and travelers or migrants coming from areas with little or no malaria transmission who lack immunity [7, 8].

The problem of malaria is very severe in Ethiopia where it has been the major cause of illness and death for many years. In Ethiopia malaria transmission are unstable. Because of it, malaria epidemic is serious public health emergencies. According to records from the Ethiopian Federal Ministry of Health, 75% of the country is malarias with about 52 million people (68%) of the total population living in areas at risk of malaria [9]. The epidemiology of malaria in Ethiopia contrasts with that of many other countries in Africa with high malaria transmission where malaria morbidity and mortality mainly affect young children. The 2015 HMIS data indicated that parasite prevalence in Ethiopia was 0.5% by microscopy and 1.2% by RDTs for areas below 2,000 meters and less than 0.1% prevalence above 2,000 meters [9].

In Ethiopia there are about 835 districts with different levels of malaria risk with an estimated at-risk population of 50.5 million people as per the new stratification. However, the estimates of at risk population from the official projected population size for the year 2016 are 55.3 million. The best available proxy for local malaria transmission risk in Ethiopia is household altitude below 2,000

meters (above sea level), since malaria is rarely transmitted at higher elevations (unless there are weather abnormalities and widespread epidemics). Hence, those districts with malaria high risk needs proper vector control interventions to tackle malaria transmission [5].

Among the most malaria epidemic-prone countries in Africa, Ethiopia is the one of the few African countries that has a history of malaria control strategies for more than 40 years. To combat the burden of Malaria, globally as well in Ethiopia, different strategies were developed. Among these the two major malaria prevention services implemented in Ethiopia are targeted IRS with insecticides and distribution of LLINs for universal coverage. Other vector control activities, mainly larval control through environmental management and chemical larviciding, are also practiced in areas where such interventions are appropriate and expected to have significant impact [10].

Moreover, ITNs are the cornerstone of malaria prevention efforts, particularly in sub-Saharan Africa. Over the last 5 years, the use of treated nets in the region has increased significantly: in 2015, an estimated 53% of the population at risk slept under a treated net compared to 30% in 2010. Indoor residual spraying of insecticides (IRS) is used by national malaria programs in targeted areas. In 2015, 106 million people globally were protected by IRS, including 49 million people in Africa. The proportion of the population at risk of malaria protected by IRS declined from a peak of 5.7% globally in 2010 to 3.1% in 2015[11].

Even though the national target is to sustain 100% LLINs coverage in malaria risk areas, as Ethiopian national malaria survey report of 2015 shows, the percentage of households in malarious areas owning at least one LLIN in EMIS 2015 was 64% in Ethiopia, while it was about 58.5% in Oromiya region. On the other hand, the coverage of Indoor residual spraying (IRS) in 2015 was about 28.8% of Households in Ethiopia and 29.8 in Oromiya region [10]. However, the presence of ITN in House hold does not guarantee the prevention of malaria vectors because proper utilization is crucial. As different study showed the utilization of ITN may be affected by different personal, social and environmental barriers. Education level of the HH, awareness about ITNs, number of

sleeping rooms in the HH, individual ITN-color preference, presence of children aged under 5 years in the HH, IRS status of the HH, awareness of malaria prevention, family size of the HH, and occupational status of the HH head are reported as affecting factors in different previous study [12,13,14]. Moreover, the study supported by President's malaria initiative and conducted in five districts of Jima Zone in 2015 shows, the shape of ITN, low risk perception due to seasonality of malaria, saving nets for future use, decreased awareness, negligence and perceived low efficacy of LLITN are the major barriers. Again, the study conducted in Gambella also shows, sleeping in a member of more than three is more likely to use bed nets [15]. Study in afar region shows females were more affected than male which is 54.1% [16]. Study in Ilu woreda shows presence of person with similar malaria sign symptoms in the home before 2 wks of onset was associated with the disease(OR:2.6, 95%CI: 1.4-4.4)[18] other studies shows population living and staying outside home during night (OR: 1.3, 95% CI: 1.1 – 2.8). [17]

Objectives

General objective:

To investigate the malaria outbreak in siremerate Cluster Dasenech District, South Omo Zone, 2018

Specific objective

- To verify the existence of malaria outbreak in siremerate cluster Dasenech District.
- To summarize magnitude of the disease by person, place and time.
- To identify risky factors with contributing to the occurrence of malaria outbreak.

METHODS AND MATERIALS

Study area and period

This study was conducted in dasenech district, south omo zone, SNNRP. Dasenech district is in southern Ethiopia, near the borders of Kenya. The district is located in the southern Zone of the SN Regional state 1000 km away from Addis Ababa. The district is 40 villages (kebeles). The villages

which we investigate the outbreak has 5783 population, which were 2861 (49.5%) male and 2922 (50.5%) female.. the district and most villages live near or around Omo river which has a risk for malaria transmission. The total population of the district is at risk of malaria. According the surveillance report of the district malaria is the number one causes of outpatient cases. The previous efforts to prevent and control of malaria in districts IRS and environmental management, new strategy of malaria prevention and control strategy as the rest of the country is applied in the district including using LLIN and treatment with ACT as well as the environmental management. This study was conducted from April 30 to May 13, 2018

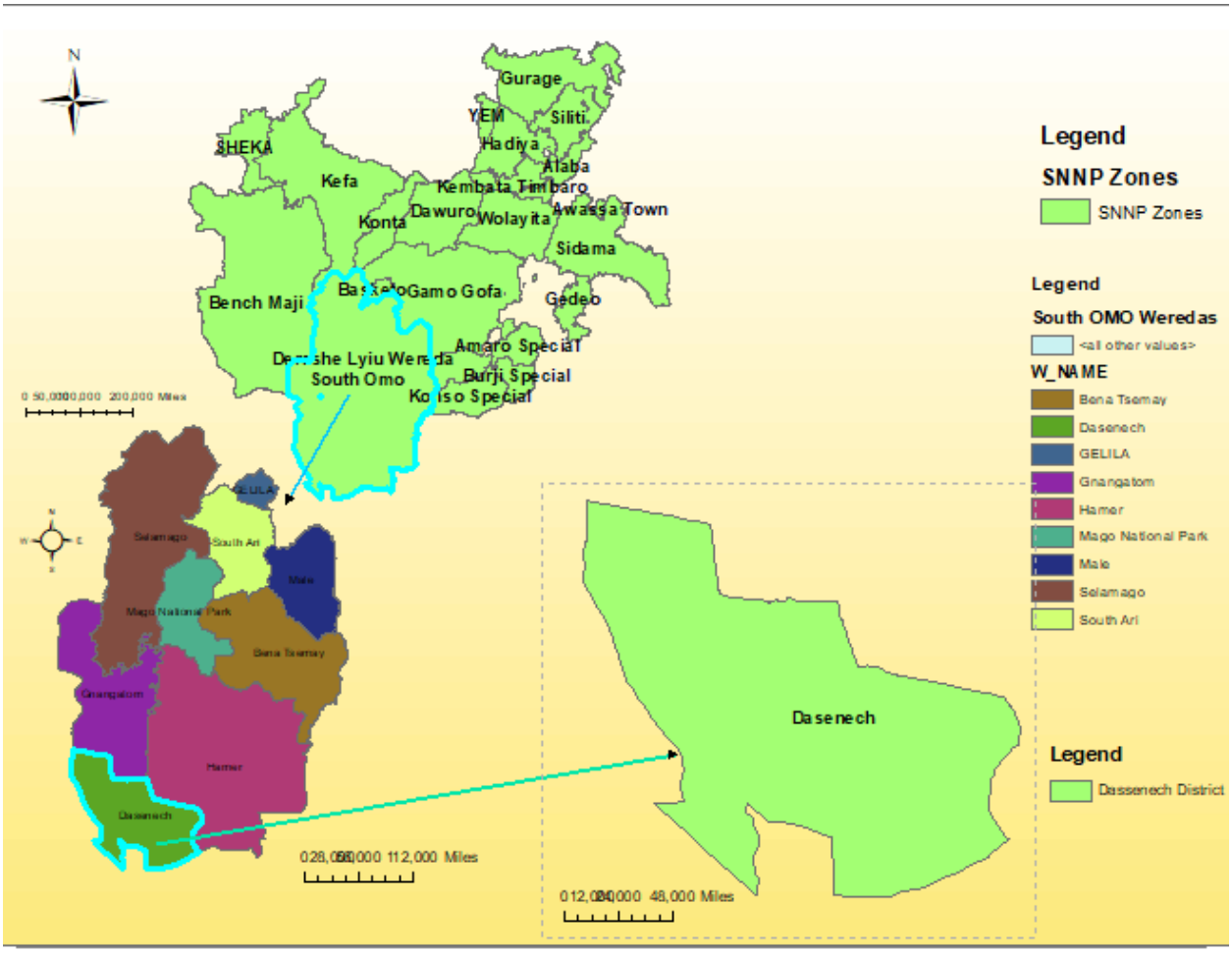

Figure 1: Dasenech district, south Omo zone, SNNPR, Ethiopia

Surveillance

There was suspected malaria outbreak information from dasenech district. School of public health and National Public Health Emergency Management in EPHI facilitate for outbreak investigation in dasenech district to south omo zone, SNNPR. After discussion with the national and regional PHEM a team which has three from EFETP residences with district PHEM officer and other health staff was deployed to the siremerate cluster to investigate and control the outbreak on malaria.

Study Design: Community based unmatched case – control study was conducted in the siremerate cluster from April 30-May 13, 2018

Target population: Populations in Siremerate cluster, Dasenech District, South Omo, SNNP, Ethiopia, 2018

Sampling unit: Populations in Siremerate cluster in four Villages and tested to have malaria

Study Unit: Those participants randomly selected from the community as a cases and control.

Inclusion and Exclusion Criteria

- **Inclusion Criteria**: those were tested malaria positive and found in home during the study period was recruited as a case group and those have no clinical features or history of malaria within the last two weeks back from the data collection day was enrolled and interviewed as a Control Group.
- **Exclusion criteria**: Person who came from other woreda or districts or a person who did not stay in the villages in the previous two weeks was excluded from the study. Critically ill, psychiatric patients, less than 18 yrs with no care givers at home at the time of interview was excluded from both and controls.

Case definition

- **Suspected case**: - Any person with fever or fever with headache, rigor, back pain, chills, sweats, myalgia, nausea, and vomiting diagnosed clinically as malaria (PHEM guideline).
- **Confirmed case**: - A suspected case confirmed by microscopy or RDT for Plasmodium parasites (PHEM guideline).
- **Clinically treated cases: -** A suspected case or negative lab result treated as malaria case.
- **Malaria Outbreak: -** Crossing the normal line (threshold) or Doubling of cases compared to the same week of the previous year (PHEM guide line).
- **Malaria breading site:** sites those favors the survival and breading of mosquito parasite (Stagnant water, swamp area, interrupted river, hold/disposed tyre containing water, open plastic container…)

Variables

- **Dependent Variables:** Malaria illness
- **Independent:** Socio demographic (Sex, Age, Family size, Residency area, Occupation, Educational status, Marital status), Knowledge, Risk factors(ITN ownership, ITN utilization, Sleeping area, travel history, Contact history, staying outside at night, breading site)

Sample size Determination: The sample size was calculated using EPI-Info statistical package at 95% CI, Power of 80% and 1:1 case control ratio. Different assumptions from different study were used to determine the percent of cases exposed and percent of control exposed. Then the variables with high number of Sample size was taken as the final sample size for our study (table 1).

Table 1 Sample size determination using different previous study

Sn	Variables	% of cases Exposed	% of control Exposed	OR	Sample cases	Sample Controls	Total
1	Not using ITN(afar2016,	69.2%	31.6%	4.9	32	32	64
2	Sleeping outside at night	76.9%	59.2%	2.3	99	99	198
3	Presence of stagnant water in lessthan500-1000m (dagnachew,2014 oromiya)	87%	45%	8.2	24	24	48
4	Poor knowledge: not having awareness about transmission(dagnachew,2014)	57%	10%	11.9	19	19	38
5	IRS spray no	88%	47%	8.3	26	26	52

Sample Size: The total calculated sample size were 198 and by adding 10% non respondent rate, 218 participants were interviewed (109 cases and 109 controls).

Sampling Procedure:

- **Case**: Malaria cases were taken from line lists with their address (Sampling Frame) and to select our sample unit we use simple Random sampling. To give equals chance for all Villages total sample was distributed proportionally according to the number of cases (Figure2).
- **Control:** For every cases recruited we interviewed one controls from the next house. In cases where there is no the first neighbor members in the house/there is no above 18 years member in the house we select the second houses. Among the family members, priority was given to Mother or Father and when there is no one of them in the house other family members with age of greater the 18 was interviewed with priority of their age (Figure 2).

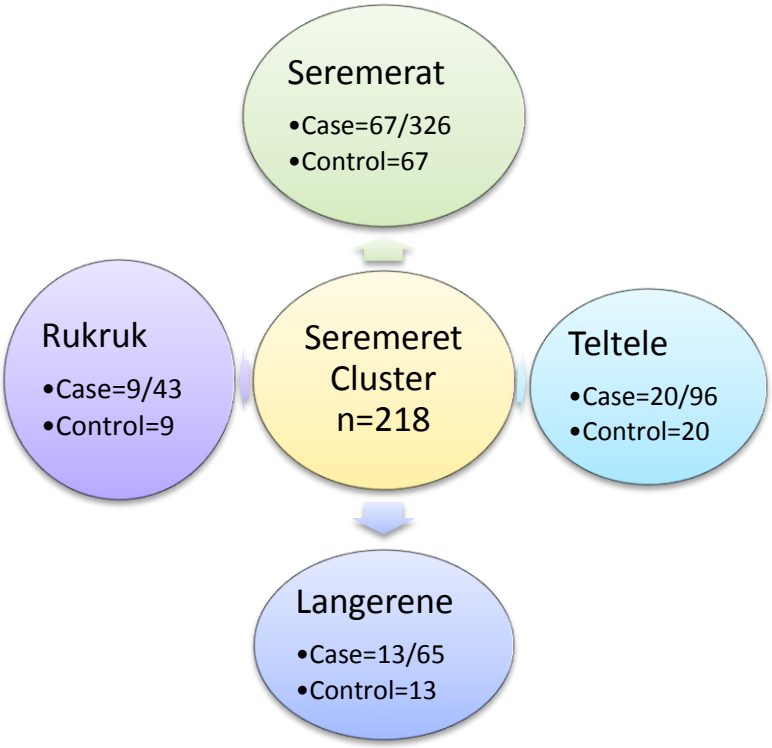

Figure 2 Diagrammatic representation of sample frame

Data collection procedure

Line lists from health facility were taken for descriptive study. The line list contains the total outpatients of clinical and confirmed cases and confirmed malaria cases diagnosed via microscopy or multi-species rapid diagnostic test (RDT) and were aggregated by malaria species (Plasmodium falcipharum100%). Selected cases and controls were interviewed face to face using Semi structured questionnaire which was adopted from CDC standard questionnaire and customized in to local situation. The interviewer was trained and translated to the local language during data collection. The questionnaire comprises demographic data (age, ethnic group, marital status, educational level and occupation), clinical history of cases (history of treatment, sign and symptoms and treatment outcomes), and risk factors of the disease and knowledge level of the participants about the disease, mode of transmission and prevention method.

Quality control: Orientation and discussion was done among the data collectors of the study team based on the questionnaire and the way how to collect the data in house to house. All collected data was checked for completeness before entering into epi info.

Data analysis

The questioner was projected into Epi-info version 7.1.1 encoded, entered and cleaned using Epi-info and analyzed using both Epi info and Microsoft- excel. Descriptive data were analyzed for frequencies and proportion. All independent Variables was cross tabulated with dependent variables in Bivariate analysis and variables with p value of 0.2 or less in Bivariate analysis was run in multivariate logistic regression to minimize possible confounders. Finally significant association was declared at p value of 0.05 or below.

Ethical consideration: Official letter was obtained from EPHI and given to the regional and woreda health bureau. Oral informed consent was received from all participants and through our study the confidentiality of the study participant was secured.

Dissemination of the study: Briefing and debriefing was conducted to South Omo zone, Dasenech district and regional health bureau. Final report will be submitted to Addis Ababa University, School of public health department. It will be also presented to scientific conference if there is opportunity.

Result

Description of malaria cases by person

We identified 638 suspected malaria cases of which 530 (83.1%) of them were confirmed by RDT. The overall attack rate for confirmed malaria among four Villages was 9.2% with Zero case fatality rate. Of the total suspected cases, 349 (54.7%) were females with positivity rate of 83.7% and Specific attack rate of 9.7% No pregnant ladies reported during the outbreak (Figure 3).

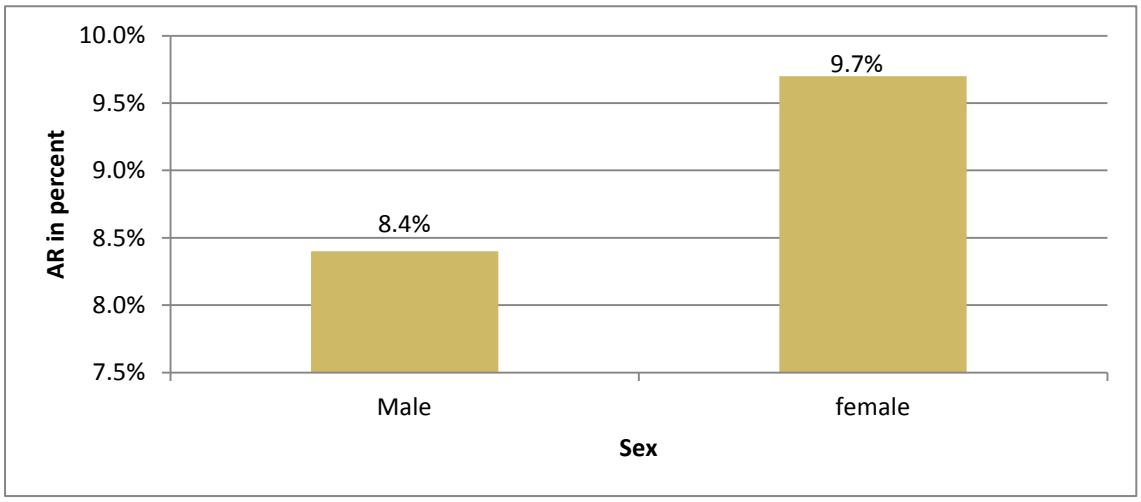

Figure 3 Sex Specific AR of malaria in Four Villages of (siremerate cluster) Dasenech District south omo zone, SNNRP, 2018.

Age group of 5-14 years was the most affected groups, 218 cases with an AR of 11.8% followed by under five years which accounts 81 cases with attack rate of 8.9%. The median age of affected population was 13yrs (IQR 14years) (Figure 4).

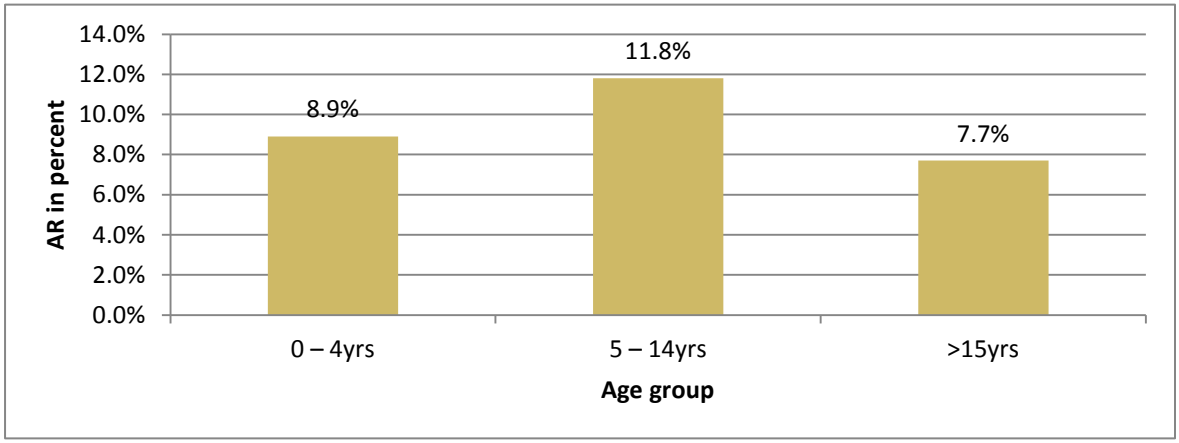

Figure 4 Age specific Attack rate of malaria four villages in Dasenech District, south omo zone, SNNRP, April 30 to May 14, 2018

Description of malaria cases by place

Malaria epidemic was detected & reported to south omo Zone health department on May 8th, of 2018. Among the total cases, 326 (61.5%) were from siremerate and 96(18.1%) were from telltale in the period April 30 to May 13th of 2018 (Table 2).

Table 2: Distribution of malaria cases by villages and plasmodium species in Dasenech District, south omo zone, SNNRP, April 30 to May 13th, 2018

Name of kebeles	Population	Malaria cases by Sex		Malaria cases by age			Total cases	AR
		M	F	0-4yrs	5- 14yrs	+15yrs		
Siremerate	1236	150	176	36	134	156	326	26.4%
Telltale	1620	44	52	13	44	39	96	5.9%
langrage	1692	25	40	21	25	19	65	3.8%
Rukruk	1235	19	24	11	15	17	43	3.5%
Total	5783	238	292	81	218	231	530	9.2%

The populations in siremerate village were more affected by malaria followed by Telltale village with attack rate of 26.4 and 5.9 per 1000popn respectively.

Description of malaria cases by time

The malaria outbreak was declared in our study area by comparing the current cases with the doubled previous year reported cases. Accordingly, as we can see from the figure 5 below the threshold line was crossed at the mid of week 18th of WHO Epi week.

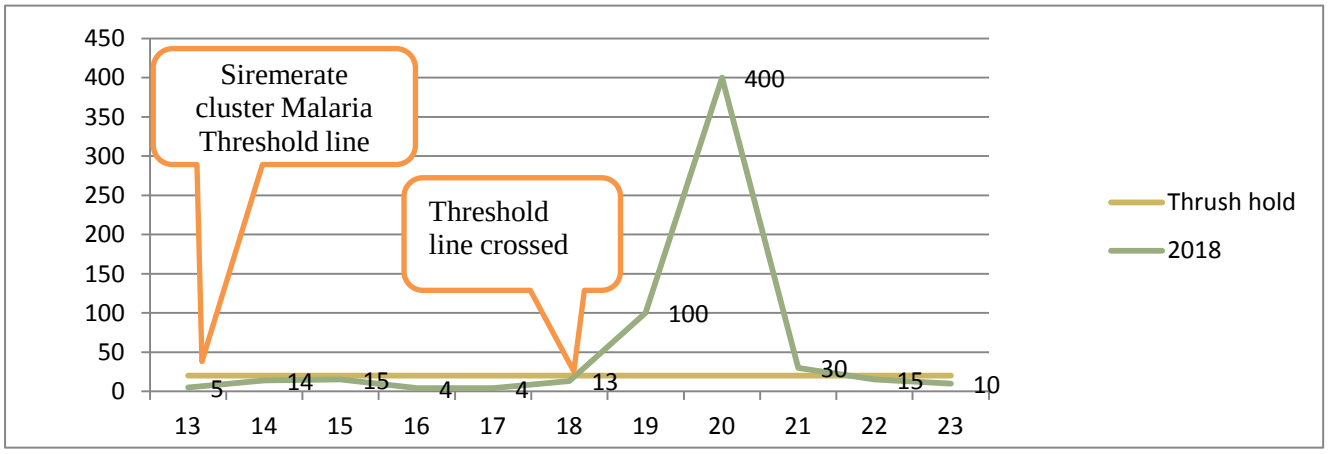

Figure 5: trends of malaria cases crossing doubling the No in 2017 the same week of 2018 dasenech district, south omo, SNNRP, 2018

Starting from the mid of 18th WHO Epi week the malaria cases started increasing and was notified to Woreda PHEM office on 3/5/2018. The cases reached peak at the end of week 18th (on 6/5/2018) at where investigation started (7-13/5/2018). The cases started declining from 7/5/2018 after intervention was initiated and the outbreak lasted after four weeks (Figure 6).

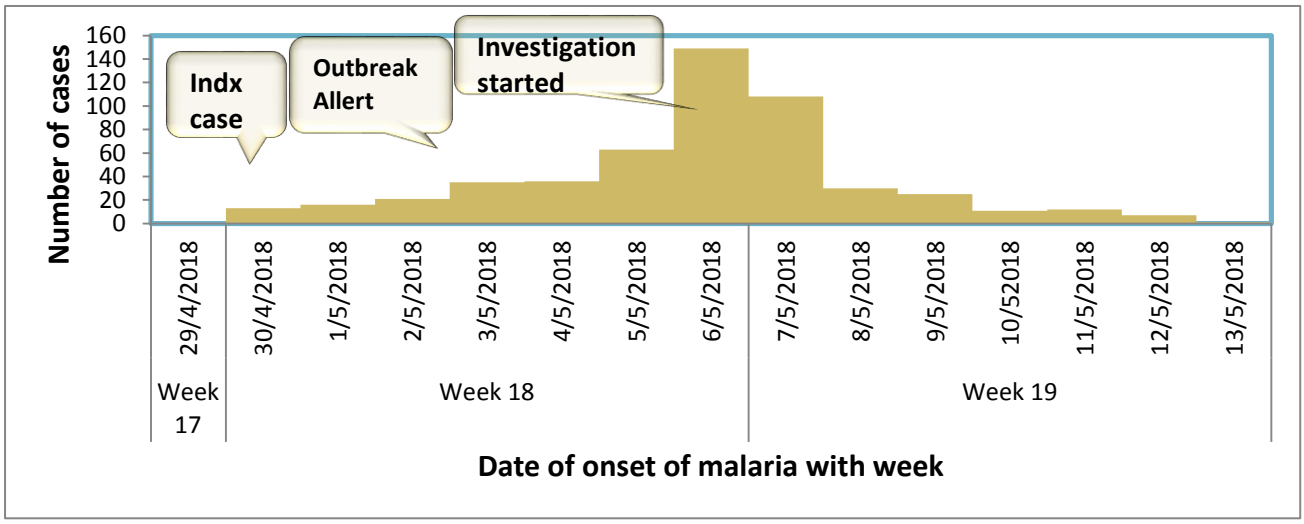

Figure 6: EPI curve showing date of onset of malaria outbreak in Dasenech Woreda (4 kebeles), South Omo zone, Southern Region, Ethiopia, 2018

Laboratory Investigation

From April 3, 2018, a total of 638 blood smear tests were done by RDT for suspected malaria cases in investigated village's health posts of Dasenech district. Of the total tested cases, 530 (83%) were found to be positive for malaria. All positive cases were P. Falcipharum. The highest and lowest positivity rate was reported in the age above 15 (83.7%) and 0 - 4 years (82.6%) respectively (Table 3).

Table 3 distributions of malaria and positivity rate (PR) of malaria cases by age group in Dasenech district (4 kebele), South Omo, May 3-14th 2018

Characteristics		Total tested by RDT	Total positive	Percent	PF	PV	Mixed
Sex	Male	289	238	82.3	238	0	0
	Female	349	292	83.6	292	0	0
	Total	638	530	83.1	530	0	0
Age group	0 – 4	98	81	82.6	81	0	0
	5 – 14	264	218	82.6	218	0	0
	+ 15	276	231	83.7	231	0	0
	Total	638	530	83.1%	530	0	0

Analytic Study

During this un-matched case-control study, 109 malaria case-patients and 109 community controls were selected and interviewed from four villages of the districts. Of 109 case-patients and 109 controls, 47 (43.1%) and 50(46%) were Males for case-patients and controls respectively. The median age of cases and controls were 29(IQR=20yrs) and 35(IQR=15yrs) respectively.

Bi variate analysis shows, statistical difference was observed among the family size having Family those living in the member of 3-5 were 60% less likely affected by malaria compared to those who live in the member of more than five family members (COR 0.4, 95% CI 0.2-0.7). Family history of malaria infection was identified as a risk factor for the occurrence of outbreak compared to the controls with COR 9.1, 95% CI 4.4-18.8 in bivariate analysis. On the other hand, owning any types of Bed nets (COR 0.1, 95% CI 0.02-0.4) and utilizing bed net were found to be preventive factors for malaria infection (Table 4).

Table 4: Bi-variate analysis of independent factors related to malaria outbreak in siremerate cluster, Dasenech district, and South Omo Zones, SNNPR, Ethiopia, 2018

Variable	Category	Cases (n=109)	Control (n=109)	COR (95% CI)	P- value
Age group	**>44yrs**	25(23%)	18(17%)	Reference	
	15-24yrs	32(29%)	17(16%)	1.4(0.6-3.2)	0.4799
	25-34yrs	37(34%)	37(34%)	0.7(0.3-1.5)	0.3950
	35-44yrs	15(14%)	37(34%)	0.3(0.1-0.7)	0.0039
Sex	**Female**	62(57%)	59(54%)	Reference	
	Male	47(43%)	50(46%)	0.9(0.5-1.5)	0.6826
Family size	**>5 members**	51(47%)	32(29%)	Reference	
	3-5 members	41(38%)	66(61%)	0.4(0.2-0.7)	0.0015
	Two and less	17(16%)	11(10%)	0.9(0.4-2.3)	0.9452
Malaria family History	**Yes**	55(50%)	11(10%)	9.1(4.4-18.8)	0.0000
	No	54(50%)	98(90%)	Reference	
Travel history	**Yes**	11(10%)	6(5.5%)	1.9(0.7-5.4)	0.2066
	No	98(90%)	103(94.5%)	Reference	
Owning Bed net	**Yes**	89(82%)	107(98%)	0.1(0.02-0.4)	0.0000
	No	20(18%)	2(2%)	Reference	
Using bed Net	**Always**	85(78%)	85(78%)	0.2(0.05-0.5)	0.0019
	Some times	6(6%)	21(19%)	0.05(0.01-0.2)	0.000
	Never	18(17%)	3(3%)	Reference	

Number of bed Nets	**One & less**	89(82%)	69(63%)	2.6(1.4-4.8)	0.0024
	more than one	20(18%)	40(37%)	Reference	
Staying outside during night	**Yes**	100(92%)	31(28%)	27.9(12.6-62.0)	0.000
	No	9(8%)	78(72%)	Reference	
Stagnant water	Yes	97(87%)	103(95%)	0.5(0.2-1.3)	0.1398
	No	12(11%)	6(5%)	1	
Knowledge	Poor	39(36%)	22(20%)	2.2(1.2-4.1)	0.0103
	Good	70(64%)	87(70%)	Reference	

In multi variate logistic regression Family malaria infection history (AOR 20.7, 95 % CI 5.5-77.3), Having one and less bed nets for house hold (AOR 6.6, 95% CI 1.9-23.5) and staying out side at night times (AOR 48.3, 95% CI 14.1-65.4) were found to be independent risk factors of malaria infection in the study area. On the other hand, using bed nets (AOR 0.1, 95% CI 0.01-0.9) and Living in Family size of 3-5 compared to more than five family members (AOR 0.2, 95% CI 0.1-0.6) were found to be preventive factors (Table 5).

Table 5 Multivariate Vs Bivariate analysis of risk factors for malaria outbreak siremerate cluster, Dasenech District, South omo zone, SNNPR, Ethiopia, 2018

Variables	Category	**AOR**	**95% CI**	**P-Value**
Age group	15-24yrs	5.4	0.7-43.8	0.1120
	25-34yrs	1.5	0.3-7.2	0.6009
	35-44yrs	0.5	0.1-2.2	0.3359
	>44yrs	1		
Family size	3-5 member	0.2	0.1-0.6	0.0087
	Two and less member	0.2	0.01-1.4	0.0938
	>5 member	1		
Malaria family history	Yes	20.7	5.5-77.3	0.0000
	No	1		
Owning Bed nets	Yes	0.1	0.02-1.2	0.0649
	No	1		
Using Insecticide Treated Bed nets	Some times	0.1	0.01-0.9	0.0449
	Always	0.8	0.1-7.6	0.8654
	Never use	1		
Number of bed nets	One and less	6.6	1.9-23.5	0.0036
	More than one	1		

Staying outside at night	Yes	48.3	14.1-65.4	0.0000
	No	1		
Knowledge about malaria transmission	**Poor**	2.4	0.7-7.7	0.1525
	Good	1		
Stagnant water around	Yes	0.2	0.02-1.01	0.0516
	No	1		

Public health intervention

A Total of 611 houses were sprayed with bendiocarp chemical in 4 kebeles of siremerate cluster and 20 volunteered people were participated on this activity. Communities were mobilized and taught on prevention and control measures of malaria disease. Active case search and early management were done at community and health facility level.

Discussion

Multiple risk factors were assessed during investigation intervention activities. This outbreak was detected at the end of April 2018 and crossed the threshold level at WHO Epidemiologic Week 19 and 20 of May 2018. The outbreak was lasted after 3 weeks. There were no deaths reported in this outbreak. One possible reason may be the presence of strong case detection and management in the study area. In our study area Female Populations were more affected (54.7%) with sex specific attack rate of 9.7% than male (45.3%) with sex specific attack rate of 8.4%. This may be due to Females have a culture of poor clothing which may expose them to mosquito bite. Our study is similar with the study done in afar region, 2016 which reports Female 54.1% and male 45.9% [16].

Different study reports age groups as a risk factor for malaria where under five age groups and elderly age groups are more affected than the other age groups due to some favoring conditions among these age groups such as low (week) immunity(7,8). Our study result shows the age groups of 5-14yrs old were more affected than other age groups having age specific attack rate of 11.8% which is different from other studies.

Households having one or less bed net per household were found to be 6.6 times more likely to be exposed to malaria parasites than those who have more than one treated bed net per house hold (AOR 6.6, 95% CI 1.9-23.5). This is supported by the study done in Afar region 2016 [(16)].

The odds of being infected by malaria were 48.5 times more among person those stay outside during night time than those do not stay outside at night (AOR 48.5, 95% CI 14.1-65.4). The possible reason may be because of exposing to mosquito bite is high during staying out side home. This is supported by the study done in Humera town, 2014(OR = 2.3 95% [CI 1.1 – 4.8]) [17]. In addition to this the odds of developing malaria infection were found to be 20.7 times higher among those having contact history (malaria sick patient in the family) than the counterpart (AOR 20.7, 95% CI 5.5-77.3). The study done Erere woreda, Ethiopian Somali region, 2012 supports this result (OR: 12, 95% CI: 4.9 – 32.5) [18]. On the other hand, participants those were using bed nets were 20% less likely to be infected by malaria (AOD 0.8, 95% CI 0.1-7.6) which similar to the study done in ilu woreda, oromiya region, 2013(OR 0.4,95% CI 0.2-0.8)[(19)]. WHO recommended at least one bed nets per two persons in household and in our study area households with family size of 3-5 members were 80% less likely to be affected by malaria infection than those households with family size of greater than five (AOR 0.2, 95% CI 0.1-0.6). This may be due to lack of enough bed nets for family member as recommended. There were no significant association found between participant's knowledge about malaria transmission and availability of stagnant water around. These results were contradicting with the study done in Seba Boru and Melka Soda woredas Guji and Borena zones, oromiya, 2014 [19].

Conclusion

- There was malaria outbreak in siremerate cluster over three weeks starting from the mid of 18th WHO Epi week.
- Staying outside during night time, malaria sick pt in the family and number of bed net per house hold were found to be contributing risk factors for occurrence of the outbreak.
- Using bed nets and less family members were preventive factors for malaria infection.

Recommendations

- Since all kebeles of the woreda are malarious area, insecticide treated bed net should be distributed for all households based on family size; beside this, utilization of bed net should be monitored.
- Using Insect side treated bed nets during staying outside at night time(community)
- Identification and removal of potential mosquito breeding sites should be conducted by Community participations
- Social behavioral communication and change (SBCC) should be in place to create awareness in the community about Malaria
- Regular indoor residual spray per required standard should be kept in place.

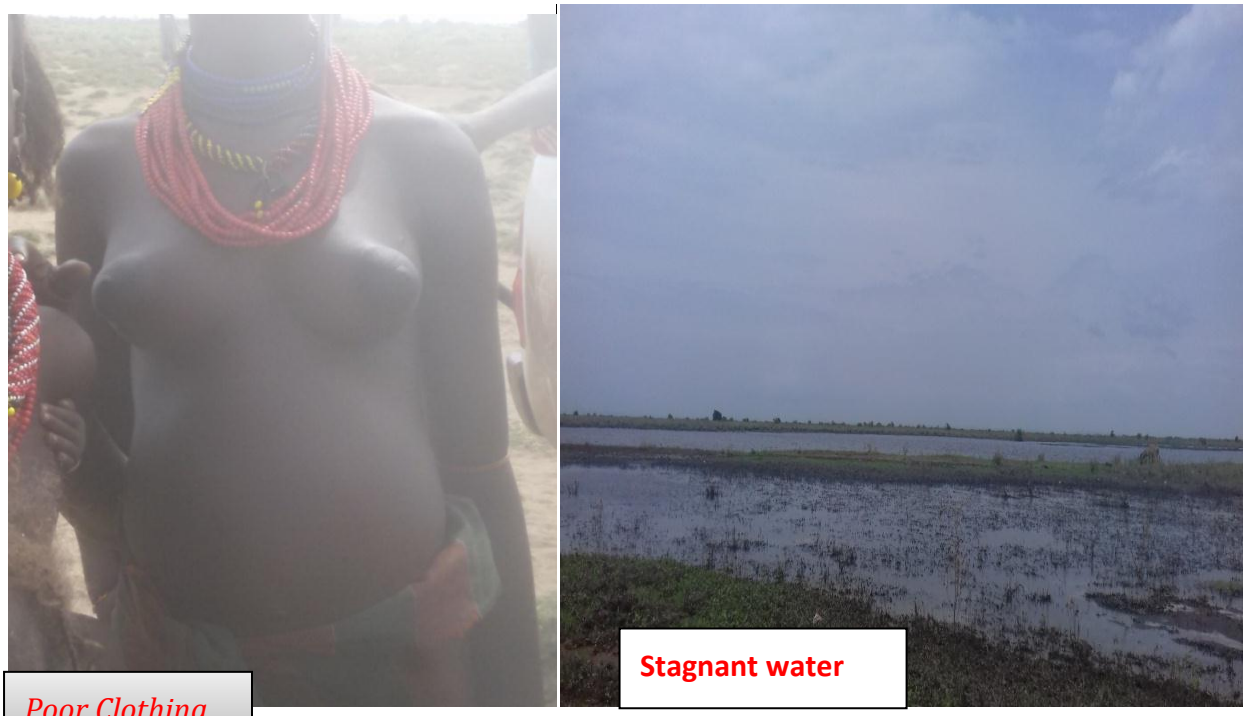

Figure 7: poor clothing, stagnant water, Mosquito breeding site and areas staying at night around their home at study area, 2018

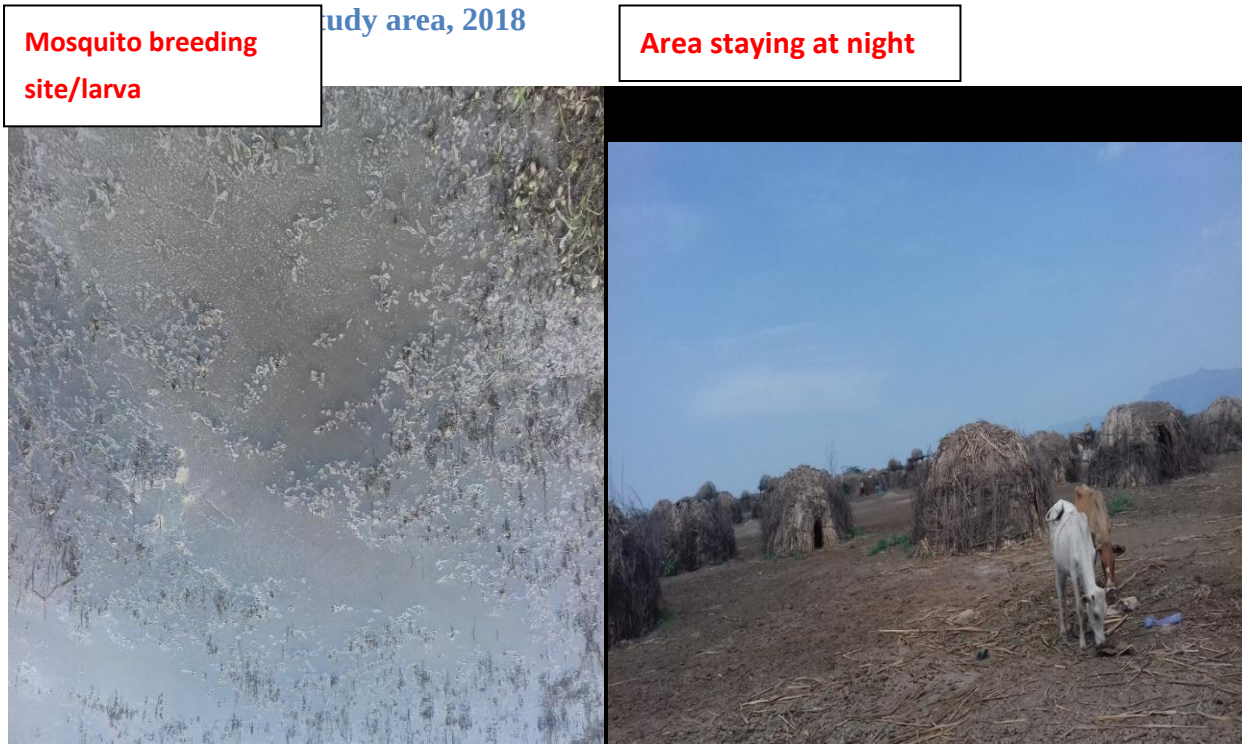

Figure 8: poor clothing, stagnant water, Mosquito breeding site and areas staying at night around their home at study area, 2018

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1.2: Scabies outbreak investigation in woreda 13, Kolfe Keraniyo sub city, Addis Ababa city administration, March 3/2018 - 30/2018.

Abstract

Introduction: Scabies remains a public health problem, especially in developing countries, with a worldwide incidence of approximately 300 million cases each year. In Ethiopia, scabies is common, especially during natural or man-made disasters, such as flooding, drought, civil war and conflict, poor water supply and sanitation, and overcrowding living condition. This study aimed to investigate the scabies outbreak in woreda 13, kolfe keraniyo sub city, Addis Ababa, from March 3 to 30, 2018

Methods: We conducted descriptive cross sectional study design. We used structured questioner which were adapted from different studies. Sample size all scabies cases from health centers and searching cases home to home with health extension worker in identifying kethenas in the woreda by interviewing key informants with cases. Data were Analyzed using MS Excel is also used.

Result: we identified a total of 103 scabies cases from 3 kethenas of woreda 13 kolfe keraniyo sub city overall Attack rate of 1.8/1,000 population with no scabies related death reported (CFR=0). Out of 103 total cases, 60(58 %) of them were males and 43(42%) were females. The median age was 16 year with Range from 1 year to 65 year and most affected age group was 5-14 years 36(35%). The cases were reported from kethenas 1, 8 and 9. Mostly affected body Parts of the cases by skin sores were elbow 31(30%).

Conclusion and recommendations: in this descriptive study the existence scabies was confirmed in the District and AR of scabies higher in males than females. Therefore, increasing awareness creation about the transmission, prevention and control methods of this scabies disease is recommended.

Keywords: Scabies outbreak, descriptive study, woreda 13.

Introduction

Scabies is a neglected parasitic disease that is a public health problem worldwide, and particularly in resource-poor regions. It affects people of all age groups, races and socioeconomic levels. Approximately 300 million cases are reported worldwide each year (1).

Human scabies is caused by an infestation of the skin by the human itch mite (*Sarcoptes scabiei* var.*hominis*). The adult female scabies mites burrow into the upper layer of the skin (epidermis) where they live and deposit their eggs (2). The incubation period before symptoms occur is 3–6 weeks for primary infestation but may be as short as 1–3 days in cases of re-infestation (3). The characteristic clinical feature is intense nocturnal pruritus. Diagnosis is made clinically, based on patient history and physical examination. It is confirmed by the demonstration of mites, eggs, or (black or brown football-shaped masses of scabies faces) on microscopic examination (1).

Scabies infestations are generally categorized as typical or atypical (also known as crusted or Norwegian). Patients with typical scabies usually have only 10 to 15 live adult female mites on the body at any given time. When diagnosis and treatment are delayed, scabies can develop an unusual or atypical presentation, indicating infestation of hundreds to thousands of mites (4). Infestation is frequently complicated by bacterial skin infection, including impetigo, cellulites, and abscess due to Streptococcus pyogenes and Staphylococcus aurous. Such bacterial skin infections predispose to serious supportive and non-supportive sequelae (5).

The most commonly affected areas are the hands, feet, the inner part of the wrists and the folds under arms. It may also affect other areas of the body, like elbows and the areas around the breasts, genitals, umbilicus and buttocks (6).

The predominant route of transmission of Scabies is by direct, prolonged skin-to-skin contact with an infected person. However, a person with crusted (Norwegian) scabies can spread the infestation by brief skin-to-skin contact or by exposure to bedding, clothing, or even furniture that he/she has used Transmission among family members and in institutional settings is common (7). A person infested with mites can spread scabies even if he or she is asymptomatic. Scabies has been classified

as a water shortage disease because of its association with inadequate water supply leading to poor personal hygiene and thus increased risk of transmission (3). Treatment of scabies infection is includes topical or oral administration of a scabicidal agent, an antipruritic agent such as an antihistamine, and an appropriate antimicrobial agent if secondarily infected (8).

Globally, it affects more than 130 million people at any time. Rates of scabies occurrence vary in the recent literature from 0.3% to 46% (9). In the developed world, outbreaks in health institutions and vulnerable Communities contribute to significant economic cost in national health Services. However, in resource-poor tropical settings, the sheer burden of scabies infestation, as well as their complications, imposes a major cost on health-care systems. In 2010, it was estimated that the direct effects of scabies infestation on the skin alone led to more than 1.5.million YLDS (years lived with disability), and the indirect effects of Complications on renal and cardiovascular function are far greater (10). Scabies affects people of all countries, particularly; children in developing countries are most susceptible, with an average prevalence of 5–10% (10). The highest incidence is in tropical climates, with rates of up to 25% overall and up to 50% in some communities in the South Pacific and northern Australia (9). Poverty and overcrowding are the main risk factors, and outbreaks in institutions and refugee camps are common. Scabies causes intense itch, severely affecting sleep and quality of life.

In Ethiopia, scabies is common, especially during natural or man-made disasters, such as flooding, drought, civil war and conflict, poor water supply and sanitation, and overcrowding living condition. For example, according to public health emergency measures surveillance report scabies is becoming beyond sporadic clinical cases, but turn to be a public health concern, affecting three kethenas, especially in overcrowding living condition, poor water supply and sanitation in the woreda.

Statement of the problem

Scabies affects people of all races and social classes worldwide. It can spread easily under crowded conditions where close body and skin contact is common. Institutions such as schools, refugee

camps, sanitarium and prisons are often sites of scabies outbreaks. Ethiopia is experiencing scabies outbreak in affected areas where there is shortage of water for drinking and personal hygiene (3).scabies disease one of the weekly reportable diseases in the region. In March, 2018 an increased case reports of scabies was reported to kolfe keraniyo sub city from woreda 13 health bureau. Hence this study aimed to investigate the scabies cases for intervention.

Significance of the study

Scabies is a highly contagious disease and it can affect Socio Economy of the Society if it is not Early Controlled. In this case, epidemiological assessment of communicable diseases like scabies surveillance and control interventions at community level in this district is necessary to employ the prevention and control measures, and to identify the gaps and intervene accordingly. Moreover, the result of this Study may provide important information for other researchers.

Literature review

Scabies is a major global health problem in many indigenous and third world communities [19]. It has been added to WHO's list of Neglected Tropical Diseases (NTDs), in recognition of the very large burden of disease unlike many other NTDs, scabies can also occur in temperate regions where it similarly has a predilection for vulnerable communities in which overcrowding and poverty co-exist [14].The prevalence and complications of scabies make it a significant public health problem in the developing world, with a disproportionate burden in children living in poor, overcrowded tropical areas [15,16].

Scabies is commonly observed in very young children followed by older children and young adults (18). Some immune compromised, elderly, disabled, or debilitated persons are at risk for a severe form of scabies called crusted, or Norwegian, scabies. Persons with crusted scabies have thick crusts of skin that contain large numbers of scabies mites and eggs (19).

The primary contributing factors in contracting scabies seem to be poverty and overcrowded living conditions [16]. Studies from Mali, India, Brazil and northern Australia all show an association with

overcrowding, especially sleeping quarters [16]. The other study conducted in Mali, Malawi, Tanzania and Sierra Leone also point to scabies as one of the common skin problems in Africa. This report explores Scabies, one of the highly contagious skin infections commonly seen in Africa, to understand the disease and ways of prevention and treatment [17].

In Ethiopia, according to national survey, there was 6.2% of school children with scabies on their arms and 5.6% of orphan school affected by this neglected tropical disease [20].Most of the Ethiopian country, especially rural area has been affected by Scabies outbreaks in different time. The scabies outbreak reported from St. Lideta Lemaryam church to Gondar town health office among "Yekolotemari" On November 10, 2015 was ended with overall attack rate of 22.5% mostly affecting age group of 15-18yrs (ASAR of 25.9%) which are all male student (21). East Bedwacho Zone, southern Ethiopia reported an outbreak of scabies in 2016, and outbreak investigation was conducted. As this study reported, the overall attack rate in this zone was 110 cases/1,000 populations, with no scabies related death (CFR = 0). Most affected populations were children in the primary schools with age group of 5-14ysr (ASAR of 26.3%) and most of them had shown sign of secondary infection attributable to scabies [22]). In the similar years, other scabies outbreak was reported from Bati district, Oromiya zone, Amhara Region which was affected under five children with ASAR of 33.5 per 10,000 and Male population with attack rate of 15 per 10,000 populations. It was ended with the overall attack rate of 14.7 per 10,000 populations ([23]. In addition to this, other scabies outbreak was reported from Kacha Bira district of KembataTembaro Zone, SNNP Region2016 Male population more affected than Female, which is 58% [25]. Concerning the site of rash, inter digital spaces (71 %), flexor wrists (64 %) and buttocks (75%) were the main sites in Kacha Bira district [25].

Objective

General objective

- To investigate the Scabies outbreak in woreda 13, kolfe keraniyo sub city, Addis Ababa city administration March, 2018.

Specific objectives

- To verify existence of outbreak
- To determine the magnitude of outbreak
- To describe the scabies outbreak in terms of person, place and time.

Methods and materials

Study area and population

The study was conducted in woreda 13, Kolfe Keraniyo sub city in Addis Ababa which is one of the 15 woreda. The woreda has 10 kethenas. As of 2007 GC population and housing census projection, the 2010 EFY population of the woreda is estimated to be 56,963 of which, 25,493 and 31,470 of them are males and females respectively and 5000 households with the average household size of 5 persons. Currently, the woreda has 2 health centers with 100% health service coverage. The overall water supply coverage of the woreda 13 was 100 % (pipe water) but some sort of interaction.

Study period: the investigation was conducted from March 3 – March 30, 2018.

Study Design: Descriptive Cross sectional study design.

Target population: population living in woreda 13 kethenas 1, 8, 9

Study population: all population in woreda 13 cases selected.

Sample size: all cases from the line list which was found from H/F and community case search onset of itching in the last 6 weeks from the selected kethenas for descriptive study.

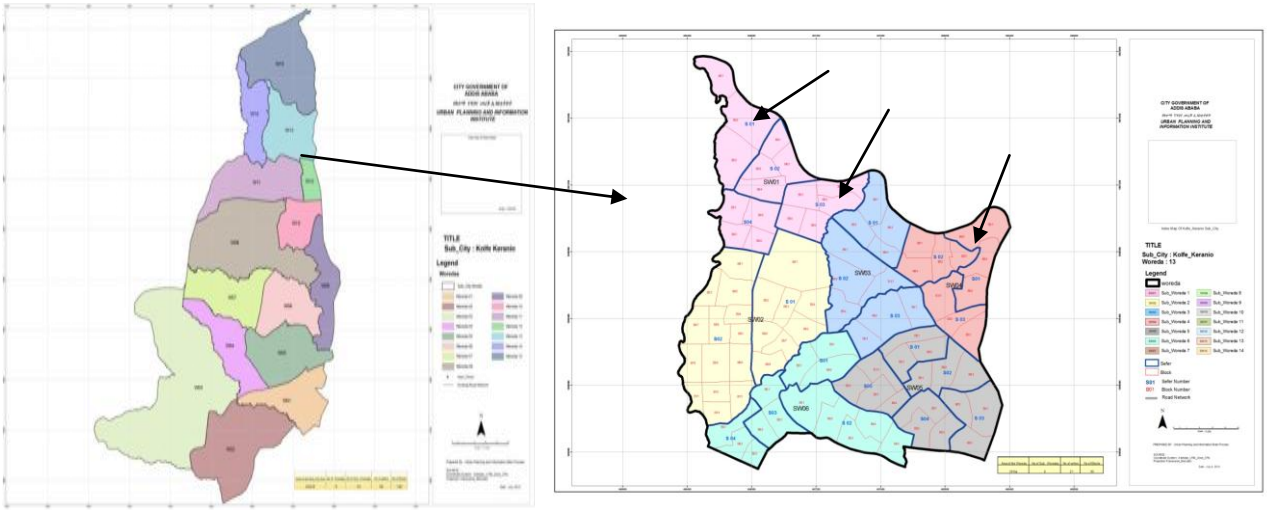

Figure 9: Map of kolfe keraniyo sub city and woreda 13 affected kethenas

Data collection method and tool

The investigation was conducted through house-to-house searching for scabies case in selected kethenas. We used semi-structured questionnaires which adopted and modified from previously used and interviewed cases and collected data. Data was collected by principal investigator, 1 woreda PHEM officer, and 1 heath extension worker. Orientation was given for data collectors on the questionnaire. The collected data was checked and when entering the data in to the computer the missing variables and consistency of filling of questionnaires and completeness of data checked out carefully.

Data entry and analysis

Data was checked, entered and analyzed on computer using MS- Excel for descriptive analysis.

Ethical issue

The outbreak investigation was done after the approval of Support letter was obtained from sub city health department in order to technical support. Informed Consent was taken from all respondents for under 18 years old we obtained informed consent form their parents or guardians and study participants found scabies were linked to health centers (refer to health center).

Inclusion criteria &Exclusion criteria

Inclusion criteria: - Cases: any resident of woreda 13 who had scabies based on WHO case definition and who agreed to participate in the study was included.

Exclusion criteria: Cases that did not fulfill the signs and symptoms of scabies based on WHO case definition was excluded from cases. Children those not accompanied with no family were excluded.

Case definition

Suspected case: Any person with generalizing itching which often becomes worse at night, and abnormal skin lesions which are papules, pustules, nodules or urticarial (PHEM Guideline)

Confirmed case: A person who has a skin scraping in which mites, mite eggs or mite feces have

Been identified by a trained health care professional (PHEM Guideline)

Contact: A person without signs and symptoms consistent with scabies that has had direct Contact with a suspected or confirmed case in the two months preceding the onset of scabies signs and symptoms with the case (PHEM Guideline)

However, in our study we used WHO suspected case definition and eye observation of the respondent's clinical features for cases were selected.

Results

Descriptive Epidemiology

Scabies cases were reviewed outpatient registration book and weekly report. We identified the cases home to home from March 3/2018 – March 30/2018.We identified a total of 103 scabies cases from 3 kethenas in woreda 13, kolfe keraniyo sub city, Addis Ababa city administration. No scabies related death (CFR=0) reported.

Description of scabies cases by person

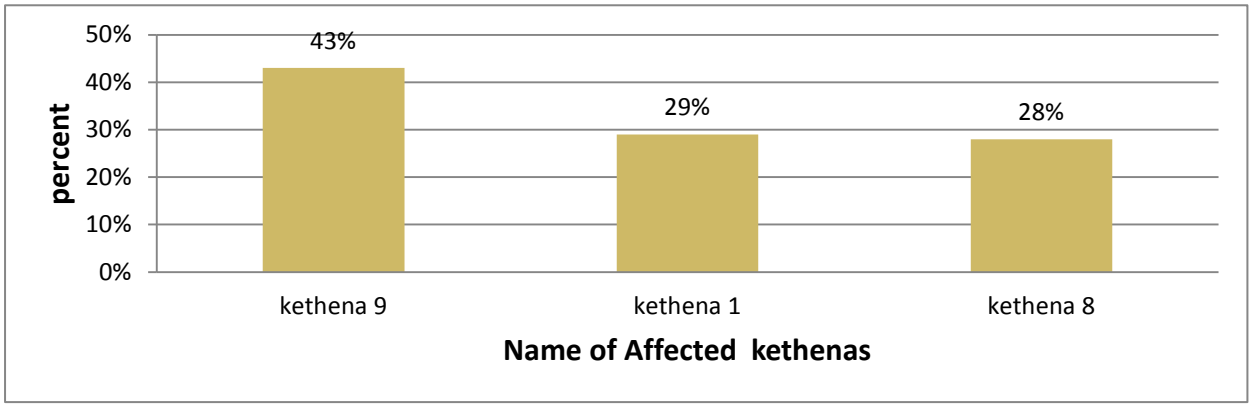

Figure 10: proportion of scabies cases by kethenas in woreda 13, KOK sub city, Addis Ababa, 2018

Of the total cases, 60(58%) of them were males and 43(42%) were female.

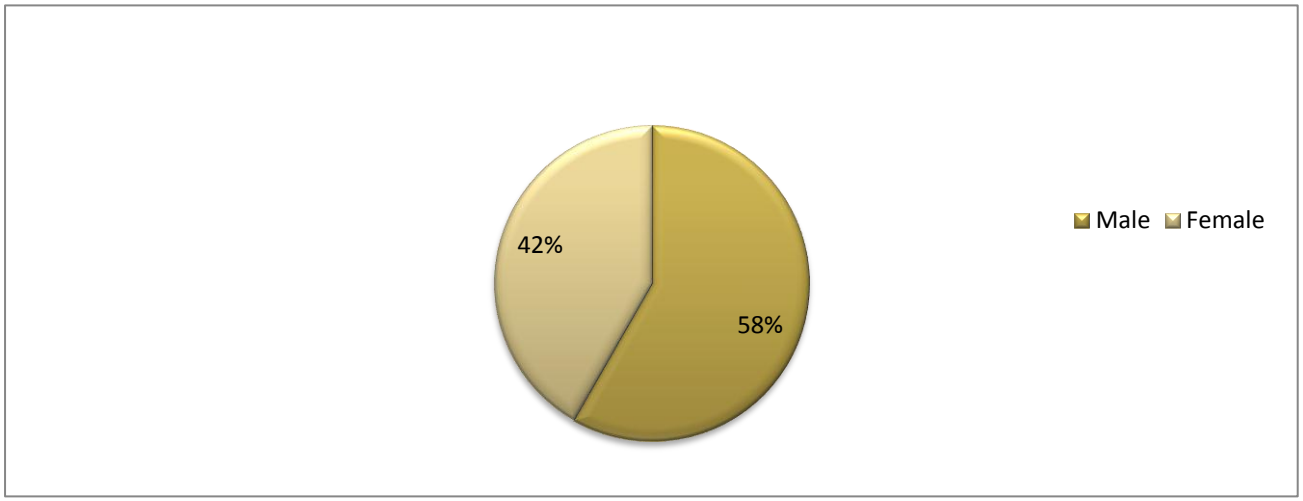

Figure 11: proportion of scabies cases by sex woreda 13, KOK sub city, Addis Ababa, 2018

The median age of affected groups was 16yrs (IQR=19). Of affected age groups 5-14yrs old children were more affected, 36(35%), than other age groups and less than five children were less affected in our study area.

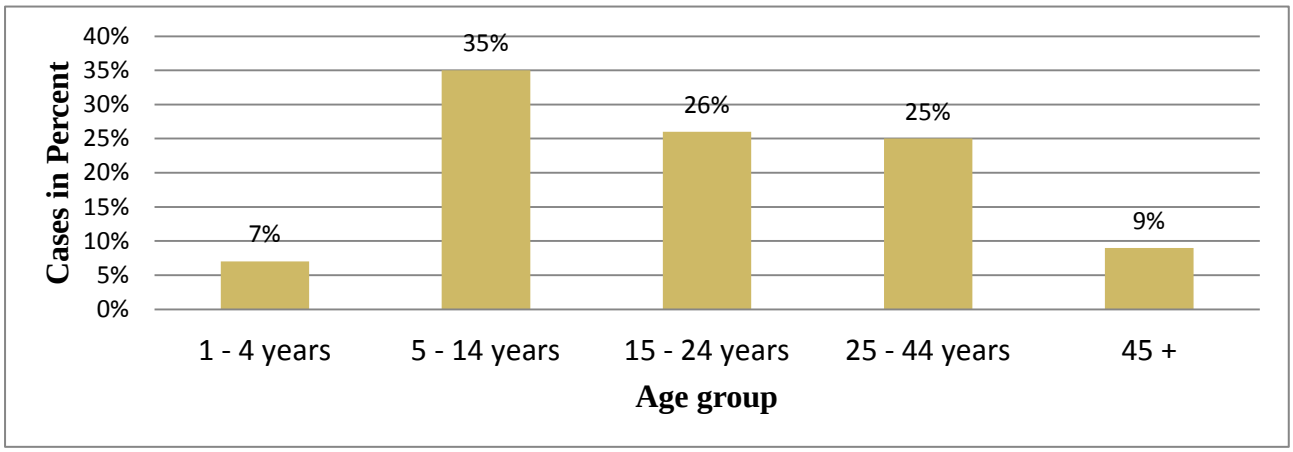

Figure 12: distribution of cases by age group in woreda 13, KOK sub city, Addis Ababa, 2018

All of scabies cases 103 (100%), first experienced sign and symptoms were manifested with itching and 100% intensity of itching is high at night. Mostly affected body Parts of the cases by skin sores were elbow, 31(30%) , Wrist 30(29%), Finger Webs, 25(24%).

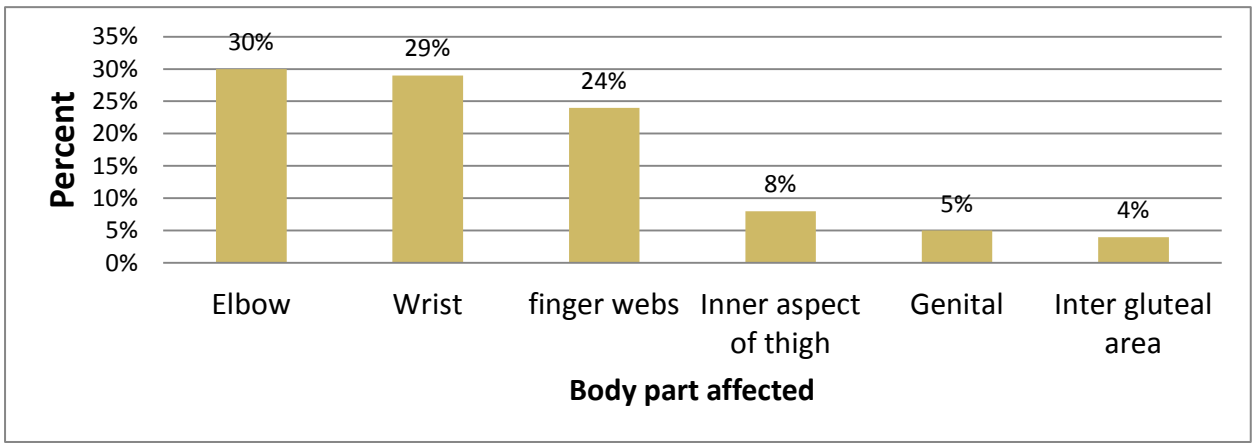

Figure 13: scabies affected body parts in woreda 13, KOK sub city, Addis Ababa, 2018

The most lesions on the affected body part were nodular type accounting 93%.

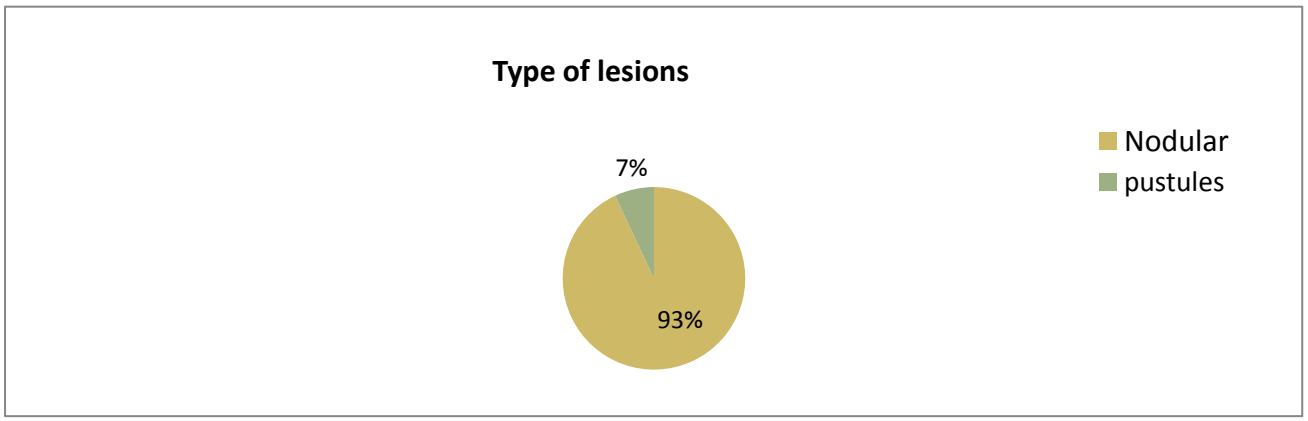

Figure 14: Type of lesions found in 103 cases with scabies in woreda 13, KOK sub city, Addis Ababa,2018

Marital status of the respondents cases were 52(50.5%) married, 20(19.5%) single and the remaining were not eligible. Occupational status of the respondents (cases) 35(34%) were students, 23 (22.3%) house wife and 15(14.6%) merchant. Education level of the respondents (cases) were 55(53.4%) elementary, 27(26.2%) secondary, 8 (7.8%) not educated and 13(12.6%) reading and writing.

Table 6: Socio Demographic information of Scabies patients in woreda 13, kolfe keraniyo sub city, Addis Ababa city administration, 2018

Socio demographic		**Frequency**	
		Number	**%**
Marital status	**single**	**20**	**19.5**
	married	**52**	**50.5**
	Not eligible	**31**	**30**
	Total	**103**	**100**
Type of occupational status	**civil servant**	**8**	**7.8**
	Student	**35**	**34**

	house wives	23	22.3
	Merchant	15	14.6
	others & kids	22	21.3
	Total	103	100
level of Education	No education	8	7.8
	writing & reading	13	12.6
	primary	55	53.4
	Secondary	27	26.2
	Total	103	100
Family size	> 4 and 4	70	68
	<4	33	32
	Total	103	100

Description of scabies cases by time

In woreda 13 the first date of onset of itching was presumed on February 25/2018 and the woreda was reported it incorporated with others reports in weekly report. The outbreak investigation was started March 8/2018 and intervention was under taken. We identified a total of 103 scabies cases from 25/2/2018 to march 26/3/2018 with over all attack rate of 1.8% and Zero case fatality rate. The case reported Arrive peak in March 14/2018 and started declining from March15/32018.

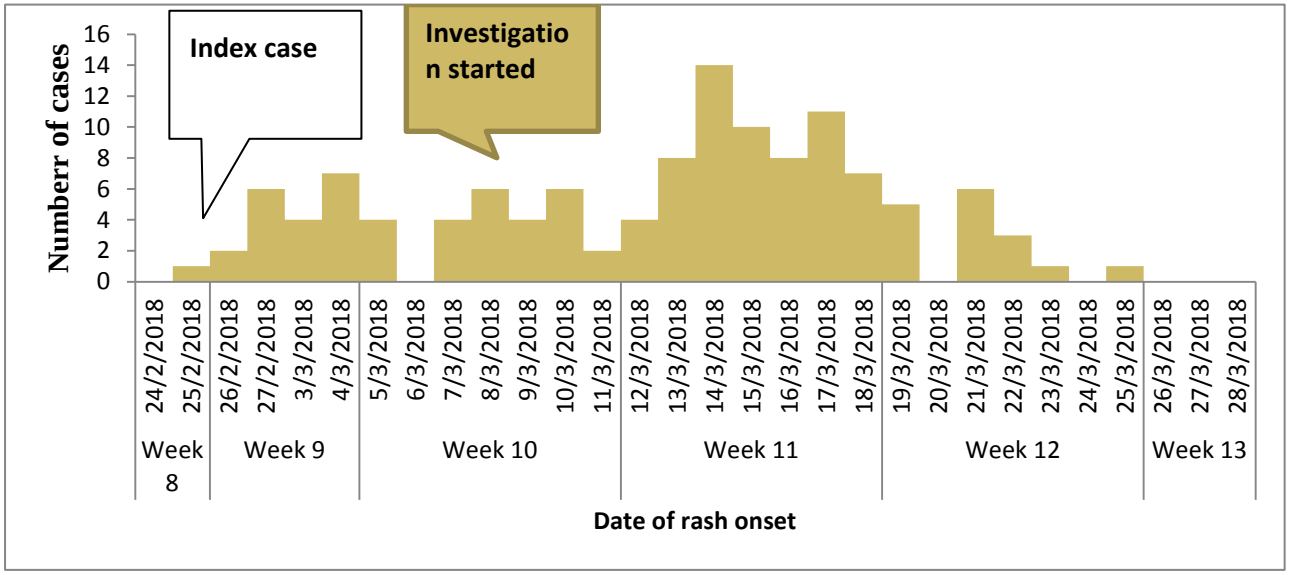

Figure 15: Epidemic curve of scabies outbreak by date of rash onset woreda 13, KOK sub city, Feb 5- March 25/2018

Intervention

When we conducted the outbreak most of the cases were treated with benzyl benzoate lotion and Sulphur ointments in health centers and cases not on treatment were registered and referred to health

center. We have given health education on mode of transmission, prevention and control measure of scabies disease for the affected communities.

Discussion

We investigate that scabies outbreak was occurred in woreda 13, Kolfe Keraniyo sub city, Addis Ababa city administration, Ethiopia. We identified a total of 103 scabies cases lists from woreda 13 health facilities during investigation period. The overall Attack Rate was 1.8% in studied area and zero case fatality rate. More than half of the cases 58% were males. This result was similar with the study done in Kacha Bira district of KembataTembaro Zone, SNNP Region2016, which is 58% [25]. In our study area Females were less likely to be infected compared to Male population. The possible assumption is Females have more access to water every day than males and able to keep their personal hygiene relatively.

The age group 5 – 14 years was the most affected age group which is 35%, population followed by 15 – 24 years with 26% and most of them show no sign of secondary infection. This might be due to the fact that younger children, particularly those at school are at high risk of scabies infestations as the school environments may increase the susceptibility of cross-infestation and increase contacts which can be passed to family members and other.

Concerning the site of rash, on elbow 30%, wrist 29%, and finger webs 24% were the main sites. This is different with the study conducted at Kacha Bira district of KembataTembaro Zone, SNNP Region2016 which is wrist 64%, inter digital spaces 71% and buttocks 75% [25].

In our study area families those live in a member of four and above were more affected (68%). then those living in a member of less than four. This crowdedness may create conductive environment for the transmission of scabies. Similarly the study conducted on scabies out break investigation among "Yekolo temaris" in Gonder town November, 2015 reported Living in the member of greater than five is risk for developing scabies [21]. It might be due to overcrowding among larger families compared to the smaller ones, which increases sharing of cloths, beds, etc. It is well known that

Scabies can spread easily under crowded conditions where close body and skin contact is common [12].

Conclusion

- Scabies outbreak occurred in woreda 13, kolfe keraniyo sub city, Addis Ababa city administration
- Male scabies cases higher report than female.
- The most affected site was elbow, wrist and finger webs.

Recommendation

- Routine surveillance should be strengthened at all level.
- Increase awareness of the community about mode of transmission and prevention.
- Woreda health office and health center has to promote on hygiene and sanitation of the community.

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Chapter two: Surveillance data analysis

2.1. Surveillance data analysis of typhoid fever in kolfe keraniyo sub city, Addis Ababa city administration, Ethiopia, 2012 – 2016

Abstract

Background: Typhoid fever is a communicable disease, found only in human caused by systemic infection with the bacterium Salmonella enteric sero type typhi and paratyphoid. In 2014, there were 21 million cases and 222,000 typhoid-related deaths occur annually worldwide. This surveillance data analysis study could help to identify the trend of typhoid fever in Kolfe Keraniyo sub city with in the past five years and compare it with the current status of disease which may give information on the trends of typhoid fever. This study is aimed to describing magnitude and distribution of typhoid fever from 2012-2016.

Methods: this retrospective record review of surveillance data was conducted in Kolfe Keraniyo sub city by using secondary data that was recorded in sub city from 2012-2016 and analysis was done from March 07/2017 to March 26 /2017. Data was collected from documented PHEM report in sub city. The result was presented with text, tables and graph.

Results: 73,444 typhoid fever cases were reported from 2012-2016 with 0 case fatality rate. An average of 16,889 cases reported per year. The highest incidence cases were reported in 2016 which was 20403 (28%), high incidence rate was recorded in woreda four 17.7%.

Conclusion: the trend of typhoid fever was increasing from 2012-2016 and no number of deaths reported. The highest Incidence cases were reported in 2016. The highest incidence reported by woreda 4 during the reported period.

Introduction

Typhoid Fever

Typhoid fever remains an important public health problem in many developing countries. It is estimated that the worldwide incidence of typhoid fever exceeds 50 million cases per year, with 500,000 deaths occurring annually (1). In Ethiopia in 2012, 24,030,746 patients visited health facilities to get treatment or medication. Of these cases, 665,220 (3%) were acute febrile illness patients and it was in the top ten list of morbidity and from 15008 of total death 336 (2%) deaths caused by typhoid fever account (2).

Typhoid is transmitted by water or food contaminated by Salmonella typhi. As it is water borne or food borne, a small infecting dose can cause the disease in someone who drinks contaminated water or eat contaminated food. As so many water sources are inadequately protected in Ethiopia, the disease is very common, particularly among overcrowded urban migrants who often live in wretched conditions. It can also be described as water borne disease since it results from fecal or urinary contamination of food and drink. Subjects who are particularly susceptible to typhoid infection include those patients with chronic schistosomiasis who may become chronically infected homozygous sickle cell subjects and HIV patients. All are liable to develop chronic invasive salmonella. The mechanism is uncertain but it may be due to reduced complement-mediated opsonizing activity and deficient macrophage function. An infected person passes the bacteria in urine or stool. Ten percent of convalescent patients become chronic carriers as their gall bladder continues to discharge typhoid bacilli for up to 3 months after onset of infection. Patients acutely infected also pass the organism in to their urine before treatment is given. The nature of intestinal pathology dictates that most new infections come either from recent cases or from carriers like food handlers. (3)

Risk factor include contaminated water or ice, flooding, food and drinks purchased from street vendors, row fruits and vegetables grown in field fertilized with sewage, ill household contacts, lack

of house hold contact, lack of hand washing and toilet access, and .evidence of prior helicobacter pylori infect ion (an association probably related to chronically reduced gastric acidity.

At present, Typhoid fever prevention focuses on improving sanitation, ensuring the safety of food and water supplies, identification and treatment of chronic carriers of *S.* Typhi, and use of typhoid vaccines to reduce the susceptibility of hosts to infection.

Rational of the study

Ethiopia, as one of the countries with high burden of the disease experienced recurrent epidemic of communicable disease for many years. Since typhoid fever is among the major widespread diseases affecting both young children and young adults as a result of many interrelated factors such as inadequate facilities for processing human wastes and water, sanitation. Morbidity associated with illness due to typhoid continues to be on the increase. It is difficult to evaluate typhoid fever burden because of the very limited scope of studies the lack of coordinated epidemiological surveillance systems at all levels of government(city administration, sub city and woreda), and the presence of other diseases considered to be of higher priority. These situations have undermined reported cases of waterborne infections, particularly typhoid fever. This study initiated with a view to generate information through a coordinated epidemiological surveillance study from which typhoid fever burden in Kolfe Keraniyo sub city could be assessed.

Ongoing analysis of surveillance data is important for detecting outbreaks and unexpected increases or decreases in disease occurrence, monitoring disease trends, and evaluating the effectiveness of disease control programs and policies. There for surveillance data analysis will carry out to describe the disease burden and trend retrospectively from 2012 to 2016, to improve public health actions against the disease and focus on the study on the disease in the study area (4).

Literature review

Reports that estimate the global burden of typhoid fever indicate the disease is still a public health issue. WHO reported, in its 2000 global typhoid and paratyphoid fever estimate, that there were around 22 million typhoid fever cases and 5 million paratyphoid fever cases.[5, 6]

A recent publication that revised typhoid fever incidence data indicated that, in 2010, there were an estimated 27 million typhoid fever episodes globally; and a systematic analysis for Global Burden of Disease Study confirms that, in 2010, there were about 190,000 deaths due to typhoid fever. [7,8]

Asia is the top-ranking part of the world where the prevalence of typhoid fever is high compared to the other parts of the world. A prospective population-based surveillance conducted by WHO in five Asian countries result was consistent with previous reviews and showed higher incidences of typhoid fever in India, Indonesia and Pakistan, and relatively lower incidences in Vietnam and China. [9]

On the other hand, in Europe, North America, Australia and New Zealand, the incidence of new enteric fever cases has significantly decreased mostly due to the improved water quality and sanitation [10, 11, 12].

In Sub-Sahara Africa, the epidemiology of typhoid fever is still not clearly understood. A recent review on the issue of typhoid fever in Sub-Sahara Africa stated that epidemiological study is important to have a clear image on the real prevalence of enteric fever [13].

A chronic carrier state can be expected to develop in about 3 percent of cases. Fecal carriers are more frequent than urinary carriers. A chronic carrier may excrete bacilli for several years either continuously or intermittently. It is a disease which is amenable to control through modern public health measures. [14]

The incidence of typhoid rises at the end of the dry season when the rural water supply is lowest and people congregate at the source of water: The infection is more common from October to February when the rain helps spread already contaminated water supplies. Untreated, 10-25% of people with typhoid fever die, but mortality is much less with treatment (1).

Objectives:

General objective

To assess the epidemiology of typhoid fever cases in Kolfe Keraniyo sub city 2012 to 2016.

Specific objectives:

- To describe the distribution of typhoid fever cases in terms of person, time and place
- To describe the burden of typhoid fever in the sub city
- To recommend public health action

Materials and Methods

Study area

The study was conducted in Kolfe Keraniyo sub-city. KOK sub city is one of the ten sub city in Addis Ababa city administration. The sub city is bounded by Gulele and Addis Ketema in the north, Lideta sub city in the east, Nifasilk –Lafto sub city in the south and Oromiya regional state of government the west. The sub city has 15 Woreda'. Kolfe Keraniyo sub city in 2016 (estimated from 2007 population census) has a total population of 524200from which 48% are male and 52% female.

Figure 16: kolfe keraniyo sub city map

Study design

A Retrospective descriptive study design was conducted to assess the last five years (2012-2016) surveillance data of typhoid fever.

Study period

We collected analyzed and interpreted secondary data on Typhoid fever cases for the past five years (2012-2016) and conducted from Mar 07 /2017 – Mar27/2017.

Data collection procedure

The data was collected using Secondary data from the sub city. Five years back document was extracted from sub city PHEM data base. Extracted data was cross checked with weekly PHEM and documents from each woredas by the principal investigator.

Source population

The residents in of Kolfe Keraniyo sub city.

Study population

Typhoid fever cases reported through routine surveillance report from Jan/2012 - DEC/ 2016 in Kolfe Keraniyo sub city.

Case definition

Suspected

Any person with gradual onset of remittent fever (rising stepladder fashion) in the first week, head ache, arthralgia, anorexia, constipation and abdominal pain.(PHEM Guideline)

Confirmed

A suspected case with reactive Widal test or ''O "titer of 1/160 and more is very suggestive,

A suspected case with positive blood culture at the first week or positive stool culture at 3rd, 4thand 5th week of illness is very definitive.

Data analysis

The five years of data were analyzed by using Microsoft Office Excel 2016.

Data dissemination

Written report (both hard and soft copies) was arranged and shared to AAU school of public health, Kolfe Keraniyo sub city health office and Resident advisors.

Results

Magnitude of Typhoid fever by place

From 2012 _ 2016, a total of 73444 typhoid fever cases were reported from 11 woredas. As presented in the graph below the highest portion of cases were reported from Woreda 4 (17.7%) followed by Woreda 13 (16.5%) & Woreda nine (14.7%), while Woreda one & Woreda six shared the smallest portions of the case load. However, Woreda two, seven, eight & twelve were no case report due to the absence of governmental & non-governmental health facilities.

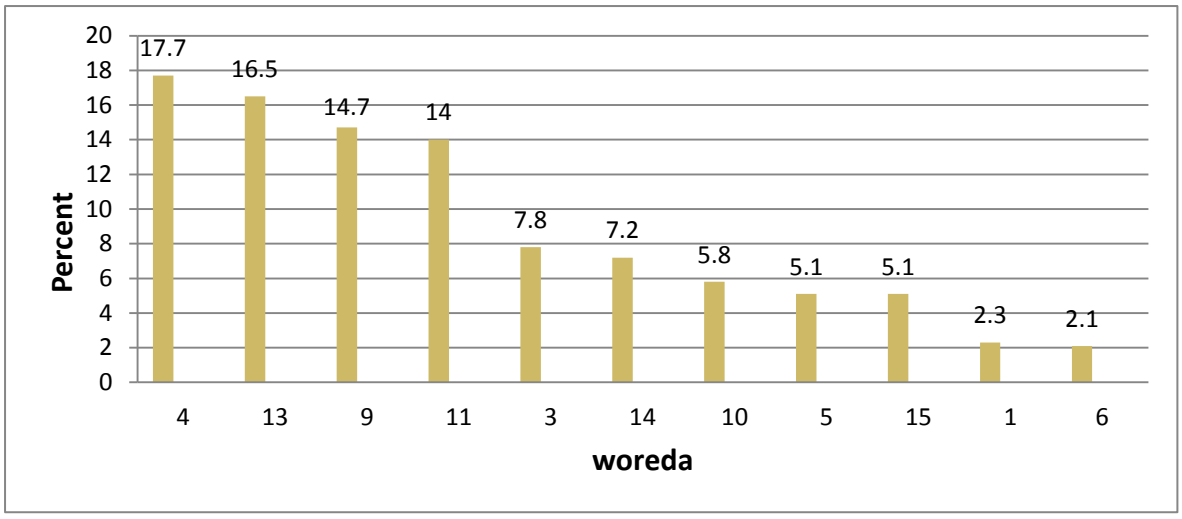

Figure 17: Five year Typhoid fever cases distribution by woreda in KOK sub city, A/A, Ethiopia, 2012-2016

Description of Typhoid fever cases in kolfe keraniyo sub city by Time

Within the last five years, there were different trends of typhoid cases reported in kolfe Keraniyo Sub City of which the highest number of cases were reported in 2016 and the lowest number of case were reported in 2012.

Table 7:-Incidence (%) of Typhoid fever cases reported during five years (2012-2016) in kolfe keraniyo sub city, Addis Ababa city administration.

Year	Population at risk	Number of cases	Total death	Incidence Rate (%)
2012	**475593**	**11182**	**0**	**2.3**
2013	**485088**	**11191**	**0**	**2.3**
2014	**493338**	**14097**	**0**	**2.8**
2015	**511642**	**16601**	**0**	**3.2**
2016	**524200**	**20403**	**0**	**3.9**
Total	**2,489,861**	**73444**	**0**	**2.9**

73444 Typhoid fever cases were reported during five years period in all months of the year. Among those months in December 2016 with the amount of 2762(3.8%) is the highest cases reported. The least number of cases reported in January2012 which is 204(0.3%) in the sub city.

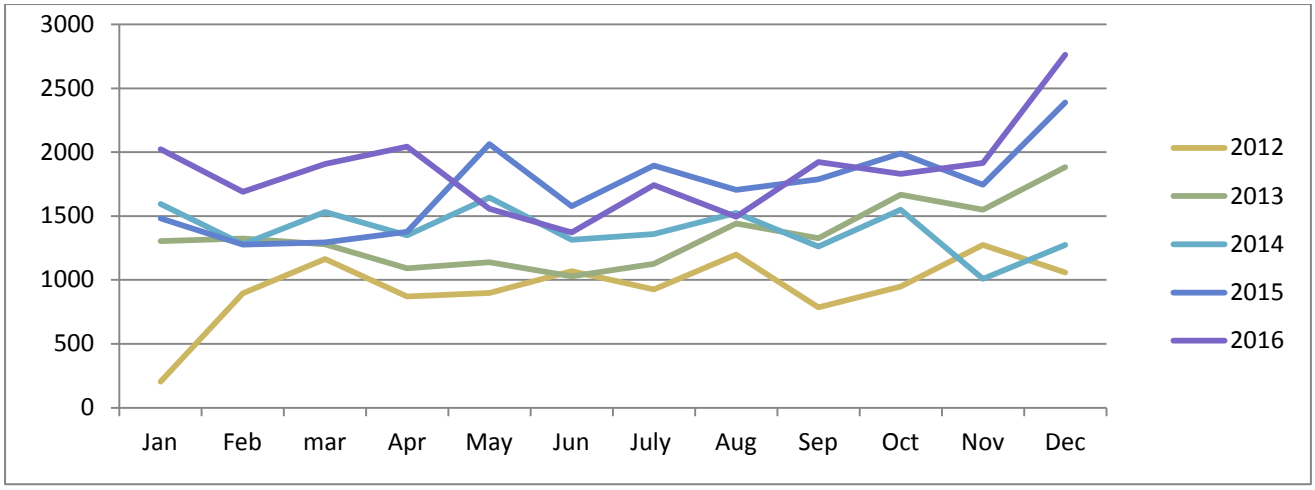

Figure 18: yearly trend of typhoid fever cases by month in Kolfe Keraniyo sub city, Addis Ababa 2012-2016

During five years of period the trends of typhoid fever were increasing every year. The highest incidence rate reported in 2016 which is 3.9% and the least incidence reported in 2013 which is 2.3%.

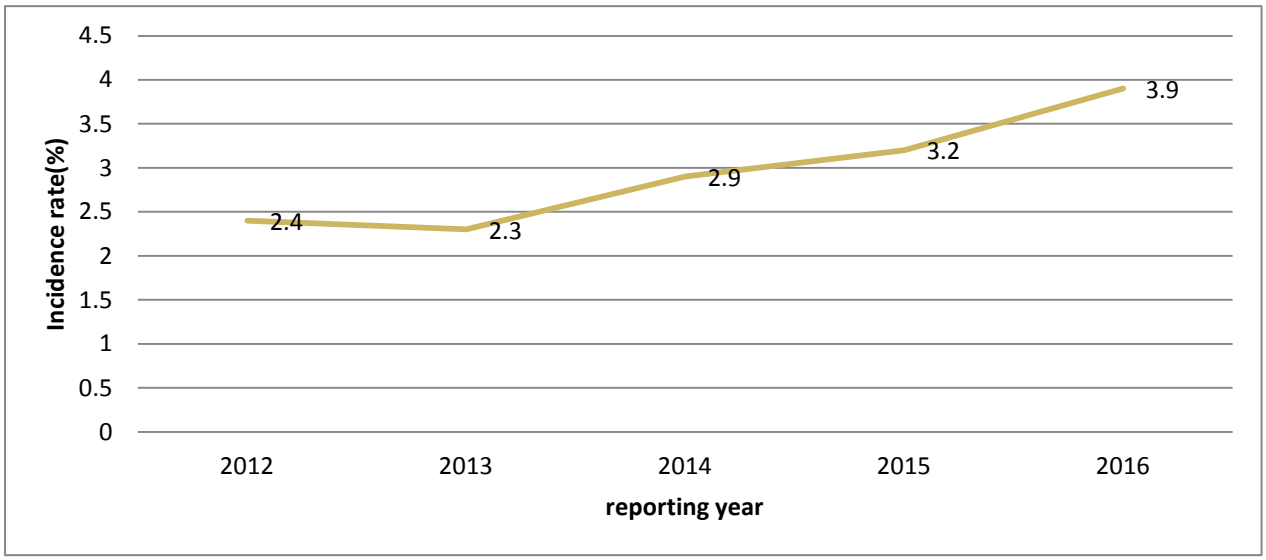

Figure 19: Trend of Typhoid fever cases in kolfe keraniyo sub city, A/A, 2012-2016

Discussion

The incidence of typhoid fever cases in outpatient department increased every year in Kolfe Keraniyo sub city the increment was not only in Kolfe keraniyo sub city also at regional level. In 2016 the highest Incidence of typhoid fever cases were reported (3.9%) and 2013 the least Incidence cases reported (2.3%). From all reported woreda the highest incidence case reported by woreda 4 which is 17.7% and the least incidence case reported 2.1% by woreda 1.

Seasonality of the occurrence of typhoid fever is not strongly evidenced with studies. However, the incidence of typhoid rises at the end of the dry season when the rural water supply is lowest and people congregate at the source of water: The infection is more common from October to February when the rain helps spread already contaminated water supplies (1). Similarly, in kolfe sub city infection is more common from August to December. This may be rain (flood) contaminate water source. Therefore, the opportunity of contamination of water with pathogenic organisms is high.

Limitation

- Lack of demographic information to analyze the data by age and sex, because the PHEM reporting format lacks these variables.
- Woreda 2,7,8,12 not reporting surveillance report
- All health facilities diagnostic test were Widal test

Conclusion

- The incidence of typhoid fever increased every year from 2012-2016.
- The highest Number of typhoid fever cases was reported in 2016 and the highest incidence of typhoid fever cases was reported in December.

Recommendation

- Regional health bureau has to manipulate surveillance data on regular basis to see the trend.
- Weekly reporting format is better to be revised and incorporate demographic information such as age and sex. (EPHI)
- Sub city health office and woreda PHEM should give attention on hygiene and sanitation activities and health education for community.

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Chapter three: Surveillance system evaluation

3.1: Sentinel surveillance system evaluation on influenza like illness in Addis Ababa, Ethiopia, 2016

Abstract

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. The Global Influenza Surveillance and Response System have been performing influenza virological surveillance since 1952. Ethiopia conducts influenza sentinel surveillance since 2008 in eight sites. Federal Ministry of Health/EPHI carries it out but the little is known whether the system meets its objective. We conducted to evaluate the sentinel surveillance attributes, purposes and its operation system.

Methods: We conducted a descriptive cross-sectional study from July 3-21, 2017 in Influenza like illness Sentinel sites. We used updated CDC guideline, interviewed sentinel surveillance focal person in three influenza Sentinel surveillance site, one person from National Lab, one from regional Pubic health emergency management, three sub city PHEM officers and reviewed secondary data using checklist. We analyzed and compiled the data using Microsoft excel.

Results: - All the visited health facility posted the ILI case definition and none of the sentinel sites have been reporting influenza data to their next higher level but to the national PHEM (NIL). Laboratory identified influenza AH1N1, AH3N1 AND B type's 2016. The positive predictive value was 13.3 %(781). Among 781 case reports in 2016, 5(0.6%) age variable, 12(1.5%), body temperature variable, and 7 (0.9%) sex variables were not filled.

Conclusion: the surveillance system able to identify, type of influenza strains, its burden and trend, the system has good data quality, the surveillance system has providing virological data used to characterize and monitor influenza (ILI) trends in Addis Ababa.

Key words: Surveillance, Evaluation, Influenza, Addis Ababa

Word count: 255

Introduction

Background: 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 and mortality and to improve health. A communicable disease surveillance system serves two key functions; early warning of potential threats to public health and programmed monitoring functions which may be disease- specific or multi-disease in nature (1).Surveillance system evaluation allows us to define whether a specific system is useful for a particular public health initiative and is achieving the overarching goals of the public health program and the data collection objectives (2). This is done for monitoring disease trends, describing natural history of diseases, identifying epidemics or new syndromes, monitoring changes in infectious agents, identifying areas for research so as eventually to reveal disease burdens and guiding the action to be taken, the health policy, planning, evaluation of health programs and the likes(3).

The Global Influenza Surveillance and Response System (GISRS), previously known as the Global Influenza Surveillance Network (GISN), has been performing influenza virological surveillance since 1952(4).This network has played a critical role in the current better understanding of global influenza virus circulation. The GISRS consists of over 130 National Influenza Centers (NICs) around the world that collect and test clinical specimens, submitting a sample of these to WHO Collaborating Centers (WHO CC) and Essential Regulatory Laboratories for further characterization(4).

In recent years, an increasing awareness has developed of the need to expand influenza surveillance and to include more epidemiological information to complement the virological data collected by GISRS. This need was formally recognized by the World Health Assembly in 2011 in Resolution 64.5 and in the adoption of the Pandemic Influenza Preparedness Framework (5).

The pandemic of 2009 uncovered several specific gaps in global influenza surveillance capacity, which compromised the assessment and monitoring of the event. The lack of a pre-existing international mechanism for sharing epidemiological data presented challenges to understanding global patterns of transmission and disease. And finally, the non-standardized approach to data collection and outbreak investigations early in the event resulted in data that was often incompletely understood outside the local context. The accumulation of historical data for influenza-associated severe respiratory disease will allow rapid comparative assessment of each influenza season and of future pandemics both locally and globally.

Public health surveillance systems play a critical role in national health management. They provide data that can be used for several purposes(6).Data disseminated by a public health surveillance system can be

used for immediate public health action, program planning and evaluation, and formulating research hypotheses(7). For example, in America, Public health officials rely on the timeliness and completeness of the surveillance system data to design public policies and interventions (8).

Moreover, sentinel surveillance provides an alternative to population-based surveillance for the collection and analysis of individual patient-related information and more limited monitoring of influenza trends. Sentinel surveillance has the potential to provide more complete data about some of the epidemiologic characteristics of influenza like illness (ILI) at a particular sentinel surveillance site and also to determine the proportion of ILI cases which are due to influenza. One of the advantages of the sentinel surveillance approach is that it requires fewer resources by reducing the number of sites collecting laboratory specimens for influenza testing.

Ethiopia has launched influenza sentinel surveillance since 2008(9) and currently 5 SARI and 3 ILI sites are engaged in the influenza surveillance. All three out pt ILI and one SARI in pt sentinel surveillance site found in Addis Ababa such as Shiromeda, Akaki and kolfe H/C for ILI out pt yekatit 12 for SARI in pt. It is carried out by Federal Ministry of Health/EPHI through a system which has support from CDC and WHO and extending from EPHI down to the sentinel site. These includes upward and down ward reporting and feedback mechanism.

Sites were selected based on availability of resources, technical capacity and number of staffs, availability of functional service for ILI/SARI for all age groups, accessibility to adequate clients and geographical proximity between SARI and ILI sites.

Rationale for Influenza Surveillance System Evaluation

The world health organization has put a standard about periodic evaluation of influenza sentinel surveillance which states a comprehensive evaluation of the system to be done regularly, beginning one to two years after initial implementation of the surveillance system or more importantly if an expansion of the system is being considered (10). However, since the start of sentinel surveillance the system, documents showing an accomplished evaluation of the system were not found except one that was done by FELTP resident in 2012(11). Little is known whether the system meets its objective. Hence, this evaluation is conducted to evaluate the sentinel surveillance attributes, purposes and its operation system.

Objectives

General objectives

- To evaluate Addis Ababa influenza like illness sentinel surveillance system

Specific objectives

- To assess the core and supportive functions of Addis Ababa ILI sentinel surveillance system.
- To evaluate the key attributes of the Addis Ababa ILI sentinel surveillance system

Methods and Materials

Study Area

This surveillance system evaluation was done in Addis Ababa City Administration, Gulele sub city (shiro meda H/C), Akaka Kality Sub City (Akaki H/C) and kolfe keraniyo sub city (kolfe H/C). Which is located northwest, southeast and west southern part of the city respectively. All ILI influenza sentinel surveillance data in 2016 was included in the study. Three ILI sites (Shiromeda health center, Akaki health center and Kolfe health center) were included in the study.

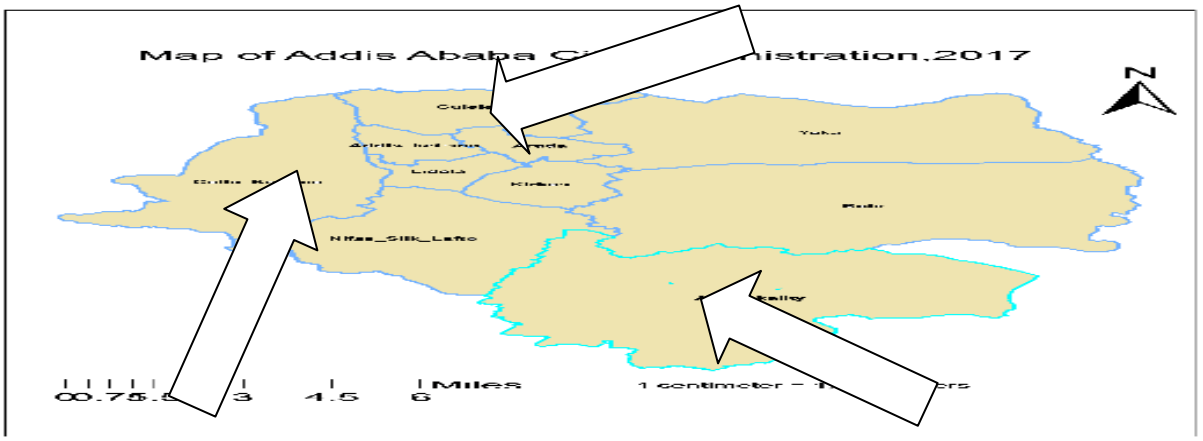

Figure20: map of Addis Ababa city administration sentinel sites sub city 2017

Study design

A descriptive cross sectional study was conducted from July 3 - 21, 2017 in all three ILI Sentinel sites.

Study Population

Three ILI sentinel health facilities, health offices of the sentinel site sub city, national PHEM and lab were included in the study population.

Study unit

All three ILI sentinel health centers, three sentinel site sub city health office, national PHEM and lab was included in the study.

Data source

Secondary data of ILI reports from the most recent four consecutive weeks during data collection were obtained from PHEM departments of health facilities, national PHEM and national influenza lab. Records of disease and laboratory registration books, feedback reports of surveillance, summery report sheet (weekly report format) of influenza and line lists of outbreak investigation were reviewed. Focal persons of PHEM at sub city, districts and at health facility, levels and health professionals were interviewed to get the important data of the existing ILI sentinel surveillance system of the sub city.

Data Collection Methods

Primary data were collected using structured questionnaire and Interview with influenza sentinel surveillance focal persons, woreda PHEM, sub city PHEM, regional health bureau PHEM officers and national PHEM officers. Secondary data sources such as surveillance report completeness and timeliness as well as ILI sentinel surveillance data, supervision report, written feedbacks, preparedness plans were also reviewed.

Evaluation methods from Centers for Disease Control and Prevention (CDC), Updated Guideline for Evaluating Public Health Surveillance Systems: Structured questionnaire was prepared and used to collect data about the core functions of surveillance, support functions of surveillance and attributes of surveillance system.

Data Quality Management

After data were collected using WHO tools for surveillance evaluation by principal evaluator daily, Completeness and consistency of collected data were checked before data entry and analysis.

Data Analysis

We analyzed and compiled the data using Microsoft excel.

Operational definitions

Case detection: is the process of identifying cases and outbreaks.

Case registration: is the process of recording the identified cases.

Case/outbreak Confirmation: refers to the epidemiological and laboratory capacity for confirmation

Reporting: Refers to the process by which surveillance data moves through the surveillance system from the point of generation.

Epidemic preparedness: Refers to the existing level of preparedness for potential epidemics

Stakeholders: The organizations or individuals that generate or use surveillance data for promotion of health, prevention and control of diseases

Usefulness: - how helpful the system is to public health staff in taking actions as a result of interpreting and analyzing its data.

Simplicity: - Refers to both its structure and ease of operation.

Flexibility: - a flexible public health surveillance system can confirm to changing data needs or operating conditions with little extra time, staff office, or allocated funds.

Information quality: - Data quality reflects the completeness and robustness of the data entered to the public health surveillance scheme.

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

Sensitivity: - refer to the ability to detect out breaks, including the ability to monitor changes in the number of cases over time.

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

Representatives: - refers to the extent to which the surveillance system accurately describes the occurrence of medical condition over time and their distribution in the population by place and person.

Stability: 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.

Data Dissemination

The result of this study was presented to the Addis Ababa University School of Public Health. It was communicated to the kolfe keraniyo, Akaki kality and yeka Sub City Health Office, Addis Ababa City Administration Health Bureau PHEM Department and to Influenza lab.

Results

Engagement of stakeholders

A brief discussion was led by the national lab and PHEM focal person of the sentinel surveillance site to conduct the surveillance, evaluation in order to identify the weakness of the system, to evaluate the caring out of the objective of the scheme. They assisted us to speak the appropriate inquires and assess pertinent attributes. They also provided as the guidelines and the aim of the system execution. Three ILI sentinel site focal person, woreda PHEM, sub city PHEM, national influenza lab supports provided us data and important information.

Description of Influenza Sentinel Surveillance Evaluation

Africa, Ethiopia has limited data regarding the burden and the impact of influenza. The spread of novel influenza virus is the pandemic potential of the region and the continent. Lower respiratory tract infection/pneumonia is among the common causes of morbidity and mortality in Africa, especially among the children <5 year of age, but few data are still allowed to estimate the how the respiratory tract infection burden, that is due to influenza.

In the three ILI sites there were 781 specimens were collected for ILI suspected cases. Out of the total ILI cases 104 (13.3%) was positive for influenza.

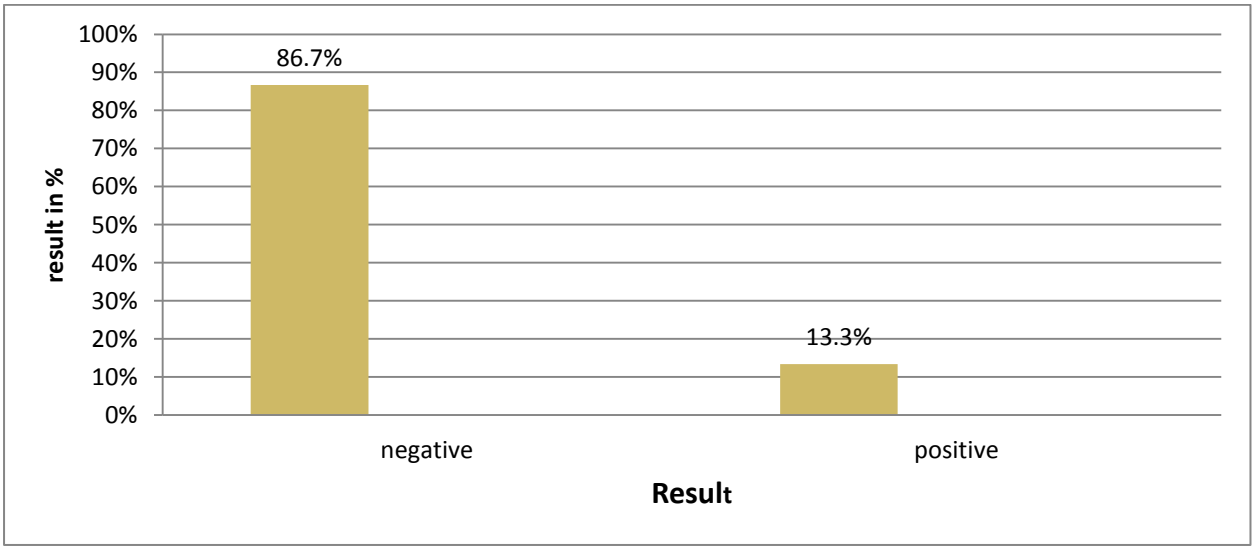

Figure21: ILI sentinel sits specimen collection & result in 2016, Addis Ababa city administration, Ethiopia

Purpose and Operation of the Surveillance System of *Influenza Sentinel*

They throw a protocol for ILI surveillance or a set of standard operating procedures developed by the national PHEM together with national Lab and CDC. The protocol includes clearly defined targets for the surveillance organization. The surveillance site has a copy of guideline and SOPs and also broadcast to all participating staffs. The objectives were stated as follows.

Objective of surveillance system in PHEM

- Ensure rapid detection of any public health menaces
- To ensure preparedness related to logistics and fund government activities
- Prompt response and recovery from diverse public health emergencies, which range from recurrent epidemics, emerging infections, nutritional emergencies, chemical spills, and biological terrorism

The Objective of Influenza Sentinel Surveillance

- Detect new influenza strains capable of or having the potential to cause the pandemic
- Determine the characteristics of influenza and other respiratory disease
- Characterize and monitor trends in illness and deaths attributable sever acute respiratory infections
- Determine the proportion of confirmed cases of influenza among SARI inpatients and/or among ILI out-patients
- Collect data which will be useful for determining burden-of-disease estimate due to influenza in the rural area
- Supply data to distinguish and supervise groups at high risk for serious disease
- Offer data on the contribution of influenza to the burden of respiratory disease in order to prioritize and plan public health interventions
- Provide the platform to monitor impact of control schemes

Case definition

ILI Cases are identified using standardized case definition indicated in the Ethiopian influenza sentinel surveillance implementation guideline adopted from WHO African region which is recommended to be used by all member states to enable comparison between different countries in the region.

Case Definition for Influenza-Like Illness (ILI)

A person, child or adult with: Sudden onset of fever > 38 ºC AND Cough or sore throat in the absence of other diagnoses (Ethiopian influenza sentinel surveillance guideline).

A confirmed case of influenza is a case that meets the clinical case definition and is laboratory confirmed (laboratory results must be positive for influenza virus)

Population under surveillance

The National PHEM guideline stated that influenza is one of the twenty two priority diseases set to be under the surveillance of the population living throughout the countryside. Kolfe health center (kolfe keraniyo sub city), Akaki kality H/C (Akaki sub city) and Shiromeda H/C (Gulele sub city) was ILI influenza surveillance sentinel site in Addis Ababa city administration.

Regional, sub city and woreda PHEM has no the same follow up as of the other disease in influenza surveillance. At that place was no vertical coordination link in follow up of the surveillance organization. The ILI sentinel surveillance links with national Lab and national PHEM.

The influenza sentinel surveillance of ILI sites has lack of integration with sub city health authority like with PHEM. There was no Influenza/ILI focal person in the sub city health department. The integrated surveillance system was not established related to the influenza surveillance sentinels system activities of the infirmary with the sub city health department. The established connections were with national PHEM and national Lab was based on supportive supervision and feedback, training and supplying funds. The second established link was with national lab that was grounded on the sample collection and investigation of samples and sharing of sample investigation result.

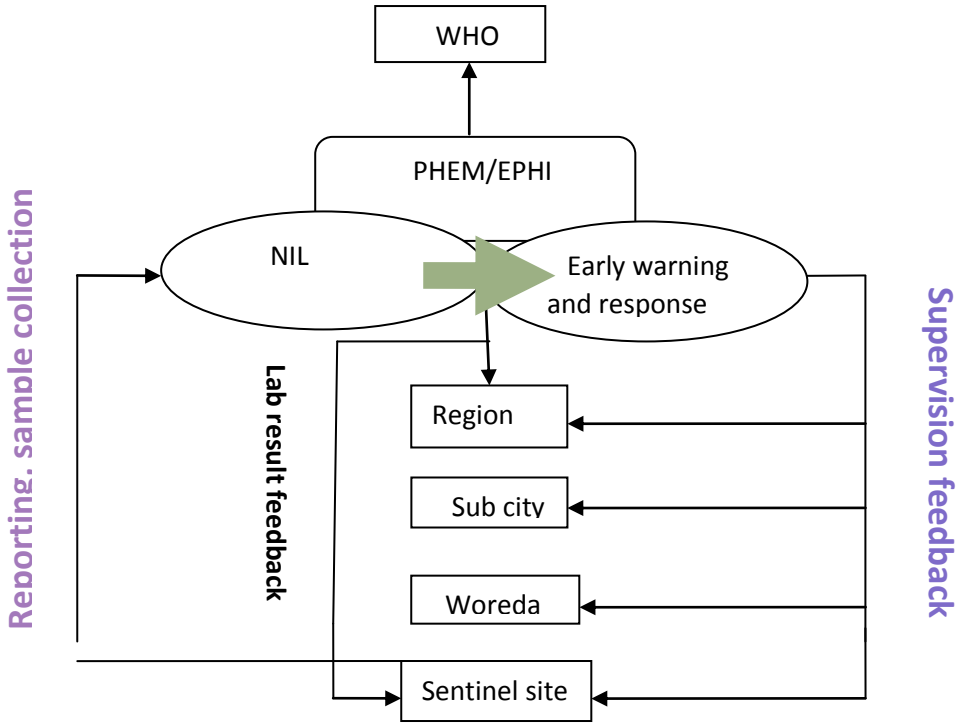

Figure22: Addis Ababa ILI sentinel site information flow

Supporting Functions of the surveillance system

Availability of Budget and Resources for Surveillance Activities

Funding resource to run ILI sentinel surveillance system was from the government and CDC. The sentinel sites (health center) provided 70,000-100,000 birr every year for program. They utilized for computer, telephone, furniture and other necessary equipments/supplies. During assessment, there is interrupted the allocated budget for ILI sentinel surveillance. The sentinel sites their own room for surveillance, computers, printers, frig for sample collection and other office furniture. There was no shortage of reporting format, VTM, PPE and registration book was available at all sentinel sites in the last six months.

Table 8: availability of resource in sentinel sites for surveillance activities, in Addis Ababa, 2017

No	Item	Sub city	%	Woreda	%	Health center	%
1	Computer	1	100%	0	0	3	100%
2	Printer	1	100%	3	100%	3	100%
3	Stationary	1	100%	3	100%	3	100%
4	Fax	0	0	0	0	0	0
5	Internet CDMA	1	100%	0	0	3	100%
6	Telephone	1	100%	3	100%	3	100%
	Card for focal	0	0	0	0	9	100%
7	Vehicle	0	0	0	0	0	0
8	Refrigerator	0	0	0	0	3	100%

Case detection and registration

During this evaluation, all the visited health facilities have posted the cases definition of ILI and the understanding of the cases definitions by the influenza focal persons and other staff was satisfactory. The focal person collects samples from under five and referred cases from Adult OPD and triage room. The specimens collected methods were throat swap and the focal persons uses PPE. The specimens were stored in controlled temperature below 4℃ and specimen collection materials available in the office. Lab results (feedback) back to the sites from national influenza lab quarterly and for national PHEM and CDC weekly. The registration book and guidelines was found in all sites.

Reporting

There was no shortage of reporting forms in all visited sentinel sites since it is also available in soft copies. All sites use similar reporting format which is incorporated in the influenza sentinel surveillance implementation guideline. None of the sentinel sites have been reporting influenza data to their next higher level but to the national PHEM (NIL).All focal persons have responded that they were expected to do so. 100% The ILI sentinel site were preparing and ready the reports in hard copies along with the throat swab samples weekly for the National Influenza Laboratory staffs to transport and test in the national influenza laboratory.

Data analysis and interpretation

Although they have computer in all ILI sentinel sites, all influenza surveillance focal persons have never analyzed and interpreted their data routinely but only for presentations during review meetings; both case-based and aggregated. It is only analyzed by national PHEM. All of the focal persons have responded that they do not have advanced computer skills.

Feedback and supervision

Supervision and provision of feedback were assessed at national level one time per year. These assessments have found that periodic supervision was not done. Laboratory feedback (test result) has been provided quarterly from 2017 to the sentinel site by the national lab. The national laboratory staffs visits the site every week and solve the problem if there is any.

Training

There are 3 influenza surveillance focal persons currently working in place. All of them have taken training on influenza surveillance, Including facility medical directors and regional PHEM officers. But not sub city and woreda PHEM officers.

Epidemic Preparedness and Response

Public health services needing to be well prepared to outbreaks, and adequately react if an outbreak occurs. Out of all visited health office and health center (sentinel site) experience Cholera (AWD) outbreak in the last 2016. During assessment, all sentinel sites woreda and health center including sub city have establish Rapid Response Team (RRT). But this committee were actively engaged only if outbreak occurred at all level. On the other hand, 3(100%) woreda, sub city health office and health center has written plan for Epidemic preparedness and response. all Woreda and health center have no implemented prevention and control measures based on local data for Cholera and Influenza in2016. 100% of woreda and 100 % health center have documents or meeting minutes at the time of the evaluation that shows the existence and activities of RRT. Sub city, woreda health office and health

center have no specific budget line for emergency management and response. During assessed 3(100%) health centers have emergency stock of drugs and supplies at all time in 2016. But all Woreda and health center including sub city have no experienced shortage of drugs, Vaccines or supplies during the most recent outbreak.

Table 9: influenza sentinel surveillance sites emergency preparedness status in A/A

No	Variables	Sub city	%	Woreda	%	Health centers	%
1	Established Rapid Response Team (RRT)	1	100%	3	100%	3	100%
2	Availability of Written emergency preparedness plan	1	100	3	100%	3	100%
3	Observed epidemic management (RRT) meetings minutes	1	100%	3	100%	3	100%
4	Availability of emergency stocks of drugs and supplies	1	100%	3	100%	3	100%
5	Experienced shortage of drugs during in the past year out break	1	100%	3	100%	3	100%
6	Presence of budget line for epidemic response	0	0%	0	0	0	0

Surveillance system attribute

Usefulness

Before the beginning of influenza sentinel surveillance in Addis Ababa (Ethiopia) nothing was known about influenza strains circulating in the country. Currently because of the surveillance data generated by the system, type of influenza strains, its burden and trends are being understood. It also permits to evaluate the effectiveness of the prevention and control program and intensify researches based on prevention and control of disease.

Simplicity

The case definition of ILI was easy for detection by all tiers of health professional of the health center staff. But sample tacking and filling the data and report by focal persons. The surveillance system has significant information for information and allows updating the data of cases. The system takes 10 to 15 minutes to fill the format.

Data quality and completeness

Data quality reflects the completeness and validity of the data recorded in the public health surveillance system. In contrast to simplicity of the system, some important variables were in case based reports. For instance, among a total of 781 case based reports in 2016, 7 (0.9%) sex variables, 12 (1.53%) temperature variables, and 13 (1.7%) dates of specimen collection variables were not filled.

Table 10: Number (percent) of variable missed during implementing influenza like illness sentinel surveillance (ILI) in A/A, Ethiopia, 2016(781)

Variable	Incomplete data (%)	Above Expected percentage(80%) of completeness
Age	5(0.64)	Yes
Sex	7(0.9)	Yes
Woreda	8(1.02)	Yes
Body Temperature	12(1.53)	Yes
Date Specimen Collection	9(1.15)	Yes
Specimen Condition	13(1.7)	Yes

Acceptability

All levels of the health personnel especially focal person willing to participate in the surveillance system. The national influenza laboratory staffs to transport the collected specimens from the ILI sentinel sites twice a week. All ILI sentinel sites were prepared a room for influenza surveillance activities and assigned trained focal persons.

Representativeness

The ILI sentinel surveillance is only on three health center in three sub city in Addis Ababa. Even though the site was selected to represent most of the population it is still difficult to generalize to the whole population. In the system the catchment population was not clearly defined, because of this, calculating the incidence rate was difficult.

Stability

In that location were no new restructures affected the operations and activities of the surveillance. No lack of resources interrupts the surveillance organization even if the incentive discontinue for two years.

Sensitivity

By using Influenza like illness case definition able to pick all ILI suspected cases, and prevention and control measures able to be doing. In this evaluation the denominator was not available to calculate

sensitivity of the surveillance system. However, beside loose of case definition which is very sensitive to ILI cases, specimen tested at EPHI laboratory was also tested positive at WHO reference laboratory.

Timeliness

Timeliness in this report reflects the elapse between date of symptom onset and date of specimen collection. In this regards, the range of the elapsed time is between two and seven days which is exactly in line with the time indicated in the Ethiopian national influenza sentinel surveillance implementation guideline.

Positive predictive value

The positive predictive value (PPV) or the proportion of cases reported by the system that actually have influenza was 13.3% (n= 781). The capacity of the laboratory diagnostic test was periodically ensured by WHO confirmatory laboratory.

Flexibility

A flexible public health surveillance system can adapt to changing information needs or operating conditions with little additional time, personnel and additional funds. The case definition by itself can be also used to detect any other respiratory infection like Middle East respiratory syndrome corona virus (MERS- CoV).

Table 11: surveillance attributes summary table, ILI sentinel surveillance in A/A, Ethiopia, 2017

s/n	Surveillance attributes	Finding in national PHEM/NIL
1	completeness	• 100% in national PHEM/NIL
2	timeliness	• 100% in national PHEM/NIL
3	Usefulness	• All believed the existing system helps them to detect any outbreak • None of sentinel sites and national PHEM perform trend analysis of influenza
4	Simplicity	• It takes 5-10min to fill the format
5	Acceptability	• All sentinel sites (100%) accepted and engaged to the system • Cases are being identified using standard case definition in facilities
6	Flexibility	• Easy to use for new disease (100%)

7	Sensitivity	• ILI case definition easily able to pick all ILI suspected cases
8	PPV	• 13.3%
9	Representativeness	• The sentinel site only on 3 health center in 3 sub city in Addis Ababa city administration • health centers in other sub city ignored
10	Stability	• No new restructure affected the operation and activities of surveillance in the study period

Discussion

Generally, this evaluation revealed that the Addis Ababa/ Ethiopian ILI sentinel surveillance is on the right track to achieve its objectives. This sentinel surveillance had identified circulating influenza viruses in Addis Ababa/Ethiopia which pandemic influenza A (H1N1)2009, Seasonal influenza A (H1N1), Seasonal influenza A (H3N2) and influenza B. Seasonality and trends are also defined as in October, November and December(12). The season is not very different from Albanian influenza season (13).

Regarding the functions of surveillance system, there are gaps in reporting, data analysis and interpretation because of lack of skill from the sentinel site focal persons side and lack of integration next to higher level(woreda & sub city). Failure to conduct periodic supportive supervision from the national and regional side might have bolded this gap. As it was stated in the influenza implementation guideline, monthly supportive supervision for sites of Addis Ababa and quarterly for others had to be done by the national PHEM/NIL and periodic supervision and feedback had to be given to sites by regional/woreda/sub-city offices(9). The sentinel surveillance was very simple; ILI focal persons at sentinel site identify eligible cases, collect throat swab samples with case based reporting format and the laboratory personnel from NIL directly receives(collect) from the sentinel site. This system is very easy for health care providers at sentinel site like Madagascar's influenza system (13).

The system has good data quality but there is below 2% incomplete variable (Date specimen sent to lab). The sentinel sites do not represent the whole population. Even the catchment population was not clearly defined. Hence to calculate incidence rate and to generalize to the whole population, the sentinel sites will need to be more expanded considering Varity of geographic location and community life style. A lack of dedicated resources from government may affect the stability of influenza sentinel surveillance. The sentinel surveillance is donor dependent; this may affect sustainability of the system. All running coast, supplies and logistics are donated by CDC.

Conclusion

The influenza sentinel surveillance system has proven to be useful in providing virological and epidemiological data used to characterize and monitor influenza trends in Addis Ababa. Generally, the staff members using the system are satisfied with the forms and procedures involved, all ILI sites are reporting regularly (weekly) to the national influenza lab and PHEM but not to the next higher level (woreda & sub city). The influenza sentinel surveillance system is simple, acceptable, stable, flexible and able to detect outbreaks, identify and characterize circulating influenza strains but yet to expand other sub citywide. Data quality is yet to be maintained.

Recommendation

- Training should be given by national influenza lab and PHEM for woreda and sub city PHEM about influenza surveillance.
- The sentinel site should be reporting the surveillance data to the next higher level (woreda & sub city).
- Continuous supportive supervision should be in placed using checklist to increase the quality of data.
- Data should be continuously analyzed and feedback should be given periodically to health care provider and partners.
- Monitoring should be done as scheduled in the national influenza surveillance guideline to improve data quality.
- The national PHEM (influenza) should be released incentives (budget) timely to the sentinel sites.

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Chapter four: Health profile report

4.1. Health profile description of woreda 12, Kolfe Keraniyo sub city, Addis Ababa city administration, 2017

Abstract

Description: Health Profiles is a program used to improve availability and accessibility for health and health-related information. It provides a summary of health information of the community as a whole which helps in disease prevention, health promotion, and health related issues intervention. The Main Objective of this study is to assess the Health and health related profile of Kolfe Keraniyo sub city Woreda 12 in 2017.

Method: This health profile description was done in Kolfe Keraniyo Sub city Woreda 06. Cross sectional retrospective descriptive study was conducted. Woreda historical background, overall health profile, maternal health, child health, epidemic prone disease situation, and other health hazard situation were assessed. Health profile assessment was done using secondary data from documents, and primary data from interviewing key informants in different sector offices, and community representatives. Data was analyzed by frequency, proportion, percentage, and ratio using Microsoft Excel software.

Result: the total population of the woreda 12 was 28522 of this, 15008(52.6) were males and 13514(47.4) were females. Male to female population ratio at the woreda was 1: 0.9. Kolfe health center gives health services to woreda 12population which is found in woreda 13. The Health center catchments population is 61,214. The immunization coverage based on the health center catchments target (woreda) was greater than 100 percent (the health center was given services to the neighboring woreda including Oromiya). But the dropout rates of penta1 to penta3= 216(11%), PCV1 to PCV3= 1197 (40.9%), Rotarix1 to rotarix2= 608 (25.1%), penta1 to Measles =224 (11.5%).

Conclusion and recommendation: AURTI is the leading cause of morbidity both in Adult and Pediatrics. Vaccine coverage, ANC1st and deliveries were more than expected. Community mobilization on maternal health improving liquid waste disposal is recommended to build healthy community.

Key Words: Health profile, Woreda 12, Kolfe Keraniyo sub city, Addis Ababa, 2017

Word count: 282

INTRODUCTION

Background

Health profile

Health description is crucial for prioritizing health and health related problems of the community at any level. Housing is one of the critical problems of Addis Ababa. Because of rural-urban migration and natural increase there is an alarming population increase in the City. This causes shortage of social utilities including housing. Sanitation and sewerage management and disposal is a serious socio economic problem of the City (1).

Addis Ababa lies 9°1′48″N latitude and 38°44′24″E longitude. The city is located at the heart of the Country, at an altitude ranging from 2,100 meters at Akaki in the south to 3,000 meters at Entoto Hill in the North(1). This makes Addis Ababa the third highest city in the world, after La Paz and Quito in Latin America (1). Its time zone categorized in East Africa Time. The city occupies a total area of 540 Km2 with a Sub-tropical highland climate (1). The city has a complex mix of highland climate zones, with average temperature differences of up to 12.2°C, depending on elevation and prevailing wind patterns. The high elevation moderate's temperatures year-round, and the city's position near the equator means that temperatures are very constant from month to month (2). The day to day life activities of the City's population is predominantly based on different sorts of occupation. These, include 119,197 in trade and commerce; 113,977 in manufacturing and industry; 80,391 homemakers of different variety; 71,186 in civil administration; 50,538 in transport and communication; 42,514 in education, health and social services; 32,685 in hotel and catering services; and 16,602 in agriculture(3). Besides, the residents of rural parts of Addis Ababa, the city dwellers also participate in animal husbandry and cultivation of gardens. Currently, 677 hectares of land irrigated annually, on which 129,880 quintals of vegetables are cultivated (3).

The health institutions in Addis Ababa include hospitals, health centers, health stations, clinics and drug vendors, which are run by the government, NGOs and private health institutions. According to Addis Ababa Health Bureau, currently there is 1192 health service rendering institutions in Addis Ababa (4). Those include, 58 hospitals (11 governmental owned general and 5 Specialized hospitals, 39 private and 3 NGO), 90 health centers (82 are run by government, 5 private and 3 NGO), 592 clinics (6 governmental owned 586 private clinics)) and 452 drug vendors (4).

Kolfe keraniyo sub city has 15 woreda, woreda 12 one of 15 woreda in the sub city with the population of 28522 male accounts 15008 and female 13514 (5). It is important to have Health description of a community for prioritizing health and health related problems of the community at any level. Related to this, there is no organized, completed and well-documented health profile data in Woreda 12 of kolfe keraniyo Sub City. Therefore, describing the health profile of the Woreda is helpful to give evidence-based information for prioritizing and conducting appropriate public health interventions in the Woreda.

Rationale of the Description

The purpose of collecting health profile data is to identify strategies that improve the access of every member of the community to effective health care and health promotion. Kolfe keraniyo Woreda 12 Administration health profile was not done before and also there is no organized health and health related information. No organized health and health related indicator which determine the health status of the community and those contribute to a gap in planning and taking evidence based information for action.

Literature Review

Healthcare Situations of the Addis Ababa City

Health institutions, infrastructure and personnel are important inputs that help to ensure healthy society. Modern health care institutions commenced in the Reign of Menilik II marked by the opening of the first modern hospital, Menilik II in 1900. In this regard, recently the city administration has been making efforts to render health care access services based on prevention policy. The health facilities of Addis Ababa improved in service and increased in number in the past five years (5). The health institution present in Addis Ababa includes hospitals, health centers, health stations, clinic and drug vendors, which are run under government, NGO and private health institutions. According to the information obtained from the Addis Ababa Health Bureau, currently, there are 1192 health service rendering institutions in 2015. It comprises 58 hospitals (11 governmental owned general and 5 Specialized hospitals, 39 private and 3 NGO),90 health centers (82 are run by government, 5 private and 3 NGO),592 clinics (6 governmental owned 586 private clinics)) and 452 drug vendors (1).

Health Access Indicators

Acute upper respiratory infection (41,334), (217,979) and (233,334) is by far the most frequent disease in the years mentioned followed by other or unspecified diseases of the eyes which is (19,946), (84,964) and (100,067) and pneumonia (15,504), and (69,560) in 2010, 2011, and 2012 EFY were the top ten causes of morbidity in the city in the past three years respectively (9).

HIV/AIDS Situation in the City

HIV/AIDS is a deadly disease prevailing in developing nations. The rate of HIV/AIDS prevalence is high in urban centers. As Addis Ababa is the political and economic Centre of the country, the rate of HIV/AIDS prevalence is expected to be high. Recent reports and assessments showed, that have been marked increases in the number of health facilities and sites providing HCT, PMTCT, and ART services result in a decline of newly infected people (10).

Housing, Status of Housing facilities and Tenure of the City

Housing is one of the most important basic services, which affects the life of most of the population of the city. According to the 2010 welfare Monitoring Survey of central statistics agency, the available stock of houses can only sufficiently accommodate about 73% of the households and the remaining 27% are homeless people(6). Therefore, housing is one of the critical problems of the city. Most houses of the city are old, unplanned and inconvenient for living (6). Similar study was conducted by the Addis Ababa Housing Project Office. According to the study from the total of 387,000 houses in the city, about 238,000 of them or 61.5% were residential (6). It was only 53% of them were used for living. According to this study 150,000 of houses under government tenure, 76% were older and without any maintenances. Furthermore, 31% of the houses were with single room, 25% without toilet and 27% without kitchen. Generally, 75% of the houses were made of mud and wood. Because of rural-urban migration and natural increase there is an alarming population increase in urban areas. This causes shortage of social utilities, including housing in the urban centers. Likewise, housing is the major problem of Addis Ababa (6).

Water Resource, Water Supply and Sanitation

Water access and adequacy is one the conditions that makes an urban Centre comfortable place to live in. Accordingly, the City Administration of Addis Ababa worked hard to meet the ever-growing need of its residents. Potable water is one of the favorable conditions of urban centers that attract people to live in. In this regard, the City Administration is working aggressively to meet water need of the growing population. The City Administration provided water for its residents from underground (70,152,807 m3) and surface water sources (42,062,760 m3) (7). Regarding water coverage, it had risen from 52% in 2000 E.C to73percentage in the 2003 E.C and made outstanding performance in the year 2004 and reached 94% (7). The amount of water production per day also shows a significance improvement from 232,000-m3in 2000 to 374,000 m3 the year 2004 E.C (7).

Sanitation and Sewerage

Sanitation and sewerage management and disposal is a serious socio economic problem of the City. The system is not well developed. Recently, efforts were made to restructure and improve the system. The sewerage disposal capacity of the City Administration showed progress in the past five years. The performance of the year under discussion was much better than the previous years. According to the 2013 survey study of Central Statistics Agency, 14.9% of housing units of Addis Ababa had flush toilets, 70.7% pit toilets (both ventilated and unventilated), and 14.3% had no toilet facilities (7).

Rationale of the Description

The purpose of collecting health profile data is to identify strategies that improve the access of every member of the community to effective health care and health promotion. Kolfe keraniyo Woreda 12 Administration health profile was not done before and also there is no organized health and health related information. No organized health and health related indicator which determine the health status of the community and those contribute to a gap in planning and taking evidence based information for action.

Objectives

General objectives

- To assess health and health related information in Kolfe Keraniyo sub-city woreda12 from Jan 24. 2017 – March2. 2017.

Specific objectives

- To gather community health and health related information and make ready for use at each level
- To describe health service infrastructures in kolfe keraniyo sub city, woreda 12 in 2017.
- To make straightforward health information and communicate the local burden of disease and other health related information in a practical, accessible format
- To set recommendations based on the identified findings

Method and materials

STUDY AREA

- The health profile assessment was conducted in woreda 12 found in Kolfe Keraniyo sub-city. Woreda 12 is one of 15 woreda of kolfe keraniyo sub city. It is bounded by woreda 11 in the south, woreda 13 in the north, ring road in the east, and woreeda14 in the west. The total population of the woreda 12 was 28522 male accounts15008 (52.6) and female 13514 (47.4). Woreda 12 contains 7 kethenas.

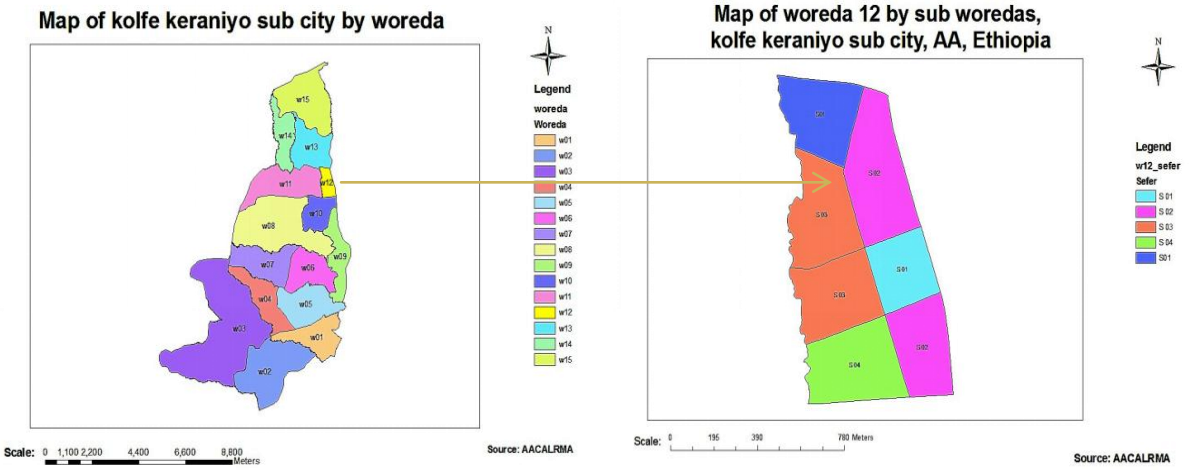

Figure 20: Map of Kolfe Keraniyo sub-city (left) and its woreda 12 (right) by ketena

Study period

- All required data of (2016) were collected, analyzed and interpreted from Jan23/ 2017 – March2/ 2017

Study design

- Descriptive cross sectional study was conducted

Source of the data

- Using semi-structured questionnaire, check list, review hard copy and soft copy of available data in health office, health institution, education, and water office. In addition, interviewing and discussion with concerned bodies was also being conducted. The health profile assessment of the woreda 12.

Study population

- The study population was the population of woreda 12.

Data collection technique and procedure

Both Filling semi-structured questionnaire, specifically developed for collecting the district

Health profiles and making interview with responsible district personnel were used as tools to

Collect the required data. Before starting filling the questionnaire on the brief discussion was conducted with Woreda Health office. Health and health related data were collected using check list. The data sources were Woreda health office, education sector, agriculture and rural development, district finance, water office and other sectors.

Data analysis procedure

Data were analyzed using Microsoft excel. Frequency distribution, table and figures were used to show the results.

Data quality control

- The health profile assessment data was collected using health profile assessment tool by check list
- Check on completeness. To make sure, interviewing the key informant in the sector offices

Ethical consideration

Official letter was obtained from Addis Ababa university health science college school of public health for kolfe keraniyo sub city health biro also the letter was given by sub city to the study woreda health office and other relevant offices to accept the legality of this study.

Measurement

Variables

Demography: The study of population and its characteristics, with reference to such factors: size, age structure, density, fertility, mortality, growth and social and economic variables.

Child mortality rate: The number of births occurring in 2016 per 1000 women in the reproductive ages (i.e. women aged 15-49).

Crude birth rate: Number of live births during a specified time interval

Crude Mortality Rate: The crude mortality rate is the mortality rate from all causes of death for a population

Infant Mortality Rate (IMR): Number of deaths of children < 1 year of age reported during a given time period among Number of live births reported during the same time period.

Clean and safe delivery: Proportion of deliveries attended by HEWs

Contraceptive prevalence rate: Proportion of women of reproductive age (15-49 years) who are using (or whose partner is using) a contraceptive method, on the year 2016

Contraceptive acceptance rate: Proportion of women of reproductive age (15-49 years) who are accepting a modern contraceptive method (new and repeat acceptors) at least once in the reporting period whether they are pregnant or not at this time.

First ANC coverage rate: Proportion of pregnant women attended, at least once during the current pregnancy, by a health professional, for reasons related to pregnancy

Skilled delivery: Proportion of deliveries attended by skilled health attendants; A skilled birth attendants an accredited health professional – such as a midwife, doctor or nurse – who has been trained in the skills needed to manage normal (uncomplicated) pregnancies, child birth and the immediate postnatal period, and in the identification, management and referral of complications in women and newborns.

Tuberculosis (TB) case detection rate: Number of new smear positive TB cases detected, among the new smear-positive TB cases estimated to occur in the woreda.

TB treatment success rate: Percentage of a cohort of new smear positive TB cases registered in a specified period that successfully completed treatment. Successful completion entails clinical success with or without bacteriological evidence of cure.

TB cure rate: Percentage of a cohort of new smear-positive TB cases registered in a specified period that was cured as demonstrated by bacteriologic evidence (a negative sputum smear result recorded during the last month of treatment and on at least on one previous occasion during treatment).

TB defaulter rate: Percentage of a cohort of new smear-positive TB cases registered in 2016 that interrupted treatment for more than 2 consecutive months.

TB death rate: Percentage of a cohort of new smear-positive TB cases registered in a specified period that died during treatment, irrespective of the cause.

Skilled birth attendant: An accredited health professional such as midwife, doctor or nurse who has been trained in the skills needed to manage normal (uncomplicated) pregnancies, child birth and the immediate postnatal period and in the identification, management and referral of complications in women and newborn. (Exclude TTBA and HEWs)

Leading cause of morbidity: the frequently occurring causes of morbidity (10) under which the greatest number of morbidity have been reported during the given year.

Fully Immunized: Children under one who took whole vaccinations available in Ethiopia.

Antenatal coverage: proportions of pregnant women attended, at least once during the current pregnancy, by a health professional, for reasons related to pregnancy.

Contraceptive accepter's rate: proportion of women of reproductive age (15-49 years) who are accepting a modern contraceptive method (new and repeat acceptors).

Postnatal care (PNC) coverage: proportion of women who seek care at least once during postpartum (42 days after delivery) from skilled health attendants including HEWs for reasons relating to post-partum.

Leading causes of mortality: the most frequently occurring causes of mortality (10) under which the greatest number of deaths have been reported during a given year.

Maternal mortality rate: Number of deaths assigned to pregnancy-related causes during a given time interval

Result

Transportation, Telecommunication, water and electricity every sub woreda, joined with each other and with the woreda by cobblestone and asphalt roads. The woreda connected with other woreda and the sub city offices with asphalt road and high way ring road. The main means of transportation of the woreda people is taxies /minibus/ and city bus. Woreda 12, access to telecommunication, pipe water supply and electricity to some sort of interruption. Water supply to the whole woreda is weekly based as of other neighboring woreda and stays 2—3 days to leave.

Population

According to regional population projection woreda health profile 2007 EFY, the total population of the woreda 12 was 28522 male accounts15008 (52.6) and female 13514 (47.4) male to female population ratio at the woreda was1:0.9.according to this data the male to female ratio is different from the sub city/regional population projection was, i.e. 0.92:1(48%, 52% respectively). The population density of the woreda was people/Hr 294.8. Woreda13 health center gave services for woreda 12 population. Total catchment population of health center 61,214 which is added the neighboring woreda in which health centers not constructed. This and other related conditions made difficult to assess the particular health profile of the woreda 12 have no its own HC.

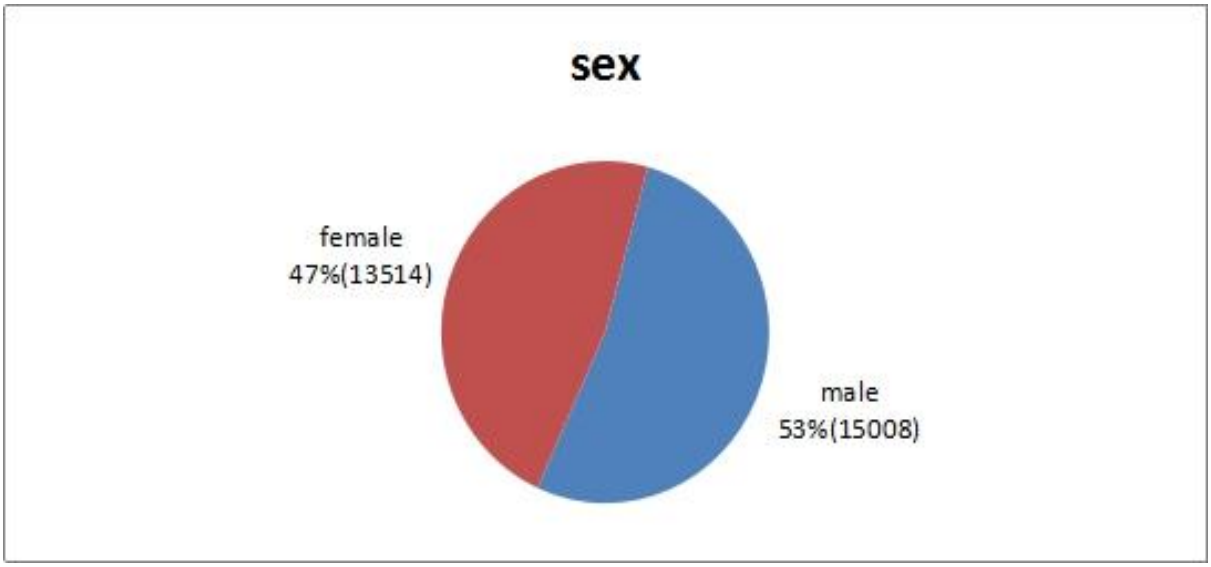

Figure 21: population distribution by sex, number and percent in woreda12 2008

Table 12: population distribution by age group in kolfe health center catchments (woreda 12 and woreda 13), KOK sub city, A/A, 2016

S. No	Description	Total Population	%	Remark
1	< 1 year	1871	3.05	
2	1-4 years	4058	6.63	
3	5-14 year	10409	17	
4	15-24 years	17490	28.6	
5	25-59 years	25010	40.85	
6	+60	2376	3.88	
Total		61214		

Source: woreda 13 Kolfe health center 2008 E.C

Religion

As known, Ethiopia is a country of diversified multi ethnic, religion and culture groups. Woreda 12 in Kolfe Keraniyo sub city is one of the residential areas of these diversified people. Available data showed that Ethiopian Orthodox is the dominant religion with the 65.7%, followed by Muslim religion which accounts around 20.01%, and Protestant represents 13.1%. Talking about ethnicity in this woreda is essential but recent data is not available to describe which ethnic group in the woreda is dominant.

Table 13: population distribution by religion in woreda 12, KOK sub city, A/A, 2016

Characteristics	Number	Percentage
Orthodox	8186	65.7
Muslim	2494	20.01
Protestant	1711	13.1
Catholic	66	0.53
Others	4	0.032

Source: woreda 12 health biro /UHEWs health profile 2007 E.C

Economic status/ occupational status

The main economic source of the population was small scales trade and other business. The small scale business includes restaurant, grosser, bar, coffee and tea, kiosk, wood and metal work, beauty and cosmetic salon, etc. The income status of the community depends on one's economic involvement in different work fields. When we come to the employment of the woreda population 1476 people employed in government institutions, 1661 people employed in private industries and enterprises , 2090people enjoyed with their private business, 1807 are in education process and 2839 are still jobless,3300 females are house wife and the rest of the woreda people are on the other field. Children and other unknown employments status accounts 2000. The average income of the residents of the woreda is not known (data not available).

Table 14: Occupational status of people in woreda 12, KOK sub city, A/A, 2016

S. No	Employment	Number	Percent
1	Government Employee	1476	9.73
2	Private Employee	1661	10.9
3	Self-employee	2090	13.8
4	On education	1807	11.9
5	un employee	2839	18.7
6	House wife	3300	21.7
7	Others	2000	13.2

Source: woreda 12 health biro /UHEWs health profile 2007 E.C

EDUCATIONAL STATUS

The woreda has a total of 6 schools, including 3 governmental and 3 private schools. The legal age of schooling in the woreda is 4 years for stage one kinder garden and seven years for primary school. Based on the woreda education office data there are 3 KG, 1 primary and 1 secondary- preparatory schools in the woreda. There is one TVET School in the woreda. A total of 3443 students were followed their education with 1406 male and 2037 female students with only 2.7% dropout rate. The gross enrolment in KG 587 (17.04%), primary school 984 (28.6%) and high and preparatory school 2367 (68.7%). The enrollment status indicates that in students the female magnitude greater than the male and in teachers the male magnitude greater than female. All schools have water and electric supply. All schools in the woreda have functional health related clubs except KG schools. Latrine status in the school no of latrine holes = 61(for all school), access to disabled student = 1school and access to menstrual hygiene management room = 1 school. The following tables and figure 4 shows distribution of students and teachers by gender and organization in the woreda.

Table 15: Distribution of student population by sex and organization in woreda 12, KOK sub city, A/A, 2016

	Male	**Female**	**Total**
Government	**1116**	**1740**	**2856**
Private	**290**	**297**	**587**
Total	**1406**	**2037**	**3443**

Source: woreda 12educational biro 2008 E.C

Table 16: Distribution of human resource by sex and organization in woreda 12 KOK sub city, 2016

	Government		**Private**		**Total**
	Male	Female	Male	Female	
Master & above	**3**	**5**	**0**	**0**	**8**
Degree	**84**	**33**	**0**	**0**	**117**
Diploma	**14**	**11**	**0**	**9**	**34**
Certificate	**0**	**0**	**0**	**1**	**1**

Supporting stuffs	**33**	**37**	**0**	**13**	**83**
Total	**134**	**86**	**0**	**23**	**244**

Source: woreda 12educational biro 2008 E.FY

Health related information

Health facilities

Woreda 12 was Different private clinics and pharmacies, 8 pharmacies and1 drug dispensaries, 2 medium and 2 small clinics. But Kolfe health center (woreda 13) given services to woreda 12 populations with the total population of 61,214 (total population both woreda). There are 123 government and 94 private health workers from nurses to medical practitioners. Among these health facilities one health centers (woreda13 Kolfe HC) serve the woreda people as OPD, IPD in some extent, and services like Immunization, ART, TBL, TB-HIV, ANC, delivery, PNC and the like. the health centers has long time experience in delivering health service and has currently exercised OR(C/S) for obstructed laboring women within the woreda and other bordering woreda and sub-cities collaborating with St Paul hospital. The health center to population ratio is which is 1: 61,214 which is poor achievement comparing with the set target (1:25,000) in the Addis Ababa city Administration. But the HCs have given services to neighboring woreda population in which health centers not available. Doctor to population, HO to population, nurses to population, Lab. Workers, Pharmacy workers, Environmental Health, UHEW ratio is 1:61214, 1:5101 and 1:1748, 1:4372, 1:6121, 1:20404, 1:1700 respectively. In addition to these health workers, there are 73 supportive staffs which are the back bone to the proper implementation of health delivery system in the health centers.

Table 17: Health facility distribution by type in woreda 12 and woreda 13 , KOK sub city, A/A, 2016

Organization	Type	Number		
		Woreda12	**woreda13**	**total**
Public	HC	0	1	1
	HP	0	0	0
Private	Medium clinics	2	8	10
	Small clinic	2	1	3
	Pharmacy	8	8	16
	Drug stores	1	6	7

Source: woreda 12 and 13 health biro 2008

Table 18: woreda health office and health center human resource distribution by sex and profession in woreda 12 and 13, KOK sub city, A/A, 2016

	GP	**HO**	**Nurses**		**Midwives**		**Lab. Workers**		**Pharmacy workers**		**Env'tal Health**	**Anesthetist**	**HEW**	**Total**
			Bsc	Dip	De	Di	De	Di	De	Di	De			
Male	**1**	**7**	**2**	**8**	**0**	**3**	**2**	**1**	**1**	**4**	**2+1**	**0**		**32**
Female	**0**	**5**	**9**	**16**	**1**	**7**	**0**	**11**	**0**	**5**	**0**	**1**		**55**
Total	**1**	**12**	**11**	**24**	**1**	**10**	**2**	**12**	**1**	**9**	**3**	**1**	**8+28**	**93**
Supportive staffs														**73**
Grand total														**166**

Source: woreda 12 and 13 health biro 2008

Table 19: private health facilities human resource distribution in woreda 12 and 13, KOK sub city, A/A, 2016

No	**Profession**	**Number**		**Remark**
		Woreda12	Woreda13	
1	GP	**1**	**1**	
2	HO	**3**	**8**	
3	Nurse BSC	**1**	**3**	
4	Clinical nurses	**4**	**11**	
5	Midwife diploma	**0**	**0**	

6	Lab. Technician	**6**	**11**	
7	Pharmacist	**9**	**12**	
8	Pharmacy technician	**2**	**21**	
9	Health assistant	**1**	**0**	
Total		**27**	**67**	

Source: woreda 12 and 13 health biro 2008

Vital statistics

Table 20: vital statistics of the woreda (health center), kolfe keraniyo sub city 2015/2016

Indicator	%
Child Mortality Rate	**0.21**
Crude Birth Rate	**2.33**
Maternal Mortality Rate zero	**0**
Contraceptive acceptance rate	**27**
ANC rate (how many of the total expected pregnancies attended 1st ANC)	**>100**
Percentage of deliveries attended by skilled birth attendants	**88.2**
ANC rate (how many of the total expected pregnancies attended 4th ANC)	**65**
Percentage of deliveries attended by HEWs	**0**
Percentage of deliveries attended by TBA	**NA**
Average family size	**4.1**
Age dependency ratio (%working age population)	**69.4**
Age dependency ratio; old	**4.4**
Age dependency ratio in %; young	**26.6**

Child health

Improving child health is one of the national strategies which set a target for reduction of under five mortality rates from 101 to 68 per 1,000 live births and the infant mortality rate from 77 to 31 per 1,000 live births. To reduce the under-five mortality rate by two third between 1999 and 2015 is one of the target of MDGs. There are many national and sub national strategies designed by FMOH collaborating with international and national partners.

Among these strategies some include expanded program on immunization (EPI), effective management of less than five diarrhea diseases and pneumonia, screening and management of malnutrition and etc.

To achieve this target, EPI activity plays key role in reducing less than five children mortality. Now a day, Ethiopia has experienced ten antigens and vaccines immunization activity intensively throughout the country. These ten antigens and vaccines includes BCG, OPV, pentavalent (DPT+ hep-B and HIb), PCV, Rotarix and Measles.

The immunization coverage of the woreda health centers in 2008 showed that 3137children had access to BCG, 1949 children to OPV 1(142.1%), 1733 to OPV 3(126.4%), 1949 to penta1(142.1%), 1733 to penta3(126.4%), 2418 to rotarix1(176.4%), 1810 to rotarix2(132%), 2927 to PCV1(213.5%), 1730 to PCV3(126.2%) and 1725 to Measles and fully vaccination(125.2%). 2484 children were protected from tetanus at birth through their mothers who got two and more doses of tetanus toxoid vaccine during and before pregnancy. Based on health centers catchment population, health centers was expected to provide vaccines for 1371 children but they performed by more than 354.

The dropout rate of penta1 to penta3, PCV1 to PCV3, Rotarix1 to Rotarix 2, penta1 to Measles is 216 (11%), 1197 (40.9%), 608 (25.1%) and 224 (11.5%) respectively. The WHO and FMOH accepted dropout rate of vaccinated children is $\leq$5% but in this woreda some vaccine dropout rate (for example Measles dropout rate was (11.5%) exceeded the expected one.

EPI services

Table 21: vaccination status in woreda 12 and 13/KHC/, KOK SC 2015/2016

Type of Vaccine	Vaccination Status			Dropout	Remark
	1st dose	2nd dose	3rd dose		
BCG	**3137**				
Pentavalent	**1949**		**1733**	**216(11%)**	
PCV	**2927**		**1730**	**1197(40.9%)**	
Rotarix	**2418**	**1810**		**608(25.1%)**	
Measles	**1725**			**Penta1to measles 224(11.5)**	

Source: Kolfe health center

Children service

Table 22: less than five year children activity plan Vs performance in KHC, KK Sc 2015/2016

Activities for under five children	Plan	Performance	Remark
		No	%
Number of live-born babies with birth weight less than 2,500g	**0**	**196**	**8**
children screened for malnutrition	**2522**	**7466**	**296**
Total number of admission for severe malnutrition	**62**	**25**	**40.3**
Number of children recovered		**20**	**80**
Number of children defaulted		**5**	**20**
Number of children died	**0**	**0**	**0**
<5 year children treated for diarrhea at public HF	**1031**	**1115**	**108.15**
<5 children year treated for pneumonia at public health facilities	**886**	**1419**	**160.16**

Source: Kolfe health center

As we know diarrheal and pneumonia diseases were the top leading cause of morbidity and mortality on under five children in a country up to recent years. Data in the health centers showed the incidence of diarrheal disease was 2.1% and pneumonia cases accounted 2.9%. Those could be occurred as the result of after launching Rota and PCV routine vaccine.

Maternal Health

Table 23: percentage of MCH (ANC, Delivery, and PNC) activity in woreda 13 & 12/KHC/KK Sc 2015/2016

Indicator	Target and Eligible	Achievement	
		Number	%
Number of ANC Cases Registered	1426	2932	205.6
Pregnant women received at least first antenatal care visit	1426	2816	197.5
Pregnant women received antenatal care at least four visits	1426	1817	64.5
Number of pregnant women tested for HIV	1426	1308	46.4
pregnant women eligible for HIV	45	6	13.3
HIV positive pregnant women eligible for HAART	45	26	57.7
pregnant women tested for syphilis	1426	2816	197.5
pregnant women provided at least TT2	1426	3179	222.9
Pregnant women provided iron foliate	1426	2548	90.5
Post Natal Care visited	1426	1823	73.4
Number of children <5 year treated for diarrhea at public HF	1031	1115	108.1
Number of children <5 year treated for pneumonia at public HF	886	1419	160.1
Deliveries conducted by skilled attendants	1426	2484	88.2
Number of live births	1426	2480	99.8
Number of still births	0	4	0.2
Total obstetrics/Maternal/deaths	0	0	0
Total Newborn deaths	0	0	0
Number of facilities reporting stock out of contraceptive	0	0	0
Comprehensive abortion care services		230	
Number of safe abortions performed	143	216	94
Less than 18 years		0	
Greater than or equal to 18 years		216	94
Number of post abortion/emergency care		14	6
Less than 18 years		0	
Greater than or equal to 18 years		14	6
FP service for cases	100	230	100

Strategic effort to reduce or eliminate maternal death focuses on assessment of risk mothers and risk factors, increasing access to skilled delivery care, strengthening referral network

system, increasing number of ambulances with their full working time and strengthening reproductive health and family planning services.

Antenatal care service such as HIV and syphilis screening activity (46.4%, 100%), provision of TT2 (>100) and postnatal care visit (>100) performance was gone with as expected. There was one stand by ambulance in the woreda HC which served for 24 hours and seven days in a week for its full working time. There also were 10 trained midwifery health workers in the health centers of the woreda. Institutional as well as community maternal death was not recorded in the woreda, 2015/2016.

Family planning (FP)

The total target for FP method was 15,904 (50%) of eligible. Among those 9,542 were for long term method. FP accepter rate in the woreda was 27.33% and of which 19.5% were long term family planning method users. Percentage of post abortion FP service was 100% and it was one of the strong activities among other services in the woreda.

Table 24: family planning (FP) activity by method and performance in woreda 13 KK Sc 2015/2016

Methods	Target	Achievement		Remark
		Number	%	
Total FP methods	**15904**	**4347**	**27.33**	
Short term methods	**40% from target (6,362)**			
Oral contraceptives		**400**		
Inject able		**367**		
Condom distribution		**481**		
Others				
Long term methods	**60% from target (9542)**			
Implants	**3817**	**1935**	**50.7**	
IUCD + pp IUCD	**5725**	**1066+93**	**20.24**	
Permanent tuba ligation		5		
Total	**50% (15904)**			**50% from eligible**

Top ten causes of morbidity and mortality

Health centers have responsibility to admit patients for 24-72 hours and manage all out patient department visitors at their own level but Kolfe health centre HMIS report and annual achievements was 605 patients admitted we cannot found the registration / admission and discharge/ book for doing Top ten diseases for admission. In the 2015/2016 a total of 52714 cases had been managed in the outpatient department of health centers which are found within the woreda. Out of those cases 43237 (82.0%) were ≥5 years and 9477 (18%) were under 5. OPD visitors by gender includes 19618 (45.4%) were male patients and 23619 (54.6%) were female patients.

Table 25: top ten leading causes of all OPD visit (morbidity) in kolfe HC, KK Sc 2008 E.C (2015/16)

S. No	Diseases	Number	Percent
1	AURI	**7029**	**25.48**
2	UTI	**2727**	**9.8**
3	HTN and related diseases	**2609**	**9.46**
4	Dyspepsia	**2427**	**8.8**
5	Diarrhea (non-bloody	**2398**	**8.69**
6	Unspecified diseases	**2251**	**8.16**
7	AFI	**2223**	**8.06**
8	disease of musculoskeletal	**2202**	**7.98**
9	Pneumonia	**1987**	**7.2**
10	Skin Infections	**1728**	**6.27**

Table 26: top ten leading causes of OPD visit (morbidity) by age in kolfe H/C, KOK Sc, 2008 E.C (2015/2016)

	Under 5 years		Above 5 years	
1	AURI	**3385**	AURI	**3640**
2	Unspecified diseases	**1563**	UTI	**2691**
3	Pneumonia	**1539**	HTN and related diseases	**2609**
4	Diarrhea (non-bloody)	**1126**	Dyspepsia	**2417**
5	Skin infections	**687**	AFI	**2213**
6	Eye diseases	**261**	Musculoskeletal system diseases	**2202**
7	Helmenthiasis	**224**	Trauma	**1647**
8	MAM	**141**	Diabetes mellitus	**1599**
9	Diarrhea with blood(dysentery)	**131**	Diarrhea (non-bloody)	**1272**
10	Diarrhea with dehydration	**124**	Skin infections	**1041**

Table 27: top ten leading causes of OPD visit (morbidity) by sex, in kolfe H/C, KOK Sc, 2008 E.C (2015/2016)

	Male		Female	
1	AURI	**3532**	AURI	**3497**
2	Unspecified diseases	**1541**	UTI	**1934**
3	HTN and related diseases	**1305**	Skin Infections	**1553**
4	Diarrhea (non-bloody)	**1263**	Musculoskeletal system diseases	**1377**
5	Pneumonia	**1138**	AFI	**1341**
6	Trauma	**1135**	HTN and related diseases	**1304**
7	AFI	**882**	Diarrhea (non-bloody)	**1135**
8	Dyspepsia	**874**	Skin Infections	**866**
9	Skin Infections	**862**	Pneumonia	**849**
10	Musculoskeletal system diseases	**825**	Diabetes mellitus	**809**

URTI was the leading cause (morbidity) of adult and children as well as female and men population; unspecified disease was the second causes of morbidity for <5 years and male population and UTI for age ≥5 year and for female; and pneumonia, hypertension, hypertension and skin infections were the 3rdcauses of morbidity for <5 years,≥5 years, male and female patients respectively in the woreda. In general, URTI is significantly increased from year to year in the woreda as well as in the sub city at large.

TBL and TB-HIV

Tuberculosis is contagious infectious disease and can infect large number of people at a time. Different findings indicated that two third of developing countries population exposed to tuberculosis infection. Currently MDR TB case is a serious challenge in the world wide especially in under the Sahara region. Our country Ethiopia is among top ten TB burden countries in Africa. Data showed in the woreda that still there is significant number of TB cases circulating in the community. Among 122 all form TB detected cases 12 of them were retreatment and were risk for development of multi drug resistant TB.TB Detection, cure and success rate of TB includes 77.2%, 84.09% and 86% respectively. To reduce the burden of MDR TB, efforts need to improve the success and cure rate of TB treatment and strengthen the detection rate intensively.

Effective screening and management of TB-HIV co-infection cases is basic strategy to reduce TB mortality rate. Proportion of TB patients screened for HIV was 73% and initiation of cotri-moxazole prophylaxis therapy and antiretroviral treatment for TB-HIV co-infected patients was 100% respectively in the health Centers under the woreda. It was below the target of sub-City, region and federal ministry of health.

Table 28: TB, TB HIV and leprosy program activity in kolfe HC, KOK Sc, 2008 EFY (2015/2016)

Activity	Target	Achievement		Remark
		Number	%	
All forms of TB detection rate	**100% (158#)**	**122**	**77.2**	**This data covers not only the woreda population but it includes health centers catchment population**
Bacteriologic ally positive TB detection rate	**42% (66#)**	**25**	**20.5**	
Cure rate	**85% (60#)**	**37**	**61.7**	
Treatment success rate	**90% (60#)**	**74**	**123.3**	
All form TB treatment completion rate	**90% (122#)**	**111**	**86**	
Defaulter rate	**<5%**	**7**		
Death on TB Rx	**<5%**	**5**	**4.09**	
TB treatment failure	**3.4% (2#)**	**1**		
Leprosy detection rate	**4#**	**0**	**0**	
Leprosy treatment completion rate	**100% (#4)**	**0**	**0**	
TB patients screened for HIV	**100% (122#)**	**89**	**73**	
TB patients tested positive for HIV	**100% (58#)**	**16**	**17.6**	
TB-HIV co-infected Patients initiated CPT	**100%(16#)**	**16**	**100**	
TB-HIV co-infected Patients initiated HAART	**100% (16#)**	**16**	**100**	
PTB negative among all TB cases		**26**	**21.3**	
EPTB negative among all TB cases		**59**	**48.4**	
Retreatment TB cases among all TB cases		**12**	**9.84**	

Source: Health centers TB registration

HIV/AIDS

The woreda had low achievement in INH preventive treatment for newly enrolled HIV patients (22%) as well as in HIV testing and counseling program which was 0% of the target plan for the year 2008 EFY. INH preventive treatment reduces the risk of acquiring active tuberculosis at least by 50 to 60 percent if it is provided as early as possible. Negligibility of HIV screening may result in abrupt outbreak so that need serious attention.

Table 29: the status of HIV/AIDS by age in kolfe HC, KOK Sc, 2008 EFY (2015/2016)

Activities	Total	Adult	Pediatric	Remark
Total HIV tested	**3141**	**3139**	**2**	
VCT	**0**	**0**	**0**	
PITC	**1744**	**1744**	**0**	
PMTCT	**1308**	**1306**	**2**	
Tested positive for HIV	**38**	**36**	**2**	
Newly enrolled in pre ART	**27**	**25**	**2**	
Ever enrolled	**1622**	**1581**	**41**	
Pre ART	**35**	**33**	**2**	
Ever started	**1991**	**1887**	**104**	
Currently on ART	**1278**	**1250**	**28**	
IPT uptake	**13**	**11**	**2**	Among newly enrolled

Essential drugs

There were no shortage/ out stock of essential drugs in the health centers of the woreda (except drugs which are unavailable in the market). In addition to health budget, health care financing system in the health centers made easy the process of drugs purchasing procedure and reduction of essential drugs gap. Out of a total of **2,350,0008EBR** allocated budget, + 1m from internal income **2,350,000 EBR (100%) and 1m EBR was utilized for medication and other medical supplies.**

Nutrition

There were a total of 11 (14.1%) severely malnourished children enrolled as Out Patent Therapeutic Program (OTP) in Kolfe health centers. Among those out patent children 9

(81.8%) were recovered and the rest 2 (18.2%) were defaulted. No death due to severe malnutrition in the woreda.

Disaster situation in the woreda

There was no any natural or manmade disaster but there was feature of an outbreak/ epidemic of acute watery diarrhea in the woreda in2015/2016.

Community Health Services

Health Services Integration with community is vital to diseases prevention and health promotion as well as services expansion and quality assurance. To facilitate this integration, organizing women development army and strengthening 1 to 5 networking system is a key factor in government health policy. Urban health extension workers have tremendous role in the community both in health service integration and awareness creation within the community. There are 8 UHEWs and 1 supervisor, and around 602 model households who were networked by 1 to 5 in to 10. They introduced 15 health packages already designed by Addis Ababa City Administration for urban dwellers to the community. Urban health extension workers have responsibility to educate and demonstrate the residents of the woreda about these health packages thoroughly. Some of the major activities of UHEWs are: provision of health education about prevention of communicable and non-communicable diseases, how to manage solid and liquid wastes; how to handle personal, household and surrounding hygiene; assisting and facilitating mothers and care givers to take their children to the health institutions for vaccination; assisting and facilitating pregnant mothers to attend and get ANC, delivery and PNC service in the health facilities; screening and referring malnourished and any health conditions to the health facility; training model households and networking them to other community members; collecting and recording the health profile of the community and the like.

Environmental Health and Sanitation

Solid waste management

Clean environment is vital to reduce diseases causing pathogens and to improve the health of the community. Addis Ababa City Administration efforts setting objectives to expand free waste disposal, clean and green woreda and sub woreda in the city. Woreda 12 solid waste management office tried to accomplish the objective of the City Administration by fulfilling human resources, availing solid waste containers and managing waste disposal activities. There were around 24roads cleaner, 5 members for 4 groups and 4 members for 1 group (in 5 groups) 40 household solid waste collectors in to 2 groups and 4 management officers assigned in the woreda. The woreda solid waste management office designed one group of household solid waste collectors to serve 2048 households at least two times per week using more than 11 waste containers and only two combiners in the sub city to load and reload the waste from the container sites. According to the office information, the woreda waste disposal activity was delayed 2 to 3 weeks until loading and reloading. The delayed waste disposal activity made delayed solid waste collection from households, facilitated to accumulate harmful pathogenic micro-organism and created offensive bad odors around the area of solid waste containers.

Liquid waste management and housing situation

There was no reflective tangible data about liquid waste management in the woreda but the following table showed us that some households with liquid waste management and housing condition.

There were still open defecation habit in the in some households in the woreda. Those households 14 in number were owned by Keble and had no latrine nearby them and unable to construct by themselves otherwise construction permission given to them by Sub-City land

resource management office. It needs the woreda 12 executive office attention to execute and construct communal latrine for those households.

Table 30: liquid waste management and housing situation in woreda 12, KOK Sc, 2008 EFY (2015/16

	Satisfactory	Not satisfactory	Total	Remark
Private latrine	**2012**	**659**	**2671**	
Communal latrine	**150**	**85**	**235**	
Households who have private bathing room	**1134**	**150**	**1254**	
Households who have communal bathing room	**60**	**20**	**80**	
Households with liquid waste disposal	**-**	**-**	**-**	**No data**
Households with solid waste disposal	**1050**	**568**	**1618**	
Households having light	**3720**	**-**	**3720**	
Households having ventilation	**3000**	**720**	**3720**	
Number of households used Open field defecation			**14**	

Problem Identification and Priority Setting

In general, from our study as stated in the following table there are different problems identified in this Woreda. Among them Absence of health center is the leading followed by Poor liquid and solid west management

Figure 22: problem identification and priority setting

	Identified problems	Relevance	Availability of information	Urgency of the problem	Feasibility	Political acceptance	Applicability	Ethical acceptability	Total	Rank
1	**Poor liquid & solid west management**	**3**	**2**	**2**	**3**	**3**	**2**	**3**	**18**	**2**
2	**Low family planning**	**3**	**2**	**2**	**3**	**2**	**3**	**2**	**17**	**3**
3	**Absence of Health center in the woreda**	**3**	**3**	**3**	**3**	**3**	**2**	**3**	**20**	**1**

Key:- each indicator was graded out of three

Discussion

Ratio of Health center to population reached 1:61,214 which were not equivalent the national standard (1:40,000). The findings verified that; the potential health service coverage of Woreda reached 100%. This description is similar with the HSDP III target to attain 100 % of potential health service coverage at national level.

The assessment verified health professional to population ratio in 2016 were Doctor-1: 61214 Health Officer-1:5101; Environmental Health Officer-1:20404; Nurse-1:1748, Mid Wife Nurse-1:5565; Pharmacy technician-1:6121; Medical Laboratory technician- 1:4372 and Health Extension Worker-1:1700.

ANC1st and ANC4th services in the woreda (kolfe health center) is more than 100% of the expected plan of the Woreda Health office and it is similar result from kolfe keraniyo sub city. Therefore, all pregnant women in the Woreda registered by urban health extension professional in each Ketena and Other pregnant comes from out of Woreda catchment areas were receiving four focused Antenatal care visits.

Contraceptive acceptance rate of the Woreda is 27% that is below 50% of the 2016 Plan of Addis Ababa city Administration Health Bureau of 65% respectively. Deliveries conducted by skilled health professional More than 100% of Woreda plan. This may be due to the Woreda health office plan were not considered populations who are not the catchment Woreda. The fully immunization coverage of the woreda > 100% in 2016.When we compare the fully immunization coverage in the same year for kolfe keraniyo sub city, it is similar to Woreda >100% while the regional coverage were 98%.

Acute upper respiratory tract infection was the leading causes of morbidity both in under five and general population 25.5%. Pneumonia and Diarrheal disease were also found to be an

important cause of morbidity in under five children. This finding is similar to the national top causes of morbidity.

Among TB cases reported in the Woreda 21.3% were Pulmonary TB negative, 20.5% were pulmonary TB positive, 48.4% were extra pulmonary TB cases. Among All form of TB cases estimated in the Woreda (TB detection rate) was 77.2% which is lower than the regional TB detection rate (90.6%) and more than national (58.6%) (6). TB treatment completeness and TB cure rate were 86% and 84% respectively. 89(73%) TB patients were screened for HIV; out of those 17.9% were positive.

Limitation

- Data discrepancy between health centers annual report, HMIS and Woreda information
- Lack of organized and standardized health profile data in the woreda
- Woreda 12 have no its own Governmental HC because of this it is difficult to assess the particular health profile of the woreda.
- Getting appropriate person on time on their seat was very difficult.

Conclusion

- Antenatal care attendants coverage at least one visit was >100% in 2008E.C (2015/2016), that was a good performance. Proportion of ANC for fourth visit was 64.5% of the first visit. It was low compared to the sub city target (100%) for the same year.
- The percentage of deliveries assisted by skilled health personnel was 88.2% which was good compare to the coverage of the sub city (89%).
- Still birth accounts 4 among institutional deliveries. It could result from either poor service provision for pregnant mothers during first ANC visit, and labor and delivery,

or due to lack of birth preparedness counseling plan in ANC follow up, or weak referral linkage between health centers and community i.e. loose integration of HEP to Health facilities.

- ❖ The immunization coverage based on the health center (woreda) target was greater than 100 percent. The WHO maximum expected measles or fully immunized children dropout rate is £ 5%. Here, in the above mentioned immunization program showed as it has gap. So that children still at high risk acquiring infectious diseases like Measles infection. That might be due to lack of provision of information to mothers and care givers about vaccines benefits, or improper handling of customers specially mothers and care givers, or due to vaccines stock out in the health institutions within the woreda.
- ❖ TB-HIV activities in general, indicated as a weak performance in the woreda.
- ❖ Upper respiratory tract infection was the leading ten top causes of adult and children as well as female and men population. URTI was series challenge to entire populations in the woreda which also was the leading cause of morbidity in the sub city. Delayed collection and disposal as well as long time accumulation of solid waste within the community may also the main precipitating factors to URTI.
- ❖ Woreda 12 needs its own health center to assess the particular health profile of the woreda uses to identify community health problems and gives a solution for population in the woreda.

Recommendation:

- I strongly recommend primarily health centers to assess ANC, Delivery/PNC/, EPI, FP, TB and ART service provision protocol, customer handling practice, ways of communication with customers to minimize the identified gaps in each service provision area.

- I recommend Health center and woreda health office to set collaborative strategy to strengthen HEP to achieve targeted goals within the community.
- The sub-city health office to strengthen continuous and regular supportive supervision to both woreda health office and health center
- URTI was the leading cause of morbidity and it became strong challenge and increased year to year in the woreda as well as in the Sub-City so that it needs respect sector offices attention to closely monitor the pattern of transmission to set minimizing strategy.
- Improving sewerage system and solid waste management system which is highly affects human health.
- The sub city and woreda administrative (health) biro construct health center for woreda 12 population.

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Chapter five: Scientific manuscript for peer reviewed journal

5.1. Sentinel surveillance system evaluation on influenza like illness in Addis Ababa, Ethiopia, 2016

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Background: 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. The Global Influenza Surveillance and Response System have been performing influenza virological surveillance since 1952. Ethiopia conducts influenza sentinel surveillance since 2008 in eight sites. Federal Ministry of Health/EPHI carries it out but the little is known whether the system meets its objective. We conducted to evaluate the sentinel surveillance attributes, purposes and its operation system.

Methods: We conducted a descriptive cross-sectional study from July 3-21, 2017 in Influenza like illness Sentinel sites. We used updated CDC guideline, interviewed sentinel surveillance focal person in three influenza Sentinel surveillance site, one person from National Lab, one from regional Pubic health emergency management, three sub city PHEM officers and reviewed secondary data using checklist. We analyzed and compiled the data using Microsoft excel.

Results: - all the visited health facility posted the ILI case definition and none of the sentinel sites have been reporting influenza data to their next higher level but to the national PHEM (NIL). Laboratory identified influenza AH1N1, AH3N1 AND B type's 2016. The positive predictive value was 13.3 %(781). Among 781 case reports in 2016, 5(0.6%) age variable, 12(1.5%), body temperature variable, and 7 (0.9%) sex variables were not filled.

Conclusion: the surveillance system able to identify, type of influenza strains, its burden and trend, the system has good data quality, the surveillance system has providing virological data used to characterize and monitor influenza (ILI) trends in Addis Ababa.

Key words: Surveillance, Evaluation, Influenza, Addis Ababa

Word count: 268

Introduction

Back ground: 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 and mortality and to improve health. A communicable disease surveillance system serves two key functions; early warning of potential threats to public health and programmed monitoring functions which may be disease- specific or multi-disease in nature (1).Surveillance system evaluation allows us to define whether a specific system is useful for a particular public health initiative and is achieving the overarching goals of the public health program and the data collection objectives (2). This is done for monitoring disease trends, describing natural history of diseases, identifying epidemics or new syndromes, monitoring changes in infectious agents, identifying areas for research so as eventually to reveal disease burdens and guiding the action to be taken, the health policy, planning, evaluation of health programs and the likes(3).

The Global Influenza Surveillance and Response System (GISRS), previously known as the Global Influenza Surveillance Network (GISN), has been performing influenza virological surveillance since 1952(4).This network has played a critical role in the current better understanding of global influenza virus circulation. The GISRS consists of over 130 National Influenza Centers (NICs) around the world that collect and test clinical specimens, submitting a sample of these to WHO Collaborating Centers (WHO CC) and Essential Regulatory Laboratories for further characterization(4).

In recent years, an increasing awareness has developed of the need to expand influenza surveillance and to include more epidemiological information to complement the virological data collected by GISRS. This need was formally recognized by the World Health Assembly in 2011 in Resolution 64.5 and in the adoption of the Pandemic Influenza Preparedness Framework (5).

The pandemic of 2009 uncovered several specific gaps in global influenza surveillance capacity, which compromised the assessment and monitoring of the event. The lack of a pre-existing international mechanism for sharing epidemiological data presented challenges to understanding global patterns of transmission and disease. And finally, the non-standardized approach to data collection and outbreak investigations early in the event resulted in data that was often incompletely understood outside the local context. The accumulation of historical data for influenza-associated severe respiratory disease will allow rapid comparative assessment of each influenza season and of future pandemics both locally and globally.

Public health surveillance systems play a critical role in national health management. They provide data that can be used for several purposes(6).Data disseminated by a public health surveillance system can be used for immediate public health action, program planning and evaluation, and formulating research hypotheses(7). For example, in America, Public health officials rely on the timeliness and completeness of the surveillance system data to design public policies and interventions (8).

Moreover, sentinel surveillance provides an alternative to population-based surveillance for the collection and analysis of individual patient-related information and more limited monitoring of influenza trends. Sentinel surveillance has the potential to provide more complete data about some of the epidemiologic characteristics of influenza like illness (ILI) at a particular sentinel surveillance site and also to determine the proportion of ILI cases which are due to influenza. One of the advantages of the sentinel surveillance approach is that it requires fewer resources by reducing the number of sites collecting laboratory specimens for influenza testing.

Ethiopia has launched influenza sentinel surveillance since 2008(9) and currently 5 SARI and 3 ILI sites are engaged in the influenza surveillance. All three out pt ILI and one SARI in pt sentinel surveillance site found in Addis Ababa. It is carried out by Federal Ministry of

Health/EPHI through a system which has support from CDC and WHO and extending from EPHI down to the sentinel site. These includes upward and down ward reporting and feedback mechanism.

Sites were selected based on availability of resources, technical capacity and number of staffs, availability of functional service for ILI/SARI for all age groups, accessibility to adequate clients and geographical proximity between SARI and ILI sites.

Materials and Method

STUDY design and AREA

A cross-sectional descriptive study was conducted from July 3 - 21, 2017 in all three ILI Sentinel sites. All influenza sentinel surveillance data in 2016 was included in the study. Three ILI sites (Shiromeda health center, Akaki health center and Kolfe health center) were included in the study.

Data source and collection

Primary data were collected using structured questionnaire and Interview with influenza sentinel surveillance focal persons, woreda PHEM, sub city PHEM, regional health bureau PHEM officers and national PHEM officers. Case based reports of influenza like illness were also reviewed. Secondary data were collected from the national public health emergency management center based at EPHI. Evaluation methods from Centers for Disease control and Prevention (CDC), Updated Guideline for Evaluating Public Health Surveillance Systems: Structured questionnaire was prepared and used to collect data about the core functions of surveillance, support functions of surveillance and attributes of surveillance system.

Case definition

ILI Cases are identified using standardized case definition indicated in the Ethiopian influenza sentinel surveillance implementation guideline adopted from WHO African region

which is recommended to be used by all member states to enable comparison between different countries in the region.

Case Definition for Influenza-Like Illness (ILI)

A person, child or adult with: Sudden onset of fever > 38 ºC AND Cough or sore throat in the absence of other diagnoses.

A confirmed case of influenza is a case that meets the clinical case definition and is laboratory confirmed (laboratory results must be positive for influenza virus)

Data Analysis and Report Writing

We analyzed and compiled the data using Microsoft excel spread sheet and presented using narration and table.

Result

Engagement of stakeholders

A brief discussion was led by the national lab and PHEM focal person of the sentinel surveillance site to conduct the surveillance, evaluation in order to identify the weakness of the system, to evaluate the caring out of the objective of the scheme. They assisted us to speak the appropriate inquires and assess pertinent attributes. They also provided as the guidelines and the aim of the system execution. Three ILI sentinel site focal person, woreda PHEM, sub city PHEM, national influenza lab supports provided us data and important information.

Description of Influenza Sentinel Surveillance Evaluation

Africa, Ethiopia has limited data regarding the burden and the impact of influenza. The spread of novel influenza virus is the pandemic potential of the region and the continent. Lower respiratory tract infection/pneumonia is among the common causes of morbidity and

mortality in Africa, especially among the children <5 year of age, but few data are still allowed to estimate the how the respiratory tract infection burden, that is due to influenza.

In the three ILI sites there were 781 specimens were collected for ILI suspected cases. Out of the total ILI cases 104 (13.3%) was positive for influenza.

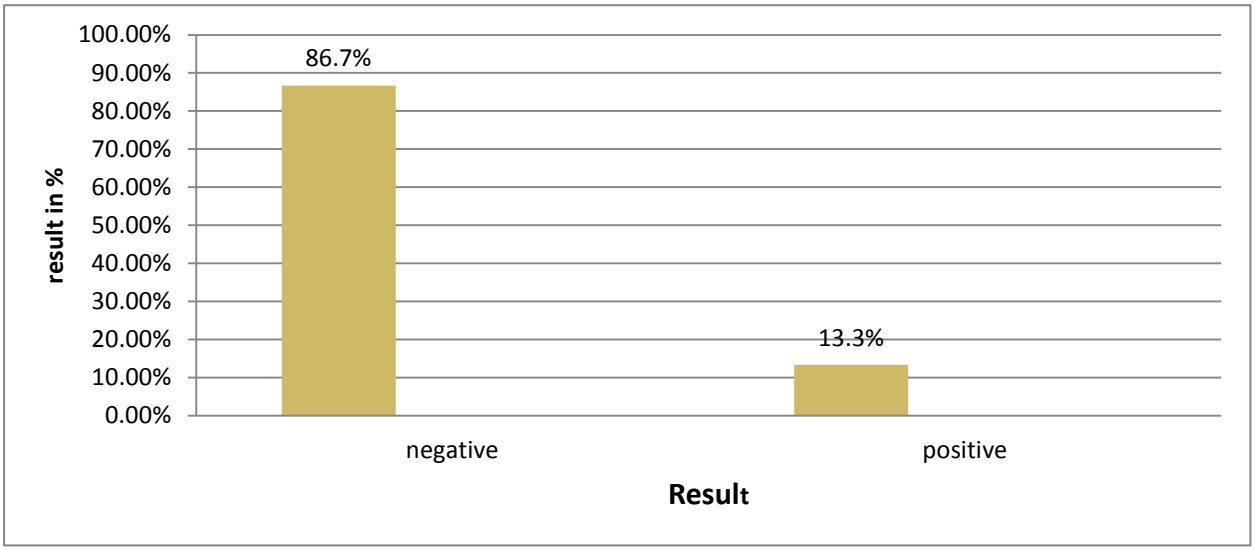

Figure 23: Sentinel sits ILI specimen collection & result in 2016, A/A, Ethiopia

Purpose and Operation of the Surveillance System of *Influenza Sentinel*

They throw a protocol for ILI surveillance or a set of standard operating procedures developed by the national PHEM together with national Lab and CDC. The protocol includes clearly defined targets for the surveillance organization. The surveillance site has a copy of guideline and SOPs and also broadcast to all participating staffs. The objectives were stated as follows.

Objective of surveillance system in PHEM

- Ensure rapid detection of any public health menaces
- To ensure preparedness related to logistics and fund government activities

- Prompt response and recovery from diverse public health emergencies, which range from recurrent epidemics, emerging infections, nutritional emergencies, chemical spills, and biological terrorism

The Objective of Influenza Sentinel Surveillance

- Detect new influenza strains capable of or having the potential to cause the pandemic
- Determine the characteristics of influenza and other respiratory disease
- Characterize and monitor trends in illness and deaths attributable sever acute respiratory infections
- Determine the proportion of confirmed cases of influenza among SARI inpatients and/or among ILI out-patients
- Collect data which will be useful for determining burden-of-disease estimate due to influenza in the rural area
- Supply data to distinguish and supervise groups at high risk for serious disease
- Offer data on the contribution of influenza to the burden of respiratory disease in order to prioritize and plan public health interventions
- Provide the platform to monitor impact of control schemes

Case Definition for Influenza-Like Illness (ILI)

A person, child or adult with: Sudden onset of fever > 38 ºC AND Cough or sore throat in the absence of other diagnoses.

A confirmed case of influenza is a case that meets the clinical case definition and is laboratory confirmed (laboratory results must be positive for influenza virus)

Population under surveillance

The National PHEM guideline stated that influenza is one of the twenty two priority diseases set to be under the surveillance of the population living throughout the countryside. Kolfe health center (kolfe keraniyo sub city), Akaki kality H/C (Akaki sub city) and Shiromeda H/C (Gulele sub city) was ILI influenza surveillance sentinel site in Addis Ababa city administration.

Regional, sub city and woreda PHEM has no the same follow up as of the other disease in influenza surveillance. At that place was no vertical coordination link in follow up of the surveillance organization. The ILI sentinel surveillance links with national Lab and national PHEM.

The influenza sentinel surveillance of ILI sites has lack of integration with sub city health authority like with PHEM. There was no Influenza/ILI focal person in the sub city health department. The integrated surveillance system was not established related to the influenza surveillance sentinels system activities of the infirmary with the sub city health department. The established connections were with national PHEM and national Lab was based on supportive supervision and feedback, training and supplying funds. The second established link was with national lab that was grounded on the sample collection and investigation of samples and sharing of sample investigation result.

Supporting Functions of the surveillance system

Availability of Budget and Resources for Surveillance Activities

Funding resource to run ILI sentinel surveillance system was from the government and CDC. The sentinel sites (health center) provided 70,000-100,000 birr every year for program. They utilized for computer, telephone, furniture and other necessary equipments/supplies. During

assessment, there is interrupted the allocated budget for ILI sentinel surveillance. The sentinel sites their own room for surveillance, computers, printers, frig for sample collection and other office furniture. There was no shortage of reporting format, VTM, PPE and registration book was available at all sentinel sites in the last six months.

Table 31: availability of resource in sentinel sites for surveillance activities, in Addis Ababa, 2017

No	Item	Sub city	%	Woreda	%	Health center	%
1	Computer	1	100%	0	0	3	100%
2	Printer	1	100%	3	100%	3	100%
3	Stationary	1	100%	3	100%	3	100%
4	Fax	0	0	0	0	0	0
5	Internet CDMA	1	100%	0	0	3	100%
6	Telephone	1	100%	3	100%	3	100%
	Card for focal	0	0	0	0	9	100%
7	Vehicle	0	0	0	0	0	0
8	refrigerator	0	0	0	0	3	100%

Case detection and registration

During this evaluation, all the visited health facilities have posted the cases definition of ILI and the understanding of the cases definitions by the influenza focal persons and other staff was satisfactory. The focal person collects samples from under five and referred cases from Adult OPD and triage room. The specimens collected methods were throat swap and the focal persons uses PPE. The specimens were stored in controlled temperature below 4℃ and specimen collection materials available in the office. Lab results (feedback) back to the sites

from national influenza lab quarterly and for national PHEM and CDC weekly. The registration book and guidelines was found in all sites.

Reporting

There was no shortage of reporting forms in all visited sentinel sites since it is also available in soft copies. All sites use similar reporting format which is incorporated in the influenza sentinel surveillance implementation guideline. None of the sentinel sites have been reporting influenza data to their next higher level but to the national PHEM (NIL).All focal persons have responded that they were expected to do so. 100% The ILI sentinel site were preparing and ready the reports in hard copies along with the throat swab samples weekly for the National Influenza Laboratory staffs to transport and test in the national influenza laboratory.

Data analysis and interpretation

Although they have computer in all ILI sentinel sites, all influenza surveillance focal persons have never analyzed and interpreted their data routinely but only for presentations during review meetings; both case-based and aggregated. It is only analyzed by national PHEM. All of the focal persons have responded that they do not have advanced computer skills.

Feedback and supervision

Supervision and provision of feedback were assessed at national level one time per year. These assessments have found that periodic supervision was not done. Laboratory feedback (test result) has been provided quarterly from 2017 to the sentinel site by the national lab. The national laboratory staffs visits the site every week and solve the problem if there is any.

Training

There are 3 influenza surveillance focal persons currently working in place. All of them have taken training on influenza surveillance, Including facility medical directors and regional PHEM officers. But not sub city and woreda PHEM officers.

Epidemic Preparedness and Response

Public health services needing to be well prepared to outbreaks, and adequately react if an outbreak occurs. Out of all visited health office and health center (sentinel site) experience Cholera (AWD) outbreak in the last 2016. During assessment, all sentinel sites woreda and health center including sub city have establish Rapid Response Team (RRT). But this committee were actively engaged only if outbreak occurred at all level. On the other hand, 3(100%) woreda, sub city health office and health center has written plan for Epidemic preparedness and response. all Woreda and health center have no implemented prevention and control measures based on local Data for Cholera and Influenza in2016. 100% of woreda and 100 % health center have documents or meeting minutes at the time of the evaluation that shows the existence and activities of RRT. Sub city, woreda health office and health center have no specific budget line for emergency management and response. During assessed 3(100%) health centers have emergency stock of drugs and supplies at all time in 2016. But all Woreda and health center including sub city have no experienced shortage of drugs, Vaccines or supplies during the most recent outbreak.

Table 32: influenza sentinel surveillance sites emergency preparedness status in A/A

No	Variables	Sub city	%	Woreda	%	Health centers	%
1	Established Rapid Response Team (RRT)	1	100%	3	100%	3	100%
2	Availability of Written emergency preparedness plan	1	100	3	100%	3	100%
3	Observed epidemic management (RRT) meetings minutes	1	100%	3	100%	3	100%
4	Availability of emergency stocks of drugs and supplies	1	100%	3	100%	3	100%
5	Experienced shortage of drugs during in the past year out break	1	100%	3	100%	3	100%
6	Presence of budget line for epidemic response	0	0%	0	0	0	0

Surveillance system attribute

Usefulness

Before the beginning of influenza sentinel surveillance in Addis Ababa (Ethiopia) nothing was known about influenza strains circulating in the country. Currently because of the surveillance data generated by the system, type of influenza strains, its burden and trends are being understood. It also permits to evaluate the effectiveness of the prevention and control program and intensify researches based on prevention and control of disease.

Simplicity

The case definition of ILI was easy for detection by all tiers of health professional of the health center staff. But sample tacking and filling the data and report by focal persons. The surveillance system has significant information for information and allows updating the data of cases. The system takes 10 to 15 minutes to fill the format.

Data quality and completeness

Data quality reflects the completeness and validity of the data recorded in the public health surveillance system. In contrast to simplicity of the system, some important variables were in case based reports. For instance, among a total of 781 case based reports in 2016, 7 (0.9%) sex variables, 12 (1.53%) temperature variables, and 13 (1.7%) dates of specimen collection variables were not filled.

Table 33: Number (percent) of variable missed during implementing ILI in A/A, Ethiopia, 2016(N=781)

Variable	Incomplete data (%)	Above Expected percentage(80%) of completeness
Age	5(0.64)	Yes
Sex	7(0.9)	Yes
Woreda	8(1.02)	Yes
Body Temperature	12(1.53)	Yes
Date Specimen Collection	9(1.15)	Yes
Specimen Condition	13(1.7)	Yes

Acceptability

All levels of the health personnel especially focal person willing to participate in the surveillance system. The national influenza laboratory staffs to transport the collected specimens from the ILI sentinel sites twice a week. All ILI sentinel sites were prepared a room for influenza surveillance activities and assigned trained focal persons.

Representativeness

The ILI sentinel surveillance is only on three health center in three sub city in Addis Ababa. Even though the site was selected to represent most of the population it is still difficult to generalize to the whole population. In the system the catchment population was not clearly defined, because of this, calculating the incidence rate was difficult.

Stability

In that location were no new restructures affected the operations and activities of the surveillance. No lack of resources interrupts the surveillance organization even if the incentive discontinue for two years.

Sensitivity

By using Influenza like illness case definition able to pick all ILI suspected cases, and prevention and control measures able to be doing. In this evaluation the denominator was not available to calculate sensitivity of the surveillance system. However, beside loose of case definition which is very sensitive to ILI cases, specimen tested at EPHI laboratory was also tested positive at WHO reference laboratory.

Timeliness

Timeliness in this report reflects the elapse between date of symptom onset and date of specimen collection. In this regards, the range of the elapsed time is between two and seven

days which is exactly in line with the time indicated in the Ethiopian national influenza sentinel surveillance implementation guideline.

Positive predictive value

The positive predictive value (PPV) or the proportion of cases reported by the system that actually have influenza was 13.3% (n= 781). The capacity of the laboratory diagnostic test was periodically ensured by WHO confirmatory laboratory.

Flexibility

A flexible public health surveillance system can adapt to changing information needs or operating conditions with little additional time, personnel and additional funds. The case definition by itself can be also used to detect any other respiratory infection like Middle East respiratory syndrome corona virus (MERS- CoV).

Table 34: surveillance attributes summary table, ILI sentinel surveillance in A/A, 2017

s/n	Surveillance attributes	Finding in national PHEM/NIL
1	completeness	• 100% in national PHEM/NIL
2	timeliness	• 100% in national PHEM/NIL
3	usefulness	• All believed the existing system helps them to detect any outbreak • None of sentinel sites and national PHEM perform trend analysis of influenza
4	Simplicity	• It takes 5-10min to fill the format
5	Acceptability	• All sentinel sites (100%) accepted and engaged to the system • Cases are being identified using standard case definition in facilities
6	Flexibility	• Easy to use for new disease (100%)

7	sensitivity	• ILI case definition easily able to pick all ILI suspected cases
8	PPV	• 13.3%
9	Representativeness	• The sentinel site only on 3 health center in 3 sub city in Addis Ababa city administration • health centers in other sub city ignored
10	stability	• No new restructure affected the operation and activities of surveillance in the study period

Discussion

Generally, this evaluation revealed that the Addis Ababa/ Ethiopian ILI sentinel surveillance is on the right track to achieve its objectives. This sentinel surveillance had identified circulating influenza viruses in Addis Ababa/Ethiopia which pandemic influenza A (H1N1)2009, Seasonal influenza A (H1N1), Seasonal influenza A (H3N2) and influenza B. Seasonality and trends are also defined as in October, November and December(12). The season is not very different from Albanian influenza season (13).

Regarding the functions of surveillance system, there are gaps in reporting, data analysis and interpretation because of lack of skill from the sentinel site focal persons side and lack of integration next to higher level. Failure to conduct periodic supportive supervision from the national and regional side might have bolded this gap. As it was stated in the influenza implementation guideline, monthly supportive supervision for sites of Addis Ababa and quarterly for others had to be done by the national PHEM/NIL and periodic supervision and feedback had to be given to sites by regional/woreda/sub-city offices(9). The sentinel surveillance was very simple; ILI focal persons at sentinel site identify eligible cases, collect throat swab samples with case based reporting format and the laboratory personnel from NIL directly receives(collect) from the sentinel site. This system is very easy for health care providers at sentinel site like Madagascar's influenza system (13).

The system has good data quality but there is below 2% incomplete variable (Date specimen sent to lab). The sentinel sites do not represent the whole population. Even the catchment population was not clearly defined. Hence to calculate incidence rate and to generalize to the whole population, the sentinel sites will need to be more expanded considering Varity of geographic location and community life style. A lack of dedicated resources from government may affect the stability of influenza sentinel surveillance. The sentinel surveillance is donor dependent; this may affect sustainability of the system. All running coast, supplies and logistics are donated by CDC.

Conclusion

The influenza sentinel surveillance system has proven to be useful in providing virological and epidemiological data used to characterize and monitor influenza trends in Addis Ababa. Generally, the staff members using the system are satisfied with the forms and procedures involved, all ILI sites are reporting regularly (weekly) to the national influenza lab and PHEM but not to the next higher level. The influenza sentinel surveillance system is simple, acceptable, stable, flexible and able to detect outbreaks, identify and characterize circulating influenza strains but yet to expand other sub citywide. Data quality is yet to be maintained.

Recommendation

- Training should be given by national influenza lab and PHEM for woreda and sub city PHEM about influenza surveillance.
- The sentinel site should be reporting the surveillance data to the next higher level.
- Continuous supportive supervision should be in placed using checklist to increase the quality of data.
- Data should be continuously analyzed and feedback should be given periodically to health care provider and partners.

- Monitoring should be done as scheduled in the national influenza surveillance guideline to improve data quality.
- The national PHEM (influenza) should be released incentives (budget) timely to the sentinel sites.

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Chapter six: Abstracts for scientific presentation.

6.1. Sentinel Surveillance System evaluation on influenza like illness in Addis Ababa 2016

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Abstract

Background: 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. The Global Influenza Surveillance and Response System have been performing influenza virological surveillance since 1952. Ethiopia conducts influenza sentinel surveillance since 2008 in eight sites. Federal Ministry of Health carries it out but the little is known whether the system meets its objective. We conducted to evaluate the sentinel surveillance attributes, purposes and its operation system.

Methods: we conducted a descriptive cross-sectional study from July 3-21, 2017 in ILI Sentinel sites. We used updated CDC guideline, interviewed key informants and reviewed secondary data using checklist. We analyzed and compiled the data.

Results: The visited sentinel sites (100%) have posted the case definitions and have not been reported to the next higher level but reported to the national influenza lab weekly. Laboratory identified influenza AH1N1, AH3N1 AND B types feedback was providing irregularly to the site 2016.Focal persons trained on influenza surveillance. The positive predictive value was 13.3% (781). Among 781 case reports in 2016, 5(0.6%) age variable, 12(1.5%), body temperature variable, and 7 (0.9%) sex variables were not filled.

Conclusion: the surveillance system able to identify, type of influenza strains, its burden and trend the system has good data quality, reporting regularly to the national PHEM and influenza lab but not to the next higher level.

Key words: Surveillance, Evaluation, Influenza, Addis Ababa

Word count: 233

Chapter seven: proposal for epidemiological research

7.1 Determinant of MDR TB among TB patients in Kolfe Keraniyo sub city

Abstract

Background: Although a lot of efforts have been made to reduce the global burden of sensitive Tuberculosis and remarkable achievements were brought, emergence of Multi-Drug Resistant Tuberculosis (MDR-TB) and Extensively Drug Resistant Tuberculosis (XDR-TB) during the past decade jeopardized the global effort to control TB.

Objective: to assess the determinants of MDR TB in all health center and one hospital of kolfe keraniyo sub city, Addis Ababa city administration from January to November, 2018.

Method: A health facility based unmatched case control study design will be conducted. Data collection will be selected 86 confirmed MDR TB cases recruited as a case from all health facilities which provide MDR TB management service in kolfe keraniyo sub city. 172 pulmonary TB who cured or treatment completed for first line TB treatment will be recruited as control from health facilities in kolfe keraniyo sub city, Addis Ababa city administration.

Data will be entered and analyzed by using EPinfo version 7. Bivariate and multivariate analysis by different statistical methods will be done to identify statistically significant associated factors.

Project outcome: This study will answer the major determinants of MDR-TB in kolfe keraniyo sub city, Addis Ababa, Ethiopia so that planners and policy makers can utilize it as in put for designing effective prevention and control strategies towards MDR-TB.

Key words: MDR TB, Determinant

Word count: 223

Introduction

Tuberculosis (TB) is an infectious disease caused by Mycobacterium Tuberculosis bacillus. It mainly affects the lung (Pulmonary TB) and also can affect all other organs of the body (Extra pulmonary TB). TB transmits when people who are sick with pulmonary TB expel bacteria in to the air, for example by coughing. . In general, the risk of getting infected and developing TB disease is minimal. However, the probability can be much higher among people infected with HIV, and also higher among people affected by risk factors such as under- nutrition, diabetes, smoking and alcohol consumption (1).

The diagnosis of TB had been limited on sputum smear microscopy since 100 years ago. But currently, culture which is the current golden standard method and gene expert by molecular tests are being utilized specially in developed countries (1).

Even though TB is an ancient disease, it remained without having specific Anti-TB Drugs until 1940s and had been a cause of death throughout the world. As the study of natural history of the disease showed, about 70% individuals with sputum smear-positive pulmonary TB died within 10 years of being diagnosed, as did about 20% of people with culture-positive (but smear- negative) pulmonary TB. 1940s and 1950s were the time that Anti-TB Drugs developed and as a result dramatic reduction of mortality rate achieved (up to 90% in clinical trials); WHO also reported 83% cure rate among pulmonary TB cases in 2016(2).

The most recent global TB report estimated that there were 10.4 million new cases globally and 1.3 million deaths in 2016(4). The geographic distribution of the disease varies across the glop, as well as within countries, with poverty and a number of other risk factors being strong predictors of incidence rates; it accounts for 26% of all TB cases in the world and the highest reported incidence rate of 275 cases per 100,000 populations (4). Approximately 87% of the global TB burden is reported from 30 high TB burden countries (4, 8). Ethiopia is one of these 30 high-burden countries and has been classified as having high burdens of TB,

multidrug resistant TB(MDR-TB) and TB-HIV co-infection(4,8), the country is striving to reduce the magnitude of the disease in line with the objectives of the global end TB strategy(9).

Multidrug-resistant TB is defined as TB that is resistant to at least ionized and rifampicin (10). The emergence of MDR-TB has posed an additional challenge for global and national TB control efforts. Globally, in 2015, there were an estimated 481,400 new cases of MDR-TB, and approximately 250 000 deaths from MDR-TB (4). According the 2016 WHO global TB report, In Ethiopia an estimated 2.7% and 14% of new and previously treated TB cases had MDR-TB (11). Among notified pulmonary TB cases, more than 3300 MDR-TB patients were estimated to occur in 2015 (equivalent to an incidence rate of 3.4 cases per 100,000 populations). The MDR-TB case-detection rate is very low; less than a quarter of the estimated 3300 MDR-TB patients were identified in 2015. However, it is improving and the reported number of patients with MDR-TB has increased from 140 in 2010 to 597 in 2015(11, 12). The reasons behind the emergence of MDR-TB are multi-factorial, and are associated with socio- economic, demo graphic, cultural, behavioral, clinical and environmental factors.

Following the declaration of TB as a global public health emergency, WHO designed TB control strategy known as DOTs (Directly Observed Therapy short course) which has been the most popular and efficient strategy(1).

This strategy contributed a lot for reduction of TB burden across the globe. However, the occurrence of unexpected situations like emergence and expansion of drug resistance TB, HIV, expansion of private sectors and the likes forced WHO to revise the strategy towards TB control starting from 2006 to 2015in line with the Millennium Development Goal for Poverty Reduction. This document “The Stop TB Strategy” has included new strategies to address the above challenges including MDR-TB (FMoHE, 2010a) (partnership, 2011).

In2013, three special consultations including senior officials of Member States, technical experts and civil society were organized in order to discuss (i) formulation of the post-2015 tuberculosis targets; (ii) approaches to building on the opportunities presented by expansion of universal health coverage and social protection to strengthen tuberculosis care and prevention; and (iii) research and innovation for improved tuberculosis care, control and elimination. In June2013, the Strategic and Technical Advisory Group for Tuberculosis endorsed the draft, including the global targets and their rationale (4).

POST-2015 GLOBAL TUBERCULOSIS STRATEGY FRAME WORK

Vision	A world free of tuberculosis Zero deaths, disease and suffering due to tuberculosis
Goal	End the global tuberculosis epidemic
Milestones for 2025	75% reduction in tuberculosis deaths (compared with 2015) 50% reduction in tuberculosis incidence rate (less than 55 tuberculosis cases per 100 000 population) No affected families facing catastrophic costs due to tuberculosis
Targets for 2035	95% reduction in tuberculosis deaths (compared with 2015) 90% reduction in tuberculosis incidence rate (less than 10 tuberculosis cases per 100 000 population) No affected families facing catastrophic costs due to tuberculosis
Principles 1. Government stewardship and accountability, with monitoring and evaluation 2. Strong coalition with civil society organizations and communities 3. Protection and promotion of human rights, ethics and equity 4. Adaptation of the strategy and targets at country level, with global collaboration	
Pillars and Components	

1. Integrated, Patent-Centered Care and Prevention A. Early diagnosis of tuberculosis including universal drug-susceptibility testing, and systematic screening of contacts and high-risk groups B. Treatment of all people with tuberculosis including drug-resistant tuberculosis, and patient support C. Collaborative tuberculosis/HIV activities, and management of co morbidities D. Preventive treatment of persons at high risk, and vaccination against tuberculosis
2. BOLD POLICIES AND SUPPORTIVE SYSTEMS A. Political commitment with adequate resources for tuberculosis care and prevention B. Engagement of communities, civil society organizations, and public and private care providers C. Universal health coverage policy, and regulatory frameworks for case notification, vital registration, quality and rational use of medicines, and infection control D. Social protection, poverty alleviation and actions on other determinants of tuberculosis
3. INTENSIFIED RESEARCH AND INNOVATION A. Discovery, development and rapid uptake of new tools, interventions and strategies B. Research to optimize implementation and impact, and promote innovations

Unless possible interventions are made timely through introducing high impact interventions in Ethiopia, the negative impact of MDR-TB might not be easily averted due to the rapid increasing number of MDR-TB cases and its consequence...

Various factors are widely recognized by different studies. History of previous TB treatment mostly considered as the main determinant of MDR-TB. However the characteristics of those previously treated cases vary from area to area. Poor adherence, poor National TB program (NTP), inappropriate regimen, patient behavior like drug abuse and patient socio demographic characteristics are expected factors behind those previously treated patients. Significant numbers of primary MDR-TB cases with or without having the above risks are

also reported across the globe. The association between HIV and MDR-TB is the other focus area that should be clearly known.

In order to have cost effective MDR-TB control program, it is important to point out the major determinants of MDR-TB especially in Countries like Ethiopia where resource is limited, no large scale studies been conducted and new MDR-TB control initiatives are in place. Unless possible interventions are made timely through introducing high impact interventions in Ethiopia, the negative impact of MDR-TB might not be easily averted due to the rapid increasing number of MDR-TB cases and its consequence.

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In order to have cost effective MDR-TB control program, it is important to point out the major determinants of MDR-TB especially in Countries like Ethiopia where resource is limited, no large scale studies been conducted and new MDR-TB control initiatives are in place.

Therefore, this research will be conducted to identify determinants of MDR-TB in health facilities of kolfe keraniyo sub city, Addis Ababa. The results obtained from this study would help the health facilities -to design selection criteria to perform Culture and DST for MDRTB patients and look for other effective prevention strategies towards MDR-TB.

The objective of this study was to assess the determinants of MDR-TB among TB patients in health centers in kolfe keraniyo sub city, Addis Ababa, Ethiopia from January 1, 2018 to November, 2018

Literature review

A previous TB treatment suggests that MDR-TB is developed/ acquired during previous treatment period. This mainly occurs due to poor national TB control program, poor patient treatment adherence, or poor patient management capacity in health facilities. The study from South Africa strengthen the above suggestion that un favorable previous treatment outcome which is directly related with poor TB program, poor patient treatment adherence or poor patient management capacity are independent factor for MDR-TB with OR: 3.67, 95% CI: 1.55-8.74, P-Value: 0.004(K Weyer et al, 2007)**.** Even though previous history of TB treatment is considered as a major determinant by different researchers, the basic underlying factors behind the previous TB treatment should be clearly identified.

The association between gender and MDR-TB is still controversy. Female gender found to be a predictor of MDR-TB in a study from Georgia (OR: 1.58, 95% CI 1.02-2.32)(N Lomtadze et al, 2006)**.**Whereas studies from Europe, Peru and Iran revealed that male gender is a predictor for MDR-TB with OR= 1.83 (95%CI= 1.28-2.57, p-value= 0.002), (HR 20.7, P-value < 0.001) and OR= 1.38 (95% CI= 1.16-1.65) respectively(A Faustini et al, 2005)**,** (L. Grandjean et al, 2011)**,** (Muayad A et al, 2011)**.**These controversial findings might be due to socio cultural situation of the specific area. Therefore, it is mandatory to identify which gender is mainly affected in Ethiopia in order to have specific strategies to reach the specific group.

A systematic review from Europe confirmed that there is an association between HIV & MDR-TB with OR= 3.52 (95% CI= 2.48-5.01)(A Faustini et al, 2005).The role of HIV as an

independent risk for MDR-TB however remains inconclusive and controversial. Therefore, this study should answer the issue in Ethiopia specifically in Addis Ababa context.

Study from Peru by Gran djean L. on house hold contacts of MDR-TB showed Male contacts (Hazard Ratio HR: 2.8, P-value <0.05) were more likely to develop MDR-TB (L. Grandjean et al, 2011)

Studies from Peru by Gran djean L. and Europe by Casal M. revealed that immune suppression other than HIV and co-morbid with non-HIV have significant association with MDR-TB(L. Grandjean et al, 2011), (M. CASAL et al, 2005).Whereas studies from Brazil by Barroso E. C. did not found any association between chronic obstructive pulmonary disease, diabetes mellitus and psychiatric disorder and MDR-TB (OR=0.84, 95% CI=0.35-1.95)(E. BARROSO et al, 2003)**.**

It has been suggested that health care facilities are at a greater risk for TB transmission than general population. It can be due to the existence of larger number of source of infection and lack of strong TBIC practice in health care setting. Studies from Europe showed that health care workers are at a greater risk of getting MDR-TB (OR: 1.96) (M. CASAL et al, 2005).Similar study that supports the above finding is that study carried out in South Africa on risk factors of MDR-TB revealed that prolonged hospitalization had a significant association with MDR-TB (AOR = 3.8, 95% CI = 1.1 – 13.3)(Jason R. Andrews et al, 2010). This is also an indication for the existence of risk of MDR-TB transmission in health care settings.

Cigarette smoking continuously reported as a determinant for respiratory problems including tuberculosis. Study from Nepal by (Marahatta SB et al, 2010) showed that smoking habit had significant association with MDR-TB; OR= 2.35 (95% CI= 1.159-6.667, p-value= 0.02); whereas, alcohol drinking habit had no significant association with MDR-TBon same study.

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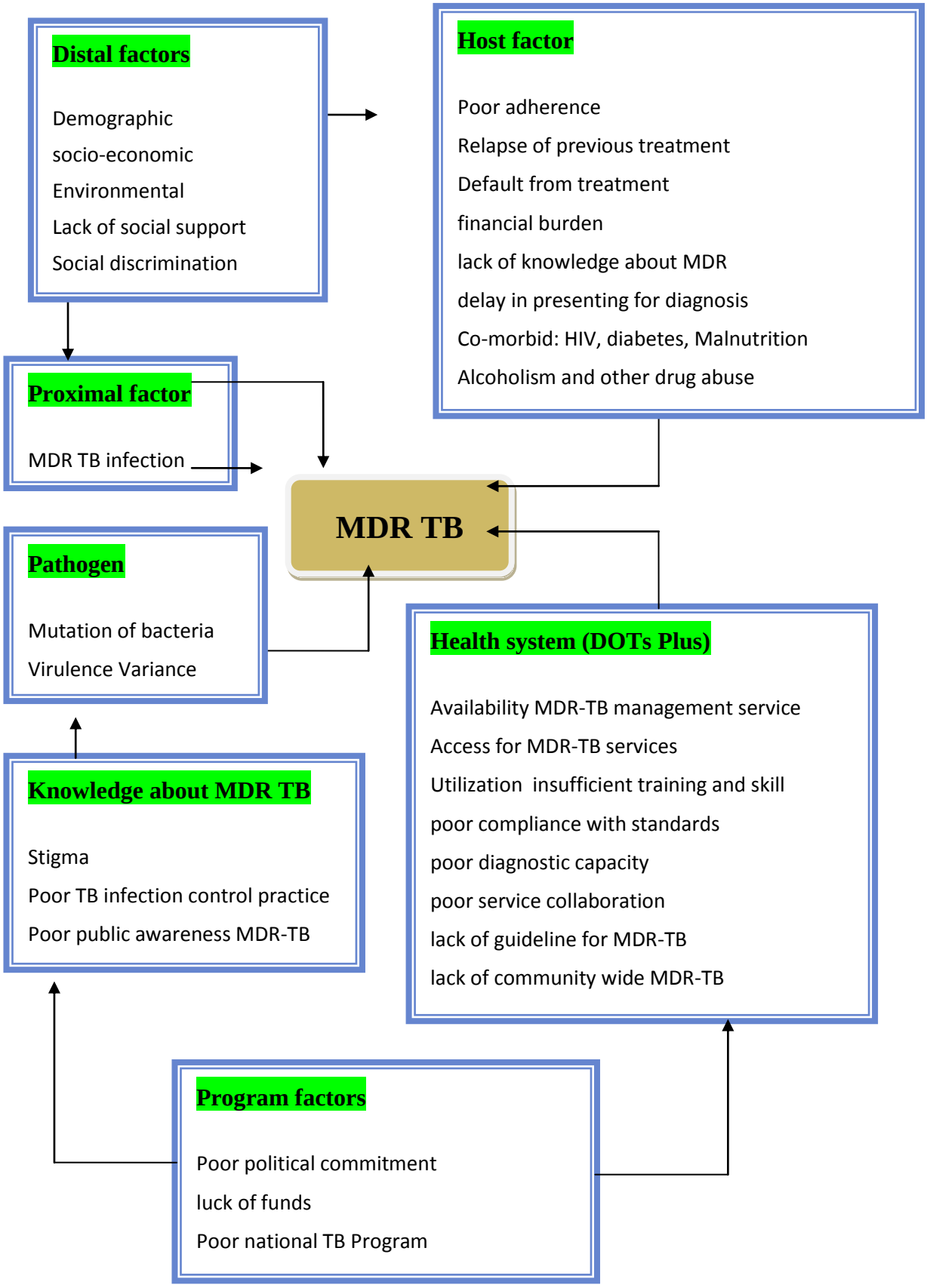

Figure 24: Conceptual frame work for Determinants of MDR-TB

Objectives

General objectives:

- To assess the determinants of MDR/RR TB among TB patients in health facilities found in kolfe keraniyo sub city.

Specific objectives

- To assess the burden of MDR TB
- To assess the factor associated with MDR TB among TB patients

Materials and methods

Study area and Period

We will conduct the study in kolfe keraniyo Sub City which is one of the ten sub cities in Addis Ababa city Administration with a total population of 524200 of which women account for 52% and male accounts 48%. The sub city has 1 governmental 2 private hospital, 11 governmental and 4 NGO health center together with 85 private different level clinics which are performing both curative and preventive services.

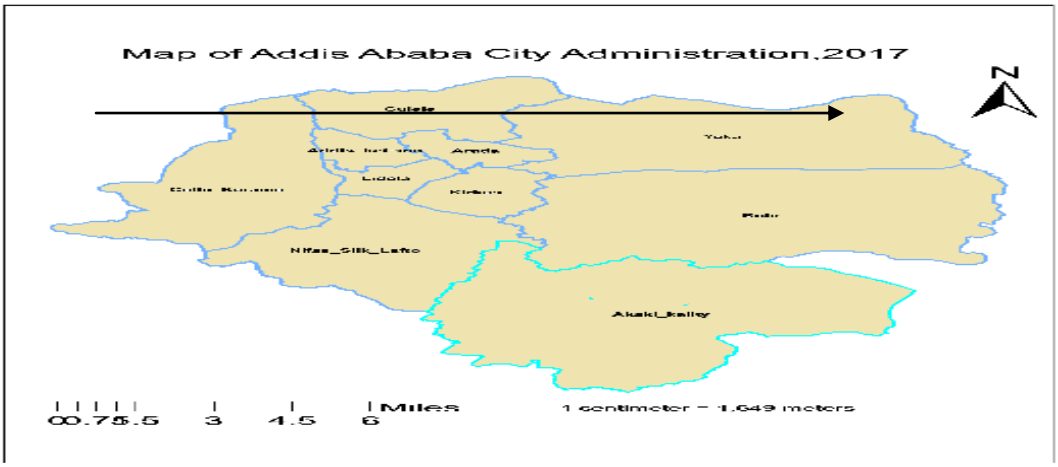

Figure 25: Map of kolfe keraniyo sub city

Study design

Health facility based unmatched case control study design will be used.

Study period

The study will be conducted from January to November 15, 2018.

Study population

- Study populations for cases will that MDR TB will register at all health facilities in kolfe keraniyo sub city for 2nd line anti TB treatment.
- Study populations for control will those TB patients who will register at health facilities of kolfe keraniyo sub city, Addis Ababa City Administration Health Bureau for first line Anti-TB treatment.

Inclusion criteria for cases: All Gene xpert confirmed MDR-TB patients who initiated their treatment at health facilities of kolfe keraniyo sub city on 2nd line TB treatment as the time of data collection.

Inclusion criteria for control: All pulmonary TB patients regardless of their previous treatment history and became cured or treatment completed (treatment outcome: cured or completed) of their last TB treatment during study period in health Centers of kolfe keraniyo sub city, Addis Ababa city administration.

Exclusion criteria: Those patients their permanent address were out of Addis Ababa

Table 35: health facilities which provide MDR TB management service in kolfe keraniyo sub city in No

Woreda	NO of MDR cases on follow up
Woreda 1	1
Woreda 3	1
Woreda 4	3
Woreda 8	6
Woreda 9	2
Woreda 11	0

Woreda 14	4
woreda15	2
woreda 13	6
Alert hospital	128
Total	151

Selection of cases

Simple random sampling methods will be used to select Cases after coding the line lists of MDR TB Cases in kolfe keraniyo sub city that are on MDR TB treatment. The selection procedure will be done by the investigator. Primarily, list of all cases on 2nd line TB treatment will obtain from health facilities.

Selection of controls

In order to make the control group comparable with cases, they will be selected from representative health facilities of sub city considering the local address of the cases. Then comparable number of controls will be selected from each health center based on the address of the cases. Nurses or health officers working at TB clinic who will be the data collector are responsible to select those controls. The data collectors will select those controls (who are cured or treatment completed) randomly among those who will be cured or treatment completed during the study period. The numbers of controls from each health facilities can be vary due to the difference of cases selected from specific locality.

Sample size calculation considers the following

Sample size was calculated by epi info version 7.1 depending on exposure percent of cases and controls to hypothesized risk factors using different prior similar study results in different areas as stated in table below. Fleiss with continuity correction sample size determination method was used. 95% CI level, 80% power and 1:2 cases to control ratio was used in sample size determination.

Formulas: -

$$P_o = \frac{(OR)P_1}{(OR)P_1 + (1 - P_1)} \mathbf{OR} = \frac{P_1(1 - P_o)}{P_o(1 - P_1)}$$

$$n_{cases-Fleiss} = \frac{\left[z_{\alpha/2}\sqrt{(r+1) * p * (1-p)} + z_{1-\beta}\sqrt{r * p_0 * (1-p_0) + p_1 * (1-p_1)}\right]^2}{r * (p_0 - p_1)^2}$$

$$n_{cases-Fleiss-cc} = \frac{n_{cases-Fleiss}}{4}\left[1 + \sqrt{1 + \frac{2 * (r+1)}{n_{cases-Fleiss} * r * |p_1 - p_0|}}\right]$$

OR

n2cc = rn2cc

Where

α = the probability of type I error (significance level) is the probability of rejecting the true null hypothesis

β = the probability of type II error (1 - power of the test) is the probability of failing to reject the false null hypothesis.

P_0 = the proportion for cases

P_1 = the proportion for controls

OR = the calculated odds ratio

r = the ratio of case to control (1 case/r controls)

n_{Fleiss} = Required sample size for cases using Fleiss's formula

Table 36: Different assumptions used in sample size determination

SN	Variables	% of cases Exposed	% of control Exposed	OR	Sample cases	Sample Controls	Total
1	History of previous treatment (11)	91.1	33.3	21	10	20	30
2	Infected with HIV(11)	50	28.9	2.5	69	137	206
3	Poor adherence(12)	38	20.6	20.6	86	172	258

Among the three indicators, to address all, we will use the variables with larger sample size which is 258.

Data collection and quality assurance

The data collection will be carried out using structured questionnaires. The questionnaire will translated to Amharic and back to English to insure consistency by the investigator. Before undertaking the data collection, the instrument will be pre-tested by taking 5% of the sample of the questionnaire.

The data collectors will recruited from those health facilities where cases and controls will selected. Most of them nurses and some will health officers working at DOT clinic and MDR-TB ward of the facilities. The supervisors will select from kolfe keraniyo sub city.

Orientation will be given for all data collectors on how to collect data from the interviewee and registers. Random questionnaire audits were done to validate information. A random sample (10%) of enrolled patients per data collection sites was re-interviewed to validate questionnaire information.

Data collection procedures for cases

The data collecting instrument will be distributed to data collectors at health facilities after the orientation on how to collect data from the patients and register. The interview will conducted when patients (cases) come to the Health facilities for follow up visit.

The supervisors will be the responsible to collect the questionnaires after checking their completeness and consistency.

Data collection procedures for controls

The data collecting instrument will be providing to all data collectors. The interview will be conducted those selected patients (controls) finalized their treatment and declared as treatment completed and cured. Those selected controls that their treatment outcome became other than treatment completed or cured at the end of treatment were excluded from the interview.

Data Collection Procedures from Registers:

Those 5 variables will be collected from the register will collected immediately after finishing the interview part of the questionnaire for a single patient so that the information for a single questionnaire will be finalized as the same time.

Data analysis

The collected data will be interred in to computer using Epi data version 3.02 Software and exported to SPSS for data analysis.

Dissemination of results

The finding will be disseminated to Addis Ababa university school of public health Ethiopian field epidemiology and laboratory training program and kolfe keraniyo sub city health office.

It will be also presented on different scientific conferences and workshop. Efforts will be made to publish the findings on different journals.

Operational definitions

Cases: Cases has been defined as those patients with confirmed MDR-TB with regardless of their previous treatment history.

Controls: Controls has been defined as those patients with pulmonary TB completed their treatment and became cured.

Cured: Those smear positive pulmonary TB patients with negative 2ndmonths, 5th and 6th months of follow up sputum.

DOT providing health facilities: Those health facilities which provide at least TB diagnosis and treatment services.

MDR-TB: MTB strain which is resistant to at least Isoniazid and Rifampicin, which are the most effective 1st line anti-TB drugs.

Sensitive TB: MTB strain that can be cured by first line anti-TB drugs

Treatment completed: Those all forms of TB patients who completed their 6/8 month of treatment without having two or more follow up sputum.

XDR-TB: Those MTB strain which is resistant to any fluoroquinolone, and at least one of the three injectable second-line drugs (capreomycin, kanamycin, and amikacin), in addition to MDR.

Variables

Dependent variables: Type of TB (MDR-TB or Sensitive TB)

Independent variables: age, sex, marital status, economic status, educational status, Place of work, TB contact history, Disclosure status, history of imprisonment, previous TB treatment

history, number of previous TB treatment, duration of previous TB treatment, Previous TB treatment outcome, history of Hospitalization, Cigarette smoking, Alcohol drinking habit, HIV status, Patient diabetes status, Patient history of COPD status and Patient psychiatric status.

Table 37: Work plan (project Time/Task chart))

N^{o}	Activities	Responsible	Time periods										
			January, 2018	February, 2018	March,2018	April,2018	May,2018	June, 2018	July 2018	August 2018	September,2018	October,2018	November,2018
1	Accomplishing the project proposal and literature review	Investigator	x										
2	Questionnaire development	Investigator	x										
3	Approval of Ethical clearance	AAUSPH		X									
4	Budget securing	Investigator & AAUSPH		X									
5	Recruitment of supervisors and training	Investigator			X								
6	Data collection	Investigator & supervisors			x								
7	Data coding entry and cleaning	Investigator				X							
8	Data analysis	Investigator				X							
9	Writing up	Investigator			x	x	x						
10	Submission of first draft	Investigator						X					
11	Second draft submission	Investigator								x			
12	Final report submission	Investigator									X		

Stationary

No	*Item*	*Unit*	*Quantity*	*Unit price*	*Total*
	Not books	PCs	10	13	130
2	Eraser	PCs	10	6	60
3	Pen	PCs	10	10	100
4	Pencil	PCs	10	6	60
5	Sharpener	PCs	10	8	80
6	Staples	Pack	4	35	140
7	Stapler	PCs	01	75	75
8	Photocopy paper	Pack	05	200	1000
	Sub Total				1645

Personal cost

Work type		**No**	**Duration**	**Per diem**	**Total Cost**
1	**Data collector**	**8**	**5**	**200**	**8000**
2	**Supervisor**	**1**	**5**	**200**	**1000**
3	**Principal investigator**	**1**	**5**	**200**	**1000**
4	**Printing and binding research**				**400**
	Sub Total				**10400**

Grand total

No	Description	Total cost (ETB)
1	**Stationeries**	**1645**
2	**Personal**	**10400**
3	**Contingency (15%)**	**1807**
	Total	**13852**

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Chapter eight: Other additional out put

8.1. Kolfe Keraniyo sub city public health emergency management weekly bulletin

Introduction

This bulletin provides information on PHEM activities, and summarizes surveillance data and performance on epidemic prone diseases and other public health emergencies. It indicates surveillance data of week 16 of 2018. It highlights the surveillance completeness, trends of diseases under surveillance in the region.

Completeness and timelines of the report

In week 16, about 99 % health facilities have sent their surveillance report on time. Except on one woreda two health facilities not reported(85.7%) but the sub city achieve above the minimum requirement of completeness (80%) as shown below on Epi-week 16.

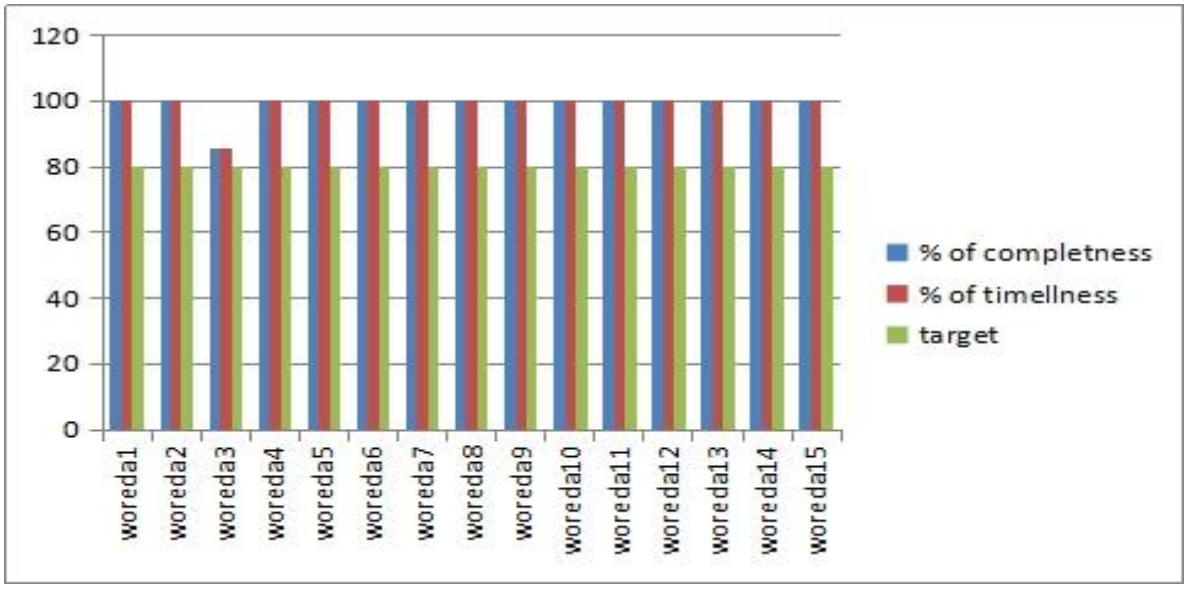

Figure 26: report completeness rate by woreda, week 16, 2008

Measles

One Suspected measles case were reported in the week 16 from woreda 8 it was decreased by 5 cases (83.3%) other woreda not reported on week 16.

Malaria

Two laboratory confirmed malaria morbidity was reported from woreda one. One cases by p. falcipharum (50%) the other one by p.vivax (50%).

Typhoid fever

A total of 516 typhoid fever cases were reported. It was decreased by 7.7% from week 15 and also the highest number (cases) reported woreda was woreda 3, 4, 8, 9, 13.

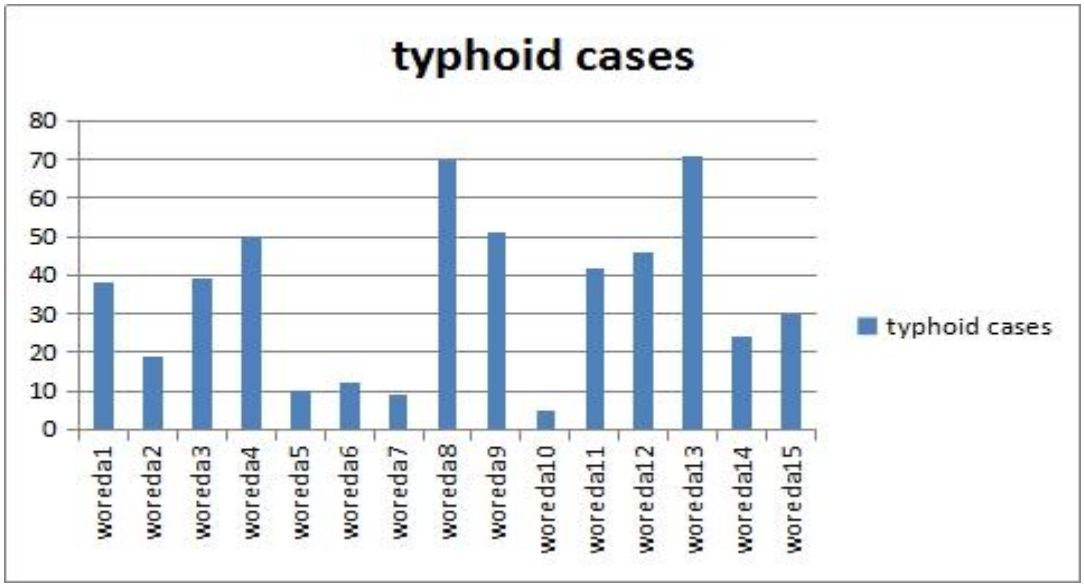

Figure 27: **shows distribution of typhoid cases by woreda, EPI-week 16, 2018**

Typhus

A total of 525 typhus cases were reported when compared to week 15 it was increased by 1.7% and the highest number of cases reported woreda was woreda 1, 4, 8, 9 and 13.

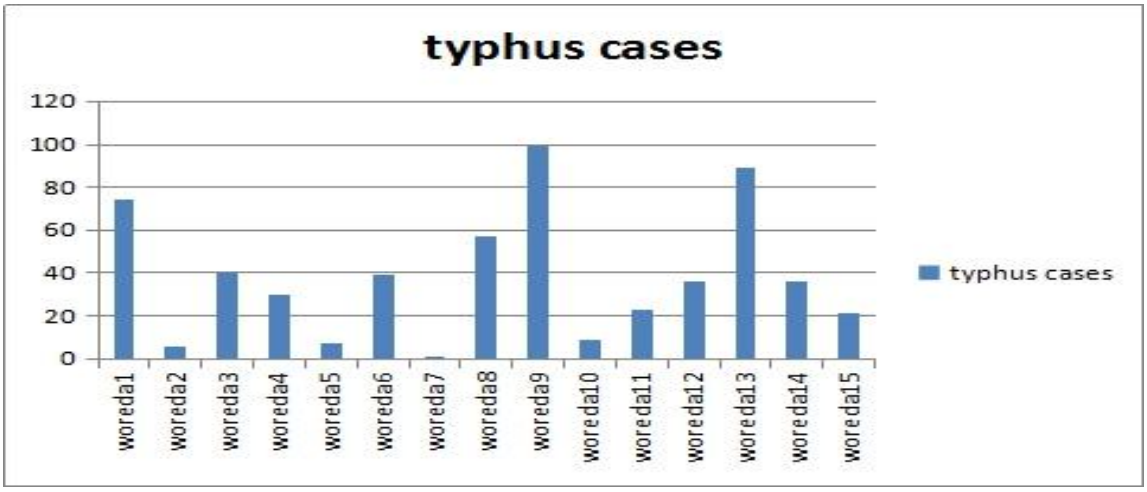

Figure 28: shows distribution of typhus cases by woreda, EPI-week 16, 2018

Dysentery

A total of 52 dysentery cases were reported it was decreased by 29% compared to week 15 and the highest number of cases reported by woreda

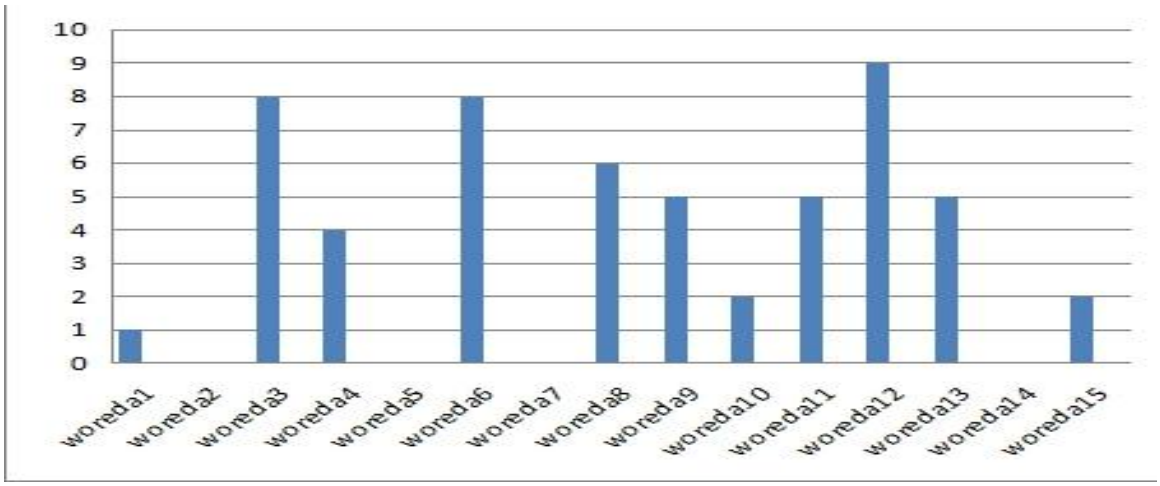

Figure 29: distribution of dysentery cases by woreda EPI-week 16, 2018

Annex 1: Data collection form for malaria outbreak investigation, SNNPR, south omo zone, dasenech woreda, May, 2018

Collection form for malaria outbreak investigation, SNNPR south north Omo zone dasenech woreda, May, 2018

I. Socio-demographic information:

1. ID number of respondent_____

2. Age in years_____

3. Sex: MF

4. Address: Region _____Zone_____ Woreda_____ kebele _____ village_____

5. Occupation: Employed unemployed Student Pastoralist Farmer

6. Total family member's _____

7. Ethnicity: _____

8. Religious: Orthodox, Protestant, Muslim other

9. Marital status: Married, single Widowed Divorced

10. Education status: Formal Primary, Secondary tertiary non-formal

11. Case status

a) Case

b) Control

II. Clinical presentations:

***(For case only)**

12. What was the first symptom? _____

13. When was the 1st symptom started (date of onset of symptoms) DD/MM/YY_____

14. What were others symptoms?

a) Fever: Yes □□No□, if yes duration of fever____ was it constant fever? Yes Noor every other days fever? Yes No

b) Vomiting: Yes No

c) Diarrhea: Yes No

d) Anorexia (appetite loss): Yes No

e) Headache: Yes No

f) Sweating: Yes No

g) Chilling and shivering: Yes No

h) Weakness: Yes No

i) Cough: Yes No

j) Back pain: Yes No

k) Muscle pain: Yes No

l) Rigor: Yes No

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

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

n) Not able to drink or feed: Yes No

o) Severe dehydration, Yes No

p) Persistent fever, Yes No

q) Frequent vomiting Yes No

r) Convulsion or recent history of convulsion Yes No

S) Unable to sit or stand up Yes No

T) pallor (Anemia) Yes No

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

v) Bleeding Yes No

w) Jaundice (yellowish coloration) Yes No

x) Difficult breathing Yes No

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

15. Did you visit health facilities? Yes□ No □, if yes, when did you visit health facilities?

DD/MM/YY_____

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

(A) Coartem Yes □ No □, was it for PF Yes No

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

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

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

(e) Other treatment given_____

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

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

19. Blood samples taken: Yes No

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

III. Risk Factors:

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

21. Specific living areas _____

22. Sleeping areas in side home _____outside home_____

23. Do you stay outside over night? Yes No

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

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

26. If yes Q 24, indicate

(a) Date of travel DD/MM/Y_____

(b) Place of travel

(c) Date when you returned back DDMMYY_____

27. If Q 24 is yes, is there sick patients (same symptoms) in the place where you have been

Yes No

28. Is there a similar sick patient in your house hold? Yes No

29. Do you have bed net in your household Yes No If is yes, how often you use?

Always Sometimes Never

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

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

32. Was deltamethrine sprayed this year? Yes No

33. If yes Q31 when? _____

34. If yesQ31 how many? Once twice

IV. Environmental investigation

35. Place of stay during night? _____

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

A. old tires: Yes No

b. Plant in the containers /flower –pots Yes No

C. plant with temporary water pools Yes No

d. Open deep well: Yes No

e. Broken glass bottles Yes No

f. Cans Yes No

g. Plastic container Yes No

h. Gutter to collect rainwater: Yes No

i. Uncovered water storage/ septic tank Yes No

j. Stagnant water Yes No

37. Presence of mosquito vectors/ mosquitoes breeding sites around the home or vicinity?

Yes No

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

39. Types of house screened yes No unscreened Yes No

40. Do you use repellents Yes No

41. Protective clothing Yes No

42. Waste collection Yes No

43. Unprotected irrigation Yes No

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

45. Presence of tick grass Yes No

V. Awareness assessment

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

---

47. How it transmitted? ----------

---

48. How it can be prevented? ----------

Annex 2: Scabies outbreak investigation questionnaire

Case status: Case _____Control_____

Patient Name_____ Code____ date of Data collection_____

sub city ---------- Woreda_____ kethenas_____

I. Socio-demographic Characteristics

S. No	Questions	Alternatives
1.1	Sex	1.Male 2.Female
1.2	Age	years___ Months_____
1.3	Resident	1. Urban 2. Rural
1.4	Religion	1 orthodox 2. Muslim 3. Protestant 4. Others
1.5	Occupation	1.farmer 2.civil servant 3.student 3.house wife 4.merchant 5.other
1.6	Educational status	
1.7	Marital status	1. Single 2.married 3.divorced 4. Widowed
1.8	Family size	_____
1.9	Is there any sick person with scabies in family?	1. Yes 2. No
1.10	If yes, number of sick person	_____

II. Clinical History of Diseases:

2.1	Do you have any itching or rash in your body?	1.Yes 2.No
2.2	Which sign and symptom did you experience first?	1. Itching 2. Rash
2.3	Date of onset of	1.Itching----------(dd/mm/yy) 2.Rash ---------- (dd/mm/yy)
2.4	During at what time the itching intense?	1.At day 2.At night
2.5	Can you see scabies lesion on infected person?	1.Yes 2.No

2.6	If yes, how many is there?		1. Mild (5 or less) 2.moderate (6-10) 3. Severe (11-49) 4. very severe(50 and more)
2.7	Which body part is mostly affected?	1.finger webs 2.ulnar border of the hand 3.elbow 4.wrist 5.anterior axillaries line	6.umbilicus 7. inter gluteal area 8.genital (male) 9.inner aspects of thighs 10.face palm and sole(children)
2.8	What type of skin lesion?		1. Nodular 2. pustules
`2.9	Is there filled sores or crusted sores over the scabies lesion?		1. Yes 2. No
2.10	Did you take treatment?		1.Yes 2.No
2.11	If yes, what type?		1. Ivermectine 2. BBL 3.Sulphur 4.premethrine

III. Risk factors

3.1	Did you have been infected Previously?	1.Yes2.No 3.Unknow
3.2	With whom do you sleep?	1.Alone2.wife/husband 3.brother/sister 4.friend
3.3	Has the person whom you are sleeping with contracted scabies	1.Yes 2. No
3.4	How often you take shower?	1,2-3 days 2,weakly 3,more than a weak
3.5	What do you use detergent to take shower?	1.Water only 2.water with soap other
3.6	Do you wash your clothes?	1.Yes 2.No
3.7	If yes, when do you wash your clothes?	1. Weakly 2. more than a weak
3.8	Have you put on clothes of someone who was diseased in the previous 6 weeks?	1, Yes 2,No
3.9	When do you change your clothes that you wear now?	1.everyday 2.weakly 3.more than a weak

3.10	Is there any shortage of water to wash your body and clothes?	1.Yes 2.No
2.11	What is the source of water for your drinking?	1.Pipe2.well3.spring 4.river

IV. Knowledge of patient on Scabies like illness

1	Do you hear about scabies?	1.Yes 2.No
2	From whom did you heard	1.Friends 2.Family member 3 HEW 4 Teacher 5. Health workers
3	Do you know the causes of scabies?	1.Yes 2.No
4	If Yes? What it is?	
5	What are the Signs and symptoms of scabies?	1. Itching 2, skin lesion 3, Don't know 4.
6	How do you think this disease transmit from person to persons?	1,.Contact with infected patient 2, sleeping with infected person 3. Don't know 4.Other(specify)----------

Annex 3: Typhoid fever data collection tool

1. Name of sub-city_____
2. Total population_____ Male _____ Female _____
3. Water and sanitation coverage _____
4. Number of typhoid fever cases in the KOK sub city report _____

S.N	Year	Number of cases
1	2011	
2	2012	
3	2013	
4	2014	
5	2015	
	Total	

Completeness

	Year	No of expected	No of timely reported	No of late report
1	2004			
2	2005			
3	2006			
4	2007			
5	2008			

Annex 4: data collection tool to evaluate influenza surveillance system

Questionnaire

Introduction:

Thank you for taking time to speak with me today. My Name is Seyoum wondafrash. I have been working in kolfe health center and now I am Field Epidemiology Resident at Addis Ababa University. I am conducting an evaluation of Influenza like Illness sentinel surveillance system and want to speak with people who are engaged in sentinel surveillance system. The aim of the evaluation is to evaluate how the system is functioning and whether the intended objectives are being met. Finally, recommendations will be forwarded all concerned bodies to improve the system.

No.	Question	Coding Classification
1. Background Information		
1.1	Region	1. Addis Ababa
1.2	Sub-city	_____ _____
1.3	Woreda	_____ _____
1.4	Name of Health Facility	_____ _____
1.5	Respondent	Name_____ ____
1.6	Total Population	_____ _____
2. Case Detection		
2.1	Do you have influenza case definition?	1.Yes 2.No
2.2	If yes, is it posted?	1.Yes 2.No
2.3	Are all health professionals aware of it?	1.Yes 2.No

3. Reporting		
3.1	Do you send influenza surveillance data to the next higher level?	1.Yes 2.No
3.2	How do you send the data to the next level?	_____ _____
3.3	When are you expected to send surveillance data to next higher level?	_____ _____
3.4	What kind of communication facility do you have?	_____ _____
4. Data analysis and interpretation		
4.1	Are you trained on influenza surveillance system?	1.Yes 2.No
4.2	Do you have computer?	1.Yes 2.No
4.3	Is it functional?	1.Yes 2.No
4.4	Do you have computer skill?	1.Yes 2.No
4.5	Do you analyze influenza surveillance data?	1.Yes 2.No
4.6	Do you use computer to analyze influenza surveillance data?	1.Yes 2.No
4.7	If answer for 4.6 is yes, do you describe data by time place and person?	1.Yes 2.No
4.8	Do you have denominator for data analysis?	1.Yes 2.No
4.9	Do you notify the results of your analysis to the sentinel site?	1.Yes 2.No
5. Feedback		
5.1	Do you provide Feedback to lower level?	1.Yes 2.No
5.2	How do you give your feedbacks?	1.Oral 2.Written
6. Training		
6.1	Did you take training on influenza surveillance within the last year?	1.Yes 2.No
6.2	How many staffs were trained?	_____ _____
7. Supervision		
7.1	Do you conduct supervision?	1.Yes 2.No

7.2	If answer for 7.1 is yes, how many times did you supervise	_____
7.3	How often do you supervise?	_____
7.4	Do you have supervision checklist?	1.Yes 2.No
	Surveillance Attribute	
8.	Completeness	
8.1	Do all sentinel sites report within expected on time?	1.Yes 2.No
8.2	Are all variables completed?	1.Yes 2.No
9.	Timeliness	
9.1	Does the sentinel surveillance data arrives on time?	1.Yes 2.No
10.	Usefulness	
10.1	Were the suspected ILI outbreaks detected early by the sentinel surveillance system?	1.Yes 2.No
10.2	Has the response initiated in a timely manner?	1.Yes 2.No
10.3	Any epidemiological investigation conducted?	1.Yes 2.No
10.4	For what purposes do you use the surveillance data?	_____
11.	Simplicity of the system	
11.1	Is the case definition easy?	1.Yes 2.No
11.2	Does the system allow all levels of professionals to fill data?	1.Yes 2.No
11.3	Does the system help to record and report data on time?	1.Yes 2.No
11.4	How long does it take to fill the format?	_____
11.5	How long does it take to have laboratory confirmation?	_____
12.	Acceptability	
12.1	Do you believe the surveillance is important for public health	1.Yes 2.No

	intervention?	
12.2	Did you accept the influenza surveillance system?	1.Yes 2.No
12.3	Do you think the reporting agents accept and well engaged to influenza surveillance activities?	1.Yes 2.No
12.4	If yes, how many are active participants in your health center.	_____ _____
12.5	If No, what is the reason for their poor participation in the surveillance activity	_____ _____
12.6	Were all participants using the standard case definition to identify cases?	1.Yes 2.No
12.7	Were all the reporting agents send their report using the current and appropriate surveillance reporting format?	1.Yes 2.No
13. Flexibility		
13.1	Can the current reporting formats be used for other newly occurring health event (disease) without much difficulty?	1.Yes 2.No
13.2	Do you think that any change in the existing procedure of case detection and reporting format will be difficult to implement?	1.Yes 2.No
13.3	Is the system easy to add new variables?	1.Yes 2.No
13.4	Is the system easy to integrate with other systems?	1.Yes 2.No
13.5	Is the system easy to add new disease on report?	1.Yes 2.No
14. Data quality		
14.1	Are all reported forms Complete?	1.Yes 2.No
14.2	Percentage of unknown or blank responses to variables from the total reports of 2016 report	Sex ___ Age_____ woreda _____ Date of specimen collection_____ specimen condition----------
14.3	Is the recorded data clear to read and understand?	1.Yes 2.No
15. Representativeness		
15.1	Was the surveillance system enabled to follow the health and health related events in the whole community?	1.Yes 2.No

16. Stability		
16.1	Was any new restructuring affected the procedures and activities of the surveillance?	1.Yes 2.No
16.2	Was there lack of resources that interrupt the surveillance system?	1.Yes 2.No
16.3	Was there any time /condition in which the surveillance is not fully operating? If yes, mention why?	1.Yes 2.No

Annex 5: data collection tool for health profile analysis

1. **Historical**

   - Woreda Name _____
   - Any other historical aspect about the Woreda
   - Number of kethenas_____
   - Sectors offices, where they found
   - Main supporting organizations

2. **Geographical coordinate**

   - Latitude
   - Longitude
   - Annual Rain Fall (average)
   - Climatic zone_____(%)_____(%)_____(%)
   - Woreda boundaries

North_____ South_____ East _____West_____

- Map of the sub city
- Culture
- Main transport and how they connected each woreda, kebele and with the capital city of the zone
- Telephone, mobile and internet
- Electricity

3. **Demographic Data**

❖ **Population**

S. No	Sub-woreda/Kethenas	Sex		Total
		Male	Female	
1				
2				
3				
4				
5				
6				
7				
8				
9				
10				

4. Population distribution

Se.No	Description	Total Population	%	Remark
1	Male			
2	Female			
3	Under 1 year			
4	Under 5 year			
5	5-15 year			
6	15 -49			
7	6-59 month age group			
8	24-59 month age group			
9	Pregnant women			
10	Non pregnant on reproductive age			

Population characteristics

Characteristics		Number	Percentage
Religion	Orthodox		
	Muslim		
	Protestant		
	Catholic		
	Others		
Occupation	House Wife		
	On education		
	Gov't employment		
	Private employer		
	Unemployed		
	Self employed		
Water Source	Pipe		
	River		
	Wale		
	Others		

5. Economy (mainstay of the economy, average income levels etc)

Main income sources

- ✓ Livestock
- ✓ Tourism
- ✓ Trade
- ✓ Other business

Household income source

- Government Employer_____(#)
- Private Employer_____(#)
- Daily Laborer_____(#)
- Different business_____ (#)

- Jobless _____ (#)
- Average Income_____

6. EDUCATIONAL STATUS

Characteristics			**Frequency**		**Percentage**
			Gov't	**Private & others**	
Educational institution	K.G				
	Primarily School 1-8				
	Secondary 9-10				
	Preparatory				
	College/ University				
	TVET				
School health activities	Number of schools with Water supply				
	Schools with functional latrine	Male			
		Female			
	Schools with HIV/other Health clubs				

School Enrolment	**Sex**			
	Male		**Female**	
	Frequency	**Percentage**	**Frequency**	**Percentage**
Illiterate				
KG				

1_8				
9_12				
TVET				
Collage/University				
School Age Children (target)				
School dropout year 2008 EFY				

o Universities _____ No of student _____

o High School _____ No of students_____

o Primary schools_____ No of students _____

o Drop out…….% compare with the previous year ……..% and means of drop out

o Enrolment compare with the previous year

Teachers' distribution

	Government		**Private**			**Remark**
	Male				**Total**	
Master & above						
Degree						
Diploma						
Certificate						
Supportive staffs						

7. Water coverage

Characteristics	**Frequency**	**Percentage**
Total safe water coverage		

Main source of water supply è è è è		
Kebeles getting safe water		
Population getting safe water		
Daily water consumption per day per person		

Other Facilities

Characteristics	**Frequency**	**Percentage**
Transport		
Accessibility (main roads)		
Type of road		
How many kethenas have access to transportation		
Flow of transportation per day		
Telecommunication		
How many people have access to fixed telephone		
How many people have access to mobile phone (coverage)		
Post Office		
Bank		
Power supply		
How many house hold get power supply		

8. Disaster situation in the woreda

- Was there any disaster (natural or manmade) in the woreda in the last one year? Yes , No
- Is there any recent disease outbreak/other public health emergency? Yes , No
- If yes, number of cases_____ and number of deaths_____

9. Vital Statics and Health Indicators

- Number of still birth in 2008 EFY_____
- Infant Mortality Rate (IMR) _____ (total <1 yr deaths in 2008 EFY _____)
- Child Mortality Rate_____(total <1-4 yr deaths in 2008EFY _____)
- Crude Birth Rate_____
- Crude Death Rate_____ (total deaths 2008 EFY ____)
- Maternal Mortality Rate_____(2008 EFY total maternal deaths_____)
- Contraceptive prevalence rate_____
- Contraceptive acceptance rate _____
- ANC rate (how many of the total expected pregnancies attended 1st ANC) _____
- ANC rate (how many of the total expected pregnancies attended 4th ANC) _____
- Percentage of deliveries attended by skilled birth attendants_____
- Percentage of deliveries attended by UHEWs_____
- Percentage of deliveries attended by TBAs _____
- Average family size_____

10. Immunization Coverage

Type of Vaccine	**Vaccination Status**			
	Zero dose	**1st dose**	**2nd dose**	**3rd dose**
BCG				
OPV				
Pentavalent				
Measles				
PCV				
TT2				
Rotarix				

11. Health facilities.

		Number		Total	Remark

S.No	Type of Health facility		Governmental	Non-governmental	HF: Population Ratio	Number of beds	
1	Hospitals						
2	HC						
3	HP						
4	Dxic laboratory						
5	Clinics	Higher					
6		Medium					
7		Small					
9	Pharmacy						
10	Drug store						

Human resource distributions

Se. No	Profession	Number		Total	HP: population Ratio	Remark
		Male	Female			
1	Specialist					
2	GP					
3	HO					
4	Nurse BSC					
5	Clinical nurses					
6	Ophthalmic nurse					
7	Public nurse					
8	Ophthalmic nurse					
9	Midwife BSC					
1o	Midwife diploma					
11	Lab.Technology					
12	Lab. Technician					

13	Pharmacist					
14	Pharmacy technician					
15	Environmental HO					
16	X-ray technician					
17	Anesthetist					
18	Health assistance					
19	HEW					
Total						
Supportive staff						

12. Top causes of morbidity and mortality

Top ten leading causes of OPD visit (morbidity)

	Adult	**Pediatrics/ < 5 years**
1		
2		
3		
4		
5		
6		
7		
8		
9		
10		

Top ten causes of admissions (Morbidity)

	Adult	**Pediatrics/ < 5 years**
1		
2		
3		
4		
5		

6		
7		
8		
9		
10		

Top ten causes of deaths (mortality)

	Adult	**Pediatrics/ < 5 years**
1		
2		
3		
4		
5		
6		
7		
8		
9		
10		

13. Health budget allocation Government

- Total budget allocated for the woreda _____
- Total budget allocated for health _____(____%)
- **Funds from NGO**
- Total _____ (purpose/programs)_____

14. Community Health Services Status of services provided by community health workers namely:

- ❖ No. of TBAs/TTBA_____ and their responsibility_____
- ❖ No. of CHWs/CHPs_____ and their _____
- ❖ Others_____

15. Status of Primary Health Care Components – with focus on the eight PHC elements and MDG

- (Immunization, MCH, Essential drugs, Food and Nutrition, Education, Illness and injury, Water and Sanitation, Vector and reservoir)

- ➢ MCH (Delivery, ANC, PNC)

S.No	Indicator	Total Number
1	Number of ANC Cases Registered	
2	Number of pregnant women provided at least TT2	
3	PNC cases visited	
4	Number of children <5 year treated for diarrhea at public HF	
5	Number of children <5 year treated for pneumonia at public health facilities	
6	Number of facilities reporting stock out of contraceptive commodities	
7	Total deliveries conducted by skilled attendants	
8	Number of live births	
9	Number of still births	
10	Total obstetrics/Maternal/deaths	
11	Total Newborn deaths	

Family Planning Methods

Methods	Frequency	Percentage
Oral Contraceptive		
IUD		
Implant		
Injection		
Condom		

- **Is their EPI (outreach service?)** Yes , No
- **Was Conduct cold chain or vaccine management supportive supervision** Yes , No
- **If yes, do you have checklist?** Yes , No

Environmental Health and Sanitation

- Latrine coverage_____ & utilization rate_____

Type of Latrine Type of Latrine	Frequency	Percentage
Open field		
Pit Latrine		
Ventilated Pit Latrine		
Others		

Solid waste management

- Is their solid waste container? Yes , No
- Is their solid waste container loader? Yes , No
- If yes, frequency of solid waste collection_____

Is there Liquid waste management? yes, No

others_____ □

□□Health Education (what, when, where, how and who conducted health education)_____

16. Endemic diseases Malaria:

- Total cases/yr_____ deaths/yr_____,<5yr cases_____ deaths_____
- Malaria supplies (Coartem, RDT, etc) shortage _____

- Other issues_____

TB/Leprosy:

Total TB cases in the year 2008EFY_____

- PTB negative_____
- PTB positive_____
- Extra PTB _____
- TB detection rate _____
- TB Rx completion rate _____
- TB cure rate _____
- TB Rx success rate _____
- TB defaulter_____
- Death on TB Rx_____

Total TB patients screened for HIV_____(%_____)

Total TB patients tested positive for HIV_____

Total number of TB-HIV co-infected Patients initiates CPT_____

Total number of TB-HIV co-infected Patients initiates HAART_____

Total Leprosy cases_____

Leprosy detection rate _____

Rx completion rate_____

HIV/AIDS

Total people screened for HIV (last one year) _____

- VCT_____ PITC_____PMTCT_____

Total PLWHA_____

- On ART _____on Pre-ART_____
- Other HIV prevention activities_____

Nutrition

❖ Total Out Patent Therapeutic Program (OTP) sites_____, total admissions to OTP/yr_____

· Total SC sites,_____, newly opened/yr_____, total admissions to SC/yr_____

ÈIs there TSF (targeted supplementary feeding) program in the woreda_____

· CBN program_____ PSNP _____other_____

17. Essential drugs (shortage)

- _____
- _____
- _____
- _____
- _____

18. Epidemic prone diseases_____

What do you think the main problems of the district are?

_____

_____

_____

Discussion of the highlights and the main findings of the health profile assessment and description

_____

_____

_____

_____

19. Problem Identification and Priority Setting – set priority health problems based on the public health importance, magnitude, seriousness, community concern, feasibility etc

Declaration

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

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Date of Submission: October 15/2018

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

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