

**ADDIS ABABA UNIVERSITY COLLEGE OF HEALTH SCIENCE
SCHOOL OF PUBLIC HEALTH**

Ethiopian Field Epidemiology and laboratory Training Program

**Compiled Body of Works in field Epidemiology
By
Daniel Yohannes G/Egziabher**

Submitted to the School of Graduate Studies of Addis Ababa University in

**Partial Fulfillment for the Degree of Master of Public Health in Field
Epidemiology**

**May- 2018
Addis Ababa**

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School of Public Health**

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Approval by Examining Board

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List of abbreviations and acronym

AA	Addis Ababa
AAU	Addis Ababa University
ANC	Antenatal care
AOR	Adjusted odd ratio
AR	Attack Rate
AU	African Union
BGC	Blood Glucose Concentration
BMI	Body mass index
CBR	Crude Birth Rate
CDC	Centers for Disease control and Prevention
CDR	Crude Death Rate
CFR	Case Fatality Ratio
CHW	Community Health Worker
CI	Confidence interval
CMR	Child Mortality Rate
COR	Crude odd ratio
CSA	Central statistical agency
CSF	Cerebro spinal fluid
CTC	Cholera Treatment Center

CTU	Cholera Treatment Unit
DACA	Drug administration and control authority
DM	Diabetes mellitus
EDHS	Ethiopian demographic health survey
FAT	Fluorescent antibody test
EFETP	Ethiopian field epidemiological training program
FR	Fatality rate
FMOH	Federal ministry of health
F	Design effect)
FBS	Fasting Blood Sugar
GDP	Gross domestic product
GOE	Government of Ethiopia
GTP	Growth and Transformation Plan
HMIS	Health Management Information System
IDF	International Diabetes Federation
IDSR	Integrated Disease Surveillance Report
IM	Intramuscular
IMR	Infant Mortality Rate
IPV	Intra venous polio
IV	Intravenous
KKSC	Kolife Keranio sub city
KM	Kilo meter

LBRF	Louse born relapsing fever
MoH	Ministry of Health
MMR	Maternal Mortality Rate
MOE	Ministry of education
MOFED	Ministry of Finance and Economic Development
NCD	Non communicable disease
OPV	Oral polio vaccine
OPD	Outpatient department
OR	Odds Ratio
ORP	Oral Rehydration Point
ORS	Oral Rehydration Salt
P	Expected prevalence
PEP	Post exposure prophylaxis
PHEM	Public Health Emergency Management
PSUs	Primary sample units
PPP	Purchasing power parity
RL	Ringer Lactate Solution
RDT	Rapid diagnostic test
SNNPR	South Nation Nationality Peoples Region
TBA	Traditional birth attendant
T2DM	Type2 diabetes mellitus

TBRF	Tick born relapsing fever
TT	Tetanus toxoid
TVETs	Technical and Vocational Education and Trainings
UNDP	United Nations Development Program
UNICEF	United Nations Children’s Fund
USAID	United States Agency for International Development
UNECA	United Nations Economic Commission for Africa
URRAP	Universal Rural Road Access Program
WHO	World Health Organization
WHR	Waist-to-hip ratio
WIR	Weekly Incidence Rate
SSA	Sub-Saharan Africa
SSUs	Secondary sample units

Executive Summary

The Ethiopia field epidemiology program is a two years' service program in field epidemiology adapted from United States center for disease control and prevention (CDC) epidemic intelligence service (EIS) program. Addis Ababa University School of public Health, Ethiopia Field Epidemiology Training Program, Federal Ministry of Health/Ethiopia Public Health Institute, CDC Ethiopia and the Regional Health Bureaus are the stockholders of the program.

During a two years stayed at kolife keranio field bases of AAU School of Public Health , as Field Epidemiology and laboratory Training Program resident, we carried out two outbreak investigations, one surveillance data analysis, one evaluation of surveillance system, one woreda health profile description, one scientific manuscript ,two abstracts for scientific conference, one research proposal and one additional output.

Chapter one consists of two outbreak investigations, the first AWD outbreak done at Oromiya zone East Harer at kurfa chelae district. The objective of study was to describe the distribution and to identify the risk factors associated with transmission of cholera outbreak. We used unmatched case control study. The possible potential risk factors for the outbreak was consuming food from street vender and visiting anyone having diharoa .we recommend educating the community segments on food, personal and environmental hygiene to bring behavioral change towards hygiene and sanitation.

Chapter two, we investigated rabies human exposure to rabid dog. We sent the head of the 709H doges to EPHI laboratory and the result show that the dog was rabid, then we trace one epidemiological linked dog, four suspected dogs, Seven human exposures and we recommend to Strengthening rabies surveillance for immediate response to take interventional measures until the locals dogs are declared free from rabies by veterinary authorities.

Chapter three consists of the surveillance Data Analysis Report of relapsing fever which was done at kolife Keranio sub-city Addis Ababa. I have worked on a five years retrospective document review of the surveillance data's of confirmed relapsing fever cases and the usual occurrence of the case per month in sub-city was 12relapsing cases per month. We review 882 confirmed cases and we found a missed out break in2013 finally we recommend trend analysis and interpretation of relapsing fever cases weekly for early detection and response.

Chapter four is the Evaluation of the surveillance system of kolife Keranio sub-city, Addis Ababa evaluation of surveillance system includes an assessment of core surveillance activities and

surveillance system attributes, we used a descriptive cross sectional study by selecting one of weekly notifiable disease called an epidemic typhus. The incidence was 2370/100000population

Chapter five is about the health profile description of District4,kolife Keranio sub-city which is in Addis Ababa By this health profile description Demographics ,geographic, Social Indicators , Health Status of the residents and other health related conditions described briefly to inform the public ,politicians ,professionals and policy-makers about matters that affect health ,in easily and understandable form.

Chapter six is of about the Manuscript from the surveillance data analysis report of relapsing fever at kolife Keranio sub-city and it is done in 2016 in Addis Ababa which prepared for submission for Peer reviewed Journals.

Chapter seven has three abstract for scientific presentation.

Chapter eight contains the protocol/proposal on epidemiologic research on selected topic, which is Prevalence and Associated Factors of Diabetes Mellitus, at kolife Keranio sub city, Addis Ababa Ethiopia 2018. The reasons we propose diabetes is from one of my output health profile description in 2017 diabetes was the leading cause of morbidity among NCD in the area.

Generally in two years field residency we did many other, which greatly contributed to strengthen the public health emergency management at 16 districts of the kolife Keranio sub city, and East Harerge.

Chapter I: OUTBREAK INVESTIGATION

1.1 Investigation of cholera outbreak kurfa chelae district, East Harer, Ethiopia 2017

Abstract

Background: Cholera kill half of affected individuals without medical interventions but preventable by personal, environmental and food hygiene. The recent cholera outbreak at kurfa chelae district started 5th September 2017 and last until 9th October 2017. Describing the distribution and identifying the risk factors associated with transmission of cholera outbreak is helpful to stop further spread of cholera outbreak.

Methods: We used descriptive and unmatched case-control study design. Study population was resident of kurfa chelae district >5 years old. We used Epi info version 7.3 to determine the sample size of unmatched case and controls with Fleiss w/CC. We enrolled 31 cases and 62 unmatched controls. Cases were all persons with cholera, controls were persons without cholera and living in the same Kebele of the case and randomly selected community controls from the same neighborhood. We used standardized questionnaires. Data were entered into Epi Info software version 7.3. Odds ratios (ORs) for Bivariable analysis were calculated, the Bivariable analysis served as a screening phase for variables to be included in a multivariate model. We got a letter of submission from federal ministry of health and Oromiya regional health bureau.

Result: 31 confirmed cholera cases identified and no deaths reported. 58% was males, median age of 28 years and standard deviation of 17 years. The age group 20-29 years was the most affected 8 (25%). Highly affected occupation was farmers 29%. The highest attack rate was showed at Goro garbi Kebele 0.26% (26/1000). 86% of latrines had no hand washing and the communal latrines were unsanitized. Poor water supply in quality and quantity. Consuming food from Street vendors (crude OR=65.7, p=0.0107), visiting anyone having diarrhea (crude OR =32.97, p=0.0098), are a significant association with cholera outbreak.

Conclusion and recommendation: Vibrio cholera 01-sero type was isolated organism from all Kebeles causing the outbreak. Youths were more affected. Farmers were highly affected. Lack of consistent water supply in the area. Consuming food from street food vendors and visiting a person who have diarrhea within five days are possible risk factors for the outbreaks. Educating the community segments on personal, environmental, and food hygiene may bring a behavioral change towards hygiene and sanitation.

Word count; 340

Key word; Cholera, partially roasted meat, street food vendor, visiting a person with diarrhea.

1. Introduction

1.1 Background

Cholera is often described as the classic water-borne disease because it is commonly associated with water. This description oversimplifies the transmission of *Vibrio cholerae*, because the bacterium can be transmitted by contaminated food also; contaminated water is frequently mixed with food, allowing either to act as a vehicle. For more developed countries, contaminated food (especially undercooked seafood) is the usual vehicle for transmission, and contaminated water is more common in less developed countries[1].

The recent AWD outbreak at kurfa chelae district started 5th September 2017 of and last until 9th October 2017. One AWD cases were reported from Dawi health center on 9/5/2017. The first reported case was a 40 years female merchant comes from Rasa Janata kebele and she had a traveled history to somali region, during travel she eat partially cooked food at restaurant, unboiled milk and fruit from straight food venders during travel .The second case reported from Dawi health center in 9/27/2017 to kurfa chelae health office is a 50 years male farmer comes from Hula Janata no travel history but he was visited a neighbor who had diarrhea come from Bedeno district before four days. The samples taken from patients investigated by RDT and positive for *Vibrio cholerae*. For confirmation test additional 10 samples were sent to Oromiya regional laboratory 9/30/2017. The culture test confirmed that out of 10 samples four samples were positive, three cases from Rasa Janata and one case from Hula Janata, water samples were not shows bacterial growth. The samples of 10 persons who were suspected to being part of an outbreak and who meet the following criteria. Had rice water stool, had onset of illness less than four days before sampling, had not received antimicrobial treatment for diarrheal illness. After the confirmation of the outbreak, Addis Ababa university school of public health field epidemiology laboratory training program residences deployed to investigation of the possible risk factors of the outbreak and to prevent further spread of the outbreak. AAU Field epidemiology residents deployed by Federal ministry of health and Oromiya regional health bureau at eastern Harerge zone kurfa chelae district

We are communicating to RRT of the kurfa chelae district those were already established before we arrived, we secured relevant supplies such as the following: Required formats, Data collection tools, Guideline on Cholera Outbreak Management, Supplies (Data analysis tools laptop, etc.) Preparatory meetings were held with the Head of Public Health Emergency Management of kurfa chelae woreda and team members.

2 Literature review

Intestinal infection with *Vibrio cholera* results in the loss of large volumes of watery stool, leading to severe and rapidly progressing dehydration and shock. Without adequate and appropriate rehydration therapy, severe cholera kills about half of affected individuals(2). Cholera toxin, a potent stimulator of adenylate cyclase, causes the intestine to secrete watery fluid rich in sodium, bicarbonate, and potassium, in volumes far exceeding the intestinal absorptive capacity [3].

Cholera epidemics often start at the end of the dry season or the beginning of the rainy season, when water sources are limited and become brackish and/or highly polluted. Reductions in water resources often force people to concentrate at fewer water sources, thus increasing the risks of contamination and transmission. Heavy rain can also trigger a cholera outbreak[4].

Research on case management of cholera led to the development of rehydration therapy for dehydrating diarrhea in general, including the proper use of intravenous and oral rehydration solutions [1].

Cholera is one of the oldest diseases affecting humans. It is caused by the gram-negative bacteria *Vibrio cholera*. Six pandemics occurred between 1817 and 1923, which started from the Ganges delta and were caused by *Vibrio cholera* O1, Classical biotype. The ongoing 7th pandemic is caused by *Vibrio cholera* O1, El Tor biotype, which started in Indonesia in 1961, reached the Indian subcontinent in 1966 and then spread to the Middle East. It reached Africa in 1970 and extended rapidly throughout the continent, creating new endemic zones that had not seen cholera for over a century [5].

Cholera has spread from the Indian subcontinent where it is endemic to involve nearly the whole world seven times during the past 185 years [6]. *V. cholera* sero-group O1, biotype El Tor, has moved from Asia to cause pandemic disease in Africa and South America during the past 35 years[2]. A new sero group, O139, appeared in south Asia in 1992, has become endemic there, and threatens to start the next pandemic [7].

There are 69 cholera endemic countries globally .Approximately 1.3 billion people are at risk for cholera in endemic countries. An estimated 2.86 million cholera cases occur annually in endemic countries. Among these cases, there are an estimated 95,000 deaths. Sub-Saharan Africa accounts for the majority of this burden. According to updated global burden of cholera estimate 2015 in Ethiopia 68,805,272 populations are at risk of cholera with incidence rate of 4 per 1000 population & case fatality of 3.8% estimated annual number of cases 275,221 [8] .

In Ethiopia since July 2008 to June 2009 there were a total of 9,485 cases and 193 deaths (with case-fatality rate 2.0%) of acute watery diarrhea in six regions including Addis Ababa[9].

The study conducted on outbreak investigation in Afar region of Ethiopia in 2009 by Bahirdar university of EFETP resident, Hand washing after latrine usage was protective of illness (crude OR = 0.13, p= 0.03), access to latrine (unsanitary latrine) [OR = 10.5, P-value= 0.001], contact with a case (OR = 200, P-value= 0.001) and visiting a place which has similar illness (OR=33.6, P=0.001) had shown statistically significant association with being a case. Whereas, shortage of water supply (OR=1.9, CI=.05-6.25, P=0.21), washing hands with soap/detergent before having meal and preparing food (OR=0.65, CI= 0.05-7.74, P=0.61) and eating /drinking in another's home in a week before your illness (OR=0.48, CI= 0.09-2.41, P= 0.3) could show statistically significant association [9].

A matched case control study design conducted at Raya kobo district Amhara region of Ethiopia to investigate AWD outbreak in 2016 by Mekelle university school of public health,EFELTP residents show that ten cases and zero deaths were registered during August 20 to September 1, 2016 in the two town Kebeles and one rural kebele with an Attack Rate (AR) of 86, 23 and 33 per 100,000 populations in town kebeles of 02, 04 and Arefa rural kebele respectively. Among cases, 6 (60%) were males and four (30%) were in the age category of 21-25 years old which also the median interval age. hand washing with soap [OR=0.78, 95%CI (0.14, 0.81), P=0.04] and cleanliness around home [OR=0.10, 95%CI (0.01, 0.87), P=0.01] were among protective factors [10].

2.1 Objectives

2.1.1 General objective

To investigate cholera outbreak in kurfa chelae woreda, Eastern Harergee, Ethiopia, 5th September and 9th October 2017

2.1.2 Specific objectives

1. To establish existence of the outbreak
2. To describe the epidemic by time, place and person
3. To identify the risk factors associated with transmission of cholera.
4. To provide immediate recommendations for interventions on the control of the outbreak

3 .Methods and Materials

3.1 Investigation Team Members

Mr Daniel Yohannes	Resident (AAU, FELTP)	principal investigator
Mr Afework Melese	Resident (AAU, FELTP)	Co-investigator

Mr Bekele Desu

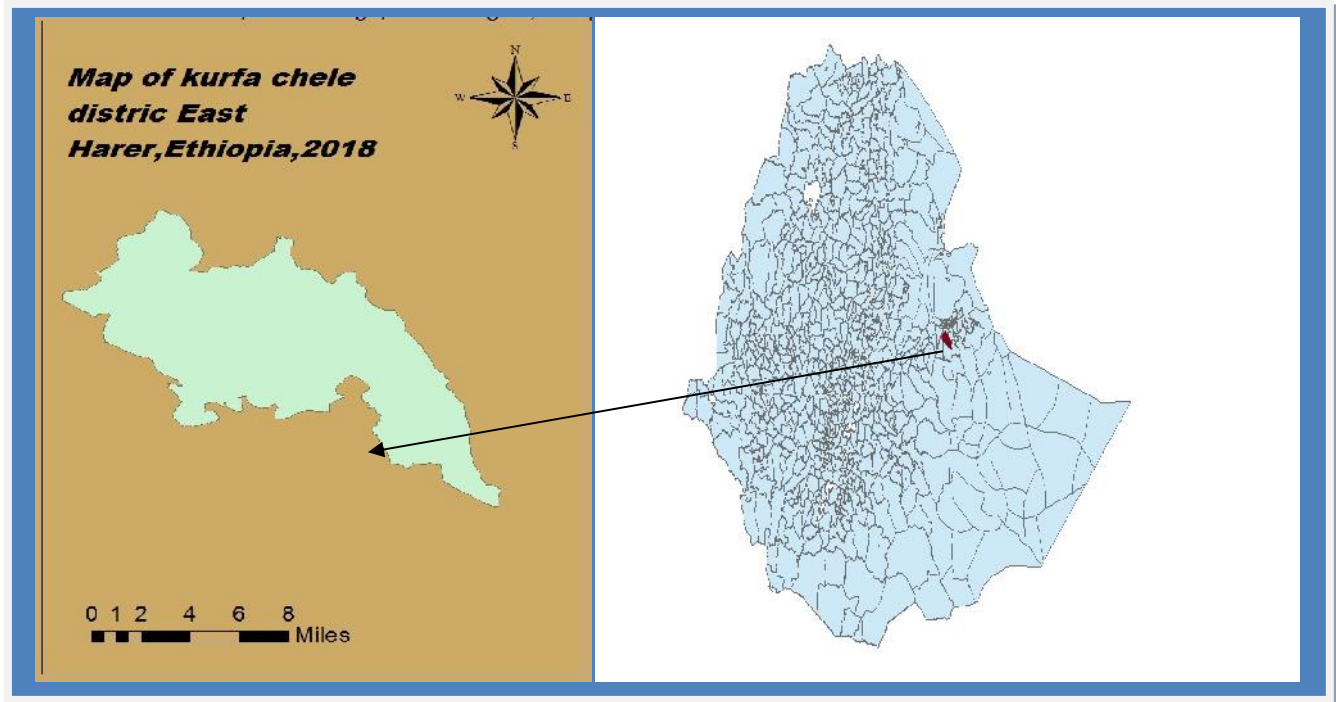
District PHEM officer

Mr Moges Getachew

Laboratory technician Local language translator /Interviewer

3.2 AWD outbreak investigation area : The study were conducted in 7 Kebeles of kurfa chelae district Afren kelo, Hula Janata ,Rasa Janata ,Darma Sheek ,Alam Pron, Dire Gudina and Goro garbi Kebeles ,which is located to the eastern part of harer 57 km from harer city. The district bordered by Harromaya district from the north Grawa district from south, Qarssa district from west and Fadis district from east. The total area of the selected district was 30,177 KM² .From the total area of the district 36% are high land, and 51% is low land, with a population of 79,712. Out of the total population, the proportion of male and female is 48% and 52% respectively. From the total population 70,630 were living in rural Kebeles and 9,082 live in urban setting. The study area comprises 4 health centers and 18 health posts. Four Cholera Treatment Centers (CTC) established at four health centers.

Figure 1, AWD outbreak investigation area.



3.3 Case Definition (Ethiopian PHEM guide line)

3.3.1 Suspected case

A case of cholera should be suspected when: In an area where the disease is not known to be present, a patient aged 5 years or more develops severe dehydration or dies from acute watery diarrhea. But Kurfa chelae was an area where cholera epidemic therefore we define a

suspected case definition , a patient lived at kurfa chelae district, aged 5 years or more develops acute watery diarrhea, with or without vomiting, after September 5, 2017. At the health post and at community levels, a suspected cholera case can be defined as follows; a person 5 years of age or more with profuse acute watery diarrhea and vomiting.

3.3.2 Confirmed case

A suspected case in which *Vibrio cholerae* O1 or O139 isolated from their stool.

3.3.3 Epidemiologically linked case

A suspected AWD case that has not had a specimen taken for confirmation and is linked (in place, person and time) to a laboratory confirmed case

3.4. Investigation Period

The investigations were done between 5th September and 9th October 2017 by a team from EFELTP and Kurfa chelae woreda health office.

3.5 Study Design

We conducted descriptive and unmatched case-control study was done from 5th September and 9th October 2017.

3.6 Source population

All residents of kurfa Chelae districts population projected.

3.7 Study population

Residents of kurfa chelae district greater than five years old.

3.8 Sample size determination

We used Epiinfo version 7.3, to determine the sample size of unmatched case and controls with Fleiss w/CC, two-side confidence level 95%, power 80%, ratio of controls to cases 2, percent of controls exposed 40% and Odds ratio of 4. And we found the sample size of 31 cases and 62 controls. Therefore a total of 93 study participants were taken to investigate the outbreak.

3.9 Sampling techniques

A total of 31 cases and 62 unmatched controls were enrolled into the study, case and control are living within the kurfa chelae district. The study was both descriptive and an un-matched community-based 1: 2 case control study. Cases were all persons with cholera and controls

were persons without cholera and living in the same Kebele of the case and randomly selected community controls from the same neighborhood where the cases live.

3.10 Inclusion criteria

The participants of the cases included all persons living in kurfa chelae district with confirmed Cholera or had epidemiological linkage with confirmed cholera cases detected during the outbreak and randomly selected community controls from the same neighborhood where the case live.

3.11 Exclusion criteria

Persons greater than 5 years old and not resident in kurfa chelae district but treated at kurfa chelae district CTC and reported by their own districts, AWD cases registered before September 2017 of the recent outbreak.

3.12 Data collection procedure

Standardized questionnaires, written in English, were administered to cases and controls in their native tongue by bilingual/English and Oromo language trained interviewers from the district health office staffs. Data on demographic information and potential risk factors including food, water, sanitation, and hygiene practices were collected through a standardized questionnaire. These questionnaires collected basic demographic information and contained questions pertaining to potential food and water exposures and hygiene practices from 5th September 2017 to the interview date. Furthermore, data were also collected on date of arrival to the CTC on or after September 2017 considered to be recent arrivals. The questionnaire included an observational component involving interviewer assessment of water, latrine, sanitation, and hygiene

Case finding was done from PHEM line list of cholera cases derived from inpatient information provided by patients evaluated at four different health center in the districts (kulifa health center, Dawi health center, Dire gudina health center and Waqe jira health center). These records captured the name, sex, age, date of admission, and general location of residence within the districts for all cases.

The EFELTP residents and Kurfa chelae district PHEM officer developed a protocol and data collection instruments by customizing the standard PHEM questioner. Questionnaires were pre-tested in other district at Kombolicha health center cholera Treatment Center of Kombolicha district.

3.13 Data analysis procedure

Data were entered into Epi Info software version 7.3. Continuous variables like age were first transformed into categorical variable before they were analyzed then we recoded the alphabetical data's into numerical data, Descriptive statistics was used to describe the study variables. Frequencies of all variables in the questionnaire were determined. Variables with p-values less than 0.25 during bivariable analysis were entered into multivariate logistic regression model to control for all possible confounders and identify factors associated with the current cholera outbreak. Odds ratio along with 95% CI were estimated to measure the strength of the association between the dependent variables and independent variables. Level of statistical significance was declared at p-value equal to 0.05. Odds ratios (ORs) for bivariable analysis were calculated, the bivariable analysis served as a screening phase for variables to be included in a multivariate model; all exposure variables were included in the initial multivariate model if their associated P value under bivariable analysis a backward elimination procedure was used where variables that were least significant systematically dropped.

3.14 Data quality control

Secondary data was compiled manually using a new line list from the log book and line lists of the health facilities and district health offices. Then all data transcribed electronically to Excel file and checked for quality by double entry.

3.15 Ethical consideration

Before going to the field was got an ethical clearance from federal ministry of health and Oromiya regional health biro. The questionnaire was administered by local bilingual trained health workers after obtaining informed consent of the respondent. In circumstances for which a child was a case or control, questions were asked to a proxy adult within the compound who knew the child, preferably a parent if present.

3.16 Dissemination of finding

Every investigation finding was reported to district health office by describing the magnitude, attack rate, fatality rate, the frequency of cases in terms of time place and person until the analysis is done.

4 RESULTS

4.1 Descriptive Epidemiology

4.1.1 Outbreak Evolution

The recent AWD outbreak at kurfa chelae district started 5th September 2017 last until 9th October 2017. The first AWD cases were reported from Dawi health center on 9/5/2017, a 40 years female merchant comes from Rasa Janata kebele and she had a traveled history to somali region, during travel she eat partially cooked meat at restaurant, unboiled milk, nut and fruit from straight food venders during travel .The second case reported from Dawi health center after 22 days (9/27/2017) to kurfa chelae health office is a 50 years male farmer comes from Hula Janata Kebele no travel history but he visited a neighbor who had diarrhea come from Bedeno district before four days. The samples taken from patients were investigated by RDT and positive for *Vibrio cholerae*. For confirmation test additional 10 samples were sent to Oromiya regional laboratory 9/30/2017. The culture test confirmed that out of 10 samples four samples were positive, three cases from Rasa Janata and one case from Hula Janata They survived the infection after being managed with Intravenous infusions (IV) such as ringer lactate and ORS, and Doxycycline antibiotic.

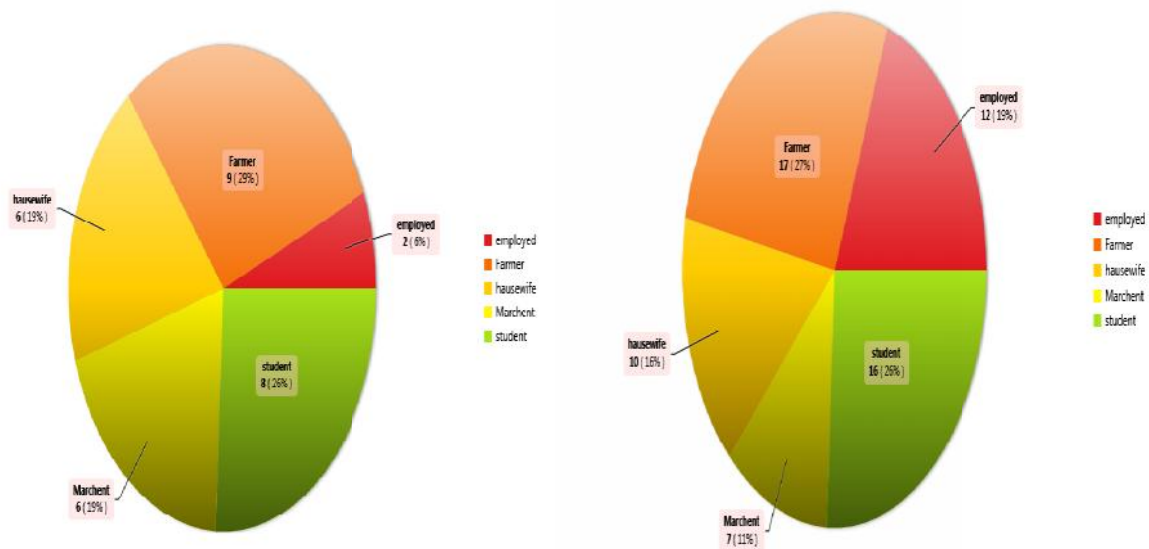


Figure 2. Distribution of cases(31) and controls (62) by occupation in seven Kebeles of kurfa chelae district, 2017

4.1.2 Magnitude of Outbreak

The outbreak is spread within 7 Kebeles among 13 Kebeles of kurfa chelae district. A total of 31 confirmed and epidemiologically linked cases with no deaths (CFR=0%) were reported between 5th September and 9th October 2017. The overall attack rate was approximately 11 per 10,000 populations with sex specific attack rates of 12.6 and 9.87 per 10,000 populations for males and females respectively. The most affected Kebeles were Goro Garbi with an attack rate of 26 per 10,000, Afran Kelo and H/Janata with an attack rate of 16 per 10,000

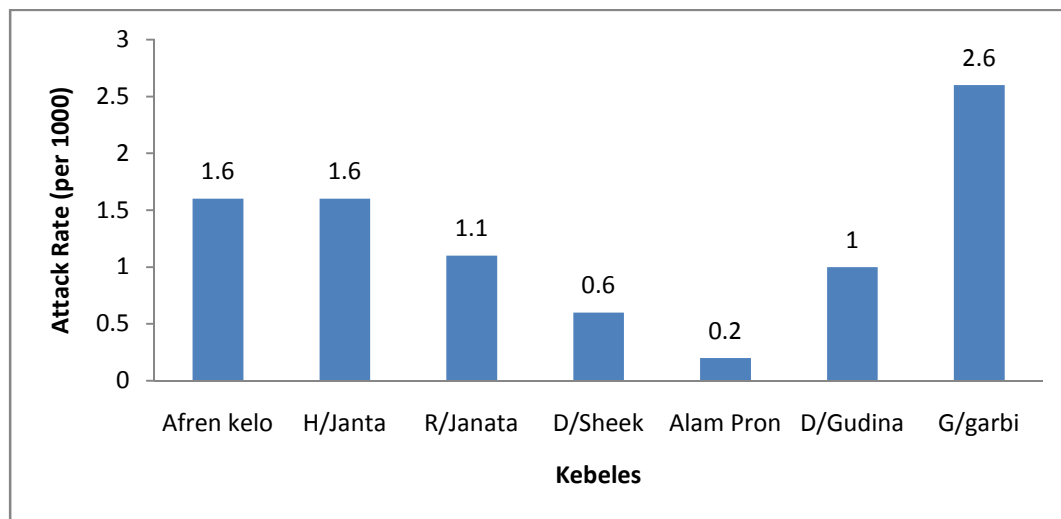


Figure 3 : Attack Rate of Cholera By districts during outbreak, kurfa chelae district, east Harer, Ethiopia, August -October 2017.

4.1.3 Age Sex Distribution of Cases

The affected ages ranged from 8 years to 67 years with a median of 28 years, mean age of 31 years and standard deviation of 17 years. The age group 20 - 29 years was the most affected; 8 (25%). The least (6.5%) affected age group was 40-49 years and above.

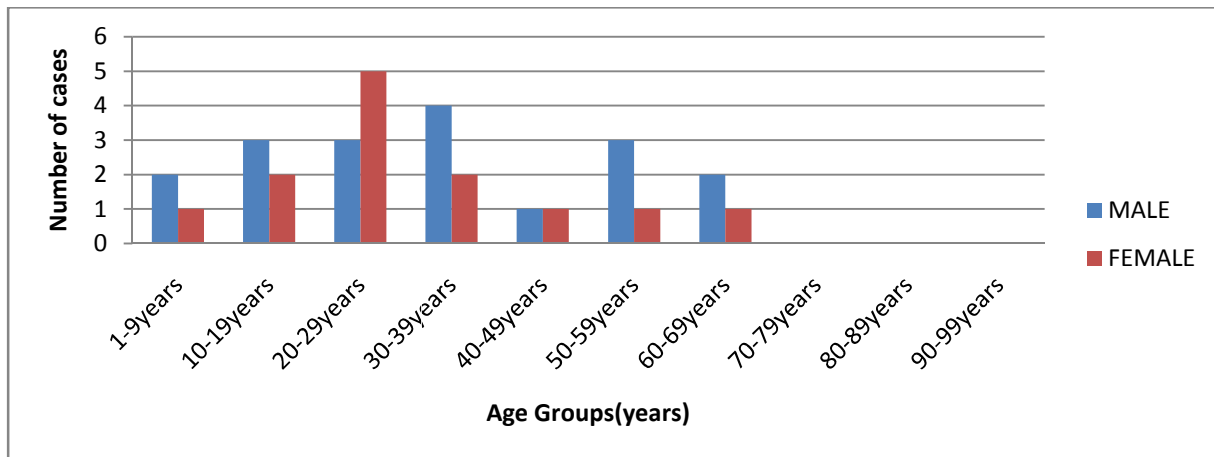


Figure 4. Distribution of cholera cases by Age and sex, kurfa chelae district, east Harer, Ethiopia, October 2017.

4.1.4 Distribution of AWD cases by time

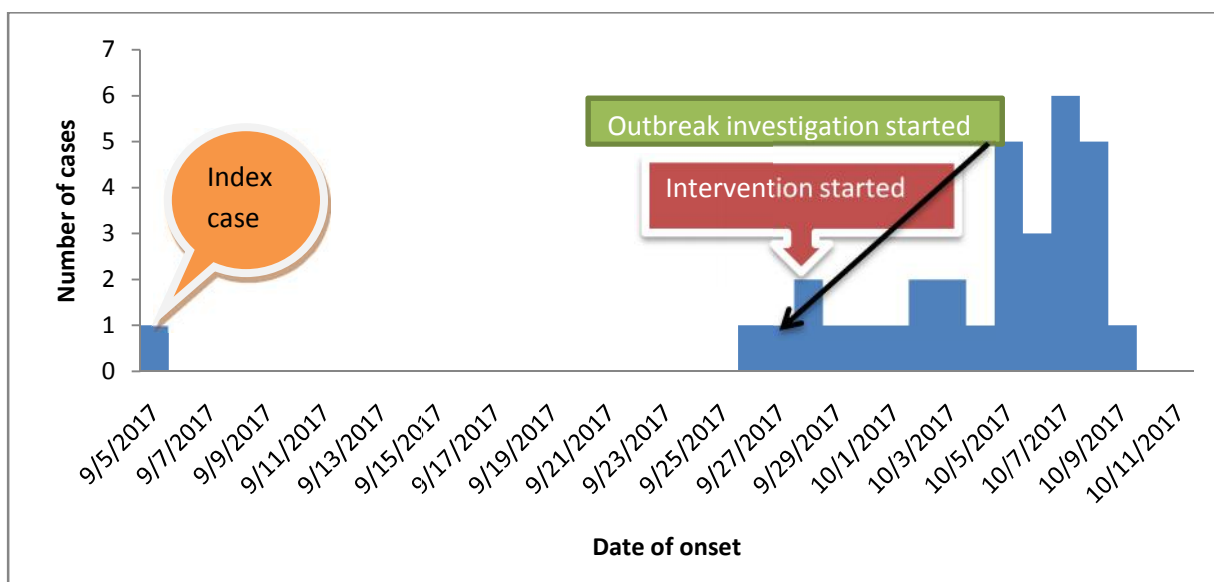


Figure 5. AWD cases by date of onset kurfa chelae district, East Harer, Ethiopia, October 2017

4.1.5 Distribution of cholera cases by place

The majority of cases were clustering in the Goro Garbi kebele 8(28.5%). Of the 31 cholera cases analyzed in the region, 19.4% were from Dire Gudina, 16% from H/janata kebele, (12%)were at Afran kelo and (9.8%) at D/sheek Kebele ,the least case reported at Alam prom(3%).

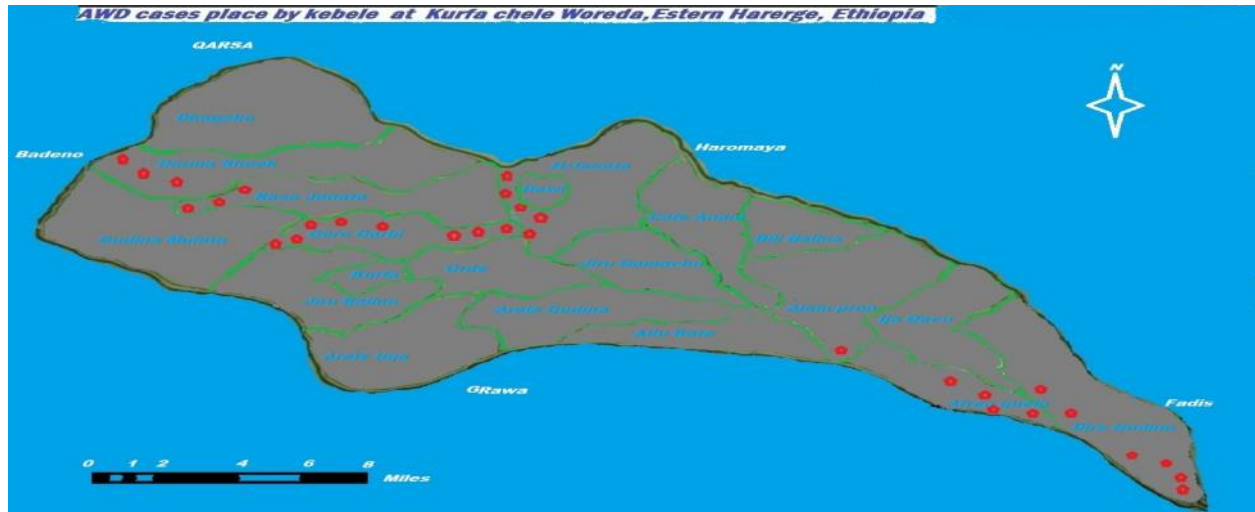


Figure 6: Distribution of Cholera cases by Kebeles, kurfa chelae district, East Harer, Ethiopia, September-October 2017

4.2 Outbreak response by descriptive epidemiology

In response to the outbreak, from 5th September and 9th October 2017 , before Addis Ababa university field epidemiology and laboratory training program residents arrived, the kurfa chelae district health office already started several interventions by taking experience from previous outbreak , including establishing a cholera treatment centers in four health centers (Kulifa health center, Dawi health center, dire Gudina health center and Waqe jira health center) and an interagency cholera taskforce to coordinate response efforts, active case finding by community outreach workers, increasing community health education and cholera awareness campaigns were taking place in 18 Kebeles of the kurfa chelae district, distributing water treatment products, increasing temporary latrine construction, and distributing prophylactic antibiotics to close contacts of cholera cases, After we arrived in affected district ,We participated in RRT ,we displayed posters on cars as a prevention messages during field investigation. We upload the IDSR data base and soft copies of AWD line list in Microsoft Excel to kurfa chelae district PHEM computer and because they use a hard copies. We give training for PHEM officer how to use the application. To enhancing cholera surveillance (including daily AWD zero report) and treatment capacity at existing health facilities we used checklist to assess the level of epidemic preparedness and response of kurfa chelae district.

Until we were doing the analysis of the study, we did a daily descriptive study of the outbreak. we inform the finding regularly for district health office to teach their community segments on safe water and food hygiene practices during travel to other Districts affected by AWD.

4.3 Environmental investigation

During the environmental assessment, among visited latrines (n=31) 27 (86%) latrines had no hand washing facilities nearest to the latrine at all; they wash their hands in the home. The communal latrines were on poor sanitation condition, Majority of household's source of drinking water were communal tap water, Hand dug water and highland waters imported from Diredawa city, lack of safe and clean water supply both in quality and quantity complained by the residents of kurfa chelae district as well east Harerge.

4.4 Surveillance System

4.4.1 Case detection and reporting

Standard case definition for cholera and diarrhea diseases were observed at 4 four health center but not at health post visited. Although there was weekly reporting to the district and zone, weekly trend analysis of diarrhea cases was not done routinely at all the facilities to detect outbreaks early. Clinician sensitizations were done during outbreak. Line list of the cases were observed and spot maps not seen at all facilities.

4.4.2. Hypothesis for why the outbreak occurred

The finding from line list, medical record from patient card, information gathered from In patient Nursing assessment , from health extension professionals and from descriptive epidemiology results show that a high proportion of the cases ate food and drank water from street vendors which was most likely to have been contaminated and have a travel history to the areas of AWD outbreak , therefore we hypothesized that the outbreak in the kurfa chelae district could be associated with, Eating food from street food vendors , travel history to other AWD outbreak areas, visiting anyone having diarrhea , Poor personal hygiene practices like washing hands with soup after using toilet and every time before and after meal, Attending social gatherings like funerals. This hypothesis was tested with analytic study (case-control study) to establish the actual risk factors associated with the Outbreak.

4.5 Analytical Epidemiology

Table 1 Bivariable analysis of potential exposures, Acute Watery Diarrhea (cholera) outbreaks in kurfa chelae district, East Harer, Ethiopia, September- October 2017.

Potential Exposures	Cases	Control	OR	95%CI	P-Value
Treating water before drinking	20/31(32.26%)	21/62(67.74%)	0.22689	0.0902-0.5703	0.0012
Consuming from private farm	22/31(35.48%)	20/62(64.52%)	0.3025	0.1229-0.7448	0.008
Wash hand before and after eating	3/31(4.84%)	14/62(45.16%)	0.0617	0.0159-0.2402	0.00002
Private latrine	33/31(53.23%)	24/26(77.42%)	0.33	0.1247-0.8831	0.024
Visiting someone having diarrhea	57/31(91.94%)	22/62(70.97%)	4.66	1.4063-15.4656	0.008
Using from street food vender	59/31(95.16%)	17/62(54.84%)	16.1961	4.1624-63.0201	0.00002
Travel to AWD declared area	53/31(85.48%)	18/62(58.06%)	4.25	1.5582-11.6088	0.0033
Eating fruits and vegetables	28/31(45.16%)	7/62(22.58%)	2.8235	1.0604-7.5180	0.0341
Burn	21/31(33.87%)	2/62(6.45%)	7.4268	1.6140-34.1752	0.0038
Open pit	34/31(54.84%)	28/62(90.32%)	0.1301	0.0358-0.4733	0.0006

Finally, we did a multivariate analysis of logistic regression. Statistically Significant exposures and wash your hands with soap before eating regularly (OR = 0.0441, p= 0.0258), and treating water before drinking (crude OR = 0.0984, p= 0.0137), were protective of illness. Consuming food by buying Street food vendors (OR =65.7, p= 0.0107), visiting anyone having diarrhea (OR = 32.97, p= 0.0098), are a significant association with AWD outbreak, other variables are not show association with the occurrence of AWD outbreak.

5. Discussion

This study sought to establish risk factors for contracting acute watery diarrhea among greater than five years old east Harerge. Interventions by the federal ministry of health and Oromiya regional health biro assisted by different partners, in putting in place cholera treatment centers in affected Kebeles yielded useful results to control the outbreak.

In this outbreak the overall case fatality rate was lower than 3.8% of WHO estimation and updated global burden of cholera estimate 2015 in Ethiopia. A matched case control study at Raya kobo district Amhara region show that a similar result of this outbreak investigation with no deaths, male are more affected than female and a median interval age of 21-25 years old. Washing hands with soap after using latrine and before and after eating food is statically significant association as protective factor.

The epidemic curve is typical of a propagated outbreak, highly suggestive of person-to person transmission. The multiple peaks, 2 to 5 days apart, suggest the incubation period of the causative organisms to be within 5 days. The causative organisms that were isolated, *Vibrio cholerae* fit into the average incubation period of 2 to 5 days [7].

The other study conducted on outbreak investigation in Afar region also show that a similar results the current outbreak at kurfa chelae district, hand washing after latrine usage was a protective factor.

The cholera outbreak ended in 10/9/2017. It is difficult to point out the main reason for its termination but the security problem may restrict the people to move to Ethiopian Somali the current cholera outbreak declared region, individuals improved water and sanitation by treating water for domestic use and dissemination of cholera preventive messages in local Oromo languages might have contributed to its decline

6. Challenges during intervention and limitation of the study

We lost too much time to trace cases to their respective homes to identify immediate contact because of poor traceable address systems. We did a rapid out break investigation because of a serious ethnic conflict in the area; this made a difficulty to undertake a matched case-control study and to search further environmental assessment.

7. Conclusion

The outbreak is occurred in seven Kebeles among 18 Kebeles of the district. *Vibrio cholera* O1 sero type was isolated organism from all Kebeles causing the outbreak. The disease affected farmers, housewives, students, merchants and professional employers but highly affected occupation were farmers and students. The communal latrines were un sanitation. Unclean and unsafe water supply, complained by the residents. Weekly trend analysis of diarrhea cases was not done and spot maps not seen at all facilities. Consuming food from street food venders (fruits and un processed nut) and visiting a person who have diarrhea within five days are a possible associated risk factors identified for the current out breaks. The epidemic curve and the possible associated risk factors show that a propagated type of outbreak and person to person transmit ion of *Vibrio cholerae* by contaminations.

8. Recommendation

Weekly trained analysis of AWD cases shall do by district PHEM officers for early detection and response to the outbreak. Registering all personal demographic data's during registering and reporting the case can improve the tracing mechanisms. To improve the water supply in both quality and quantity, it needs multi sectarian collaboration and regional administration efforts.

The investigation results show that there is a gap on personal hygiene, environmental hygiene, and food hygiene, there for health education for each community segments on hygiene and sanitation with health extension workers and other stakeholders may bring a behavioral change towards hygiene and sanitation.



Figure 7: pictures during field investigation.

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Chapter II: OUTBREAK INVESTIGATION

2.1 Assessment of human contacts with rabies confirmed and suspected dogs at district3, Gulele sub city, Addis Ababa, from 10th July 2017 to 17th July 2017

Abstract

Background: Rabies is 100% fatal disease for both dogs and humans also it is one of the immediately reportable diseases by both sectors ministry of health and agriculture and fishery. The main goal in this disease outbreak is to control the spread of the disease among rabid dogs and human exposed that is bitten by suspect rabid dogs therefore rapid identifying of people potentially exposed to rabies virus help to provide appropriate advice and prophylaxis at the right time before they develop a disease.

Methods: The investigation was done at District3 of Gulele sub-city Addis Ababa Ethiopia from 10th July 2017 to 17th July 2017 by a team from AAU field epidemiology resident, Gulele sub city agriculture and fishery veterinary clinic and woreda 3 health offices. The report describes the investigation, findings and response of a rabies outbreak. The investigation cover all Households having human exposed to rabies confirmed and suspected dogs. We define human exposed, a person who has close contact (usually a bite or scratch) with a laboratory confirmed rabid animal. Data collected by structure questionnaires designed and descriptive data analysis is done by using Epiinfo7.3.

Results: we found one lab confirmed, one epidemiological linked dog and four suspected dogs. Seven humans exposures and among them 6 (85.71%) of human exposures taken post exposure prophylaxis. Human exposure rate of the outbreak is 0.00013% (13/100,000 population) with a minimum age of 16 years old and a maximum age of 76 years old, median age of 30 years and 71.43% of human exposures are bitten by unvaccinated dogs, they do not wash the wound with water and soap and have a penetrated type of wound.

Conclusions: From the outbreak investigation result rabies is prevalent in the area. There are unvaccinated dogs in HH and on street of the district. They have also a strong traditional medicine and religious beliefs against post exposure treatment in the community, most of humans exposed they don't use washing the wound with water and soap as first aid. Many of human exposures bite distal from the brain and penetrated type of wound.

Recommendation: Strengthening rabies surveillance for immediate response to take interventional measures until the local dogs are declared free from rabies by veterinary authorities.

Key words: Rabies, Human exposure, Post exposure prophylaxis

Introduction

Human rabies is almost always fatal. Rabies is an acute encephalitis illness caused by rabies virus in the genus, *Lyssavirus* and family, *Rhabdoviridae*. The virus affects almost all mammals and results in death once clinical signs are manifested [1].

Rabies is a disease of brain causing encephalitis, almost inevitably fatal zoonosis disease. It has worldwide distribution. Humans and nearly all mammals are susceptible. Beside poliomyelitis and pox, rabies is one of the longest known infectious diseases in human history. Rabies virus infection most commonly occurs when a rabid animal bites an animal or a person [2].

Rabies is mainly a disease of animals. Humans get rabies when they are bitten by infected animals. At first there might not be any symptoms. But weeks, or even months after a bite, rabies can cause pain, fatigue, headaches, fever, and irritability. These are followed by seizures, hallucinations, and paralysis. [1].

Dogs are the principal reservoir of rabies virus in developing countries and are responsible for 99% of human infections [3]. The incubation period for rabies virus infection is usually 3-8 weeks, rarely as short as a few Days or as long as several years. The length of the incubation period depends on many factors including wound severity, wound location in relation to nerve supply, proximity to the brain, size of inoculum of virus and the degree of protection provided by clothing and other host factors[2].infection had likely incubation periods of approximately 4 weeks and may extend over 2 years,[4].

The main goal in any disease outbreak is to control the spread of the disease among rabid dogs and human exposed that is bitten by suspect rabid dogs, rabies is preventable, and effective control measures are available, the number of deaths is still high and an estimated 59,000 people die from rabies each year in the world, with Asia and sub-Saharan Africa accounting for more than 95% of these deaths [5].

Almost half of cases occur in children under the age of 15 years and more than 3.3 billion people are at risk of infection by the rabies virus [6]. In Ethiopia, the first and only recorded rabies epidemic was in 1903 in Addis Ababa [7]. Rabies is endemic in Ethiopia as well and an estimated 2,700 people die each year, which is one of the highest rates in the world [8]. 1.6rabiesdeaths/100,000population[9].Annual human rabies incidence of 2.33cases per100,000[10].

To rapid identifying of people potentially exposed to rabies virus and to provide appropriate advice and prophylaxis at Gulele sub city district3 Addis Ababa, the district health office start the outbreak investigation by tracing the human contact with suspected and confirmed rabid

dog within 36 hour for post exposure prophylaxis. AAU field epidemiology resident participate as a principal investigator of the outbreak.

2.1 Objective

2.1.1 General objective

Assessment of rabies suspecting dogs and tracing human contacts with rabies at district3, Gulele sub city, Addis Ababa, 5th July2017 and 10th July 2017

2.1.2 Specific objective

To trace rabies suspected dogs from the outbreak areas for euthanizing.

To trace persons having exposure to rabies proven or suspect dogs for post exposure prophylaxis and treatment.

To recommend the immunization campaign, for dog population in the area.

3. Methods and materials

3.1 Investigation area

The investigation was done in District3 of Gulele sub-city Addis Ababa Ethiopia, which is located to the northern part of Addis Ababa. The district bordered by district 1 from the north district4 from south, district5 from west and Yeka sub city from east. The total area of the district was 92 hectares . Out of the total population, the proportion of male and female is 48% and 52% respectively. The total populations 53679 were urban setting, at present according to city government of Addis Ababa urban planning and information institute the district is divided in to 4 sub woreda, 9 sefer and 35 blocks. The place where rabies suspected dogs reported at ketena4 sefer1 block2. According to district 3 heath offices the ketena4 have a population of 5600 and 1400 household and sub divided in to four sefer of each 350 households [11].

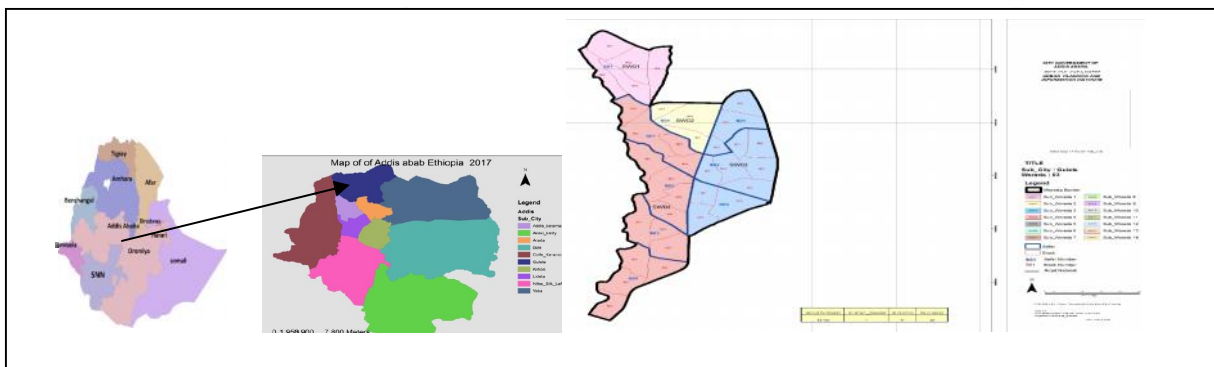


Figure 8 Maps of the investigating area of Ethiopia, Addis Ababa, Gulele sub-city, district 3

3.2 Investigation Period

The investigations were done between 10th July 2017 and 17th July 2017 by a team from EFELTP and woreda 3 health offices.

3.3 Study design

The case report describes the investigation, findings and response of a rabies outbreak in, District 3, Gulele sub-city, Addis Ababa, Ethiopia 2017

3.4 Source population

All residents of district 3 population projected from previous census.

3.5 Study population

All Household having human exposed to rabies confirmed and suspected dogs, district 3 Gulele sub city

3.6 Exclusion and inclusion criteria

3.6.1. Exclusion criteria

Household's members whose have a history of dog bite out of the district.

None exposed individuals of the district.

3.6.2 Inclusion criteria

Residents who had been a dog bit within district 3, 10th July 2017 to 17th July 2017.

3.7 case definition

3.7.1 Clinical case definition: a person presenting with an acute neurological syndrome (encephalitis) dominated by forms of hyperactivity (furious rabies) or paralytic syndromes (dumb rabies) progressing towards coma and death, usually by respiratory failure, within 7-10 days after the first symptom if no intensive care is instituted.

3.7.2 Laboratory criteria

One or more of the following:

Detection of rabies viral antigens by direct fluorescent antibody test (FAT) or by ELISA in clinical specimens, preferably brain tissue (collected post mortem). FAT positive after inoculation of brain tissue, saliva or CSF in cell culture Detectable rabies-neutralizing antibody titer in the serum or the CSF of an unvaccinated person. Detection of viral nucleic acids by PCR on tissue collected post mortem specimen (brain tissue or skin, cornea, urine or saliva).

3.7.3 Case classification (humans)

Human rabies

Suspected: A case that is compatible with the clinical case definition[12].

Probable: A suspected case plus history of contact with a suspected rabid animal [12]

Confirmed: A suspected case that is laboratory confirmed [12].

3.7.4 Human exposure to rabies

Possible exposure: A person who had close contact (usually a bite or scratch) with a rabies-susceptible animal in a rabies-infected area [13].

Probable exposure: A person who had close contact (usually a bite or scratch) with an animal displaying clinical signs consistent with rabies at time of the exposure, or within 10 days following exposure in a rabies-infected area [13]

Human Exposed: A person who has close contact (usually a bite or scratch) with a laboratory confirmed rabid animal 10th July 2017 to 17th July 2017 [13].

3.8 Data collection procedure

A structure questionnaire adapt from different literatures with a face-to-face interview will administer to all the participants and fill in by the data collectors during the interaction. We used owner of rabid dog and local association leader (youth edir) to found the address of the contact persons with rabid dog. We used the smallest cluster of the district called blocks. We marked the initial HH then we continue to the next HH. If don't found the owner of the HH we leave by marking the HH and back for the second visit.

3.9 Data analysis

The data collection tools designed, data entry and descriptive data analysis was done with Epi Info 7.3. Descriptive statistics was used to describe the study variables in terms of time, place and persons. Frequencies of all variables in the questionnaire were determined.

3.10 Data quality assurance

The questionnaire was adapted and modified into our context from previous different literatures and guidelines, to measure appropriateness and understandability of questionnaires, pretest was done in other block we checked the questionnaires at the end of the day of data collection, for consistency, completeness, clarity and a data double entry was also done.

3.14 Dissemination of finding

The study result will be present to Addis Ababa University for partial fulfillment of masters degree after open defense and a copy will be given to all concerned health offices specially district 3 health office and Gulele sub-city veterinary authorities, to Addis Ababa public health research and emergency management core process. Further attempt will be made to publish on national and international scientific journals.

3.15 Ethics Statement

We get an ethical clearance to investigate the outbreak from district 3 health office. After verbal informed consent was obtained from human exposed to rabid dog, they taken through a structured questionnaire and a participant bitten with rabid dog was receive counseling, and referred to health facilities for follow-up and to Ethiopian public health institution for anti rabies vaccination.

4. History of rabies outbreaks of human exposure in terms of person, time, place

The first bitten persons were a 19 years old women and 43 years old man from ketena4sefer1block2of 709HH. The dog showed abnormal signs such as barking and bitten the these two people at 7/10/2017 with same HH.

A 16 years old boy bitten by other dog neighbor of the first dog at 708HH, on 7/11/2017 the dog was out from the fence of the HH and it fight with other stray dogs of the village, peoples in the village was chasing the dogs by spraying water.

As Soon as AAU field epidemiology residents hear about the outbreak informally from the community, we contact the district3 health office. The head of district 3 health office receive the question of AAU field epidemiology resident to investigate the human exposure in the district. AAU field epidemiology resident with District PHEM officer, local leader, the two suspected dog owners and one veterinary trained officer from Gullele sub city veterinary clinic start the investigation at 7/11/2017 in the morning.

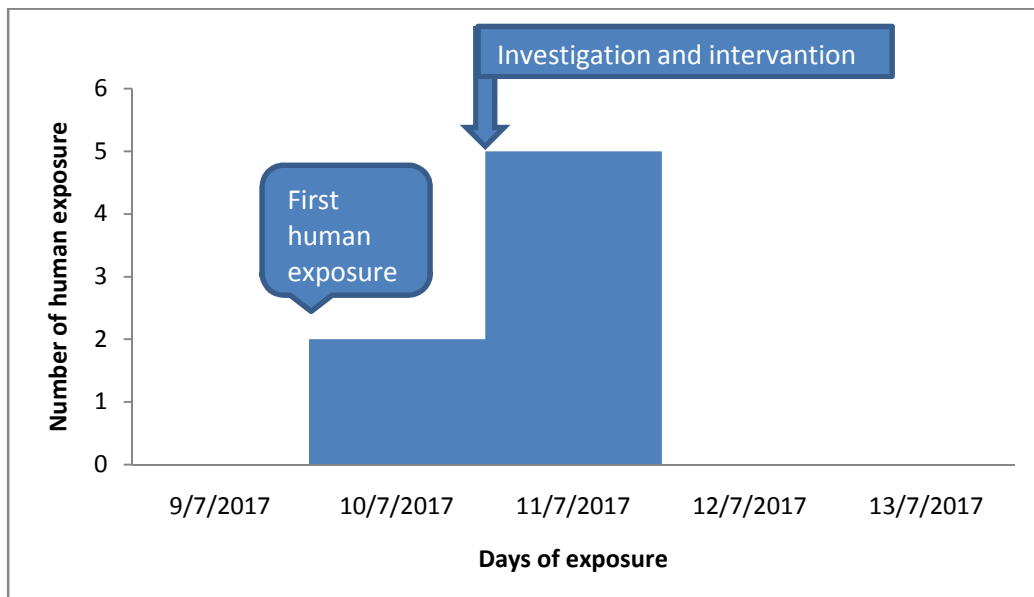


Figure 9 Human exposures to rabid dogs by time, district3, Gullele sub city, Addis Ababa, Ethiopia July 2017

The second suspected dog from 708HH was very agitated and try to bitten any one without provoked, it was difficult to catch by veterinarian officer because of the heavy rain and it was outside of the fence. In 7/11/17 night additionally a 76 years old woman bitten by 708 HH dog inside their fence. Three peoples were also bitten by other stray dog when they were passing in the village.

After the result of the confirmed rabies case in dog population the team start tracing all human exposed to rabies confirmed and suspected dogs finally we traced seven human exposed. One human exposed from sub district 1sefer1 block3, four human exposures from sub district4sefer1block1and2, and the other two from district5, at the same time we discus to 708HH owner of epidemiological linked dog from rabies confirmed dog for euthanizing and killed by the veterinary officer and the sample sent to EPHI for laboratory investigation. Additional three stray dogs which were biting each other euthanizing by the community.

Species	Number exposed	Number died	Killed for investigation	Euthanized	Killed by the community
Human	7				
Dogs	6	1	1	1	3

Table 2; Distribution of rabies virus exposure cases with species

We got a probable case of rabies dog 723HH during tracing the dog was hold and tie by its owner before four days because it try to bitten the owner of the dog, as he told us the dog develop a new behavior, barking on every family of HH, stop drinking water and hiding itself when they opened pip water and he die on 7/17/2017.

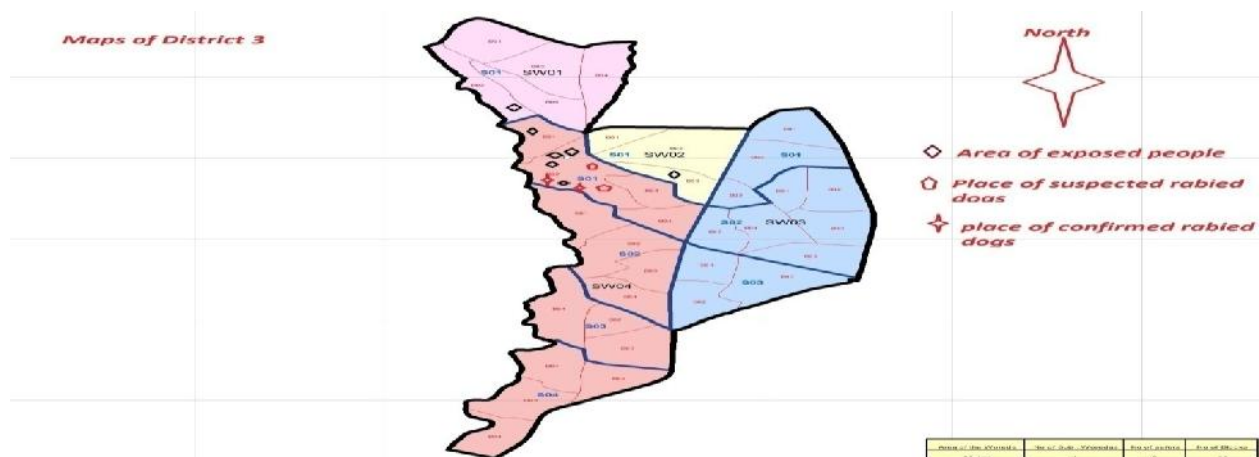


Figure 10; distribution of rabies suspected cases and human exposure in place distric3, Gulele sub city, Addis Ababa, Ethiopia.2017.

AAU field epidemiology resident and district3 PHEM officer did a 10 minute discussion for awareness creation on rabies from each seven human exposure in their home during tracing. Among seven six of them were started health care to the nearest district5health center

A 43 years old man living at 709HH by house renting was not volunteer to seek a medical care and vaccination due to religious reason, as he told as he had no a health care seeking experience before because he forbidden by traditional doctors but he used a traditional medicine and holy water for any kind of health and health related condition. He was bitten by a confirmed rabid dog at his right hand thumb and he treated by traditional medicine and religious practice.

4.1 Laboratory investigation

The suspected dog in 709 HH was hold by veterinary officer on 7/11/17 and the sample is send to EPHI for laboratory confirmation of rabies from brain tissue of the suspected dog. In 7/12/17 the sample of brain tissue sent to EPHI to detect rabies virus by rapid rabies Ag test and fluorescent antibody test (FAT) confirmed that dog from 709HH has rabies.

4.2 Clinical investigation

Sex	Demography (age in years)	Site of bite	Type of wound	Date of bitten	Immediate Measure taken	Measure at health facilities
Female	19 year	Leg	Penetrating	7/10/2017	Wa Rx	WRx,PEP,TAT,Anti Bi
Male	43 year	Hand	Penetrating	7/10/2017	W a Rx	TraRx
Male	16 years	Leg	Penetrating	7/11/2017		WRx,PEP,TAT,Anti Bi
Female	76 years	Leg, hand	Scratching	7/11/2017		WRx,PEP,TAT,Anti Bi
Male	47 year	Leg	Penetrating	7/11/2017	Alcohol	WRx,PEP,TAT,Anti Bi,
Female	27 year	breast	Scratching	7/11/2017		WRx,PEP,TAT,Anti Bi
Female	30 year	Leg	Penetrating	7/11/2017		WRx,PEP,TAT,Anti Bi

PEP: Post exposure prophylaxis using sheep brain tissue vaccine. The PEP was given within 36 hours after exposure in all three cases. The PEP was subcutaneous injection of phenolized sheep brain tissue vaccine for 14 days.

WRx ; comprehensive wound treatment at health facility

WRx: Wound treatment using soap and water

TAT ; injection of tetanus anti toxoid

AntiBi; Antibiotics for contaminated penetrated wound for bacterial infection.

TRx : Tradition treatment: made of herbs in humans and holy water for animals.

Table 3; Clinical details of the suspected rabies cases of dogs and humans exposure

4.3 Management at district health center

Wound care by irrigating with water and soap for 05 minutes also applying anti viral agent iodine and alcohol to the wound and left it open until they get rabies immunoglobulin and rabies vaccine, TAT 3000IU IM after skin test and broad spectrum oral antibiotics. Then they refer to St. Paul hospital for anti rabies vaccination

4.4 Management at St. Pole hospital

They take anti rabies virus. AAU field epidemiology and district3 PHEM officer were followed human contacts to rabies virus until they complete the full dose of rabies vaccine.

5. Main findings of investigation

Human exposure rate was 13/100,000. 4(57.14%) of the human exposures to dog bite was female and 3(42.86%) were male 6(85.71%) of human exposed to rabies had got post exposure prophylaxis and 1(14.29%) was not. (14.29%) of rabid dog exposed humans, use traditional medicine for bitten, 2(28.57%) human exposures wash their hands with soap and water immediately after they bite by the dog and 5(71.43%) not wash. 4(57.14%) of site of bites were at their lower leg and 2(28.57%) at the hands, 1(14.28%) at the breast. Based on severity of the wound 2(28.57%) human exposures had a scratching type of wound and 5(71.43%) had penetrating type of wound. 71.43% of human exposures are bitten by unvaccinated dogs. All respondents were heard about rabies before and they think dog bite is a health problem to their environment due to stray dogs and unvaccinated HH dogs.

6. Discussion

Human exposure rate of the current animal rabies outbreak is less than the studies conducted at Bishefitu 135/100,000 and Yabelo 86/100,000 [14]. This difference may be depending on the difference in dog population in urban and rural population. The minimum age of 16 years old and the maximum age was 76 years old, median age of 30 years. Females are more exposed than males it is different from the study conducted in Tigray region indicates that in Adigrat out of a total of 864 cases, 60.3% (521) were in males and 39.699% (343) [15].

In this investigation many of human exposed to rabies had got post exposure prophylaxis. Rabies infection is always fatal unless prompt post exposure treatment is administered before symptoms begin [4]. Due to 100% fatality rate of rabies, rabies vaccine is given to people at high risk of rabies to protect them if they are exposed. It can also prevent the disease if it is

given to a person after they have been exposed. Therefore people resisting not to take PAP is may be due to their strong believe by traditional medicine and holly water.

1(14.29%)of rabid dog exposed humans, use traditional medicine for bitten, according to the respondent this investigation reviled that the possible reasons they don't use modern medicine for the dog bite may be considering using of traditional plant as anti viral treatment , spiritual beliefs, no health care seeking behavior due to different reasons. Similarly in other study 45.8% of the participants in Nekemte area showed strong belief on traditional medicine and Gondar district in which 35% respondents prefer traditional medicine [16].

Many of human exposed to rabies virus do not wash their hands with soup and water immediately after they bite by the dog but different guide lines and researches recommend that washing with water and soup by irrigating the wound is a part of post exposure treatment to decrease viral exposure[4].

Many of human exposures bitten sights were distal from the brain except the breast scratching under the clothing and most of human exposures have penetrating type of wound. The study show that the length of the incubation period depends on many factors including wound severity, wound location in relation to nerve supply, proximity to the brain, size of inoculums of virus and the degree of protection provided by clothing and other host factors [2]. Many of human exposures are bitten by unvaccinated dogs and the rest of the human exposure is bitten by a vaccinated dog one times before one year (by seeing vaccinated certificate) but it was confirmed rabid, this may show the dogs in the areas dogs not appropriately vaccinated or unvaccinated.

7. Limitation

Lack of national guideline for both animal and human rabies

8. Conclusions

There are unvaccinated dogs in HH and on street of the district. All of human exposed started the vaccine take a complete dose of anti rabies vaccine. There are also a strong traditional medicine and religious beliefs against post exposure treatment in the community, most of humans exposed they don't use washing the wound with water and soup as first aid. Many of human exposures bite distal from the brain and penetrated type of wound. Fives rabies suspected dogs euthanizing during investigation

9. Recommendation

District health office shall Educating the community by understanding community's perceptions on rabies mode of transmission, symptoms and post exposure treatment and vaccination. Strengthening rabies surveillance for immediate response to take interventional measures until the locals dogs are declared free from rabies by veterinary authorities. Currently vaccinated dogs should be revaccinated immediately and observed by the owner. Euthanizing of other stray dogs having contact to rabid dog

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CHAPTER III: SURVEILLANCE DATA ANALYSIS REPORT

3.1 Relapsing fever surveillance Addis Ababa, Ethiopia 2012-2016

Abstract

Background: Relapsing fever reported throughout the years in Addis Ababa. It is highly contagious, but easily preventable by personal hygiene. Recently the disease occurred as outbreak in Addis Ababa. The objective of this study is to describe trend and distribution of relapsing fever by person, time and places.

Methods: We used descriptive study design. The data reviewed retrospectively from dec2012-jan2016, surveillance data of a confirmed relapsing fever cases received from kolife Keranio health office health management information system data base, we included 882reported case. Data cleaning conducted prior to analysis. The cases Confirmed by demonstrating *Borrelia recurrentis* in peripheral blood film . We used Microsoft offices excel2010 to display frequency distribution, tables and graph/charts.

Result: 882confirmed relapsing fever cases identified and no deaths (CFR=0.0%) reported.55% of males affected and 80%>15years were affected. The average occurrence of 176.5 and a standard deviation of 187.6, the usual occurrence of relapsing fever in the sub city was 12cases per month. There was an epidemic on the month of September 158 cases and April 156 cases 2013, In2013, 309(35%)of relapsing fever cases reported during in the season of autumn. The highest incidence was showed at district11 (1860/100,000). No reported case at district6and7. District11district9, and district1, have incidence rate>31.6/100,000of the annual average incidence.

Conclusion and recommendation: Relapsing fever cases were reported throughout the whole months of the five consecutive years in all age group and both sex, this show the endemicity of the case in kolife Keranio sub city. There was an epidemic on the month of September 158 cases and April 156 cases 2013 but not investigated. District surveillance officer must do trend analysis and interpretation weekly to detect and respond an outbreak early. A district above the annual average incidence of relapsing fever needs Proper public health interventions.

Word count; 288

Key word; surveillance data analysis, relapsing fever, incidence rate, trend analysis

1. Introduction

1.1 Background

Louse-borne (epidemic) relapsing fever (LBRF) is a disease of humans that is transmitted from one person to another by the body louse. [1] Relapsing fever is caused by infection with spirochetal gram-negative bacteria of the genus *Borrelia*. The onset of symptoms is generally sudden, associated with circulation of bacteria in the blood, and include high-grade fever, malaise, chills and sweats, headache, meningism, myalgia/arthritis and non-specific gastrointestinal symptoms. [2] The disease can be severe and death occur in 10–40% of symptomatic cases in the absence of appropriate treatment, and in 2–5% of treated patients. The diagnostic test of choice is the direct identification of spirochaetes in the blood by stained blood films (Giemsa), especially during the symptomatic febrile phase [3].

Relapsing fever was once a disease of global epidemic importance. The geographical distribution of louse-borne relapsing fever has declined due to improvements in living standards. Currently, the disease is primarily found in limited endemic foci in Ethiopia but also in Somalia and Sudan [3, 4, 5]. LBRF is now an important disease in the highlands of Ethiopia where an estimated 10,000 cases occur annually and affects mostly homeless people living in crowded and unhygienic conditions especially during rainy seasons [6].

Over 9,000 cases were reported in 2002/3 to the Ministry of Health, and it ranked the seventh cause of top 10 leading admissions, and sixth of top 10 leading causes of death among adults in the country and the number of cases during the dry season was relatively higher than the wet season according to the Ethiopian health department report [7]. In southern Ethiopia (Hosanna hospital), LBRF admissions comprised 27 % of total admissions [4]. Moreover, in south west Ethiopia, 6% of mortality rate was documented [8].

LBRF can be prevented by applying hygienic practices that reduce numbers of body lice (washing clothes, drying clothes in direct sunlight, changing clothes at frequent intervals). Spread of infection can be controlled by early case detection, treatment of infected persons and close contacts by delousing.

Relapsing fever is a disease under surveillance system of Ethiopia and highly contagious, but easily preventable by personal hygiene and the disease is currently occurred as outbreak in one of neighboring sub city of Kolife Keranio at Addis Ketema sub city. Kolife Keranio sub city health office conducted a five years document review to describe distribution of relapsing fever by person, time and places. Possible public health interventions are recommended. We analyzed the alert threshold of relapsing fever at Kolife Keranio sub city.

1.2 Statement of the problem

An ongoing surveillance data analysis is important for detecting outbreak and unexpected increase or decrease in disease occurrence will help monitoring of diseases trends and evaluating the effectiveness of disease control program in the surveillance system. Relapsing fever can be severe and death occurs in 10–40% of symptomatic cases in the absence of appropriate treatment, and in 2–5% of treated patients. [3] In Ethiopia relapsing fever is endemic, epidemic prone disease and reports are collected in weekly base. LBRF is now an important disease in the highlands of Ethiopia where an estimated 10,000 cases occur annually and affects mostly homeless people living in crowded and unhygienic conditions especially during rainy seasons. Relapsing fever is most common to in area poor sanitation, overcrowding slum and low economic status of people. [6] Now Relapsing fever occur as an outbreak at Addis Ketema sub-city. Kolife Keranio is one of sub-city having high risk areas for communicable diseases identified by public health emergency management, like the city rubbish area living slum, overcrowded poor sanitation and low economic status. Surveillance data reported throughout the years, however data of relapsing fever did not analyzed yet in sub-city level and the trends of relapsing fever not well known .therefore this study is important to appropriate public health action.

1.3 Significant of the study

Surveillance is the corner stone for early detecting of unusual trend of disease under surveillance and give quick response to the disease. Active follow up of disease trends and organizing report in good manner at district and sub-city level plays great role for surveillance and early response.

Therefore this data analysis identify effectiveness of public health intervention, proper case management in health facility and Based on the finding the disease distribution stated and in addition possible public health interventions are recommended. On the other hand the analyzed data are used as base line for alert threshold of relapsing fever at kolife Keranio sub city and further research.

2. Literature review

Relapsing fever is a recurrent febrile infection caused by various *Borrelia* spirochetes transmitted either by lice (epidemic relapsing fever) or by ticks (endemic relapsing fever). Relapsing fever was once a disease of global epidemic importance. However, largely as a result of the demise of the clothing louse *Pediculus humanus*, it is now restricted to areas where clothing lice are still common place, such as Ethiopia [9].

Humans are the sole hosts of the pubic louse (*Phthirus pubis*), the body louse (*Pediculus humanus humanus*), and the head louse (*Pediculus humanus capitis*) [10]. The body louse can transmit the following life-threatening forms of bacteria to humans: *Rickettsia prowazekii*, which causes epidemic typhus; *Bartonella quintana*, which cause trench fever; and *Borrelia recurrentis*, which causes louse borne relapsing fever [11].

Relapsing fever is an infection caused by several species of bacteria in the *Borrelia* family. There are 2 major forms of relapsing fever: Tick-borne relapsing fever (TBRF) is transmitted by the *Ornithodoros* tick. It occurs in Africa, Spain, Saudi Arabia, Asia, and certain areas in the western United States and Canada. The bacteria species associated with TBRF are *Borrelia duttoni*, *Borrelia hermsii*, and *Borrelia parkerii*. Louse-borne relapsing fever (LBRF) is transmitted by body lice. It is most common in Asia, Africa, and Central and South America. The bacteria species associate with LBRF is *Borrelia recurrentis* [12].

Sudden fever occurs within 2 weeks of infection. In TBRF, multiple episodes of fever occur, and each may last up to 3 days. People may not have a fever for up to 2 weeks, and then it returns. In LBRF, the fever usually lasts 3 to 6 days. It is often followed by a single, milder episode of fever [12].

Relapsing fever should be suspected if someone coming from a high-risk area has repeated episodes of fever. This is especially true if the fever is followed by a "crisis" stage, and if the person may have been exposed to lice or soft-bodied ticks. LBRF is mainly a disease of the developing world. It is currently seen in Ethiopia and Sudan. Famine, war, and the movement of refugee groups often results in LBRF epidemics. Tests that may be done include blood smear to determine the cause of the infection. Death rate for untreated LBRF ranges from 10 to 70%. With TBRF, it is 4 to 10%. With early treatment, the death rate is reduced. People with this condition who have developed a coma, heart inflammation, liver problems, or pneumonia are more likely to die [13].

Relapsing fever occurs in European country by East African migrant [14]. LBRF is endemic in East Africa (e.g., Ethiopia, Eritrea, Somalia, and Sudan) with the highest number of cases observed in

Ethiopia, where it is the seventh most common cause of hospital admission and the fifth most common cause of death [15].

In history the role of the human body louse in the transmission of relapsing fever was reported by MacKie in 1907 [16]. Since 1967, the epidemic form of louse borne relapsing fever has been largely confined to areas of extreme poverty in East Africa [17], and the Peruvian Andes; most cases occur in Ethiopia.

For the first time the endemicity of louse-borne relapsing fever in Ethiopia had been reported by Italian investigators as early as 1915 and several thousands of cases were reported annually to the Ministry of Health (MOH) between 1981 and 1990 with the largest number in 1983 (43727 cases) as it was shown on an epidemic report of Wolayta Zone, South Nation Nationality Peoples Region (SNNPR) [18].

LBRF is now an important disease in the highlands of Ethiopia where an estimated 10,000 cases occur annually and affects mostly homeless people living in crowded and unhygienic conditions especially during rainy seasons [19].

It is within the top ten causes of hospital admissions, associated with significant morbidity and mortality .For instance, in southern Ethiopia (Hosanna hospital), LBRF admissions comprised 27 % of total admissions [7] .Moreover, in south west Ethiopia, 6% of mortality rate was documented [20].

On the other hand, the number of cases during the dry season was relatively higher than the wet season. according to the Ethiopian health department report, it is the seventh most common cause of hospital admission and fifth most common cause of death .Over 9,000 cases were reported in 2002/3 to the Ministry of Health, and it ranked the seventh cause of top 10 leading admissions, and sixth of top 10 leading causes of death among adults in the country [21].

2.1 Objective

2.1.1 General objective

To describe the trend and distribution of relapsing fever by person, place, and time for the last five years of 2012-2016 in kolife Keranio sub city, Addis Ababa, Ethiopia.

2.1.2 Specific objective

To describe relapsing fever in kolife Keranio sub city by person .

To describe relapsing fever in kolife Keranio sub city by place .

To describe relapsing fever in kolife Keranio sub city by time .

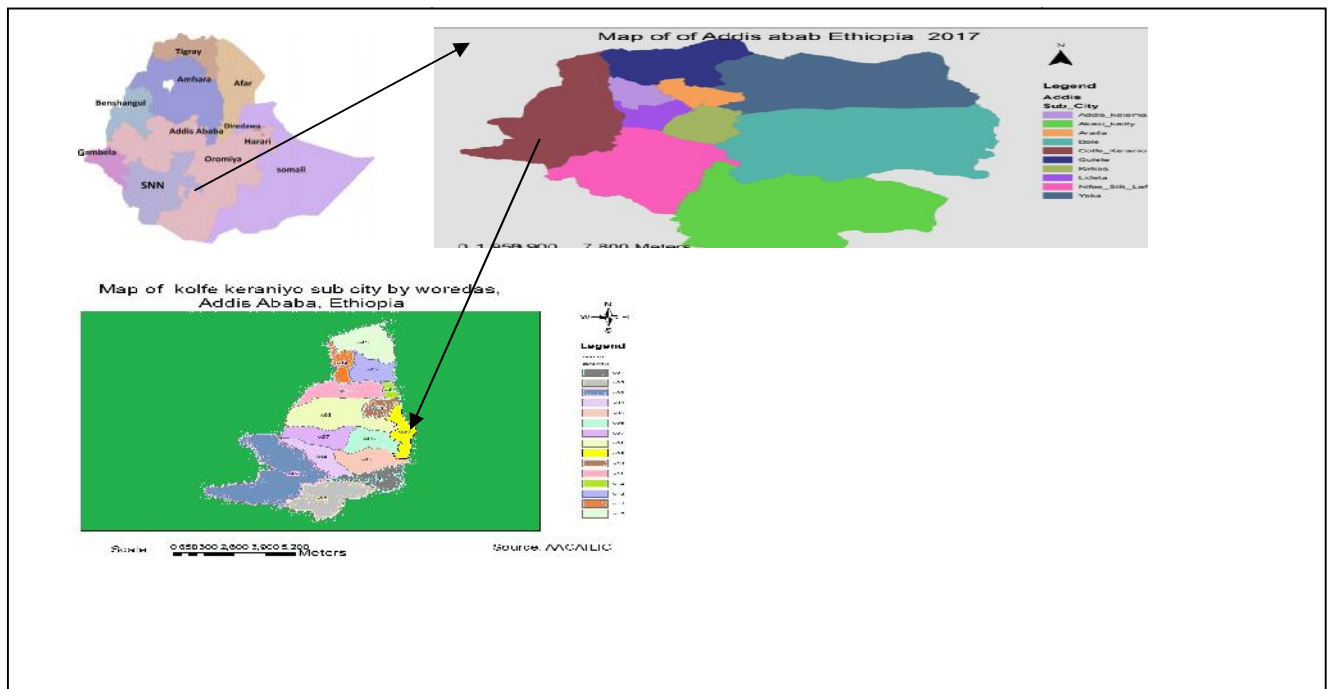
To describe the endemicity level of relapsing fever in kolife sub city sub-city Addis Ababa, Ethiopia from 2012-2016

3. Methods and Materials

3.1 Geographical area under Relapsing fever surveillance.

The study conducted in Kolfe Keranio sub city is one of the ten sub cities established under Addis Ababa city administration. It about 9.6 kms away from center of the city and about 13Kms the western side of the sub-city reaches from the center. It is located at the part of Addis Ababa, between the road to Jimma and Ambo towns. The sub-city shares boundary with 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. At present the sub city is divided in to 15 woreda 103 sub woreda, 393 sefer, and 1385 block. It has an area of 6348.09 hectares from this about 1334 hectares was covered with forest and included prominent feature of mount Jemo , Jemo river and repi Medhanealem mountain. According to a report from the city administration and officials in the sub city, it is one of the rapidly expanding sub city of Addis Ababa where intensive housing construction, is taking place and now a day’s its population and a extent is increased than the previous.[22]

Figure 11. Map of kolife Keranio sub city by districts, Addis Ababa, Ethiopia 2017



3.2 Study period

The data was collect from Jan 1/2012 to Des 30/2016

Data entry, analysis and interpretation was from March 1/2017to April 2/2017

3.3 Study design

Descriptive Cross sectional study design was used to analyze a five years relapsing fever surveillance data in terms of time, place and person.

3.4 populations under surveillance

Populations under surveillance are resident of kolife Keranio (2012-1016years projected population).

3.5 Study population

Those individuals who are developed a confirmed case and being investigated in any of the legally reporting institutions and recorded & reported as a case of relapsing fever.

3.6 Sampling size and sampling techniques

To analyze and interpret the last five years surveillance data of relapsing fever, there is no need to take sample from the reports rather, total cases of relapsing fever from HMIS data of kolife Keranio sub city from 2012 to 2016 G.C.

3.7 Exclusion and inclusion criteria

The data presented with the case in the reporting period of dec2012 to jan2016 in kolife Keranio sub city health office were included in the analysis while those values with discrepancies in any of the variable needed when we comparing district database and sub-city database deliberately excluded from the description to reduce bias.

3.8 Case definition (National PHEM guide line)

3.8.1 Suspected case:

Any person presented with an abrupt onset of rigor with fever usually remitant headache, arthralgia and myalgia, dry cough, epitasis.

3.8.2 Confirmed case

Suspected case with demonstration of *Borrelia recurrentis* in peripheral blood film .

3.8.3 Threshold levels for declaring an epidemic of relapsing fever under surveillance

Unusual increase of the cases OR Doubling of cases on subsequent weeks

3.9 Data collection procedure

We reviewed laboratory confirmed 882 relapsing fever cases by demonstrating *Borrelia recurrentis* in peripheral blood film, reported from 15 districts, a retrospective five consecutive years (dec 2012-jan 2016), we collected secondary data of relapsing fever from sub city and district reported from outpatients and inpatients of private and governmental health facilities within the catchments areas those are included in HMIS reporting system.

3.10 Data analysis procedure

We developed a structured data collection tools to collect and organized the data. We cleaned the data before entrance of Microsoft excel by checking 15 district report and kolife sub city health management information system database and we exclude 71 wrongly entered data's. Finally 882 relapsing fever cases were taken after clearance, we calculated mean, mode, and standard deviation, incidence, and average incidence to describe relapsing fever in terms of time, place, and person and to show the alert threshold level, we used Microsoft excel to present the data in table, graph and charts.

3.11 Dissemination of finding

Findings of data analysis submitted to kolife sub city health bureau PHEM department & AAU department of public health in soft and hard copy

4. Result

4.1 Analysis of relapsing fever cases by person.

Total of 882 relapsing fever cases and no deaths (CFR=0.0%) reported to sub city health office within consecutive five years. The average number of relapsing fever cases per year was 176 (49.6 /100,000 population). Total of 882 relapsing fever cases and no deaths (CFR=0.0%) reported to sub city health office within consecutive five years. The average number of relapsing fever cases per year was 176 (49.6 /100,000 population). The average occurrence of 176.5 and a standard deviation of 187.6

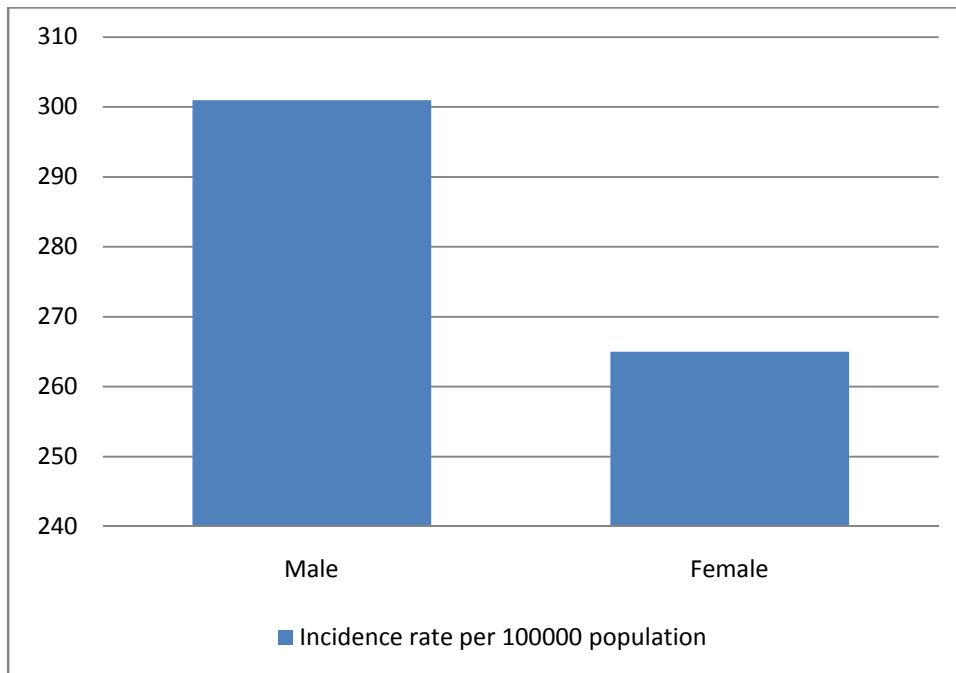


Figure 12 Distribution of relapsing fever by sex, Addis Ababa, kolife Keranio Dec2012-Jan2016

From the total of 882 relapsing fever cases reported during the study period 486 (55 %) were males and 396 (45%) were female. Incidence rate of relapsing fever regarding to sex, Male 301/100,000 and female 265/100,000.

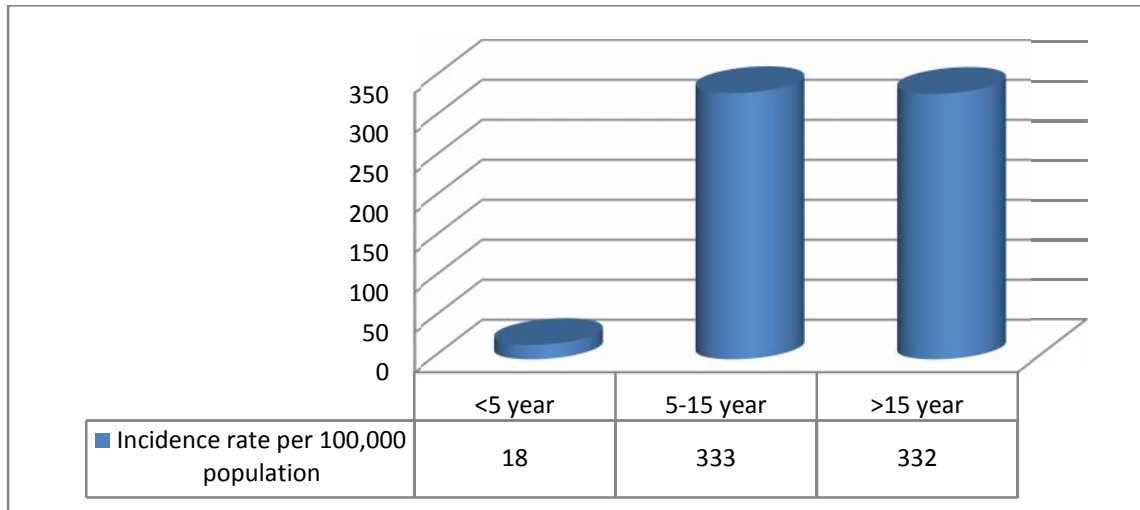


Figure 13 Distribution of relapsing fever by Age, Addis Ababa, kolife Keranio Dec2012-Jan2016

Of the total of 882 relapsing fever cases reported five consecutive years <5 years children credited 4 (0.45 %), 5-15 years 172 (19.5 %) and >15 years 706 (80%).

4.2 Description of relapsing fever cases by time.

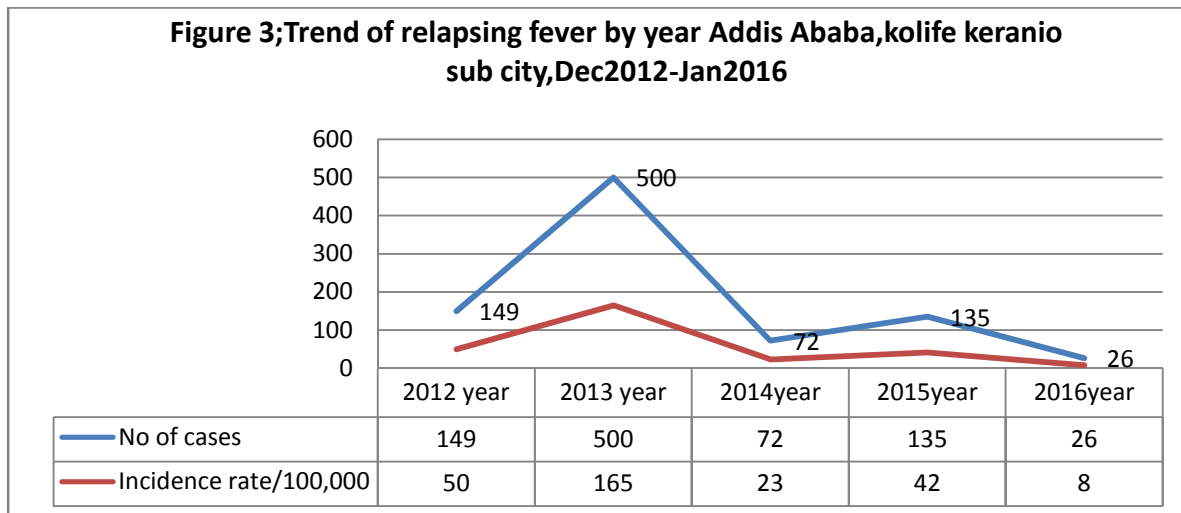


Figure 14 Trend of relapsing fever by year, Addis Ababa, kolife Keranio Dec2012-Jan2016

The incidence of relapsing fever was increased from 2012 to 2013 and decrease after 2013 till 2016, the number of cases in each year was: 149(17 %) in 2012, 500 (57%) in 2013, 72(8.1%) in 2014 & 135(15.3%) in 2015, 26(2.94%) in 2016. In 2013 an outbreak was occurred

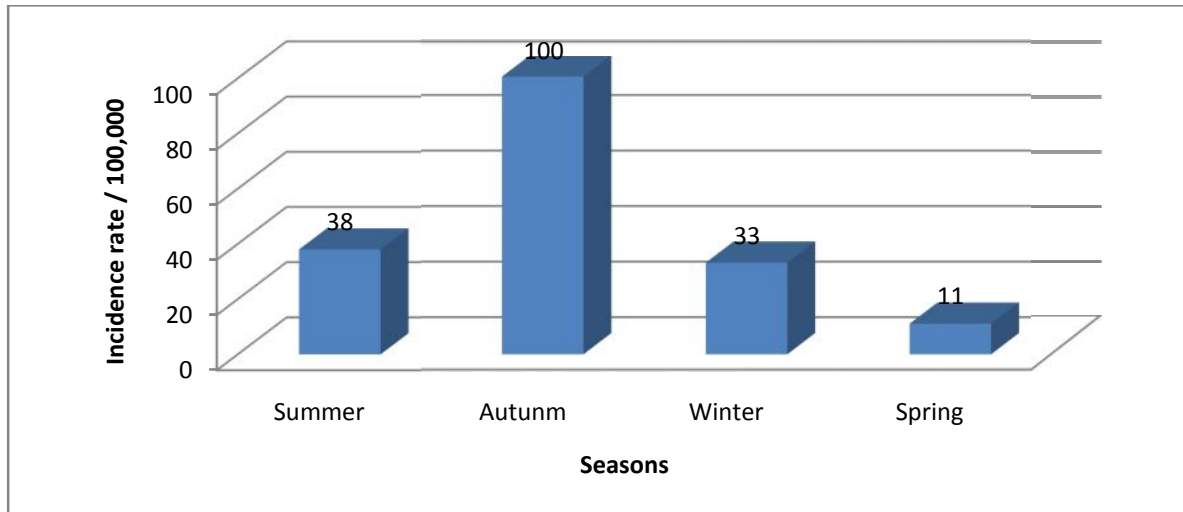


Figure 15 Seasonal variation of relapsing fever cases, Addis Ababa, kolife Keranio Dec2012- Jan2016

The highest number of relapsing fever is reported on the months of April (184 cases), September (181 cases), March (108 cases), the least number of case reported on the month of Feburary (16 cases), May (17 cases), 309(35%) of reported relapsing fever cases reported during autumn,

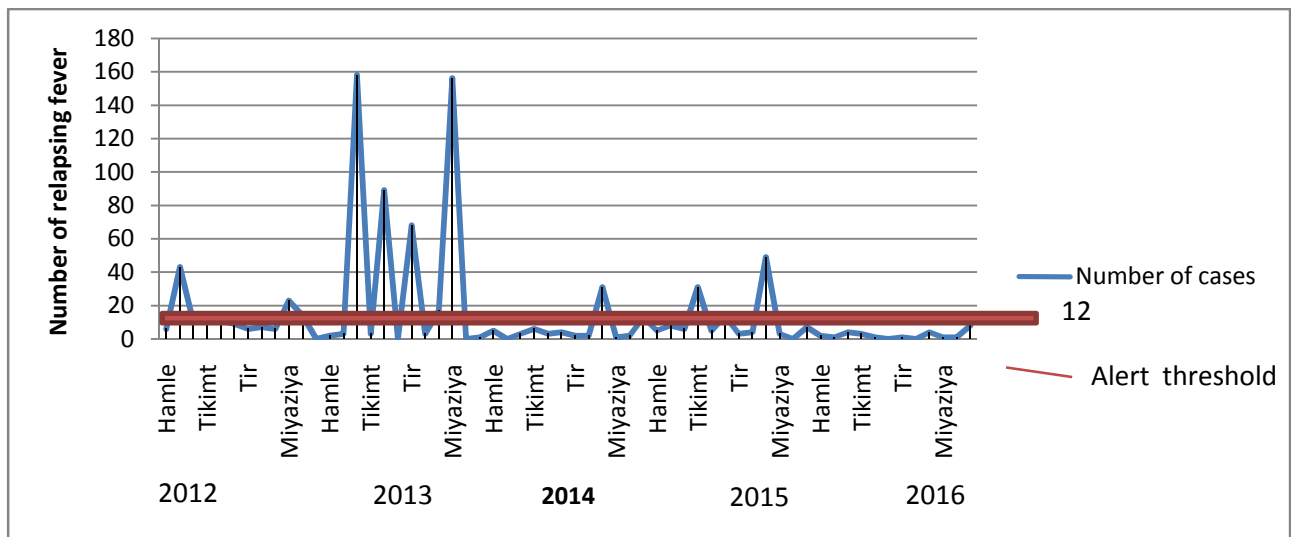


Figure 16 The alert threshold level of relapsing fever cases in kolife Keranio sub city ,Addis Ababa ,Ethiopia from 2012-2016

According to Ethiopian national PHEM guide line the alert threshold level of relapsing fever is if unusual increase of the case occur or doubling of the cases on subsequent weeks. The usual relapsing fever case reported from kolife Keranio sub city reported sight (Mode) is 12 cases per month from 2012-2016. But as figure5 show that there were an epidemic on the month of September 158 cases and April 156 cases 2013, but not investigated.

4.3 Description of relapsing fever cases by place

Based on Ethiopian PHEM structure all woredas reported their own case, therefore relapsing fever cases reported from woreda health office considered as the patient address was permanently or occasionally in the reported woreda for this surveillance data description.

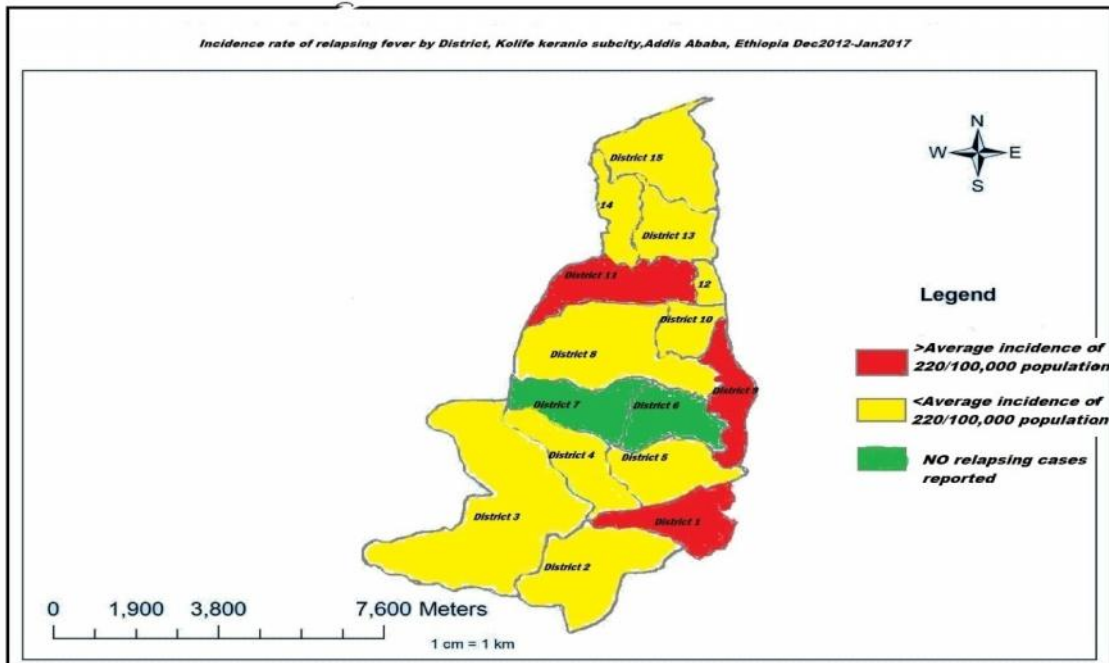


Figure 17 Incidence rate of relapsing fever by District, kolife Keranio sub city, Addis Ababa Ethiopia 2012-2016

Relapsing fever was reported from 13 districts. The highest incidence among 15 districts are 1860/100,000 at district 11 and no relapsing fever cases reported at district 6 and 7.

5. Discussion

From the total admitted cases no death is reported, but literature show that death occurs in 10–40% of symptomatic cases in the absence of appropriate treatment, and in 2–5% of treated patients. The study conducted in Jimma in south west Ethiopia, 6% of mortality rate was documented. The reduction in case fatality rate in kolife Keranio sub city possibly due to seeking medical at early stage of the disease. Males were more affected than females and the highest incidence was in the age of >15 years in both sex. The incidence of relapsing fever was increase from 2012 to 2013, according to the national surveillance guideline doubling of the reported relapsing fever case in consecutive weeks considers as an outbreak, but there is no documented response. There was an epidemic on the month of September 158 cases and April 156 cases 2013 .The highest incidences of relapsing fever cases were in April (the season at the end of summer and at the binging of winter) , relapsing fever cases were reported within each rainy season from 2012-2016, It is similar to federal ministry of health report, Common to occure during rainy seasons and the number of cases reported during the dry season was relatively higher than the wet season, Literature shows that incidence rate of relapsing fever is higher at high land homeless people living in crowded and unhygienic conditions especially during rainy season, the possible reason an increasing incidence in dry season, we hypothesized that due to overcrowded and unhygienic conditions. District 11, district 9, and district 1, have incidence rate > 31.6 /100,000 of the annual average incidence among 15 district. The possible determinant would be district 11 is nearest to the usual out break declared sub city (Addis ketema sub city), district 1 identified by kolife Keranio health office risk for infectious communicable disease and other disastrous situations like flood, also there are hundreds of people who are poor illegally settled around the Addis Ababa city rubbish dump.

6. Limitation

Lack consistent data before 2012 to see the long term trends of the disease.

No enough recent literatures on louse born relapsing fever to discuss more about the burden of the disease in Addis Ababa.

7. Conclusion and recommendation.

Relapsing fever cases were reported throughout the whole months of the five consecutive years, in all age group, both sex and in four seasons of the years. This show the endemicity of relapsing fever in kolife Keranio sub city,. There was an epidemic on the month of September and April 2013 but not investigated Surveillance data should be analyzed at district &sub city level on regular basis to look the trends of the disease. District1, the city rubbish area is risk for infectious communicable disease due to their population density (over crowded), unhygienic conditions, and the sub city health office better to give attention to Proper public health intervention and for application kolife Keranio health office should work in collaboration with other sectors. Further study has to be conduct to identify the risk factors of relapsing fever endemicity in the sub city.

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CHAPTER IV: EVALUATION OF SURVEILLANCE SYSTEM

4.1 Evaluation of Epidemic typhus Surveillance System in kolife Keranio sub-city, Addis Ababa

Abstract

Introduction: This evaluation of surveillance system includes an assessment of core surveillance activities and system attributes. Kolife Keranio health office PHEM department ask Addis Ababa field epidemiology residents to evaluate the system on epidemic typhus because of its significant numbers of reporting throughout the year and evaluation on epidemic typhus was not done before. The purpose of evaluating this surveillance systems is to ensure surveillance system of one of priority disease, epidemic typhus in kolife Keranio sub city that have public health importance being monitored for improving quality.

Methods: A cross sectional descriptive study design was conducted for the surveillance system evaluation. Among 15 woredas found in the sub city, we selected 9(60%) woreda health offices and 6(54.5%) governmental health centers conveniently. we observed system related documents. Information collected using semi structured questionnaire we did an interview the assigned PHEM focal persons and surveillance officers. We analyzed the data in Microsoft Exel2010.

Result; A total of 12739case are reported from different health facilities and incidence of epidemic typhus in the sub city was 2370/100,000population, average incidence in month 197.5/100,000 population. 100% of participants responded that they don't analyzed and interpret epidemic typhus data throughout the year but do for other immediately reportable disease; all participant health facilities confirm the case by weil-flex OX19 agglutination test, 100% of participant also responds there is no budget cascaded to their department.

Conclusion and Recommendation; Epidemic typhus data analysis is not done in2016 in all districts therefore Epidemic typhus data analysis and interpretation must do according to the guideline for early detection and response at district level. Case confirmation of epidemic typhus is performed by weil-flex OX19 agglutination test, it is better to confirm with titration rather agglutination according to the guideline. Health offices must cascade their budget to PHEM departments for investigation of out breaks and preparedness and response.

Word count; 293

Key word; Epidemic typhus, surveillance system evaluation, system attributes

1. Introduction

Public health surveillance is the on-going, 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. Data disseminated by a public health surveillance system can be used for immediate public health action, program planning and evaluation, and formulating research hypotheses (1)

Communicable disease surveillance is the continuous monitoring of the frequency and the distribution of disease, and death, due to infections that can be transmitted from human to human or from animals, food, water or the environment to humans, and the monitoring of risk factors for those infections(2)

The evaluation of public health surveillance systems also include an assessment of system attributes, including simplicity, flexibility, data quality, acceptability, sensitivity, predictive value positive, representativeness, timeliness, and stability (3).

In 1999, Government of Ethiopia introduced the strategy of Integrated Disease Surveillance and Response (IDSR), which aims at controlling infectious diseases through strengthening the disease surveillance system and analyzing the data to identify the causes(4).

The purpose of evaluating this surveillance systems is to ensure surveillance system of one of priority disease, epidemic typhus in kolife Keranio sub city that have public health importance being monitored efficiently and effectively and the evaluation will include Introduction ,Methods , Result ,Discussion, limitation of the surveillance system evaluation and recommendations for improving quality, efficiency of the system .

1.1 Target disease under evaluated surveillance system

Epidemic louse borne typhus has historically caused massive mortality in the wake of war, famine, and great migrations. The mortality rate of epidemic typhus varies from 0.7% to 60% for untreated cases. In the four years from 1918 in Eastern Europe and Russia there were up to 30 million cases, and three million deaths (5, 6).

R. prowazekii has also been responsible for the recent outbreak of louse-borne typhus in refugee camps in Burundi involving thousands of human cases (with mortality exceeding 10%) it killed 100,000 people during the civil war in Burundi (1993-2005) (7).

P. h. humanus is the principal vector for *R. prowazekii* The human body louse is highly host specific and preferentially spends its entire life cycle from egg to adult on a single human. The louse is an intermittent feeder with a preference for 20 +/- 2 which limits its resting sites to

areas away from direct contact with the host's skin, such as the folds of clothing. As an obligate ectoparasite, the body louse requires frequent visits to its host's skin to obtain a blood meal (6, 8, 9).

Rickettsia prowazekii, the etiological agent of epidemic typhus, is an obligate intracellular bacterium with typical gram-negative bacteria morphology (10). Transmission of *R. prowazekii* to host takes place via scarification of the bite sites with the *Rickettsia*-laden feces. Although this route of transmission has been a cardinal mechanism for the deposition of rickettsiae into the bite sites (10).

Rickettsia proliferation on the endothelium of small blood vessels releases cytokines which damage endothelial integrity, with consequent fluid leakage, platelet aggregation, and polymorph and monocyte proliferation, leading to focal occlusive endangiitis, causing microinfarctions, as in the typical "typhus nodule" of Wolhbach (11).

After infection via louse bite, an incubation period of 8 to 16 days ensues. Fever, anorexia, malaise, and headache herald the onset of illness. Fevers may reach 104° Fahrenheit and above. Rash, often sparing the face, begins around day 4 and has been described as measles-like. Cough is frequent, and pneumonia may also be present. Mental status changes and clouding, from which the disease gets its name—typhus is the Greek word for cloud—portend a poor prognosis. These symptoms may include restlessness, delirium, twitching, and hallucinations. Gangrene of the distal extremities can occur in severe cases. Mortality occurs most often in the second week of illness and ranges as high as 20% without antibiotics; mortality rates are higher in older adults (12).

Despite the strong, long-lasting immunity that results in survivors of louse-borne typhus, *R. prowazekii* can sequester itself within the body and remain there presumably for the remainder of the host's lifetime. Importantly, a recrudescence illness, Brill-Zinsser disease, can develop in individuals with a latent *R. prowazekii* infection. The symptoms of recrudescence typhus are less pronounced than the initial infection, and the mortality rate of Brill-Zinsser is less than 1%. However, patients with recrudescence typhus can serve as a long-term source *R. prowazekii*, permitting transmission of *Rickettsia* via lice for months to years after the primary infection, and these patients can therefore be considered as reservoirs for *R. prowazekii* (13).

Epidemic typhus is usually diagnosed by serology; a fourfold rise in titer is diagnostic. Titers usually become detectable during the second week. Serologic tests include the indirect fluorescence antibody test, latex agglutination, complement fixation, enzyme immunoassay (EIA) and the toxin-neutralization test. *R. prowazekii* may cross-react with *R. typhi* (the agent of murine typhus) in some tests and all mild and moderate forms of epidemic typhus treated by doxycycline (14).

Louse-borne diseases are associated with a high prevalence of body louse infestation, and have recently re-emerged in homeless populations living in poor-hygiene conditions in developed countries [15,16], and in Ethiopian street beggars (17).

1.2 Description of the surveillance system

In Ethiopia, the health information system for surveillance of communicable and non-communicable diseases is organized in two main categories, the surveillance system under Public Health Emergency Management core process (PHEM) and the Health Information Management System (HMIS). These systems are set at the central level Ministry of Health (MoH) and extending down to the regions and health facilities (periphery) levels including all governmental, non-governmental and private health facilities.

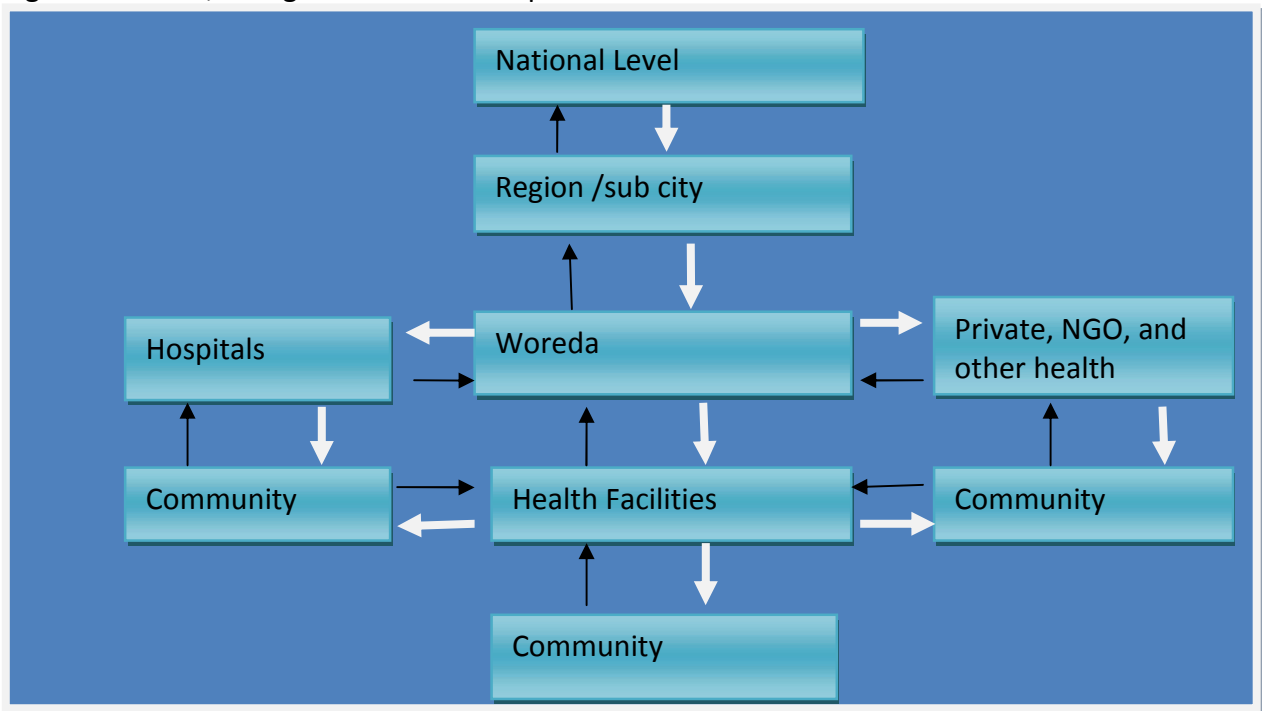


Figure 18 Data and information flow in IDSR indicating varying cycles at various levels

PHEM surveillance focuses on diseases which have epidemic potential, diseases under eradication and elimination, diseases of international concern, and malnutrition. Whereas the HMIS collects all the general health related data from the health facilities including those disease under surveillance.

1.3 Significance of the study

Surveillance is the corner stone for early detecting of unusual trend of disease under surveillance and give quick response to the disease. Active follow up of disease trends and

organizing report in good manner at woreda and health facility level plays great role for surveillance and early response.

Epidemic typhus is one of reportable disease in PHEM among 21 notifiable disease therefore epidemic typhus is one of disease under surveillance in the PHEM of kolife Keranio sub city reported in weekly bases due to Highly public concern, Reliability of the diagnosis and Highly contagiousness, but easily preventable by personal hygiene and The reasons of selecting to evaluating the surveillance system of this disease is, kolife Keranio health office PHEM department ask to evaluate the system on epidemic typhus because of its significant numbers of reporting throughout the year and evaluation on epidemic typhus was not done before.

Therefore evaluation of a surveillance system on epidemic typhus promotes the best use of health resources and assures that the surveillance systems operate effectively. This Surveillance system evaluation allows to show whether the system is useful for public health and is achieving that system's objectives.

1.4 Objectives

1.4.1. General objective:

To evaluate the surveillance system of epidemic Typhus at kolife Keranio health office, Addis Ababa, Ethiopia July 2017.

1.4.2. Specific Objectives:

1.4.2.1.To evaluate the core activities such as case detection, reporting, analysis and response of the Surveillance system of kolife Keranio sub city.

1.4.2.2.To evaluate the attributes of surveillance system in early detection of epidemic Typhus and its outbreaks.

1.4.2.3.To evaluate the contribution of surveillance system in decreasing morbidity and mortality of epidemic typhus.

1.4.2.4.To describe the linkage of woreda PHEM department with sub city PHEM during emergency and reporting times.

1.4.2.5.To identify the gap of the surveillance system in the kolife Keranio sub city.

2. Methods and materials

2.1 Study Area:

The study area will be Western part of Addis Ababa of kolife Keranio sub city; the sub city is one of the largest geographical area and high population density among 10 sub cities of Addis Ababa. It about 9.6 kms away from center of the city and about 13Kms the western side of the sub-city reaches from the center. It is located at the part of Addis Ababa, between the road to Jimma and Ambo towns. The sub-city shares boundary with 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. At present the sub city is divided in to 15 woreda 103 sub woreda, 393 sefer, and 1385 block. It has an area of 6348.09 hectares from this about 1334 hectares was covered with forest and included prominent feature of mount Jemo , Jemo river and repi Medhanealem mountain. According to a report from the city administration and officials in the sub city, it is one of the rapidly expanding sub city of Addis Ababa where intensive housing construction, is taking place and now a day's its population reach to 537524 (17).The reasons of selecting to evaluating the surveillance system of this sub city, it is one of the field base of AAU field epidemiology residence

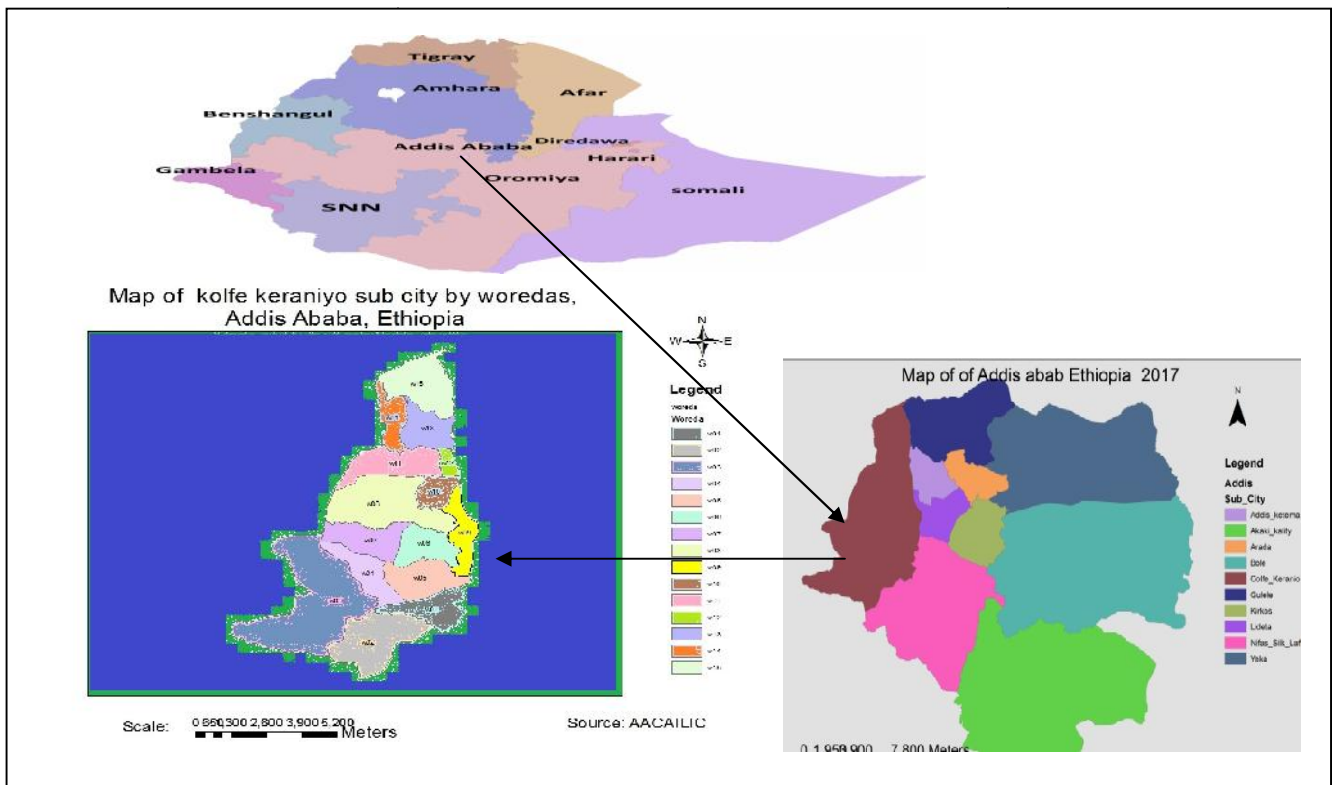


Figure 19, map of kolife Keranio sub city A.A, Ethiopia 2017

2.2 Study design

A cross sectional descriptive study design will conduct for the surveillance system evaluation.

2.3 Study Subjects:

The study subjects are Health offices PHEM departments (the kolife Keranio Health office, Woreda Health office) and health facilities.

2.4 Sample Size and Sampling

Kolife Keranio health office PHEM department receive immediate and weekly report from ,15 districts health offices, among 15 woredas found in the sub city, we selected 9(60 %)Districts health offices and 6 health centers conveniently. regarding to health facilities, Among 15 districts 11 districts have their own health center and 4district have no health center but they have other private and NGO health facility included in PHEM system, also residents in those district use the neighboring health center, In sample selection all districts are incorporate 9districtes represent by health office and 6 districts represent by health centers.

2.4 Data collection technique

We collected the data, by using CDC standard semi-structured questionnaire, interviewing the PHEM focal person at district and sub-city, health center surveillance officers and health professionals were interviewed, documents like weekly report format, IDSR database, roomer log books, supervision and feedback documents were reviewed. Posted chart, graphs, case definition in specific diseases and guidelines' were observed.

2.5 Data analysis

We entered, organized and analyzed the data by table, graph and chart using the Microsoft Office Excel. We use percentage to compare the difference in districts and health facilities.

2.6 Data quality control

We did cross check the data at different levels (sub city health department, woreda health offices and health facilities) before summarizing at eachlevel for its accuracy and consistency.

2.7 Data dissemination

We prepared and share the written report of both hard and soft copies to Addis Ababa University/School of Public Health, Kolife Keranio sub city Health office, soft copies for my mentors, resident advisor.

2.8 Ethical clearance

Official letter has been obtained submitted to study district health office and health centers from KKSC

3. Standard Cases definition

3.1 Epidemic Typhus

3.1.1 Suspected: Any person with an abrupt onset of headache, chills and rapidly mounting fever, malaise, prostration and rash.

3.1.2 Confirmed: A suspected case with Weil-Felix reaction of the proteus strain OX-19 with fourfold rise in titer, or a single titer equal to or greater than 320 in the second week of illnesses.

4. Operational terms

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:Usefulness of the surveillance system is reflected by documented changes in policies and procedures as a result of information generated by the system.

Simplicity:Simplicity denotes the structure and ease of operation of the surveillance system.

Flexibility: Flexibility of a surveillance system is its capacity to adapt to changing information needs or operating systems within minimal additional time, personnel and funding.

Quality: The quality of data reflects the completeness and validity of the data recorded in the woredas Health Department.

Acceptability: Acceptability is the willingness of persons, institutions or organizations to participate in the surveillance system.

Sensitivity: Sensitivity refers to the ability of the system to detect cases or outbreaks through trends in the surveillance data.

Positive predictive value: Positive predictive value refers to cases that actually have the health condition in question.

Representativeness: Representativeness 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 was assessed by questioning the surveillance officers on the consistency of the system.

5. Results

5.1 Engagements of stakeholders

We do a brief discussion led by kolife Keranio sub city PHEM staff and PHEM focal person to conduct this surveillance system evaluation of epidemic typhus to identify the weakness and strength of the system. District PHEM officers were assist us by providing data's and important information based on the interview. Health centers surveillance focal persons also help us by answering the Questions for interview and by provided surveillance materials for observation. All stakeholders were active participant by understanding the purpose of the evaluation. All private and NGO clinics are included in the PHEM system and they reported immediate and weekly reportable diseases to their own district health offices ,there are 15 district offices and 11 governmental health center within the sub-city

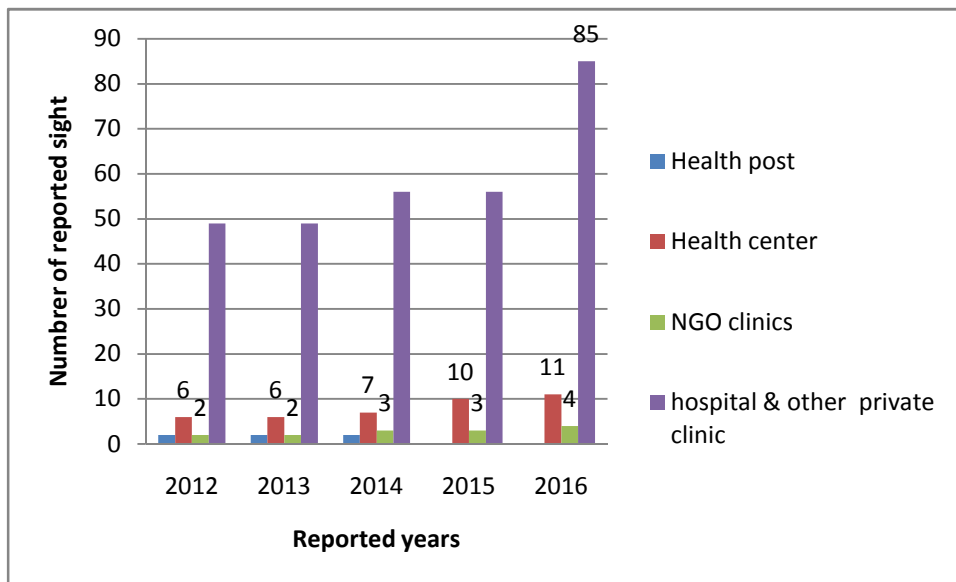


Figure 20; surveillance data reported sight kolife Keranio sub city, Addis Ababa, Ethiopia, 2012-2016.

A total of 12739 cases are reported in 2016 from different health facilities and incidence of epidemic typhus in the sub-city was 2370/100,000 population, average incidence in month 197.5/100,000 population.

5.1.1 Core functions of the surveillance system

5.1.1.1 Case detection

One of the core functions of the surveillance system is case detection

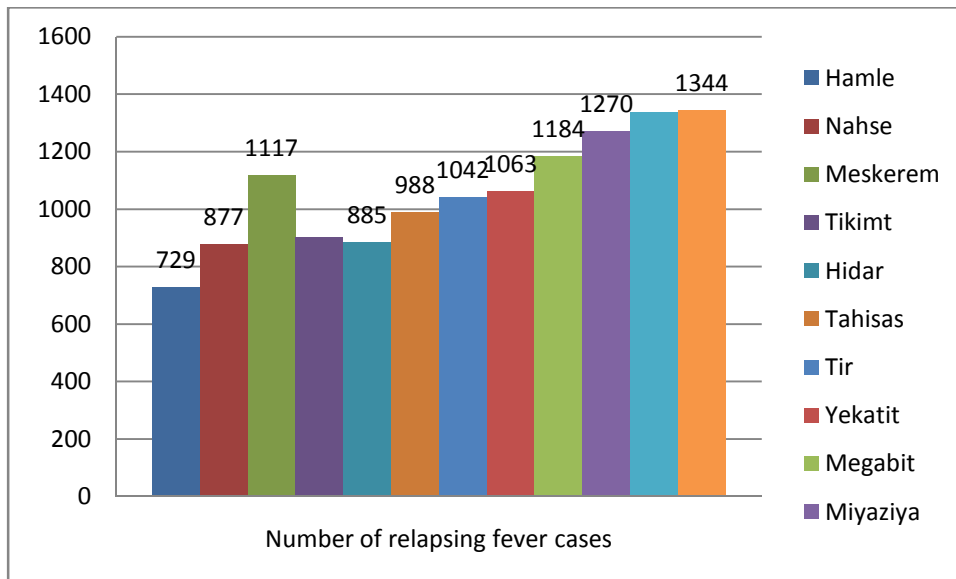


Figure 21 Epidemic typhus case detected by month, kolife Keranio sub-city, Addis Ababa, Ethiopia, 2016

All district health office respondents were not posted the case definition of epidemic typhus, but the OPD practitioner detects the case by memorized the standard case definition.

5.1.1.2. Case registration

Case registration is the process of recording the cases identified based on the standard case definitions. Concerning case registration all respondents recorded cases in their registration books.

5.1.1.3. Case confirmation

Case or outbreak confirmation refers to the epidemiological and laboratory capacity for confirmation. Having the capacity for appropriate specimen collection, packaging and transportation is mandatory for case confirmation. In this surveillance system evaluation, among 15 participants 11 districts were capable for case confirmation (eleven health centers). All responding district also have the capacity to confirm epidemic typhus Weil-Felix reaction of the

proteus strain OX-19 with agglutination test by doing quality test, but no of them perform titration indicated in the PHEM guideline .Regarding to materials required to collect specimens, 11 respondent have materials to collect the specimens. All participants have the capacity to handle and transportation of the specimens to district laboratory.

5.1.1.4. Reporting

Reporting is the process by which surveillance data moves through the surveillance system from the point of generation. The national PHEM guideline should be implemented in reporting data and information.

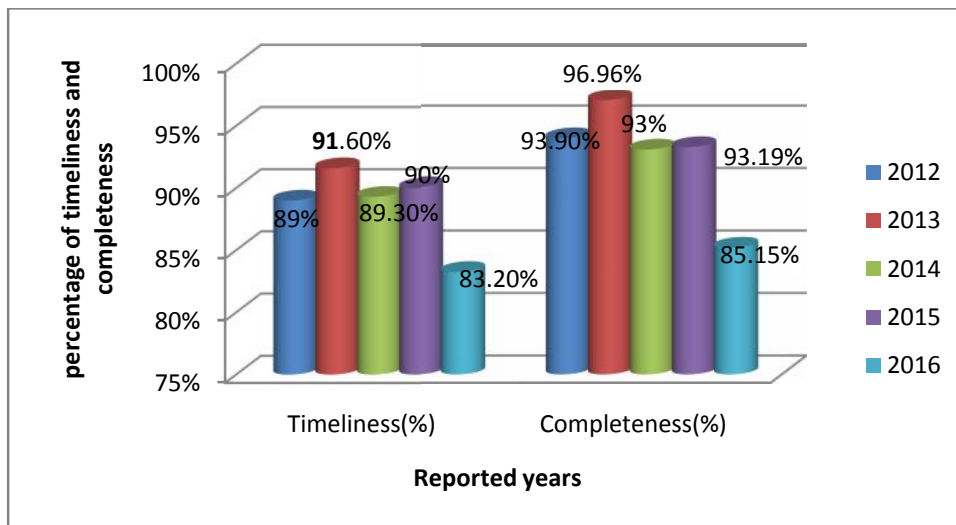


Figure 22Figure5 Report timeliness and completeness, kolife Keranio, Addis Ababa, Ethiopia 2012-2016.

Among 15 participants, 13(83.2%) reported on their assigned scheduled day, but two (16.8%) did not report according to the guideline. Of 15 participants 13(85.15%) send completed data to the next level. Relating to lack of surveillance forms in the past six months earlier to this evaluation, all of respondents were not experienced lack of surveillance forms, especially weekly report form of epidemic typhus. Of 15 PHEM focal persons who participated in the surveillance system evaluation, 15(100%) respondents have contact address of the nearest assigned PHEM focal person to transfer and receive data and information. According to the evaluation, there were no deaths in relapsing fever one month prior to this evaluation. In weekly reportable diseases, 8(53.3%) respondents used hard copies and mobile phone text message, 6(40%) used hard copies only and 1(6.7%) hard copies and email to transfer data or information to the next level.

5.1.1.5. Data analysis and interpretation

Surveillance data should be analyzed routinely and the information interpreted for use in public Health action. The data analysis is used for alert and epidemic threshold values for the priority diseases in the country. In the surveillance system evaluation, data analysis and interpretation not well conducted in the sub city of kolife Keranio. Among 15 respondents, 15(100%) of them did not conduct data analysis and interpretation in epidemic typhus , and not known the endemic level of epidemic typhus.

5.1.1.6. Epidemic preparedness

Epidemic preparedness is the existing level of preparedness for potential epidemics and availability of preparedness plan. In the evaluation of the surveillance system, 15 participants six health center and eight district health office and one sub-city health office were included. Among 15, 7 (46.7%) of respondents had general epidemic response and preparedness plan, Regarding to stock of drugs and supplies for emergencies from 7 health offices which have general emergency preparedness plan 5(72%) had drugs and supplies for emergencies, 2(28%) had no stock of drugs and supplies for emergencies; rather they prepared themselves for asking to the higher level and the neighboring district health centers. All study participated district and sub-city have rapid response team. There was no budget for epidemic response but they use the contingency of kolife Keranio sub-city administration budget during epidemic.

5.1.1.7. Epidemic response and control

Public health surveillance systems are useful if they provide data for appropriate public health response and control. Fortunately there were measles outbreak at district 3 in 2016; but not known the epidemic typhus because of the usual threshold level is not analyzed based on their previous experience. The sub-city actively participated in the epidemic response and control. Concerning laboratory confirmation, specimen, collection, packaging and transportation procedures. About 96% of the participants had implemented prevention and control measures based on their local data for at least one epidemic prone disease.

5.1.1.8. Feed back

Feedback is an important function of all surveillance system. In this surveillance system Evaluation we observed documents regarding to receiving feedback from the higher level, among.

15 participants, 10(66.7%) received minimum of two feedbacks from higher level for further Enhancing of their strong sides and to improve their weak portions.

5.2.1. Supportive functions of surveillance systems

5.2.1.1. Standards and guidelines

Standards and guidelines are mandatory for implementing the surveillance system. A Comprehensive surveillance guideline should define the priority diseases for surveillance. Among 15 participants, 14(93.7%) respondents have recently updated guidelines like PHEM guideline 2012, Measles guideline 2012 and others, but with 1(6.7%) participated facilities, not had national guidelines of national PHEM and MDSR guidelines the surveillance system, we give a soft copy of both guideline during evaluation

5.2.1.2. Training

Training refers to the needs for capacity building to enhance the quality of the surveillance system through knowledge and skill transfer. Among 15 study participants, all PHEM focal persons were trained in surveillance and 11(60%) of health extension workers were trained in surveillance for community surveillance

5.2.1.3. Supervision

Supportive supervision helps to strengthen the capacity of health staffs and ensure that the right skills used appropriately ensure that all necessary things are in place and that planned activities are implemented based on the schedule. In this surveillance system evaluation, among 14 study participants, 10(66.7%) were supervised by higher level in 2016 and . Of six health centers included in this evaluation five are not supervised by the next level but district health offices supervised at least two times per year. There was no standard check lists used during supervision. Kolife Keranio sub-city was supervised three times by Addis Ababa Regional health biro in 2016The frequency of supervision varies from zero to four times within the year.

5.2.1.4. Communication facilities

Communication facilities facilitate the reporting and feed back in any surveillance system. We reviewed that, among the 15 participants, all have no vehicle or motorcycle ,14(93.3%) were no internet access ,5 (33.3%)have no office telephone .

5.2.1.5 Material resources available for surveillance

Figure 23: Availability of resource for PHEM surveillance at different level in Kolife sub city, Aug, 2017.

S. no	Surveillance materials	Sub city	Woreda 1	Woreda 2	Woreda 3	Woreda 4	Woreda 5	Woreda 6	Woreda 7	Woreda 8	Woreda 9	Woreda 10	Woreda 11	Woreda 12	Woreda 13	Woreda 14	Woreda 15
1	Computer & Printer	Y	Y	y	y	y	Y	Y	Y	Y	Y	Y	Y	y	Y	y	y
2	Photocopier	Y	Y	y	y	y	Y	Y	Y	Y	Y	Y	Y	y	Y	y	y
3	Vehicle	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
4	Statistical package	Y	Y	y	y	y	x	y	x	y	y	y	Y	y	Y	y	y
5	Telephone service	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
6	Fax	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
7	Radio call	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
8	Internet	x	x	x	x	x	x	x	x	y	x	x	x	x	x	x	x

5.3 Description of attributes of the surveillance system

5.3.1 Usefulness

All visited health institution respondents have common understanding on usefulness of existences of public health surveillance system to prevent and control epidemic typhus outbreak. Health center surveillance officers and district PHEM focal persons complained, lack of their sustainable office organization, lack of concerned experts, attention from the higher level, low enforcement to private facilities, lack of budget on surveillance and lack of vehicle on surveillance system was identified problems to be solved in order to improve the usefulness of the surveillance system.

5.3.2 Timeliness

Timeliness of reporting was 100% for the visited health facilities.

Timeliness = No of health facilities reported on time in 52 weeks / No of HCs expected to report on time in 52 weeks *100%,

$$4326/5200 * 100\% = 83.2\%$$

5.3.3 Simplicity

All interviewed respondents from Health Office and focal person in Health Center were replied the case definition is easily understandable and simple to any Health care provider and health Office staffs. Surveillance system use Registration book of the Health Facilities as the source of information. All respondents answer that Collecting weekly epidemic typhus cases Monday

morning from OPD registration book take a maximum of five minute per one log book ,and weekly epidemic typhus reporting format Health of 15 respondent 5(%) answered it is simple and takes less than 10 minutes to record, and 10(%) of woreda health office PHEM officers and one health center surveillance officer complained on format not included personal characteristics and residence of the patient.

5.3.4Sensitivity

The ability of the surveillance system of kolife Keranio to detect the epidemic typhus and outbreak, there were 2681 epidemic typhus case detected from the health facility registry but no cases detected from the community surveillance and trend analysis of epidemic typhus not performed in 2016.

5.3.5Acceptability

In this case the participants of the surveillance system are health facilities, health offices and health workers and the community as well; therefore, the health center surveillance officers and district PHEM focal persons accept and are well engaged to the surveillance activities. Even though they mentioned that they send the report by their own means of communication methods, without allocation of budget. Privet and NGO clinics also accept the system and the report immediate and weekly reportable diseases to their own district health offices but the district PHEM officers complain that during an outbreak ,there was inconsistency of daily report from private health facilities.13(83.7%)of the respondent district complain on community surveillance ,not detect the suspected cases from the community. Acceptability of the system is a reflection of the willingness of the surveillance personnel to implement the system, interview of health center surveillance officers show that health professionals working in preventive aspect use a surveillance system case definition to detect the epidemic typhus cases but in out patient departments the health officers and physicians are use the standard case definitions regarding to the formant all respondents sent their report by using the current and appropriate surveillance reporting format.

5.3.6Flexibility

In the visited Woredas and Health Facilities, all health workers knew that the weekly form can be used to notify new diseases the reporting format is open for newly emerged and re-emergingdiseases and conditions that the existing surveillance system is flexible.

5.3.7 Positive predictive value/ cases definition ability

PVP surveillance system is calculated as per the guideline PVP is represented by $A/A+B$. where A is true positive cases, B is false positive cases. From the total of 4131 laboratorically tested suspected epidemic typhus cases 2681 cases were true positive cases and 1457 cases were false positive case.

$$\text{PVP} = 2681/2681+1453 *100\% = 64.9\%$$

5.3.8 Representativeness

All respondents from district and health centers reported that surveillance data was submitted from all health facilities 85(governmental and non-governmental health facilities) from their catchments areas. About 62.5% of respondents also agreed that rural and urban communities were equally benefited from surveillance system, but 37.5% respondents did not agreed on equal benefited from the system because of the presence of areas which are hard to reach.

5.3.9 Stability

All respondents reported that, any new restructuring in the system did not affect negatively the procedures and activities of the surveillance of the diseases. In three districts there was time or condition in which the surveillance is not fully operating for some period due to no legally assigned PHEM focal persons. All of the respondents described the lack of resources, which challenged the surveillance system, but they used other alternatives to solve the problem and also they complain that there was no budget allocated for the PHEM departments of all district in kolife Keranio sub-city.

5.3.10 Data quality

2(13.3%)districts, has not use IDSR data base and 93% of the reporting format in the visited health center with necessary information including zero reports is available.

6. Discussion

We assessed how the health facilities detect case and outbreak by one of core function of surveillance system ,case detection , but none of health professionals use the surveillance case definition of epidemic typhus rather the standard definition and the system is limited on health facility report. According to the evaluation result all selected health facilities confirmed the case by weil-flex,OX19 agglutination test rather the national PHEM guideline suggest that weil-flex,OX19 titration test. The report timeliness and completeness of kolife Keranio sub-city were greater than the target of 80%.most of the respondent use hard copies and mobile phone text message to send their report to next levels according to national PHEM guide lines districts must analyze and interpret the reported data's weekly but all districts health offices were not

analyzed and interpret the surveillance data's of epidemic typhus throughout the year but they do for other immediate reportable disease.

Epidemic preparedness of the district show that there were two districts have no stock of drugs and supplies for emergency preparedness and response and half of the district health offices have no general emergency preparedness and response plan. The system evaluation result show that all district and kolife Keranio-sub city PHEM departments have no their own budget for epidemic preparedness and response .Many of the districts were supervised and received feedback from higher level but not consistence .to support the surveillance system training enhance the quality of the system and 40% of health extension workers were not trained in surveillance to support community surveillance regardless of communication all district and sub-city PHEM departments have no vehicles of transportation during field work and except one district the rest of them were not have internet access including kolife Keranio sub-city. Many of the participants respond the weekly reported format of epidemic typhus is simple to record but not have age, sex and place variables. Acceptance of the system is the reflection of the willingness of the surveillance personnel's to implement the system. According to this concept, the result of the evaluation show that all district and health center surveillance personnel's are accepted the system and they engage in the implementation of surveillance system but community surveillance is collected by health extension workers from different community representative, the evaluation result show there were no cases in 2016 reported from the community. On surveillance system representativeness the respondent agree that the system not addressed equal benefit to hard to reach areas in the sub-city due to communication and transportation problems. There was a time the surveillance system interrupted in three districts because of staff turnover and recruitment problem.

7. Conclusion

Case detection in kolife Keranio sub-city limited in health facilities out patient department register book rather searching the disease in the community and the case definition of epidemic typhus is not available and posted in both health facilities and community. Case confirmation of epidemic typhus is performed by weil-flex OX19 agglutination test. Report completeness and timeliness of the sub-city is above 80%of the target .Hardcopies and mobile texts are the main means of communication to report to the highest level.

In 2016 epidemic typhus data analysis and interpretation was not done and half of the districts have no general emergency preparedness plan. There is no budget cascading to district and kolife Keranio sub-city PHEM departments. No reported epidemic typhus from the community surveillance throughout the year .Luck of vehicles is the main compliance of the surveillance officers for field work. Interruption of the surveillance system is due to staff turnover and hard to reach areas in the surveillance is not equally addressed by the system.

8. Recommendations

Health facilities and district surveillance officers should have post the case definition of epidemic typhus in the working place as well as in the community to measure the capability of the case definition to detect the case.

It is better confirming the epidemic typhus according to the national PHEM guideline by weil-flex OX19 titration.

The sub-city and district administration need an internet access and transportation to improve report completeness and timeliness and to address a hard to reach areas.

The sub-city and district surveillance focal person must do an epidemic typhus data analysis and interpretation according to the guideline, for early detection and response.

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CHAPTER V: HEALTH PROFILE DESCRIPTION

5.1 Health profile description of Lideta sub city, Addis Ababa, 2015

Executive summery

Background; This health profile report is divided into two sections: Demographic and Social Indicators and Health Status of the woreda 4 residence. The primary objective is to provide a broad overview of the social, economic, demographic, geographic, health and health related profile description of health profile in woreda 4 kolife sub-city Addis Ababa city administrations 2017.

Methods; A cross-sectional descriptive study was conducted that included interview and standard check-lists from EFETP resident manual, use to collect data from woreda 04 health office, health institutions and other sectors of the woreda. we use a Microsoft excel2010 for analyzed the data's. For ethical clearance an official letter has been obtained from AAU department of public health, kolife Keranio sub city, submitted to woreda 4 educational, vital statics, culture and tourism, other offices.

Result; There are 933household with 1669childrens registered as living below the poverty level in 2016/17, water supply is irregular and some areas found pip water after 2 weeks. According to woreda 4 health office and Alem bank health center report of 2016, contraceptive acceptance rate 24.67%, Antenatal care and birth by skilled health professionals are greater than 100% achievement. The incidence of pneumonia and diarrhea in <5years was 375.4/1000 and 525/1000population respectively. There is no mortality data in registration. In non communicable disease Epilepsy, mental illness and diabetes mellitus are the leading cause morbidity and AURTI, Diharoa and UTI are the leading cause of morbidity among communicable diseases , prevalence of tuberculosis is 388/10,000 population.

Conclusion; Mortality rate like neonatal mortality rate, infant mortality rate, child mortality rate, disease mortality rates should registered. Epilepsy, mental illness and diabetes mellitus are the leading cause of Non communicable disease and AURTI, Diharoa and UTI are the leading cause of morbidity in adult communicable disease, in <5 years there are high prevalence of Diharoa and pneumonia. These show woreda4 residents suffer in double burden of diseases. An increasing a four years trends of under five pneumonia and diarrheal disease , TB cases from family health profile and AURTI &diarrhea prevalence in adult from ten top morbidity data of Alem Bank health center show the woreda is susceptible to any kind of communicable disease out breaks.

Key word; Health profile, Health Status, cross-sectional descriptive study, kolife Keranio Sub-city

1. INTRODUCTION

A health profile is a qualitative and a quantitative description of the health of the citizens and the factors which influence their health. It identifies problems, proposes areas for improvement and simulates action. Since this health profile is the first profile for kolife sub city woreda 4 it should try to be as comprehensive as possible and cover a broad range of health problems and issue informing the public, policy-makers and politicians about health and its determinants in their city is the key to ensuring that all relevant groups in the city truly understand the ideas, problems and issues with which they are dealing. The city health profile is an ideal way of bringing together a wide range of health information to acquaint various groups with current health challenges. It may be useful to consider public health reports as “a visible manifestation of the public health function” [1]

The Community Health Profile Jan 2017 summarizes the health of the residents of Woreda 4. , health is described with a valuable look at the health issues and risk factors affecting kolife sub city woreda 4 residents. The report is divided into two sections: (a) Demographic and Social Indicators, (b) Health Status, These sections provide an overview of the health of kolife sub city woreda 4 residents measured by an array of indicators. These indicators include births, deaths, illness, and behavioral measures to name a few.

Demographics are ways to measure the characteristics of a population. The makeup of a population, such as its race and ethnic profiles, sex, age groups, and many additional social factors helps in examining trends and determining needs for the community.[2]

This section of the report will describe the demographic profile of the population of woreda 4 residence. Indicators such as race and ethnicity, sex, education, poverty, unemployment, health

Insurance status and commuting practices will be described here in brief.

Measures of health status provide information about the health of populations. Over the past four decades the health of the nation has been monitored through the Healthy People initiative by the use of health indicators. These indicators are useful in determining the effectiveness of health strategies and indicating where the nation can strive for improvement. According to the CSA, life expectancy and overall health have improved for most Ethiopian in recent years, but not all have benefited equally.

In this section the health trends for kolife sub city woreda4 residents described using health status indicators. These indicators include: fertility rates, birth rates, mortality rates, as well as Incidence and prevalence rates. Where possible and appropriate, woreda 4 data is compared to that of sub city and the nation’s Healthy People indicators. This is done to best illustrate

differences, similarities, and where there have been successes or where there are needs for improvement. Health behaviors are those actions used to ensure good health and prevent illness [3].

There are daily behaviors and actions that we engage in that can be protective or harmful to our health and well being. These factors, often referred to as lifestyle factors, increase or decrease our chance of illness. Certain behaviors have been found to increase risk factors contributing to chronic disease as well as excess and premature death. These behaviors, referred to as risk factors, include excessive alcohol consumption, use of tobacco, poor dietary practices, and physical inactivity. [4]

This section describes recreation centers, type of local alcohols used, sport areas, local dietary habits of the woreda.

1.2 Statements of the Problem

Health description is important for prioritizing health and health related problems of the community at any level especially detail assessment of current health status of the priority disease. Addis Ababa is the most populous city in the country. it recipient to the lion's share of the urban population growth in the past, a role which the city is likely to continue to play in the future as well. If one assumes the current trend (with Addis accounting for 25% of the total national urban population) to continue in the coming two decades, when the country's total population reaches the projected 120 million by 2030 with urbanization increasing from the current 18% to 30%, the city will have close to 9 million inhabitants [5].

Kolife sub city woreda 04 is one of woreda of Addis Ababa also share all burdens of city. As the population of the city increase poverty, overcrowding communicable and non communicable disease, disaster, homelessness and poor hygiene and sanitation will be facing problem of the city.

Due to these problems information like socio demographic, education, infrastructure, health system, public health emergency and health & health related issues should be avail in organized and well documented manner for prioritizing the problem & proper planning. In related to this, there is no organized, completed and well documented profile data in woreda 4 health office also in kolife sub-city. Therefore describing the health profile of the woreda is helpful to give evidence based information for prioritizing and instituting appropriate public health interventions in the woreda.

1.3 Significance of the Study

The role of this health profiles is Summarized health information acting as a source of epidemiological information about the locality relevant to the woreda, Identify health problems in the woreda, Identify factors that affect health in the woreda, Identify suggested areas for

action to improve health, Act as a stimulus for intersect oral action and Inform the public ,politicians ,professionals and policy-makers about matters that affect health ,in easily and understandable form

2 LITERATURE REVIEW

2.1 Study Area profile

Addis Ababa is the national capital city of the Federal Democratic Republic of Ethiopia. It is the economic and cultural hub of the nation. Hosting the head quarters of the African Union (AU), United Nations Economic Commission for Africa (UNECA), and the regional headquarters of UNDP, UNICEF and UNHCR among others, Addis is also the diplomatic center of African and international politics[1]. The city is located between 8⁰49'55.929`` and 9⁰5' 53.853``North Latitude and 38⁰38'16.555`` and 38⁰54'19.547`` East Longitude [2]. Its vast territory extends within an altitude of 2000 to 3100 meter above sea level. The average annual rainfall of the city is about 1200 mm, the minimum and maximum temperature is 11-14 ° C and 17-21 ° C. Addis Ababa is divided into 10 Sub Cities and116Woredas(Districts).The latter are the lowest level of the government structure [5] .

Kolfe Keranio sub city is one of the ten sub cities established under Addis Ababa city administration. It about 9.6 kms away from center of the city and about 13Kms the western side of the sub-city reaches from the center. It is located at the part of Addis Ababa, between the road to Jimma and Ambo towns. The sub-city shares boundary with 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. At present the sub city is divided in to 15 woreda 103 sub woreda, 393 sefer, and 1385 block. It has an area of 6348.09 hectares from this about 1334 hectares was covered with forest and included prominent feature of mount Jemo , Jemo river and repi Medhanealem mountain. According to a report from the city administration and officials in the sub city, it is one of the rapidly expanding sub city of Addis Ababa where intensive housing construction, is taking place and now a day's its population and area extent is increased than the previous. [6]

There are different accounts of the origin of the naming of the area. Word of mouth suggests thatthe area got its name during the period of Menelik. There are many speculations as to who coined the name Kolfe. Some argue that the defense minister of Menelik, Fetawrari Habtegiorgis, was the founder of the area and others argue that it was Menelik himself. The name Kolfe was believed to be derived from the Oromiffa word *Kolfa*, which literally means 'laughing'. Kolfe is located in the western edge of the Ethiopian Capital, Addis Ababa. It is considered as one of the semi-peripheral parts of the city recognized for its informal business activities.

According to the former Administrative Structure of Addis Ababa; the Kolfe area encompasses

Coordinates:9°0'49.75"N38°42'21.49"E / 9.0138194°N 38.7059694°E, Time zone East Africa Time (UTC+3) ,Area code(s) , (+251)11 , Woreda 4 have got the name Alem bank, because of most of the buildings including Alem Bank health center constructed by financial support of World Bank,

2.5 Objectives

2.5.1 General Objective

The primary objective is to provide a broad overview of the social, economic, demographic, and geographic & health and health related profile description of health profile in woreda04 kolife sub-city Addis Ababa city administration Jan 2017

2.5.2 Specific Objectives

To describe health status and health indicator of woreda 04 residence in order to identify Problems for priority setting in Jan2017

To determine disease burden of woreda04 in Jan 2017

To analyzing the information with respect to its impact on health

3. Methods

3.1 Study Area

Study was conducted at Kolife sub city at woreda 4, Addis Ababa Ethiopia, Feb 2017

3.2 Study Period

Data was collected, entered, analyzed and interpreted from 23 Jan2017 to 27 Feb 2017

3.3. Study Population

Total population of Kolife sub city woreda 04

3.4 Study Design

Institutional based cross sectional study design was conducted that included interview and standard check-list were used to collect data from woreda 4health office, health institutions and other responsible sectors of the woreda. Moreover publication and literature about the area reviewed and sociodemographic indicators derived from census data.

3.5 Data collection procedure

Standard check lists/tool was used to collect the woreda health profile. Interviews have been conducted with relevant officers & office head of the woreda health office, education, FMHACA, water and others offices based on need data.

3.6 Instrument of data collection

Historical, geographical, political administration, population & population structure, main income source, education and health system of woreda data have been collected from woreda offices.

3.7 Data analysis

Microsoft Excel was used to analysis the data and ARC GIS to draw map.

3.8 Dissemination of findings

Findings of health profile is submitted to kolife sub city health bureau and woreda4 health and administrative office by soft and hard copy to use the findings for priority setting; planning & initiate research, also submitted to Addis Ababa health bureau kolife Keranio sub city public health emergency management department & AAU department of public health in soft copy

3.9 Ethical clearance /consideratic

For ethical clearance an official letter has been obtained from AAU department of public health submitted to kolife sub city and another version of official letter has been obtained from kolife sub city submitted to woreda4 health and administrative office. The purpose of the study was explained to the study subjects and verbal consent was obtained from concerned bodies. Confidentiality of result was kept /ensured

4. Result

4.1 Administration

Woreda4 administration is the lowest level of the government structure for woreda 4 residents, there are 22 offices within woreda administration, woreda health office is one of the offices, According to the record of the woreda administration, the total population of the woreda is 34458, the population density (people/hr) of the woreda is 112. Woreda 4 is sub divided into 7 sub woreda called ketena and those 7 ketenas include 30 sefer, within 30 sefer there are 102 Blocks. The community have an access to participate on planning, implementing, and evaluating of each woreda offices via different associations like community forum, youth association, women's association, women league, youth league, and one of the most important association for health sectors' is women's development army they are graduated women by health extension workers on 15 health extension packages, and they work as voluntary community health workers, there are 95 WDA in the woreda4

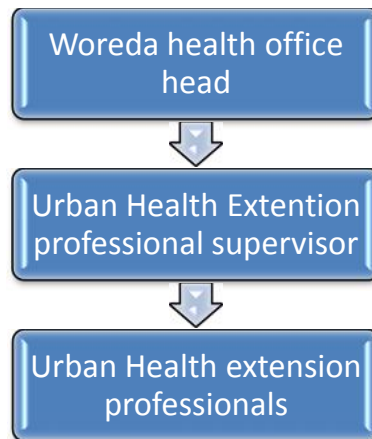


Figure 25 Kolife sub city woreda 4 health office organizational structure Addis Ababa, Ethiopia 20016

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

There are many private financial institution in the woreda like grocery, restaurant, milk and milk product shops, vegetables and juice house ,butchery, Traditional alcohol houses, bakery's ,fish shop ,barberies ,and salon are some of among many, the annual health budget of the woreda of 2016 is about 14,000,000 birr .The main sources of credit facilities in the community are Money lenders (arata) with a 10 percent interest rate; Credit associations; Close friends,

neighbors' or relatives; The work place, e.g. government offices; Banks there are nine banks two governmental and seven private banks ; Iddir and Iqub are the major form of Social security in the woreda most of the woreda 4 residences occupational status are merchants

S. no	Types of institution	No .of institutions
1	Grocery	16
2	Mini restaurants	88
3	Restaurant	18
4	Milk and milk product shops	18
5	Vegetables and juice house	16
6	Butchery	31
7	Traditional alcohol houses	6
8	Bakeries	26
9	Fish shop	2
10	Barberries	90
11	Salon	74
12	Public latrine	3
13	Public Shower houses	4
	Total	392

Table 4 Financial institution related to health of woreda 4 residence, kolife sub city Addis Ababa, Ethiopia 2017

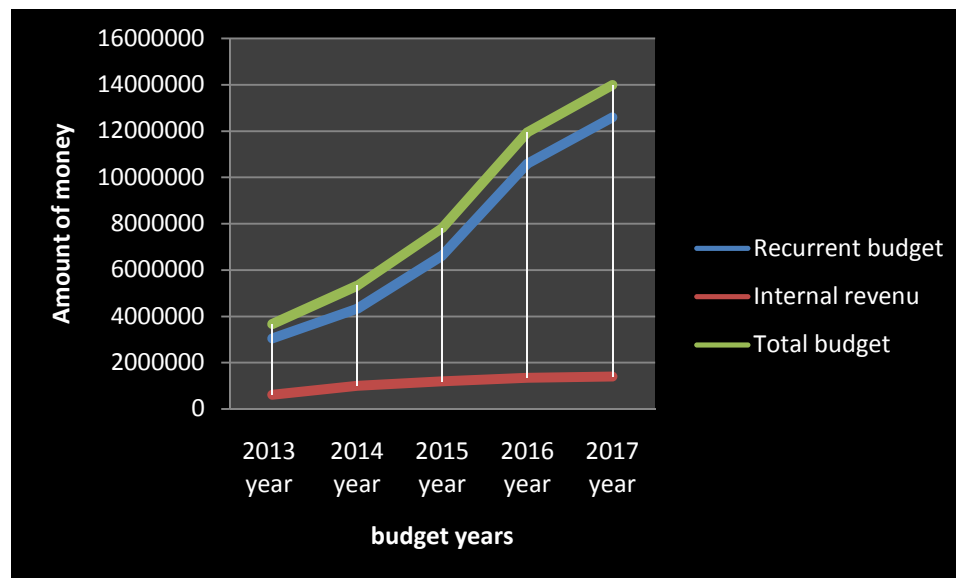


Figure 26 Projection of health budget for the last five years woreda 4 kolife sub city, Addis Ababa, Ethiopia 2013-2017

4.3 Housing condition

A household includes those members who share the same cooking pot and who live together under one roof. Some consider housemaids as members of households but others do not because they are temporarily living together and have their own households at home .there for according to the data collected by woreda health extensions workers for the purpose of PHC profile there are only 24860 house hold members in the woreda the remaining large amount of the population part live as a temporary member and renting from the individuals.

Sub Woreda	Number of Household	Number of Household members
Ketena 1	916	3393
Ketena 2	897	3550
Ketena 3	583	2601
Ketena 4	1218	4095
Ketena 5	812	2449
Ketena 6	1267	4588
Ketena 7	1159	4184
Total	6917	24860

Table 5 Number of house hold in relation to household members of woreda 4 , kolife sub city Addis Ababa, Ethiopia 2016

Among 6917 households 3744 households are living by their own private home,225 households living in rented house from government and 2948 households are living in rented house from individuals ,most of the houses are newly constructed for the purpose of resident.

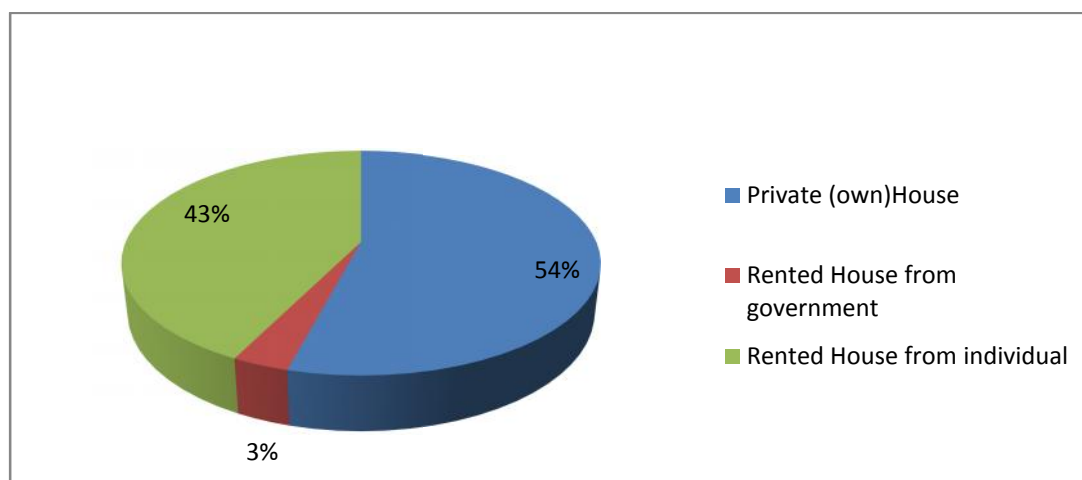


Figure 27 Household Ownership kolife sub city woreda 4, 2016

Therefore large numbers of the households in the community have their own houses of any type. Others rent from the government or individuals while some share rooms with others. The average household size is 4 members per household..

4.4 Poverty

Poverty estimated based on the family size of the house hold and the reported income of the family ,poverty have a great impact on health of the community by limiting access to health care services and also by limiting to live on safer environment and better housing.

In Alem Bank (woreda 4) Administration there are 933 families registered as living below the poverty level in 2016/17 and 1669 children's below 18 years within the families living in desperately poor conditions, those children living in poverty can experience learning difficulties , social, emotional and behavioral problems.

4.5 Road and transport services

There is an internal asphalt gravel road in the woreda 4 that connect to the ring road and it start from Ayer tena to Ale bank about 4km and the other roads in the woreda are covered by cube stones (government and community gravel road) and some roads are dusty in charity, they are the source of air pollution by wind. The damaged roads around Alem bank health center makes difficulty for clients and Ambulance .There is no transportation problems in the woredas peoples are using Taxi, city and other bus.

4.6 Water supply and sanitations

Even if most of woreda 4 residents have a portable water pipe lines ,they are still suffering by shortage of water and they complain the water provided currently is not clean and the supply is irregular based on shift ,some areas found water for few hours per week and other area found pip water after 2 weeks , this makes water vending is an important business for the local shops .According to Mr Teka Belay Woreda 4 health office supervisor due to inappropriate program of water supply peoples forced to collect water with different kinds of plastic containers for one week and more this made the water unpleasant and increase the risk of contamination.

Most of the houses in the woreda are newly constructed, their sewerage systems are well and there is no significant problems are seen in the sewerage system .All houses, schools and health facilities in the woreda have latrine

4.7 Education and school Health

4.7.1 Why does this important to health of woreda 4 residence

Education have a positive effect on health outcomes by improving the life quality of the population such as better personal and environmental hygiene ,knowledge of healthier eating practices and improving health seeking behavior.

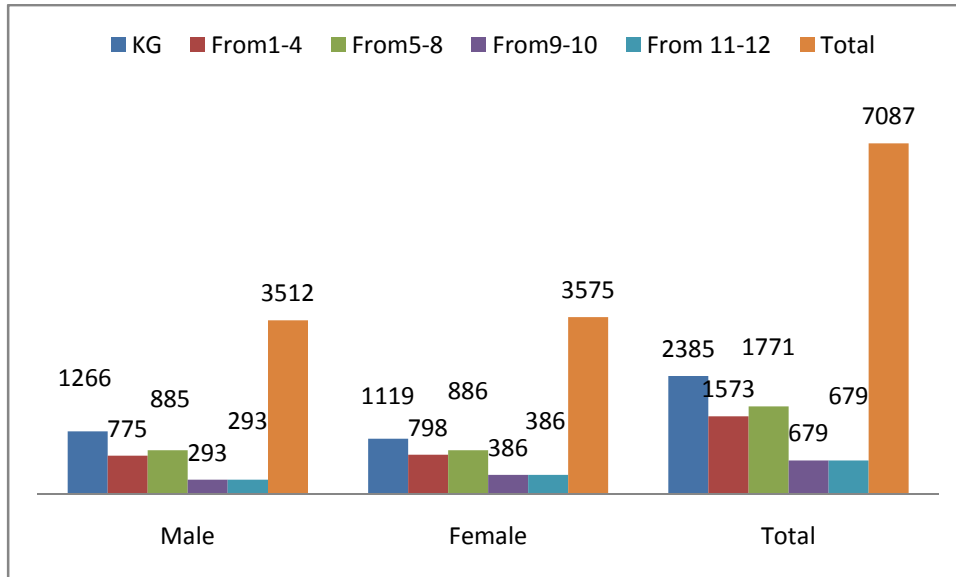


Figure 28 School enrolment by sex kolife sub-city woreda 04 Addis Ababa Ethiopia 2016

In woreda 4 , private schools have a great contribution on educating the community by accepting a large number of students than the government schools ,in the woreda 4 there are a total of 20 KG (from 3-6 years old children's), 13 primary(from 7-14 years old children's) ,secondary school (> 15 years),private and government schools are found . Even if there are schools more than any other woreda of kolife sub city, there is no college and training centers. From the total 11296 students in the woreda 62.7 % of the students learn in the private school and 37.3 % of the students learn at governmental schools.

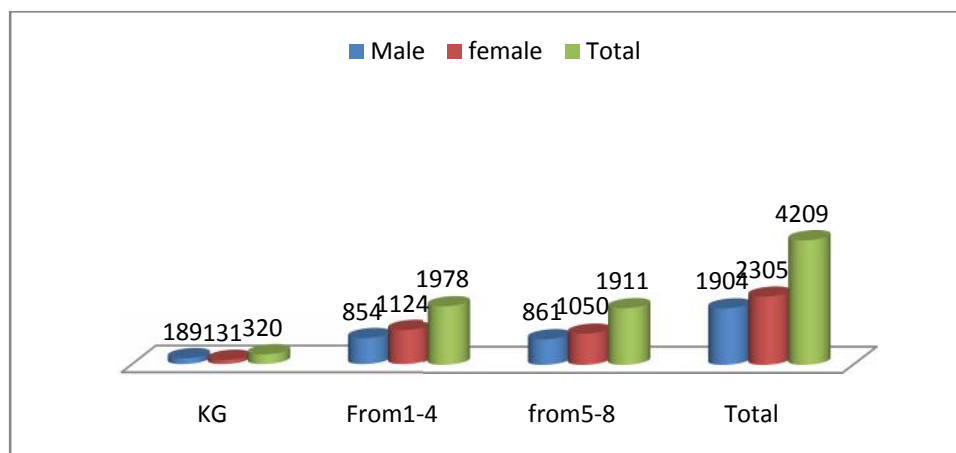


Figure 29 Number of students of governmental schools kolife sub city, woreda4, Addis Ababa Ethiopia 2016

According to the data register of woreda educational biro, From the total student registered and on learning during data collection time 5423 students are male and 5873 students are females. This shows numbers of female students out stand by a number of 450.

Sr. no	Name of organization	Types	Area of work	Remark
1	GSI	NGO	GENERAL SUPPORT	
2	AMRIF	NGO	WASH	
3	OSFAM	NGO	WASH	
4	AEHF	NGO	HIV/AIDS	
5.	CVDA	IN.NGO	F/P	

Table 6 NGO working in health related issue in kolife sub city woreda 4 Addis Ababa Ethiopia 2016

4.8 Population and population structure

4.8.1 Why does this important to health of woreda 4 residence

Measuring population change in gender, age distribution of the population is important to know the demand and utilization of the health care system. Any change in age, sex, social, economical, educational, Housing, and occupational status will have impact on Health planning and budget and resource allocation.

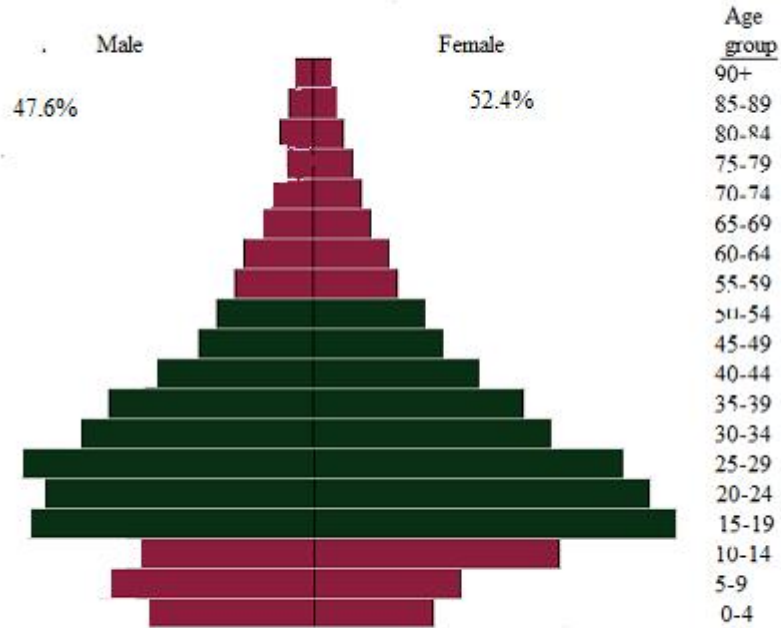
The total population of the woreda is 34458 among the total population 16402 are males and 18056 are females .The population density (people/hr) and sex ratio in the woreda 4 is 112 and 103:100 respectively

Age group	Population					
	Male	%	Female	%	Male +Female	%
0-4	1254	3.64	1213	3.52	2464	7.15
5-9	1278	3.71	1354	3.93	2636	7.65
10-14	1375	3.99	1778	5.16	3325	9.16
15-19	1930	5.6	2929	8.5	4862	14.11
20-24	1861	5.4	2757	8.0	5096	14.79
25-29	2274	6.6	2412	7.0	4679	13.58
30-34	1585	4.6	1344	3.9	2929	8.5
35-39	1234	3.58	1137	3.3	2378	6.9
40-44	827	2.4	679	1.97	1509	4.38
45-49	640	1.86	641	1.86	1282	3.72
50-54	489	1.42	524	1.52	1013	2.94
55-59	355	1.03	338	0.98	693	2.01
60-64	300	0.87	296	0.86	596	1.73
65-69	224	0.65	210	0.61	434	1.26
70-74	159	0.46	172	0.5	331	0.96
75-79	83	0.24	83	0.24	169	0.49
80-84	48	0.14	69	0.2	121	0.35
85-89	21	0.06	24	0.07	48	0.14
90+	17	0.05	24	0.07	41	0.12
Total	16402	47.6	18056	52.4	34458	100

Table 7 Population of kolife sub city woreda 4 by age group and sex Addis Ababa, Ethiopia 2017

To show ethnic and religious composition of the woreda 4 resident, Ethiopian urban study conducted at kolife area by Philippa Bevan and Alula Pankhurst by 2006. Oromo (22%),Amhara (39%),Gurage(25%),other(3%)and religious composition of protestant (8%),Islam(8%),Orthodox (78%),Other religion (6%).

population pyramid of kolife sub city woreda 4, Addis Ababa Ethiopia 2017



Based on 2007 census report

Figure 30 Population pyramid of kolife sub city woreda 4, Addis Ababa Ethiopia 2017

4.9 Health service

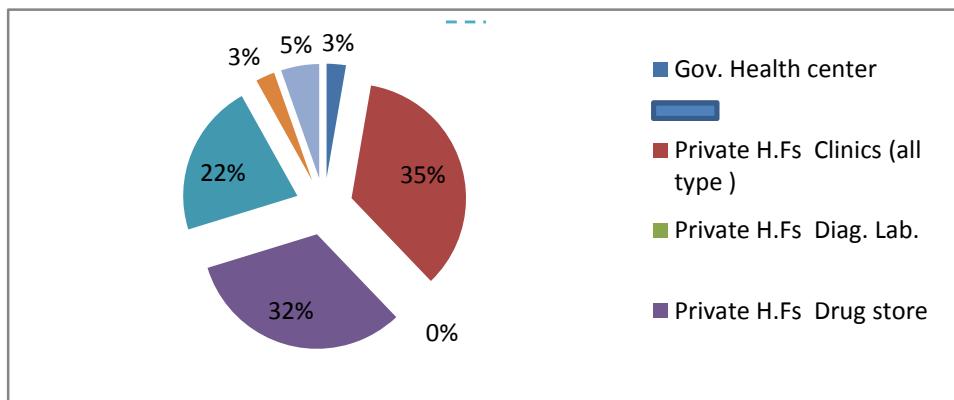


Figure 31 proportion of health institution in woreda 4 kolife sub city Addis Ababa Ethiopia 2016

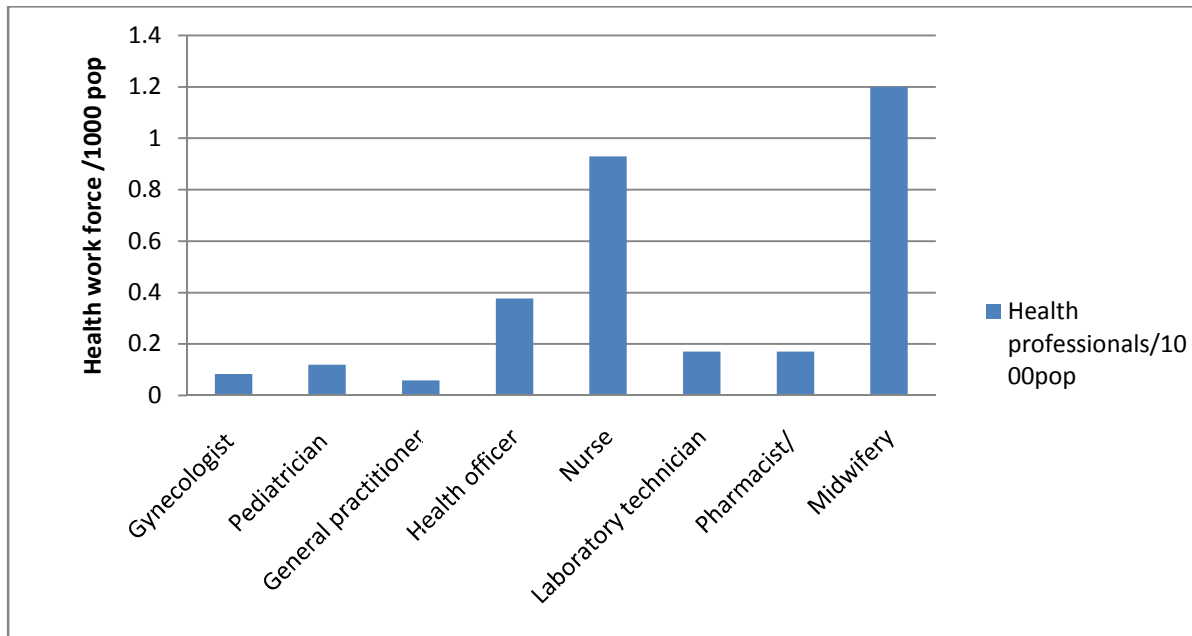


Figure 32 number of health professional and HP to population ratio. Woreda4 kolife sub city, Addis Ababa, Ethiopia 2016

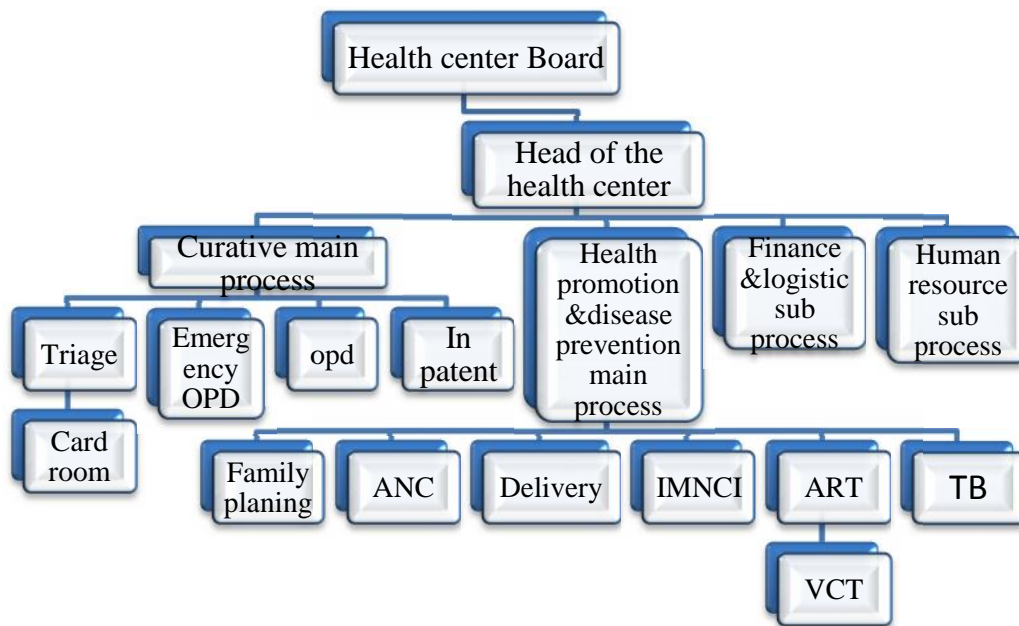


Figure 33 .kolife sub city woreda 04 Alem Bank health center organizational structure Addis Ababa, Ethiopia 2017

Alem Bank Health Center constructed at 2012 and start health service to woreda 4 and to other neighboring Woredas. There are 37 health facilities in the woreda and among them 13 are private clinics all types , 1 government health center , 8 pharmacies , 12 drug stores and 2

specialty clinics (one gynecologic and one pediatric clinics) are giving health services to woreda4 residents

S.N	Service delivered	Target woreda	of Coverage	%
1	Contraceptive acceptance rate	11133	5183	24.67%
2	Ante natal Care (ANC)1 st	803	3168	>100%
3	Ante natal Care (ANC)4 th	723	2870	>100%
4	Skilled Delivery	723	1600	>100%
5	Still birth	-	2	0.12%
6	Post natal Care (PNC)	723	768	>100%
7	Total immunization coverage	723	2839	>100%
8	Under five children Diharoa prevalence	192	1294	>100%?
9	Under five children pneumonia prevalence	165	925	>100%?

Table 8 maternal health status of kolife sub city woreda 04 Addis Ababa Ethiopia, 2016

S. no	Health Indicators	N(%)	Expected
	Age dependency rate	24	
	Infant Mortality Rate	-	No data
	Child Mortality Rate	-	No data
	Crude Birth Rate	23.9	24.4
	Crude Death Rate	-	No data
	Maternal Mortality Rate	No data	
	Still birth	0.12%	
	Total immunization coverage	>100%	772

Under five children Diarrhoea prevalence	1294	Expected 192
Under five children Pneumonia prevalence	925	Expected 165

Table 9 Vital statistics of woreda 4 kolife Keranio sub city ,Addis Ababa Ethiopia 2017

4.10 Contraceptive prevalence

4.10.1 Why does this important to health of woreda 4 residence

This indicator is directly related to operations: for contraception utilization (and prevalence) to increase, the numbers of both new and repeat acceptors should increase. Each acceptor is counted only once, the first time s/he receives contraceptive services in the fiscal year.

“New acceptors” refers to the number of acceptors who receive family planning services from a recognized program for the first time irrespective of the method used. This is not the number of consultations. Each acceptor is enumerated once in the year, at the first consultation for contraception in the calendar year.

“Repeat acceptors” refers to the number of acceptors who receive family planning services from a family planning program previously irrespective of the method used. Long acting FP method users will also be counted as repeat every year including routine checkup for ongoing use of a long term method such as Norplant, IUD, etc.

New and repeat contraceptive acceptors are reported as two separate counts, so it is possible to calculate each rate separately as needed. Acceptor data reported from NGOs and other community-based non MOH sources can also be included in this calculation.

Therefore contraceptive acceptance rate of the woreda4 is 24.67% that is below 50% of the 2016 plan of Addis Ababa city administration health biro of 65%

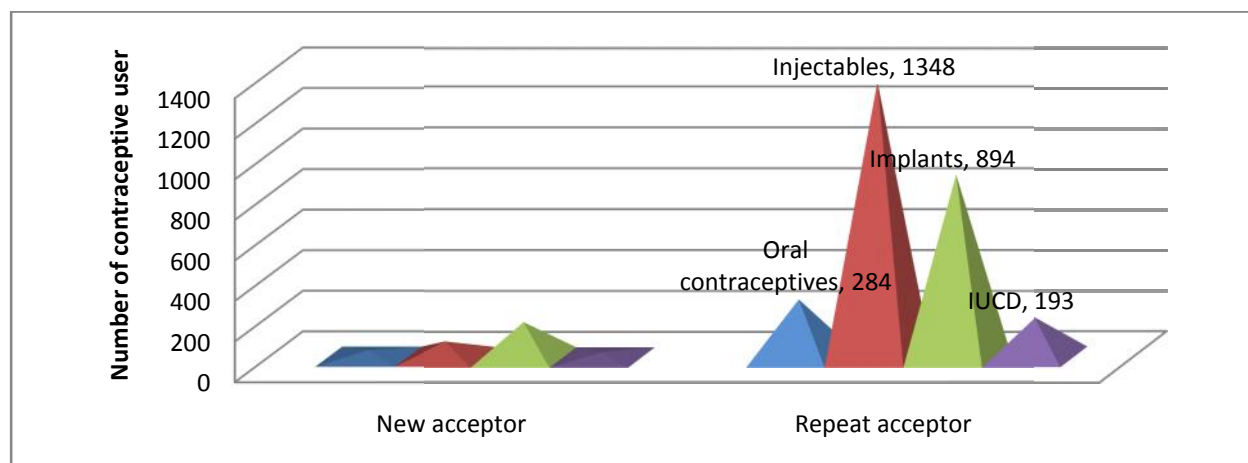


Figure 34 Number of contraceptive user by method Alem Bank Health Center, Kolife sub city, 2016

4.11 Antenatal care coverage

4.11.1 Why does this important to health of woreda 4 residence

Antenatal care coverage is an indicator of access and use of health care during pregnancy. The antenatal period presents opportunities for reaching pregnant women with interventions that may be vital to their health and wellbeing and to their infants. Receiving antenatal care at least four times increases the likelihood of receiving effective maternal health interventions during antenatal visits.

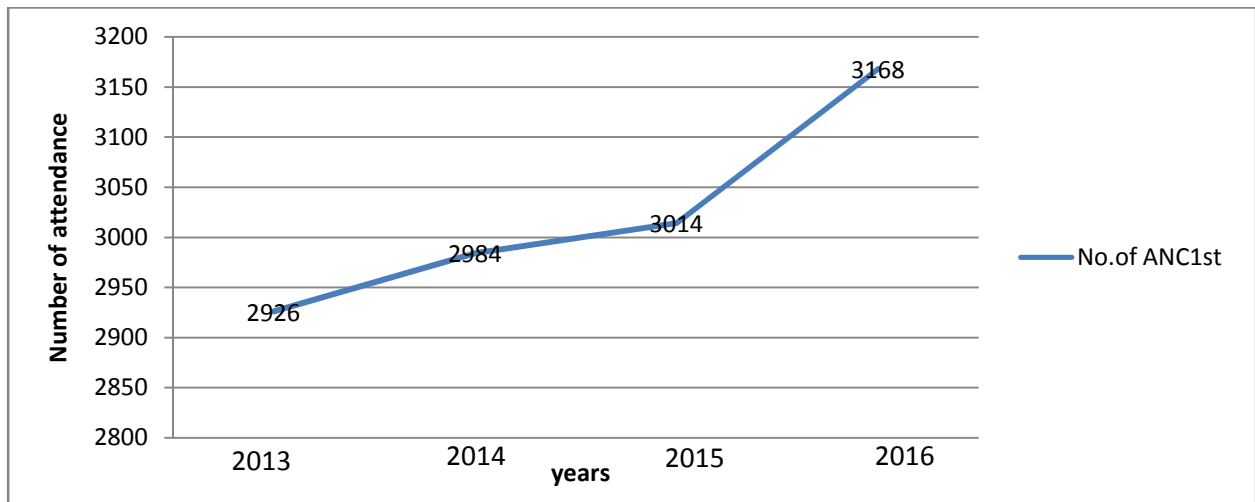


Figure 35 ANC1st service at Alem Bank Health Center kolife sub city, 2013-2016

The fourth antenatal care visit is an indicator of quality and use of health care during pregnancy. The antenatal period presents opportunities for reaching pregnant women with interventions that may be vital to their health and wellbeing and to their infants. Receiving four focused antenatal care visits increases the likelihood of receiving effective maternal health interventions during antenatal visits. In Alem bank Health Center 1st ANC is 394.5 and 4th ANC is 357.7 this show ANC coverage of the woreda 4 is more than 100% .this kind of over achievement is due to other neighboring woreda pregnant women's come to Alem Bank health Center for the health service

4.12 Birth attended by skilled health personnel

4.12.1 Why does this important to health of woreda 4 residence

All women should have access to skilled care during pregnancy and childbirth to ensure prevention, early detection and management of complications. Assistance by properly trained health personnel with adequate equipment is important to reducing maternal deaths. It is the single most important proved intervention that plays a great role in reducing the maternal mortality rate. In addition, the proportion of births attended by skilled personnel at the given facility is a measure of the health system's function, accessibility, and quality of care. "Skilled attendant at birth" has been proposed as an intermediary, process or proxy indicator for monitoring progress towards the reduction of maternal mortality, which is highly correlated with maternal mortality levels.

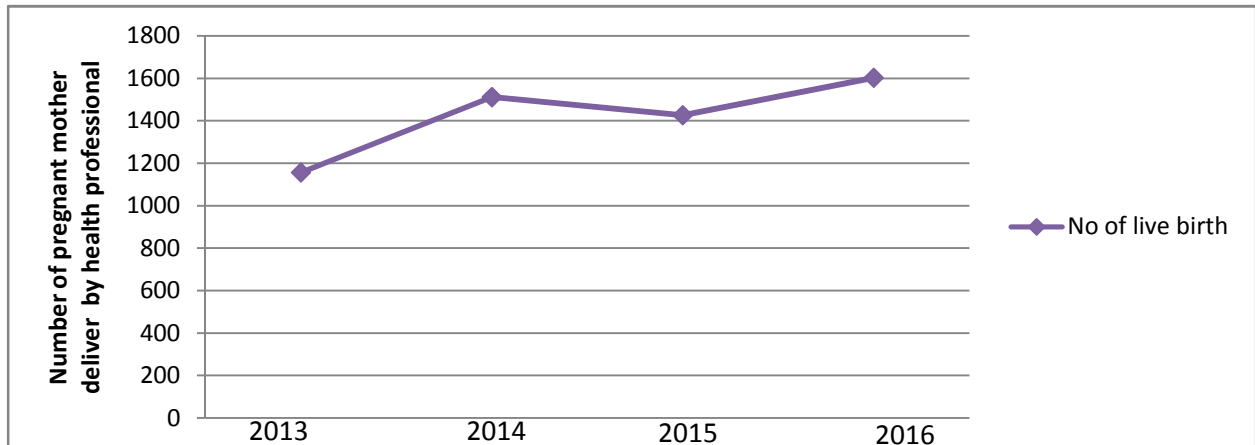


Figure 36 Birth attended by health professional, Alem Bank Health Center ,kolife sub city ,from 2013-2016 Ethiopian fiscal years

A skilled personnel is health professional (such as a midwife, nurse, health officer or doctor) who has been trained in the skills needed to manage normal (uncomplicated) pregnancies, childbirth and the immediate postnatal period, and in the identification, management and referral of complications in women and newborns. This definition excludes health extension workers and traditional birth attendants, whether trained or not. Therefore from the plan 20016 of woreda 4 Alem Bank health center the expected number of pregnant women's are 773 but during the same year 1602 birth was attended by skilled health professionals, All pregnant women health profile of woreda 4 residence are registered and included in the primary health care by health extension worker.

4.13 Post natal care coverage

4.13.1 Why does this important to health of woreda 4 residence

Early Postnatal care (PNC) coverage is the proportion of women and newborns whose get care, at least once during the first 7 days after delivery for reasons relating to post-partum services. For mothers who delivered in a health facility, the first post-partum visit is a visit after discharge. Prolonged stay after delivery in a health facility doesn't count as a postpartum visit. Even though the post-partum period is 6 weeks (42 days) after delivery, the reproductive health program especially encourages a visit within the first 7 days, and specifically the first 2 days, after delivery. It is considered critical. This indicator shows the utilization (accessibility and acceptability) of postnatal care. According to the data from woreda 4 Alem Bank health center 95% of mothers have got post natal care within the first 7 days after birth.

4.14 Fully immunization coverage

4.14.1 Why does this important to health of woreda 4 residence

Fully immunized child (FIC): The indicator measures the capability of the system to provide all vaccines in the childhood schedule at the appropriate age and the appropriate interval between doses in the first year of life; also measures public demand and perceived quality of services.

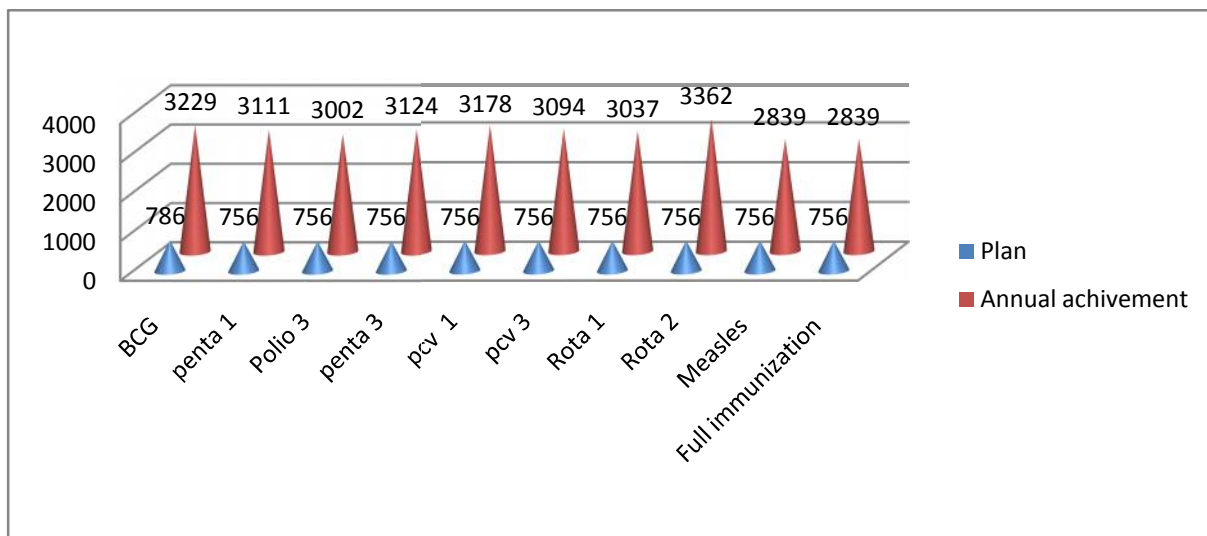


Figure 37 Immunization coverage Alem Bank Health Center, Kolife sub city,2016

Though the definition of FIC varies from country to country, the definition in Ethiopia should consider a child as fully immunized when he/she received BCG vaccine, 3 doses of DPT-Hib-Hep B , 3 doses of Polio , 3 doses of PCV ,2 doses of Rota and 1 dose of measles before the age of 1 year

4.15 Prevalence of under fives pneumonia

4.15.1 Why does this important to health of woreda 4 residence

Pneumonia is one of the leading causes of death among children under 5 years of age. Therefore, pneumonia prevention and treatment is essential to decrease child mortality rate.. A key intervention for controlling pneumonia in children is prompt treatment with a full course of appropriate antibiotics. Effective case management at health post and health facility levels is needed to ensure that sick children receive appropriate treatment. This indicator shows the proportion of under5 children treated for pneumonia at health facility levels.

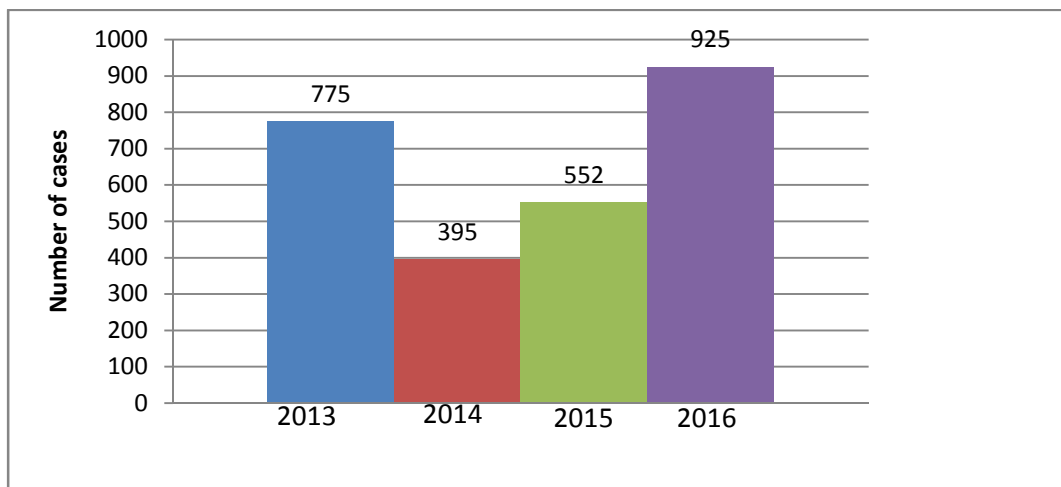


Figure 38Figure 39under five year children pneumonia prevalence kolife sub city , woreda 4,from 2005-2008 e.c

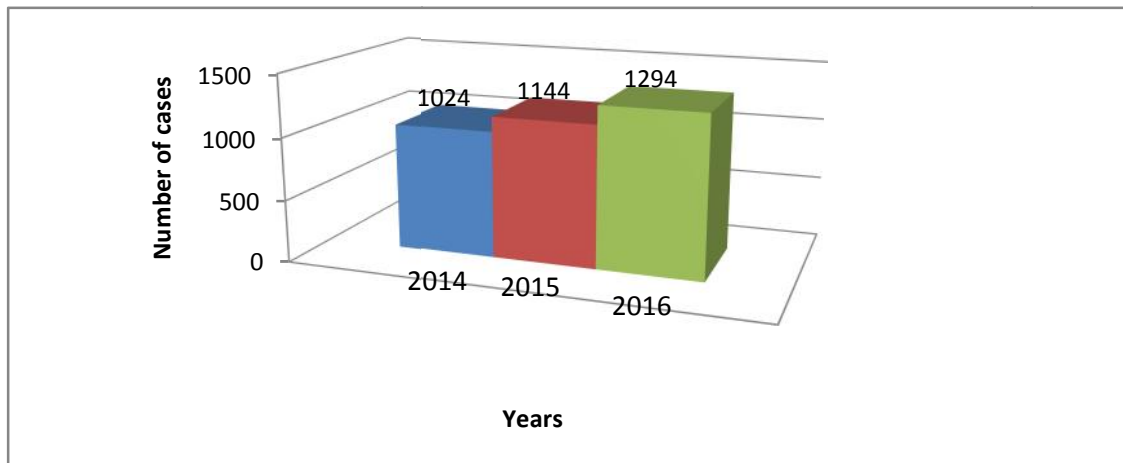


Figure 40 under five years children diarrhea prevalence kolife sub city, woreda 4, from 2014-2016

4.16 Nutrition

In woreda 4 Alem Bank health center there were only program specific nutrition program targeted on people who were under five with severe malnutrition and PLWHA on ART who have malnourished by this program 9 PLWHA on ART and malnourished and 34 under five with severe malnutrition were benefited by 2016 .there were no community based nutrition program, outreach therapeutic program & stabilizing center

4.16.1 Why does this important to health of woreda 4 residence

The LBW proportion is a rough summary measure of many factors, including maternal nutrition (during childhood, adolescence, pre-pregnancy and pregnancy), lifestyle (e.g. alcohol, tobacco and drug use), and other exposures in pregnancy. LBW is strongly associated with a range of adverse health outcomes, such as peri-natal mortality and morbidity, infant mortality, disability and disease in later life. LBW is a strong predictor of an individual baby's survival. The lower the birth weight, the higher the risk of death. Groups with lower mean birth weights show higher infant mortality rates. 1600 neonate that born at Alem Bank Health Center in the year of 2016 are measured their body Weight during delivery ,among them number live new born babies with birth weight less than 2,500gram are 80. And percentage of low birth weight (LBW) newborns is 5%.

4.17 Moderate acute malnutrition

4.17.1 Why does this important to health of woreda 4 residence

In Ethiopia, this indicator is used as an early warning for potential famine. This indicator is most sensitive to changes in the nutritional status of under fives when weights are recorded in well-child clinics, at woreda 4, Alem Bank health center in 2016, 14551 under five children weight measured and 176 children's are under weight and treated as moderate malnutrition (Z-score below -2 and -3).

4.18 Sever acute malnutrition

4.18.1 Why does this important to health of woreda 4 residence

This is an indicator for facility level prevalence of acute malnutrition. Increasing or decreasing proportion of acute malnutrition is proxy indicator of the nutritional status of the catchment population. Sharply increasing proportion of acute malnutrition may suggest the need for additional support to the health facility and nutritional intervention in the catchment community. In woreda4 from the total number of children 7711screened for malnutrition 93 children's are treated as severely malnourished ,it higher than the expected figure of the woreda that is 34.

4.19 Proportion of children aged 6-59 months who received vitamin A supplementation

4.19.1 Why does this important to health of woreda 4 residence

Supplementation with vitamin A is considered to be a critically important intervention for child survival owing to the strong evidence that exists for its impact on reducing child mortality. Therefore, measuring the number of children who have received vitamin A is crucial for monitoring coverage of interventions towards the child survival and Vitamin A doses given for treatment purpose should not be counted as supplementation .

In woreda 4 at Alem Bank Health Center 5182 children aged 6-59 month supplemented with vitamin A ,these achievement is cover whole children in the catchment area of 2467 children by integrated work of disease prevention main process and woreda 4 health extension workers.

4.20 Proportion of children aged 2-5 years de-wormed

4.20.1 Why does this important to health of woreda 4 residence

Supplementation with albendazole/ mebendazole (de-worming) is considered to be a critically important intervention for prevention of malnutrition specially anemia in children that has an impact on reducing child mortality. Therefore, measuring the proportion of children who have received two doses of albendazole/ mebendazole (de-wormed) is crucial for monitoring coverage of interventions.

Alem Bank health center and woreda 4 health biro are de-worming children aged 2-5 years by supplementation of Albendazole .A total of 4410 children every 6 months the achievement is more than 100% because of children in neighboring Woreda have no health center use Alem Bank Health Center.

4.21 HIV/AIDS prevention and control

According to the 2008 EFY Kolife sub city Woreda 4 Alem Bank Report, 1910 people got VCT service .There were a total of 407 PLWHA coming to woreda 4 Alem Bank health center & 132 were age below 15years and 275 above 15 years old also 336 were ON ART & 71on pre-ART 52 pregnant women and their new babies were having got PMTCT service.

The priority intervention area in the Woreda in relation to HIV/AIDS to date were IEC/BCC, condom promotion and distribution, voluntary counseling and testing (VCT), management of sexually transmitted infections (STIs), prevention of mother to child transmission of HIV

(PMTCT), management of opportunistic infections, blood safety, infection prevention/universal precaution, care and support to the infected and affected

Table 10 Prevalence of STI in kolife sub city woreda 4 ,Addis Ababa, Ethiopia 2017

Sexually transmitted infections	Male	Female	Total
urethral discharge	69		69
persistent / recurrent urethral discharge in men	5		5
genital ulcer	17	8	24
vaginal discharge syndrome		161	163
pelvic inflammatory disease PID		6	6
scrotal swelling syndrome		18	18
inguinal bubo swelling	17		17
neonatal conjunctivitis	1		1
Total	109	191	280

4.22 Tuberculosis prevention program

Table 11 Tuberculosis prevalence in woreda4 resident, kolife Keranio sub-city Addis Ababa Ethiopia 2016.

S.no	TB indicators	Numbers of cases
1	Number of bacteriologically confirmed New PTB cases detected in the quarter	49
2	Number of clinically diagnosed New P/Negative TB cases detected in the quarter	56
3	Number of clinically diagnosed New EPTB cases detected in the quarter	56
4	Number of bacteriologically confirmed RELAPSE PTB cases detected in the quarter	10
5	Treatment after relapse®	29
6	Treatment after loss to follow-up (L)	2
7	Total number of bacteriologically confirmed TB cases	70
8	Cured PTB+	61
9	Deaths PTB+	7
10	Failure PTB+	2
11	Moved to MDR TB Register	2
12	Total number of New P/Neg TB cases enrolled in the year	94
13	Treatment completed P/Neg TB	84
14	Deaths P/Neg TB	9
15	Total number of TB cases (all forms) diagnosed during 2016	190

4.23 NCD PRIVALENCE

4.23.1 Why it is important to health

Now a day Ethiopia is in triple Burdon of public health; communicable disease, non communicable disease and injury. Resent data's in the health facilities (HMIS) show communicable disease are emerge to top ten morbidities. An increasing NCD indicate the change in life style of the population that exposed on the four behavioral risk factors and other factors that is not clearly studies of NCDs.

A report compiled by the EPHA in 2012 indicated that the four behavioral risk factors (physical inactivity, inadequate intake of fruits and vegetables, alcohol consumption and cigarette smoking) were widely prevalent in Ethiopia. Similarly, high prevalence is reported for overweight, obesity and associated raised blood pressure in urban areas. Mental and behavioral disorders, substance abuse/misuse, violence and injuries (including road traffic accidents) are some of the health and health-related problems that also need both urgent and proper public health intervention.

On observer view during investigation a number of Alem Bank area residence are using chat in their private working place and it is common to see young people's walking on the street on one hand with chat and on other with cigarette.

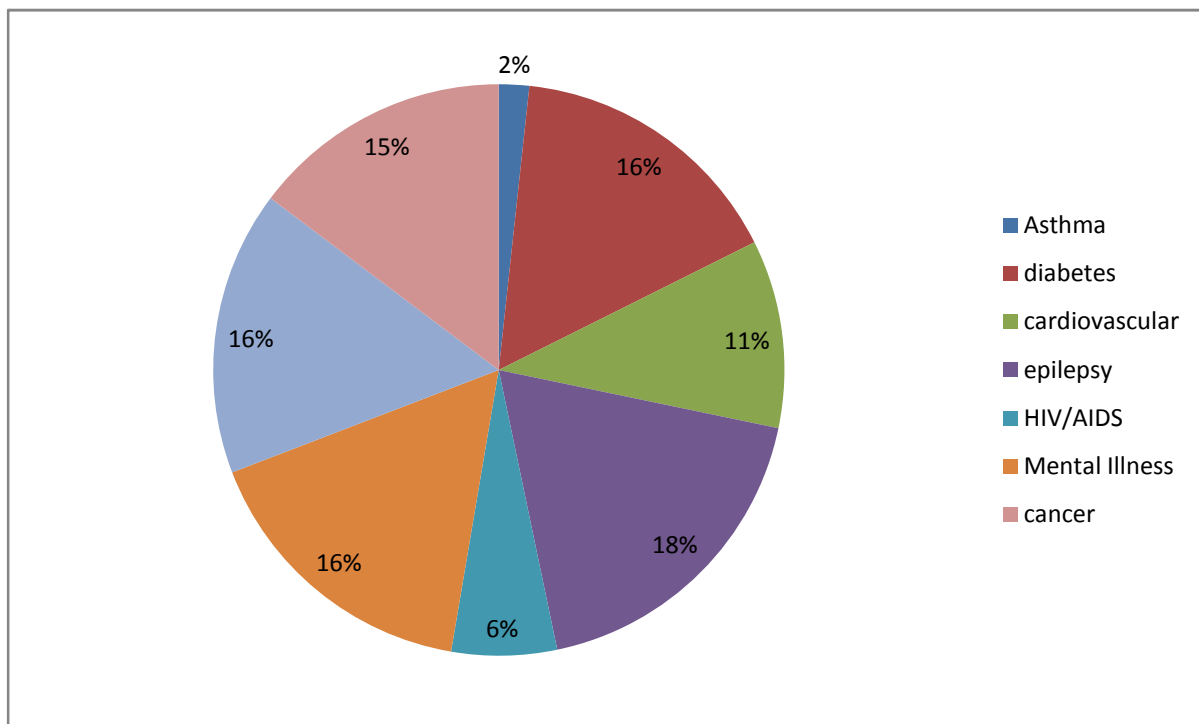


Figure 41 percentage of NCD and chronic communicable disease cases among kolife sub city woreda 4 resident ,2016

Based on the data collected by health extension workers for PHC profiles of woreda 4 residence from the total numbers of 8299 peoples, 141 peoples suffer from asthma, 1321 peoples with diabetes, 884 peoples with cardiovascular, 1532 peoples suffer by epilepsy, mental illness 1368 peoples and cancer 1223 peoples, In general 18.8% of woreda 4 residents are suffer with NCD.

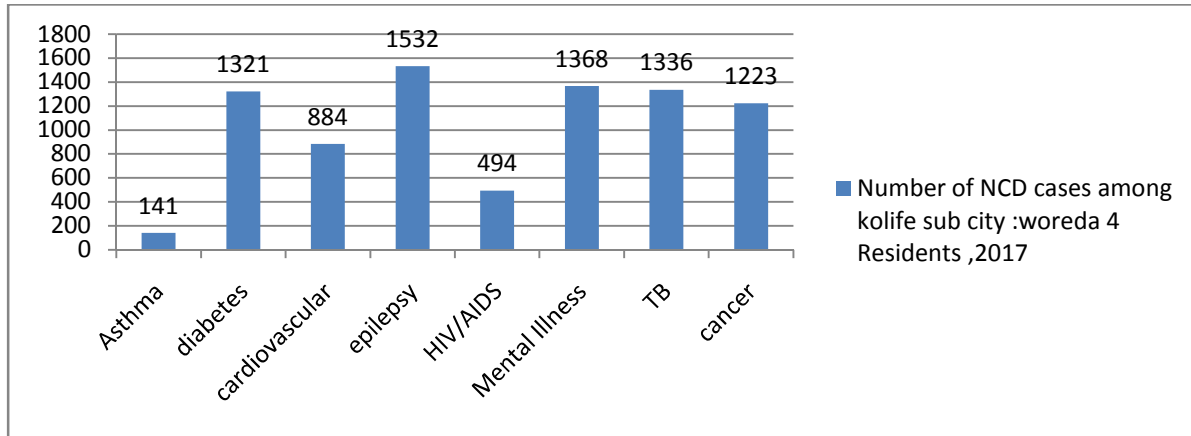


Figure 42 Number Of NCD cases and chronic disease prevalence of woreda 4, kolife sub city, Addis Ababa, Ethiopia 2017

4.24 Ten top causes of morbidity

It is the ten leading causes of morbidity per 1,000 population and Provides evidence regarding priorities for planning and resource allocation

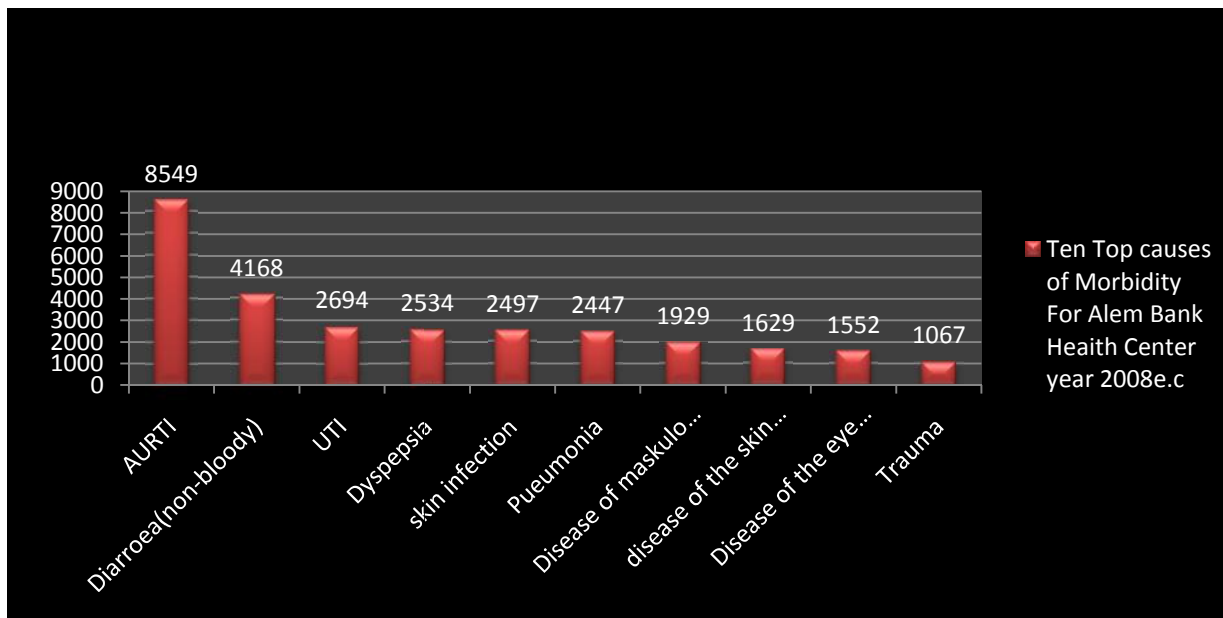


Figure 43 Ten top causes of morbidity of Alem Bank Health Center year 2016

From the total number 54407 of outpatient visits of Alem Bank Health Center 2016 , Number of new OPD + IPD Cases from specific diseases per 1000 of population from highest to lowest 9,AURTI 29.41%,Diarroea non bloody 14.34%, UTI9.27%,Dyspepsia 8.72%,infection of skin 8.59%,pumonia 8,42%,Disease of muskulo skeletal6.64%,Unspesified disease of skin and subcutaneous tissue 5.60%, Disease of the eye 5.34%,Trauma3.67% people are affected.

4.25 Disaster situation in woreda

There were no natural and manmade disaster and disease outbreak recorded in last year.

4.26 Essential drugs shortage

According to the Woreda Health center head report there was no shortage of some essential drugs in the year 2016.

Tracer Drugs by Facility	1 st quarter	2 nd quarter	3 rd quarter	4 th quarter
Amoxicillin 500mg/250 mg Caps/suspension	X	X	X	X
Arithmetic + Lumfanthrine 20mg+120mg tab	X	X	X	X
Ciprofloxacin 500mg tablet	X	X	X	X
Co-trimoxazole tablet/suspension	X	X	X	X
Mebendazole /Albendazole tab/susp.	X	X	X	
Metronidazole capsule/suspension	X	X	X	X
RHZE-150mg+75mg+400mg+275mg-tablet	X	X	X	X
TDF/ZDV+3TC+EFV/NVP adult	X	X	X	X
Ferrous sulphate + folic acid	X	X	X	
Tetracycline eye ointment	X	X	X	X
Tetanus toxoid vaccine (TT)	X	X	X	
Pentavalent vaccine (DTP+HepB+Hib)	X		X	X
Magnesium Sulphate injection	X	X	X	X
Oxytocin 10units/ml injection	X	X	X	X
ORS±Zinc sulphate tablet/syrup	X	X		
Hydralazine injection	X	X	X	X
Adrenaline (Epinephrine) injection	X	X	X	X
Aminophyllin injection	X	X	X	X
Glucose 40%	X	X	X	X
Dextrose in normal saline/Ringer lactate	X	X	X	X
Lidocaine (1% or 2% injectable)	X	X	X	X
Paracetamol 125mg syrup/500mg tablet	X	X	X	X

Table 12 Essential drugs availability in the Alem Bank Health center kolife sub city, Addis Ababa Ethiopia, 2016

4.27 Traditional medicine

There are two traditional medicine clinics licensed by FMCA are given traditional treatment to woreda 4 residents

4.28 Health and Health related regulatory system

Woreda 4 FMCA is a regulatory of food and medicine, in the woreda, more than 385 institution are licensed, some of the institution not need beyond expert knowledge of woreda regulator, is controlled and licensed by sub city regulator, this kind of lack of decentralization and absence of uniformity of the health regulatory structure makes difficult to control and register all types of services, due to the nature and diverse of food items.

In woreda 4 most of private food product institutions are serving the public by respecting the rule and regulation of the country but there is a clear limitation are observed in assessing the safety and quality of foods prior to the uses of the communities.

4.29 Community Health services

To create healthy and productive communities, the woreda 4 health offices implement a community based strategy by linking community and the health center via health extension programs to deliver health promotion and disease prevention at community levels. The 16 health packages in HEP are provided free of charge to the community, this packages focus on for major areas of promotion of hygiene and environmental sanitation, prevention and control of major communicable diseases, promoting and providing family health services and health education and communications.

There are 13 Health extension worker and 95 women development army (WDA) team to create health development army and to make the community owner ship for his own health. According to woreda 4 health office report there are 475 community health worker, 2034 model house hold graduated by health extension worker, By joint work of Alem Bank health center disease prevention and control main process and woreda 4 health office 24000 woreda4 residents have got Health education on communicable disease, non communicable disease, and also by three maternal conference 1602 pregnant women got health education on maternal health.

5. Limitation

Due to lack of budget for the investigation ,the information is limited only on already prepared data's by different woreda offices , the other data that is not capture by woreda offices but important for health profiles are not included.

There is no mortality data registered and reported on MDSR and from other morbidity kolife Keranio sub city as well as Alem bank health center in2016, this made a challenge for mortality ratio.

6. Discussion

From the total school (359) of kolife Keranio sub city 33 schools are found in woreda 4, according to kolife Keranio sub city educational office 2016, from the total of 136,657 students were enrolled at different level of schools, of whom 65,411(47.8%) were male and 71,246(52.1%) were female and male to female ratio of the school attendance was 0.91 in 1. As compared the woreda 4 from the sub city data female student accounts 5873 (52%) and men's are 5423(48%) and the male to female ratio of woreda 4 school attendance was 0.92 in 1 ,the result is almost similar to kolife Keranio sub city. This show, the result of government policy to empower women through enhancing girl's education.

Among 259 different type of health facilities 15 woredas of kolife sub city 36 health facilities are found at woreda 4, and people of woreda 4 have got specialty clinics of gynecology and pediatric additional to effort of the Ale bank Health Center to the nearest of the resident, this can help to reduce maternal, neonatal and child mortality by minimizing the 5 delays and pediatric emergency conditions.

Age dependency rate of woreda 4 population is 24% that is lower than Addis Ababa age dependency rate of 2017. That means every 100 person in the productive ages had to support 24 dependent for their basic and other needs

Contraceptive acceptance rate of the woreda4 is 24.67% that is below 50% of the 2016 plan of Addis Ababa city administration health biro and kolife Keranio sub city plan of 65% and the most used contraceptive methods is injectable, implant, oral contraceptive and IUCD respectively there is a similarity on EDHS 2016,the most commonly used methods among sexually active unmarried women are injectable (35 percent), implants (11 percent), the male condom, and emergency contraception (4 percent each).

ANC1st and ANC4th services in woreda 4 is more than 100% of the expected plan of the woreda health office and it is similar result from kolife Keranio sub city. therefore all pregnant women in the woreda 4 registered by urban health extension professional in her sub woreda (ketena),and other pregnant comes from out of woreda 4 health office catchment areas receiving four focused antenatal care visits increases the likelihood of receiving effective maternal health interventions during antenatal visits

There are 1602 births was attended by skilled health professional that is more than 100% of the woreda health office plan of expected delivery in the woreda 773. And 95 % of mothers and new borne get early post natal care within seven days of birth, this is also good achievement .like that of kolife sub city Immunization coverage woreda 4 health immunization coverage is more than 100%. This show all children registered by UHEP within the catchment area and infants comes from other woredas are complete their last vaccine before the first birth day.

Crude birth rate of the woreda is 24.4 it is higher than EDHS 2016 of 23.9. The time trained of ANS1st and Skilled delivery from 2013 to 2016 show increasing service deliveries but in under five children there is an increasing prevalence of pneumonia and diarrheal disease

The woreda 4 residents of primary healthcare profile show that epilepsy and mental illness are the leading cause of NCD; it is different from cardio vascular disease in Addis Ababa. On chronic disease 16 % of the populations have a history of TB (All forms) during the data collection time, among 8299 NCD and chronic disease cases.

7. Conclusion

Woreda 4 is a densely populated area of the kolife Keranio sub city and its population density is 112 population per hectare due to this overcrowded, air born and water born communicable disease can transmit easily and can infect a large number of the population an increasing four years trends of under five pneumonia and diarrheal disease, TB cases from PHC profile and AURTI & diarrheal prevalence from ten top morbidity data of Alem Bank health center show the woreda is susceptible to any kind of communicable disease outbreaks on the view of the investigator.

Maternal and child health of the woreda 4 residents are in a better condition interims of coverage all activities on MCH are done more than 100% and control and trace by UHEP, Alem bank health center disease prevention and promotion main process, the woreda implement IMNCI to reduce child mortality.

Even if Woreda 4 health biro organized to give health service for woreda 4 residents, according to the 2016 . Plan versus achievement of Alem Bank health center there are more than 31080 peoples are seeking the health center within the same years, this number is almost one woreda population. this make a great burden on the health center as well as the staffs, and also there is no integration between the health center and other woreda health biro, about those client .the other challenge of the woreda health biro is all MCH activities are achieved more than 100% but due to the significant numbers of clients from other woredas it is difficult to appreciate the achievement as woreda 4 resident health coverage.

8. Recommendation

woreda health office must work in collaborative way with the community and other woreda offices and other institution to make a solution like, water supply and on repairing the damaged community gravel roads those are difficult to clients and ambulance. The health office shall educate the community on both communicable and non communicable disease to reduce the double burden of health problems on the community.

Woreda 4 health bureau shall work together with neighboring woreda health office that has no health center, by creating a tracing mechanism for MCH program specially to improve post natal coverage.

The kolife Keranio FMCA and woreda 4 FMCA together must create and implement a method for controlling of food adulterations.

Some vertical programs like TB and HIV should have a well documented plan.

Since there are many coffee house, chat and cigarette smokers commonly seen in street and around their private work place, drug addiction shall better included on health education program on both health facilities and on community by urban health extension professionals.

There is no data on TB cases, referred by UHEP and community in woreda health office as well as Alem Bank health center, but there is a high number of TB prevalence in the woreda, strengthening community TB report is important for early detection

There is no mortality data registered and reported on both woreda 4 health office on MDSR and kolife Keranio sub city as well as Alem bank health center in2016, this made a challenge for mortality ratio , The reasons for every maternal death in the community should be investigated by MDSR and appropriate improvements measures must be taken. Five major obstetric complications are known to be the major cause of maternal mortality: hemorrhage (post-partum, ante-partum), ruptured uterus, eclampsia, obstructed labor, infection. The fatality rate for all five conditions taken together should be less than 1% of all deliveries. The reasons for every maternal death in a health institution should be investigated and appropriate quality/service improvements measures taken. Other mortality rate like neonatal mortality rate, infant mortality rate, child mortality rate, disease mortality rates should registered.

Table 13Action plans on some gaps woreda 4 kolife Keranio sub city, Addis Ababa , Feb2017

S.no	Activities	Responsible body
1	Improving water supply interims of quality and quantities	Woreda 4 administration and EWASSA, NGOs working on WASH
2	Health education on water treatment	Health center disease preventive and promoting main process and UHEP, NGOs working on WASH
3	Repairing the damaged community gravel roads those are difficult to clients and ambulance,	Woreda 4 administration, woreda health office, community representatives
4	Creating a tracing mechanism for MCH program ,for mothers comes from other woredas	Health center disease preventive and promoting main process
5	Create and implement a method for controlling of food adulterations	Sub city and woreda FMCA regulatory
6	Revised (Preparing)clear documented plan based on estimated projection of woreda 4 residents	Woreda health office and health center
7	Strengthening community TB referral system	UHEP and WDA
8	Improving mortality registration (vital statistics)	, woreda 4 administration vital statistics registration Alem Bank Health center, MDSR team
9	Graduating teachers and students on 15 health extension packages	Woreda health office, health center, UHEPs
10.	Educating the youths on drug addiction	Woreda 4 FMCA and health center

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CHAPTER VI: MANUSCRIPT

6.1 Relapsing Fever Surveillance Data Analysis, Addis Ababa, Kolife Keranio Sub city, Retrospective Review of 2012-2016.

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Abstract

Background: Relapsing fever reported throughout the years in Addis Ababa. It is highly contagious, but easily preventable by personal hygiene. Recently the disease occurred as outbreak in Addis Ababa. The objective of this study is to describe trend and distribution of relapsing fever by person, time and places.

Methods: We used descriptive study design. The data reviewed retrospectively from dec2012-jan2016, surveillance data of a confirmed relapsing fever cases received from kolife Keranio health office health management information system data base, we included 882 reported cases. The cases were confirmed by demonstrating *Borrelia recurrentis* in peripheral blood film. Data was cleaned and analyzed using Microsoft offices excel2010 to display frequency distribution, tables and graph/charts.

Result: 882 confirmed relapsing fever cases identified and no deaths (CFR=0.0%) reported. 55% of males affected and 80% >15 years were affected. The average occurrence of 176.5 and a standard deviation of 187.6, the usual occurrence of relapsing fever in the sub city was 12 cases per month. 309 (35%) of relapsing fever cases reported during in the season of autumn. The highest incidence was showed at district 11 (1860/100,000) and 312/100,000 cases-per 100,000 population at district 1. No reported case at district 6 and 7. District 11, district 9, and district 1, have incidence rate > 31.6 /100,000 of the annual average incidence.

Conclusion: Relapsing fever cases were reported throughout the whole months of five consecutive years in all age group and both sex, this show the endemicity of the case in kolife Keranio sub city. The possible reason we hypothesized that due to overcrowded and unhygienic conditions. District 11 and district 1 needs a proper public health intervention in collaboration with other sectors.

Word count; 247

Key word; surveillance data analysis, relapsing fever, incidence rate, trend analysis

Background

Louse-borne (epidemic) relapsing fever (LBRF) is a disease of humans that is transmitted from one person to another by the body louse. [1] Relapsing fever is caused by infection with spirochetal gram-negative bacteria of the genus *Borrelia*. The onset of symptoms is generally sudden, associated with circulation of bacteria in the blood, and include high-grade fever, malaise, chills and sweats, headache, meningism, myalgia/arthralgia and non-specific gastrointestinal symptoms. [2] The disease can be severe and death occurs in 10–40% of symptomatic cases in the absence of appropriate treatment, and in 2–5% of treated patients. The diagnostic test of choice is the direct identification of spirochaetes in the blood by stained blood films (Giemsa), especially during the symptomatic febrile phase [3].

Relapsing fever was once a disease of global epidemic importance. The geographical distribution of louse-borne relapsing fever has declined due to improvements in living standards. Currently, the disease is primarily found in limited endemic foci in Ethiopia but also in Somalia and Sudan [3, 4, 5]. LBRF is now an important disease in the highlands of Ethiopia where an estimated 10,000 cases occur annually and affects mostly homeless people living in crowded and unhygienic conditions especially during rainy seasons [6].

Over 9,000 cases were reported in 2002/3 to the Ministry of Health, and it ranked the seventh cause of top 10 leading admissions, and sixth of top 10 leading causes of death among adults in the country and the number of cases during the dry season was relatively higher than the wet season according to the Ethiopian health department report [7] , In southern Ethiopia (Hosanna hospital), LBRF admissions comprised 27 % of total admissions [4] .Moreover, in south west Ethiopia, 6% of mortality rate was documented [8].

LBRF can be prevented by applying hygienic practices that reduce numbers of body lice (washing clothes, drying clothes in direct sunlight, changing clothes at frequent intervals). Spread of infection can be controlled by early case detection, treatment of infected persons and close contacts by delousing.

Relapsing fever is a disease under surveillance system of Ethiopia and highly contagious, but easily preventable by personal hygiene and the disease is currently occurred as outbreak in one of neighboring sub city of kolife Keranio at Addis ketema sub city. Kolife Keranio sub city health office conducted a five years document review to describe distribution of relapsing fever by person, time and places. Possible public health interventions are recommended. We analyzed the alert threshold of relapsing fever at kolife Keranio sub city.

Methods

We used descriptive study design. The data reviewed retrospectively from 2012-2016, surveillance data of a confirmed relapsing fever cases received from kolife Keranio health bureau, health management information system database. The reported time was Jan 1/2012 to Des 30/2016. The data reported from private and government health facilities of confirmed and clinically treated relapsing fever cases,

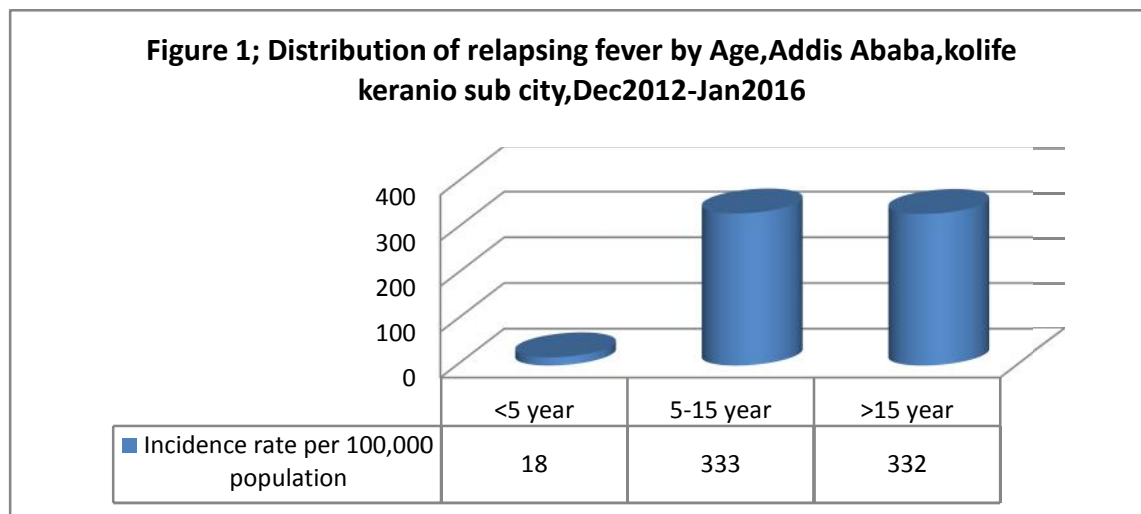
We included 882 relapsing fever cases from outpatient and inpatients department reports. We checked the data for completeness, during entrance to Microsoft excel 2010. Populations under surveillance are resident of kolife Keranio (2012-1016years projected population). We defined the conformed relapsing fever case, suspected case with demonstration of *Borrelia recurrentis* in peripheral blood film and we defined threshold level of relapsing fever based on the national surveillance guideline.

Result

Analysis of relapsing fever cases by person.

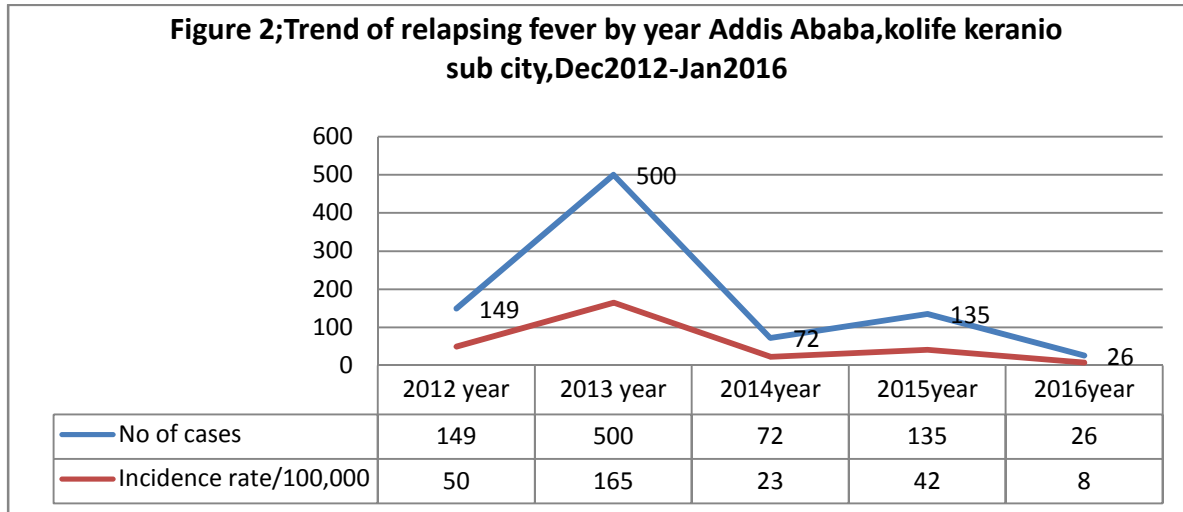
Total of 882 relapsing fever cases and no deaths (CFR=0.0%) reported to sub city heath office with in consecutive five years. The average number of relapsing fever cases per year was 176(49.6 /100,000 population). The average occurrence of 176.5 and a standard deviation of 187.6

From the total of 882 relapsing fever cases reported during the study period 486(55 %) were males and 396(45%) were female. Incidence of relapsing fever regarding to sex, Male301/100,000 and female265/100,000.

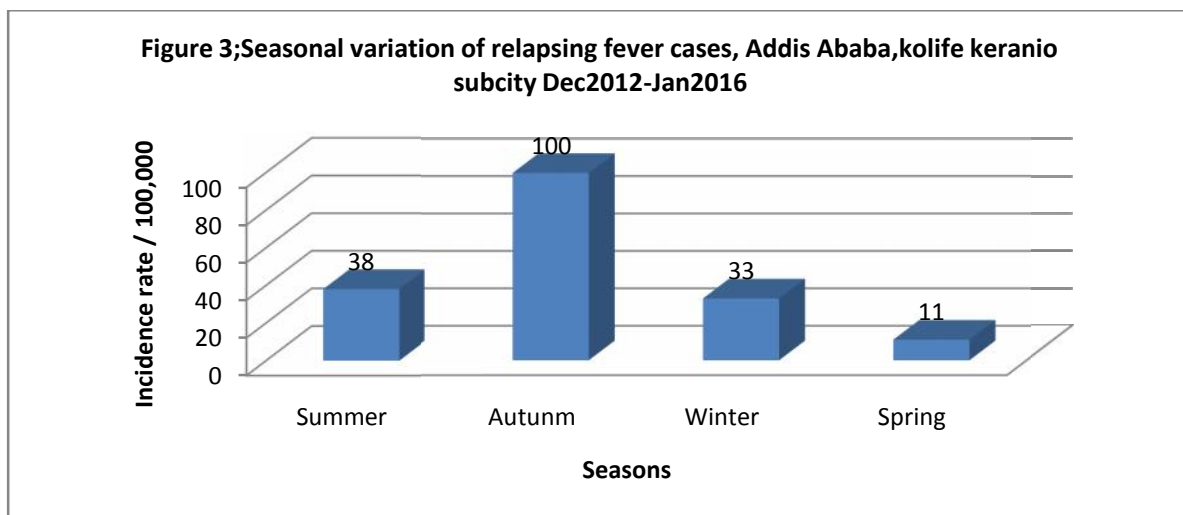


Of the total of 882 relapsing fever cases reported five consecutive years <5 years children credited 4 (0.45 %), 5-15 years 172 (19.5 %) and >15 years 706 (80%).

Description of relapsing fever cases by time.

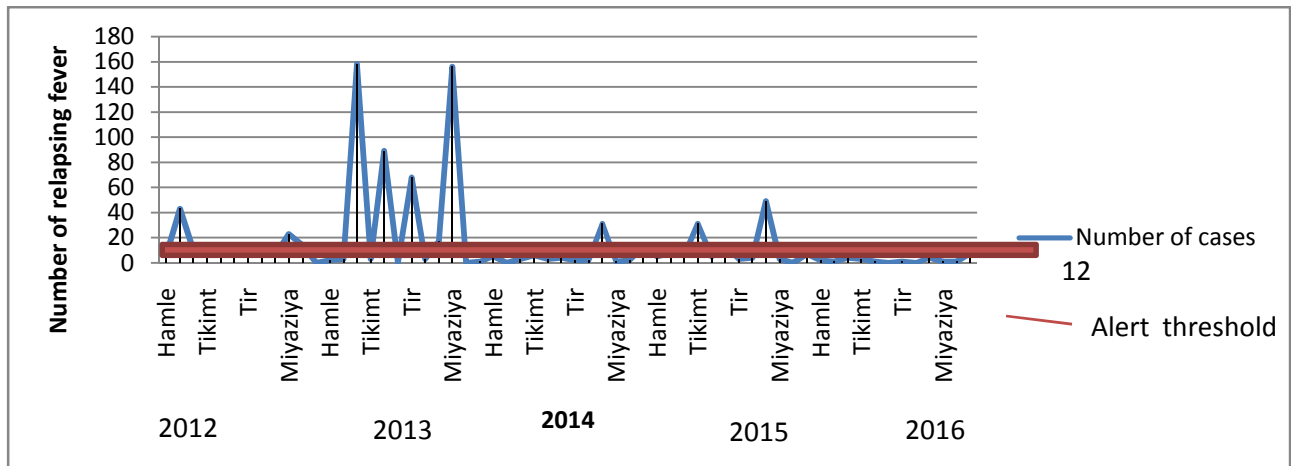


The incidence of relapsing fever was increased from 2012 to 2013 and decrease after 2013 till 2016, the number of cases in each year was: 149(17 %) in 2012, 500 (57%) in 2013, 72(8.1%) in 2014 & 135(15.3%) in 2015, 26(2.94%) in 2016. In 2013 an outbreak was occurred but not investigated.



The highest number of relapsing fever is reported on the months of April (184 cases), September (181 cases), March (108 cases), the least number of case reported on the month of February (16 cases), May (17 cases), 309(35%) of reported relapsing fever cases reported during Autumn

Figure4;The alert threshold level of relapsing fever cases in kolife Keranio sub city ,Addis Ababa ,Ethiopia from 2012-2016

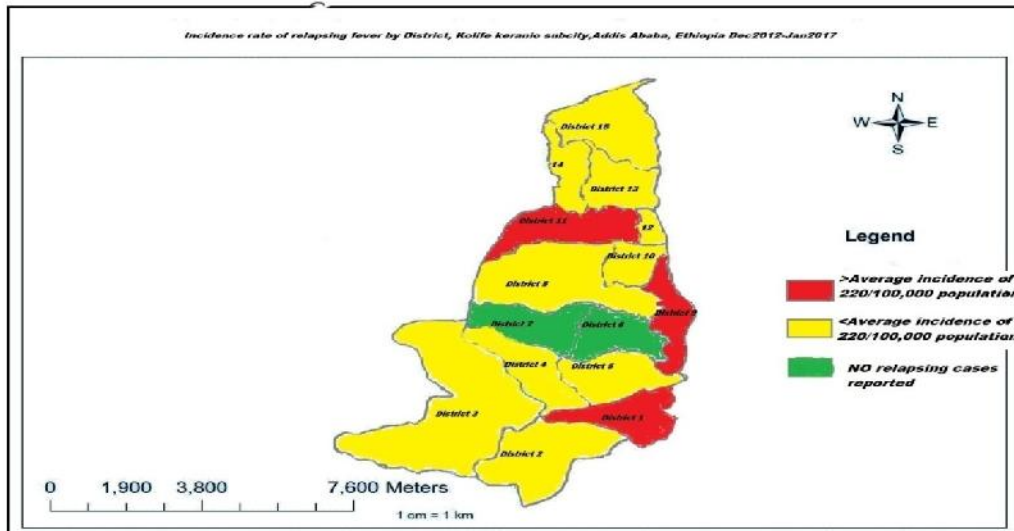


According to Ethiopian national PHEM guide line the alert threshold level of relapsing fever is if unusual increase of the case occur or doubling of the cases on subsequent weeks. The usual relapsing fever case reported from kolife Keranio sub city reported sight (Mode) is 12 cases per month from 2012-2016.

Description of relapsing fever cases by place

According to Ethiopian PHEM structure all districts reported their own catchment area, therefore relapsing fever cases reported from district health office considered as the patient address was permanently or occasionally in the reported district for this surveillance data description.

Figure5; Incidence rate of relapsing fever by District, kolife Keranio sub city, Addis Ababa Ethiopia 2012-2016



Relapsing fever was reported from all districts. The highest incidence among 15 districts are 1860/100,000 at district 11 and no relapsing fever cases reported at district 6 and 7.

Discussion

From the total admitted cases no death is reported, but literature show that death occurs in 10–40% of symptomatic cases in the absence of appropriate treatment, and in 2–5% of treated patients. The study conducted in Jimma in south west Ethiopia, 6% of mortality rate was documented. The reduction in case fatality rate in kolife Keranio sub city possibly due to seeking medical at early stage of the disease. Males were more affected than females and the highest incidence was in the age of >15 years in both sex. The incidence of relapsing fever was increase from 2012 to 2013, based on the national surveillance guideline doubling of the reported relapsing fever case in consecutive weeks considers as an outbreak, but there is no documented response. The highest incidences of relapsing fever cases were in April (the season at the end of summer and at the binging of winter.) , relapsing fever cases were reported within each rainy season from 2012-2016, It is similar to federal ministry of health report, Common to occur during rainy seasons and the number of cases reported during the dry season was relatively higher than the wet season, Literature shows that incidence rate of relapsing fever is higher at high land homeless people living in crowded and unhygienic conditions especially during rainy season, the possible reason an increasing incidence in dry season, we hypothesized that due to overcrowded and unhygienic conditions. District 11, district 9, and district 1, have incidence rate > 31.6 /100,000 of the annual average incidence

among 15 districts. The possible determinant would be district 11 is nearest to the usual outbreak declared sub city (Addis Ketema sub city), district 1 identified by Kolife Keranio health office risk for infectious communicable disease and other disastrous situations like flood, also there are hundreds of people who are poor illegally settled around the Addis Ababa city rubbish dump.

Conclusion

Relapsing fever cases were reported throughout the whole months of the five consecutive years, in all age groups, both sexes and in four seasons of the years. This shows the endemicity of relapsing fever in Kolife Keranio sub city. Surveillance data should be analyzed at district & sub city level on a regular basis to look for trends of the disease. District 1, the city rubbish area is at risk for infectious communicable disease due to their population density (overcrowded), unhygienic conditions, and the sub city health office better to give attention to proper public health intervention and for application Kolife Keranio health office should work in collaboration with other sectors. Further study has to be conducted to identify the risk factors of relapsing fever endemicity in the sub city.

Acknowledgement

I would like to thank my mentors Professor Alemayehu Worku and Mr Yimer Sied for their constructive comment on my field work. I also thank Mr Abdulnasir Abigero resident advisor, Mr Abreham Muluneh, Kolife Keranio sub city public health emergency management office and sub city supervisor, all staffs of Kolife sub city health office, for their hospitality and sharing their table and chairs.

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Chapter VII: Abstracts for scientific presentation

7.1 Relapsing Fever Surveillance Data Analysis, Addis Ababa, Kolife Keranio Sub city, Retrospective Review of 2012-2016.

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Address: 1. Addis Ababa University School of Public Health Ethiopian Field Epidemiology Training program (cohort 8 resident), 2&3. Department of preventive Medicine school of public Health Addis Ababa University

Abstract

Background: Relapsing fever reported throughout the years in Addis Ababa. It is highly contagious, but easily preventable by personal hygiene and the disease is currently occurred as outbreak in one of neighboring sub city of kolife Keranio at Addis ketema sub city. Kolife Keranio sub city health office conducted a five years document review to describe trend and distribution of relapsing fever by person, time and places.

Methods: We used descriptive study design. The data reviewed retrospectively from dec2012-jan2016, surveillance data of a confirmed relapsing fever cases received from kolife Keranio health office health management information system data base, we included 882 reported case. Data cleaning conducted prior to analysis. Cases confirmed by demonstrating *Borrelia recurrentis* in peripheral blood film. We used Microsoft offices excel2010 to display frequency distribution, tables and graph/charts.

Result: 882 confirmed relapsing fever cases identified and no deaths (CFR=0.0%) reported. 55% of males affected and 80% >15 years were affected. The usual occurrence of relapsing fever in the sub city was 12 cases per month. 309 (35%) of relapsing fever cases reported during autumn (March-May). The highest incidence among 15 districts are 1860/100,000 at district 11 and 312/100,000 population at district 1. No reported case at district 6 and 7.

Conclusion: Relapsing fever cases were reported throughout the whole months of the five consecutive years in all age group and both sex, this show the endemicity of the case in kolife Keranio sub city. The possible reason we hypothesized that due to overcrowded and unhygienic conditions. District 11 and district 1 needs a proper public health intervention in collaboration with other sectors.

Word count; 242

Key word; surveillance data analysis, relapsing fever, incidence rate, trend analysis

7.2 Outbreak investigation on Acute Watery Diharoea at Kurfa chelae District, Eastern Harerge, Ethiopia, 5th September and 9th October 2017

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Abstract

Background: Cholera kill half of affected individuals without medical interventions but preventable by personal, environmental and food hygiene. The recent cholera outbreak at kurfa chelae was 5th September 2017 to 9th October 2017. The objective of this study is to describe the distribution and to identify the risk factors associated with transmission of cholera outbreak.

Methods: We used descriptive and unmatched case-control study design. Study population was resident of kurfa chelae district >5 years old. We used Epi info version 7.3 to determine the sample size of unmatched case and controls with Fleiss w/CC. we enrolled 31 cases and 62 controls. Cases were all persons with cholera, controls were persons without cholera living in the same Kebele of the case and randomly selected from the same neighborhood. We used standardized questionnaires. Data were entered into Epi Info software version 7.3. Odds ratios (ORs) for univariate analysis were calculated, the univariate analysis served as a screening phase for variables to be included in a multivariate model. We got a letter of submission from federal ministry of health and Oromiya regional health bureau.

Result: 31 confirmed cholera cases identified. No deaths reported. 58% was males, median age of 28 years and standard deviation of 17 years. The highest attack rate was shown at Goro garbi Kebele 8 (2.6/1000). 86% of latrines had no hand washing and the communal latrines were not sanitized. Consuming food from Street vendors (crude OR=65.7, p=0.0107), visiting anyone having diarrhea (crude OR =32.97, p=0.0098), are a significant association with current cholera outbreak.

Conclusion and recommendation: Vibrio cholerae O1-sero type was isolated organism from all Kebeles causing the outbreak. Youths were more affected. Consuming food from street food vendors and visiting a person who has diharoea are possible risk factors for the outbreaks. Educating the community segments on personal, environmental, and food hygiene may bring a behavioral change towards hygiene and sanitation.

Word count; 321

Key word; Cholera, partially roasted meat, street food vendor, visiting a person with diharoea.

7.3 Assessment of rabies suspecting dogs and tracing human contacts with rabies confirmed and suspected dogs at district3, Gulele sub city, Addis Ababa, from 5th July2017 to 10th July 2017

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Abstract

Background: Rabies is 100% fatal disease for both animals and humans The main goal in this disease outbreak is to control the spread of the disease among rabid dogs and human exposed therefore rapid identifying of people potentially exposed to rabies virus help to provide appropriate advice and prophylaxis at the right time before they develop a disease.

Methods: The investigation was done at District3 of Gulele sub-city Addis Ababa Ethiopia from 10th July2017 to 17th July 2017. The report describes the investigation, findings and response of a rabies outbreak. The investigation cover all Households having human exposed to rabies confirmed and suspected dogs. We define human exposed, a person who has close contact (usually a bite or scratch) with a laboratory confirmed rabid animal. Data collected by structure questionnaires designed and descriptive data analysis is done by using Epiinfo7.

Results: we found one laboratorically confirmed, one epidemiological linked dog and four suspected dogs. Seven humans exposures were traced,6 (85.71%) of human exposures taken post exposure prophylaxis. Human exposure rate was 13/100,000population. Minimum age of 16 years and a maximum age of 76 years old, median age of 30 years and 71.43% of human exposures are bitten by unvaccinated dogs and they do not wash the wound with water and soap and have a penetrated type of wound.

Conclusions and recommendation : Rabies is prevalent in the area. There are unvaccinated dogs in the district. There is traditional medicine and religious beliefs against post exposure treatment in the community, most of humans exposed they don't use washing the wound with water and soup as first aid. Many of human exposures bite distal from the brain and penetrated type of wound. Strengthening rabies surveillance for immediate response to take interventional measures until the locals dogs are declared free from rabies by veterinary authorities.

Word count: 344

Key words: Rabies, Human exposure, Post exposure prophylaxis

Chapter VIII: Protocol/proposal for epidemiologic research project

8.1 Prevalence and Associated Factors of Diabetes Mellitus, at kolife Keranio sub city, Addis Ababa Ethiopia 2018, A Cross Sectional Study

Abstract

Background: In Ethiopia, diabetes is a double burden for the public health, yet little is known about its prevalence and risk factors, early detection and treatment of diabetes reduce cardiovascular morbidity and mortality. Diabetes and its complications bring about substantial economic loss to people with diabetes and their families and to health systems and national economies through direct medical costs and loss of work and wages. Therefore the aim of this study is contribute to the literature by estimating the prevalence of diabetes and exploring its associated risk factors by this study.

Methods: The study will be conduct at Kolfe Keranio sub city, a population of 537524. The sub city is divided in to 1385 block. Community base cross-sectional surveys of non pregnant 30-69 years and permanent resident on the sub-city will be the study population. We use a two stage cluster sampling, first we list all clusters in the kolife Keranio sub-city in Blocks, then we will select 30 clusters among 1385 blocks of the sub city by PPS then we will select the sample household by simple random sampling. Sampling variance computed using the Jackknife repeated replication finally sample size of 556 house holds will include. we define diabetes as fasting plasma glucose levels ≥ 7.0 mmol/L (126 mg/dl); or using insulin or oral hypoglycemic drugs; or having a history of diagnosis of diabetes The data will analyses using Epi Info 7 Statistical Package for Social Sciences version 20 to generate descriptive statistical information and Bivariate and logistic regression will use to see the association between each dependent variables and outcome variables. P-values less than 0.25 during Bivariate analysis will enter in to multivariate logistic regression model. Chi square tests will use for comparison of data, with a significance set at $p < 0.05$. The questionnaire will adapt and modifies into our context from previous different literatures. The study protocol will approved by Addis Ababa University School of public health Ethics Committee.

Key word; Diabetes, risk factors, cluster sampling

1. Introduction

1.1 Background

Diabetes mellitus has emerged as a global healthcare problem that has reached epidemic proportions. The international Diabetes Federation (IDF) estimates suggest that 380 million people will be affected by 2025 with one person dying every 10 seconds. Diabetes now constitutes the highest morbidity and mortality of all chronic non-communicable diseases in Africa, but with rapid urbanization and change in lifestyle and nutrition in the 21st century, there has been a rise in the disease and its complications. A 2012 report by IDF stated that most of the populous countries in Africa also had the highest number of people with the disease. Ethiopia has the highest number of people (1.4million) and in the 3rd stage next to Nigeria (3 million) and South Africa (1.9 million),. (IFD, 2013) [1]

Diabetes mellitus (DM), characterized by chronic hyperglycemia is a major global health problem emerging in developing countries. According to the World Health Organization (WHO) Regional Office for Africa, non-communicable diseases including DM, will increase so rapidly in Sub-Saharan Africa (SSA) as an epidemic by year 2020.[2]

In Ethiopia, diabetes is a double burden for the public health, yet little is known about its prevalence and risk factors, early detection and treatment of type2diabetes reduce cardiovascular morbidity and mortality [3]

To address these gaps and help inform public health efforts aimed at prevention and treatment, we will conduct a community-base, cross-sectional household study from April 2018 to Jun2018 in the kolife Keranio sub-city, Addis Ababa, Ethiopia. We will use a two-stage cluster probability sampling method to randomly select individuals. To estimate prevalence, we will follow the WHO STEP wise Approach guidelines on NCD risk factor surveillance, first we will Use of interviewer-administer pre-structure questionnaires, to assess the socio- economic, demographic and behavioral characteristics of the study subjects, which might put them at risk of diabetes and related disorders then Physical measurements such as pulse rate, blood pressure, height, weight, waist and hip circumference of all study subjects, using standard calibrated instruments finally rapid fasting blood glucose estimations of capillary whole blood samples of study subjects, using the tests strips.

1.2 Statement of the problem

Diabetes of all types can lead to complications in many parts of the body and can increase the overall risk of dying prematurely. Possible complications include heart attack, stroke, kidney failure, leg amputation, vision loss and nerve damage. In pregnancy, poorly controlled diabetes increases the risk of fetal death and other complications.

Diabetes and its complications bring about substantial economic loss to people with diabetes and their families and to health systems and national economies through direct medical costs and loss of work and wages. Despite of communicable disease diabetes is a double burden for Addis Ababa residents; therefore we will try to show the burden of diabetes by study kolife Keranio sub city survey.

1.3 Significant of the study

To control DM, it is necessary to determine associated risk factors. Even though some factors are Uncontrollable knowing as risk factures (age, sex, genetic susceptibility, and other environmental factors) they are important to do life style modification, to delay the occurrence of diabetes in early age and to delay acute and chronic diabetes complication, despite of Controllable risk factor like obesity, physical inactivity, smoking and other finding. Therefore we contribute to the literature by estimating the prevalence of diabetes and exploringits associated risk factors by this study.

2. Literature review

The risk of type 2 diabetes is determined by interplay of genetic and metabolic factors. Ethnicity, family history of diabetes, and previous gestational diabetes combine with older age, overweight and obesity, unhealthy diet, physical inactivity and smoking to increase risk. Excess body fat, a summary measure of several aspects of diet and physical activity, is the strongest risk factor for type 2diabetes, both in terms of clearest evidence base and largest relative risk. Overweight and obesity, together with physical inactivity, are estimated to cause a large proportion of the global diabetes burden [4]

Circumference and higher body mass index (BMI) are associated with increased risk of type 2 diabetes, though the relationship may vary in different populations [5]. Type 2 diabetes risk, including high intake of saturated fatty acids, high total fat intake and inadequate consumption of dietary fiber [6]

Recent evidence further suggests an association between high consumption of sugar-sweetened beverages and increased risk of type 2 diabetes [7]. Active smoking increases the risk of type 2 diabetes, with the highest risk among heavy smokers [8].

Early childhood nutrition affects the risk of type 2 diabetes later in life. Factors that appear to increase risk include poor fetal growth, low birth weight (particularly if followed by rapid postnatal catch up growth) high birth weight [9]

Soft drinks have also been bounded up with increased risk of T2DM [10]. According to WHO diabetes country profiles 2016 prevalence of diabetes was 3.8% (4.0% male, 3.6% female).

A cross sectional study conducted at Arbaminchi General Hospital Ethiopia 2016 the result show that family history of diabetes (AOR = 0.22; 95%CI; 0.08, 0.58) [11]. Research finding among workers at the spare parts share company, Akaki, Ethiopia, show that the prevalence of diabetes was present in 3.4 ± 0.2%, and among the diabetics, 38% had hypertension, 56% of subjects with diabetes were found to be overweight, while only 19% of them had obesity ($p < 0.05$). [12]

The other study conducted at Bishoftu Town east showa, Ethiopia showed that risk factors relatively higher prevalence of undiagnosed DM was observed in those overweighted (9.76%), ex-smokers (11.11%), physically inactive (7.69%), hypertensive (13.51%), frequent alcohol drinker. [13]

The prevalence of DM was estimated at 109 (8.3%). Being female [odds ratio (OR) 1.70; 95% confidence interval (CI) (1.10–2.62)], patients age [41–64 years (OR 3.35; 95% CI (2.01–5.57)), 65–89 years (OR 3.18; 95% CI (1.52–6.64)), [14].

2.1 Conceptual frame work

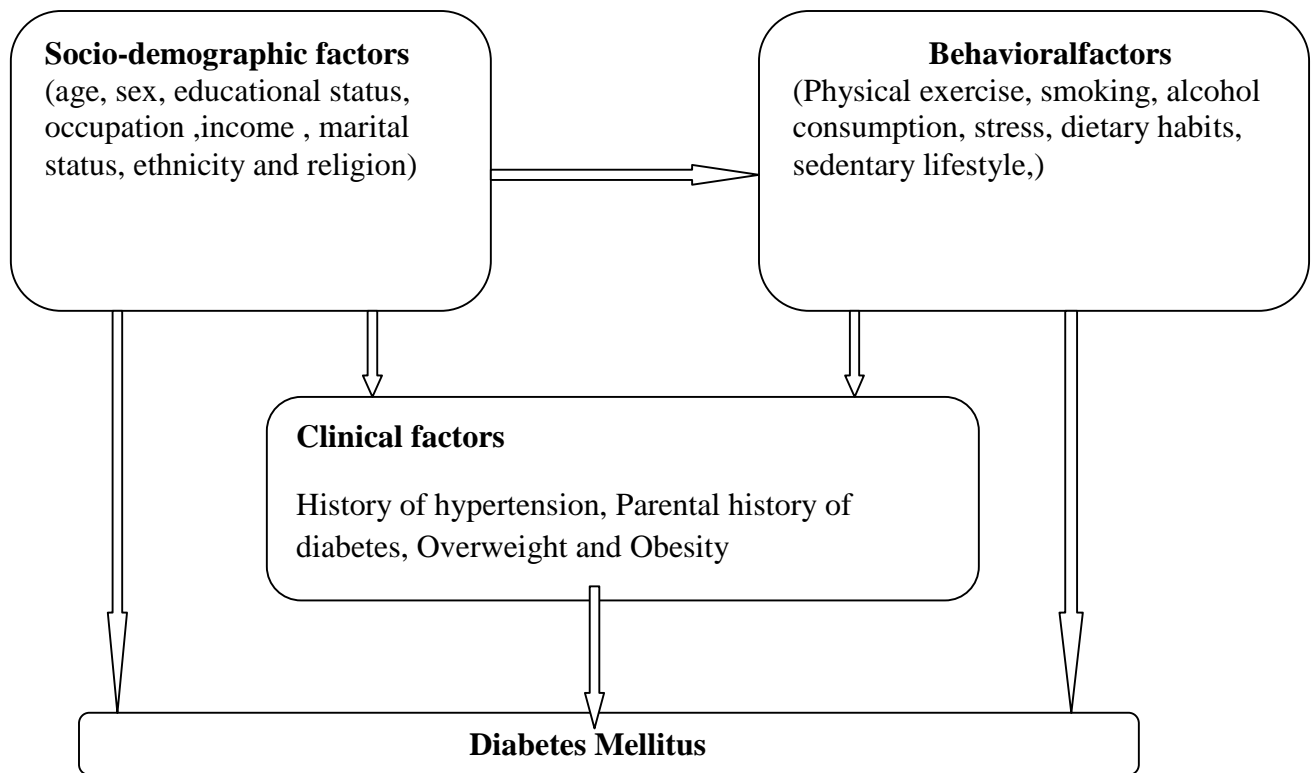


Figure 44 The conceptual framework of diabetes mellitus in this research.

2.2 Objective

2.2.1 General objective

To estimate the prevalence of diabetes mellitus and to determine the risk factors of diabetes among 30-69 years ages of non-pregnant residents of kolife Keranio sub city .

2.2.2 Specific objective

To estimate the prevalence of diabetes mellitus

To examine factors those have impact on the prevalence of diabetes in the population

3. Methods and materials

3.1 Study area

The study will be conducted in Kolfe Keranio sub city is one of the ten sub cities established under Addis Ababa city administration. It about 9.6 kms away from center of the city and about 13Kms the western side of the sub-city reaches from the center. It is located at the part of Addis Ababa, between the road to Jimma and Ambo towns. The sub-city shares boundary with 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. At present the sub city is divided in to 15 woreda 103 sub woreda, 393 sefer, and 1385 block. It has an area of 6348.09 hectares from this about 1334 hectares was covered with forest and included prominent feature of mount Jemo , Jemo river and repi Medhanealem mountain. According to a report from the city administration and officials in the sub city, it is one of the rapidly expanding sub city of Addis Ababa where intensive housing construction, is taking place and now a day's its population and extent is increased than the previous and now a day's its population reach to 537524. At present the sub city is divided in to 15 woreda 103 sub woreda, 393 sefer and 1385 block [15]

3.2 Study period

The study will conduct from April 1/2018 to Jun /2018

3.3 Study design

Community base, cross-sectional surveys of no pregnant adult, 30-69 years from kolife Keranio sub-city, Addis Ababa, Ethiopia.

3.4 source Population

Resident of kolife Keranio sub-city live at least six months in the sub-city of 2018 year projected population of last census.

3.5 Study population

Residents of kolife Keranio sub city, non-pregnant individuals aged 30–69 years

3.6 Exclusion and inclusion criteria

3.6.1. Exclusion criteria

Eligible residents will non pregnant individuals aged 30-69years and permanent resident s of the area at least six months.

3.6.2 Inclusion criteria

Residents unable to respond during the time of interview, temporary resident of the sub city

Pregnant women's, less than 30 years and more than 69 years

3.7 Sampling size and sampling techniques

We use a two stage cluster sampling, First we list all clusters in the kolife Keranio sub-city in Blocks, then we coded each blocks by their level of government administration like D1K6S2B4(district1,ketena6,sefer2,block4). We select 30 clusters among 1385 blocks of the sub city by PPS as PUSs, then the unit of element in the first stage sampled in the second stage at house holed level by simple random sampling after determining the sample size of the study elements in each clusters.

Each districts contributed with a number of clusters (blocks) calculated upon its population number:

The sample size was calculated $Z^2 \times p \times Q \times f / d^2$

Where Z: 1.96 at error risk of 5%

p: expected prevalence of DM varied across Ethiopia, from the literature review ranging from 0.3% at Debre Berhan Referral Hospital to 7.0% in Harar town. We take the prevalence dm kolife Keranio 6.5% from the study conducted Nshisso eta 2013, in Addis Ababa.

Q: 1-p; d: absolute accuracy of 5%; f: (design effect)

The value of f to correct design effect, is calculated as

Design Effect (De or f) = Var_{cl} / Var_{SRS}

Deff= $1+(m-1) \rho$

Where

m= the average size of the clusters

ρ (Intra-class correlation) = 0.23

$\rho = 1 - n / (n - 1) (\sigma_{\omega}^2 / \sigma^2)$

$\sigma^2 = \sigma_{\omega}^2 + \sigma_{\beta}^2$

Where the sampling variance computed using the Jackknife repeated replication method derives estimates of complex rates from each of replications of the parent sample,

$$Deff = 1+(22.53-1)*0.23$$

$$= 5.95$$

Then by using the standard formula for multistage cluster sampling, $n = DEFF * Z^2 pq / D^2$.

$$\text{Then, } n = (1.96)^2 \times 0.065(1-0.065) 5.95 / (0.05)^2$$

$$n = (3.8416) \times 0.065(0.935) (5.95) / (0.0025)$$

$$n = 556 \text{ households} + 10\% \text{ contingency}$$

Based on the above calculation sample size 611 HH will study and we will allocate equal number of house hold to each 30 clusters/block of localities by simple random sampling. At the end of the sampling procedures, all subjects aged 30-69 years without pregnant women's in each selected household and identified by a door-to-door census, will invite to participate for screening between May 2018 and Jun 2018.

3.8 Operational terms

Diabetes defined as fasting plasma glucose levels ≥ 7.0 mmol/L (126 mg/dl); or using insulin or oral hypoglycemic drugs; or having a history of diagnosis of diabetes [16].

Risk Factor -Any attribute, characteristic or exposure of an individual, which increases the likelihood of developing the disease of interest.

Fasting Blood Glucose -Blood glucose estimation obtained from a subject who has undergone an overnight fast from any food or drink (excluding water or clear, plain tea) for at least 8 hours.

Family History of Diabetes and Hypertension - is a reported history of diabetes and/or hypertension in the father, mother, brother or sister, or the respondent.

Obesity -a body mass index (BMI) ≥ 30.0 kg m

Overweight -a BMI =25.0 but less than 30.0 kg m

Central Obesity -A waist-to-hip ratio (WHR) greater than 1.0 in man or greater than 0.85 in women [17].

Normal Fasting Glucose- A capillary whole blood fasting glucose level <5.6 mmol l (100mg dl-1).

Hypertension -the average of casual systolic blood pressure readings =140 mmHg

and/or diastolic pressure readings = 90mmHg [17]

Heavy Alcohol Consumption- Refers to the average consumption of more than 3 standard alcoholic drinks per day for men (30gm of alcohol) or >2 alcoholic drinks (or 20gm alcohol) for women. A standard alcoholic drink is the equivalent of one glass/can/bottle (330ml) of regular beer (with 3% ethanol), one glass (100ml) of wine (10% ethanol) or one glass or measure (40ml) of distilled spirit, each of which adds up to about 10g of ethanol per drink [17].

Low consumption of fruits/vegetables– Is the consumption of less than one serving per day of fruits and vegetables, other than those added to foods such as soups, stews and sauces. A serving is the equivalent of one whole orange, one apple or banana, a slice of pineapple or papaya, half to one cup of diced vegetables or fruits, etc [17].

Sedentary lifestyle(Physical inactivity) – In this study is measured as a response of being always or usually engaged in light/leisure activities for most days of the week, or a response of sometimes/never engagement in moderate to intense physical activity outside work for most days of the week, that would add up to at least three hours per week of moderate to intense (vigorous) physical activity [17].

3.9 Dependent/Outcome) variable

Prevalence of diabetes.

3.10 Independent variables

Socio demographic characteristics, (educational status, occupation, Age, sex, household size and monthly income, Ethnicity, family history of diabetes, religion)

Personal factors(overweight or obese, unhealthy diet) smoking habit, excessive alcohol intake, physical activity, means of transportation, stress, health history, and time of sitting position in office / watching television. Usual time of Sleeping per day

3.11 Data collection procedure

A structure questionnaire adapt from different literatures with a face-to-face interview will administer to all the participants using a pretested designed questionnaire and fill in by the data collectors during the interaction. Socio-demographic data will obtain for the study and the

weight of the subjects will measure by kilogram using a weighing scale. The height will measure by centimeter. Body Mass Index (BMI) will calculate.

The waist and hip circumferences will measure by wearing minimal clothing. Blood pressure will measure by mercury sphygmomanometer. All measuring materials will calibrate for their quality. Blood pressure will measure, and lifestyle factors will ascertain through a structure interview.

Blood Glucose Concentration (BGC) of subjects will assess using the glucometer and test strips of Fasting Blood Sugar (FBS) we will inform that to participant not to eat at least eight hours before screening.

3.12 Data analysis

The data obtain will analyses using Epi Info 7 to design the data collection tools and data entry and extract the data Statistical Package for Social Sciences (SPSS) version 20 to generate descriptive statistical information and Bivariate and logistic regression will use to see the association between each independent variables and outcome variables. Continuous variables will transform in to categorical variable before analysis. Frequencies of all variables in the questionnaires will determine variables P- values less than 0.25 during Bivariate analysis will enter in to multivariate logistic regression model. Chi square tests were used for comparison of data, with a significance set at $p < 0.05$.

3.13 Data quality assurance

The questionnaire was adapted and modified into our context from previous different literatures to ensure data quality, the data collectors and supervisors were appropriately train for two days and side by side to measure appropriateness and understandability of questionnaires, pretest will conduct out of the study area in Gulele sub-city north Addis Ababa and Checking of questionnaires at the end of each day of data collection, for consistency, completeness, clarity and accuracy. Taking physical measurements twice, and in some cases three times, to minimize observer error and data double entry will also done

3.14 Dissemination of finding

The study result will be present to Addis Ababa University for partial fulfillment of masters degree after open defense and a copy will be given to all concerned health offices specially kolife Keranio sub-city health office. To Addis Ababa public health research and emergency management core process. Further attempt will be made to publish on national and international scientific journals.

3.15 Ethics Statement

The study protocol will approve by Addis Ababa University School of public health Ethics Committee. Campaigns of information and sensitization of the study areas population will deliver using community association and health extension professionals informed consent (by signature or thumbprint) will obtain from all participants, After verbal inform consent will obtained, participants will taken through a structured questionnaire (a 30 min session), and all participants with abnormal findings will receive counseling, educational pamphlets, and referral for follow-up.

4. Action plan for activities-based time budgeting and Budget Break down

Table 14 Tentative action plan for activities-based time budgeting

Table : activity-based time budgeting					
Phases of the project	Tasks to be done	Time allocation in weeks	Time of Implementation In days	Responsible body	Responsibility
Phase I; preparation	1.Proposal preparation	4weak	7April – 22April 2018	Daniel yohannes	Resident
	2.Expert judgment for proposal		22-28 April 2018	Prof Alemayehu Worku and Yemer Sied	Mentors of AAU
	3.Ethical clearance		May 2018	Addis Ababa University School of public health Ethics Committee	
Phase II: Data collection	4.Visit the study area Marking the sample house hold	2 weak	6-10May 2018	Daniel yohannes	Resident
	5.Actual data collection		11May - 25May 2018	Daniel yohannes And Data collectors	Resident
Phase III: Analysis and report writing	6.Data entry in to computer		26-27May 2018	Daniel yohannes	Resident
	7.Data processing and		28May - 30May 2018	Daniel yohannes	Resident

	analysis	3 weak			
	8.Preparing first draft of the report		1Jun -5Jun2018	Daniel yohannes	Resident
	9.Expert judgment on report		6Jun 2018	Prof Alemayehu Worku and Yemer Sied	Mentors of AAU
	10.Submission of final draft		Jun 2017	Daniel yohannes	Resident
	Total time	9 weak	63 days		

Table 15; Budget Break down

S.n	Item	Quantities	Unit measurement	of	Cost per Item	Total price
Stationary cost						
1	Paper	8	Pack		198birr	1584 birr
2	Printing cost	3000	Each		1birr	3000 birr
3	Binding cost	4	Each		30birr	120 birr
4	Pen	50	Each		3.50 birr	175 birr
5	Pencil	20	Each		3birr	60birr
6	Pen sharpener	5	Each		3birr	15birr
7	Staples	4 pack	Pack		33birr	132birr
8	Staple holder	4	Each/small		127birr	508 birr
Total						5594 birr
Communication cost						
1	Telephone		Minutes		0.35 birr	84 birr
2	Car rent		Per day		100birr	2000 birr
3	Promotion activities	30 blocks	Per block		50birr	1500birr
4	Internet	5	840MB		600	3000 birr
5	Training cost	10/3day	Days		300birr	9000birr
Total						15584
Material						
1	Glucometer and strips	4	Each strip	with 1610	1610birr	6500birr
2	Blood pressure apparatus	4	Each		300 birr	1200birr
3	Rubber meter	4	Each		40birr	160birr

4	Lancet	6	Pack/100	180birr	1080birr
5	Alcohol pad	6	Pack/100	100birr	600birr
6	Weight scale with height	4	Each	1500birr	6000birr
7	Safety box	4	Each	30birr	120birr
8	Umbrella	5	Each	250birr	1250birr
9	Hat	10	Each	100birr	1000birr
10	T-shirt	5	Each	300birr	1500birr
11	Bag	5	Each	500 birr	2500birr
Total					21910birr
Man power					
1	Expert Judgment fee	The Usual, mentors 1professor and 1Mph holder for 6 days	Person	3000birr	36000birr
2	Advisers	1 PhD and 1mph for 6days	Person	3000birr	36000birr
3	Principal investigator fee		Person	1000 birr/day	15000birr
4	Data collectors fee	4Diploma holder in health related field	Person	40birrper questioner	22240birr
5	Screeener fee/FBS	4 lab technologist	Person	50per person	27800birr
6	Data encoder fee	Biostatic/mathematics/IT related	Person	150/day	2250birr
Total					139290
summery Total				182378	
Contingency				18237.8	
Grand total =summery Total+ Contingency				200625.8	

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Annexes

1.Data collection tools of AWD outbreak investigation

This survey is conducted by Ethiopian field epidemiology and laboratory training program(EFELTP), Addis Ababa University school of public health EFELTP resident in collaboration with Federal Ministry of health to investigate the associated factor of AWD outbreak at Eastern Harergee as part of the ongoing response to Acute watery diarrhea .All personal information collected through this survey will be handled confidentially &your name is not required .This survey is being conducted to improve & control measures against AWD and stop further spread .you may wish to withdraw at any stage of the interview

Part A: - General information

1. Serial no.....
2. Case Control.....
3. Age in year
4. Sex Male.....Female.....
5. Occupation.....
6. Residential address: regionsub city.....woreda.....Kebele.....
House numberphone number.....

Part B: clinical information (for cases)

1. Date of onset (dd /mm/yyyy).....
2. Presenting symptoms
1, watery diarrhea 2. vomiting 3. dehydration 4. other specify
3. Hospitalized? Yes.....no.....
4. Date of hospitalization (dd/mm/yyyy).....

Part C: exposure

1. what is regular source of water for domestic use in the last five day?
1, house hold tap water 2, communal tap water 3, river 4, borehole 5, spring 6. bottled water e, tanker (roto)
2. What is regular source of water for drinking within the last five day?
1, house hold tap water 2, communal tap water 3, river 1, borehole 2, spring 3,tanker (Roto) 4,bottled water
3. Did you treat the water before drinking? Yes.....no.....
4. If yes, how did you treat it? a, filtration b, boiling c, aqua tab d, water guard e, bishangare f, pure
5. If yes, from which holy water site?

Food and Beverage

6. Did you eat any of the following in the last five days?

1, vegetable salad 2, fruits 3, raw meat 4, partially roasted meat 5, fish 6, unboiled milk
g, other (specify).....

7. Where did you get (buy) food for your household? A, local market b, private garden /farm c, street shop d, butcher shop e, other (specify).....

8. Did you eat food outside your home in the last five days? Yes.....no.....

9. If yes where? a, local food vendors b, street food vendors c, hotel d, restaurant & cafe e, at gathering f, school /work cafeteria

10. Did you eat any cold leftover food in the last five days? Yesno.....

11. If yes where is the source of the food? 1, at home 2, hotel 3, restaurant 4, Social ceremony
5, other (specify).....

12. Did you drink any of local made beverages in the last five days?

1, ----- 2, ----- 3, -----

Hygiene and sanitation

13. Do you wash your hands with soap before eating regularly? Yes.....no.....

14. Do you have latrine in your home? Yesno.....

15. Do you have hand washing materials around the latrine Yes No -----

16. If yes, Communal.....private

17. If no, for Q15 where do you defecate human faeces? a, open defecation b, in the river c, bury in the soil d, In the latrine

18. Did you wash your hands every time with soap after defecation? Yes.....no.....

19. Where do you dispose of your refuse? a, open dumping b, open pit c, in the river d, bury e, burn f, collected by solid waste collector g, other specify

Other exposure

20. In the last five days, did anyone in your household have diarrhea with or without vomiting? Yes.....no.....

21. Did you visit any one having diarrhea with or without vomiting in the last five days?

22. Did you attend a funeral within last five days? Yes.....no.....

23. Did you travel to place affected with diarrhea with or without vomiting? Yes.....no.....

24. If yes, where? Region zone woredaKebele.....

2. Interview questions for households with human exposure on rabies outbreak investigation.

This survey is conducted by Ethiopian field epidemiology and laboratory training program(EFELTP), Addis Ababa University school of public health EFELTP resident in collaboration with Federal Ministry of health to investigate Rabies outbreak at District 3, Gullele sub-city, Addis Ababa, Ethiopia, as part of the ongoing response to rabies. All personal information collected through this survey will be handled confidentially & your name is not required. This survey is being conducted to improve & control measures against rabies and stop further spread. You may wish to withdraw at any stage of the interview.

1. **1.1.** Date? mm/dd/yyyy -----
- 1.2.** Interviewer? -----
- 1.3.** Area? -----
- 1.4.** Block? -----
- 1.5.** House number? -----
2. Study participant's case--- control---
3. Gender of respondent? Male--- Female---
4. How many dog/-s belong to the household? -----
5. How many are adult dogs versus puppies (younger than six months)?
6. Have you had any dog/-s that died during the last year? 1. Yes 2. No
7. Why did it/them die? 1. Rabies 2. Other reasons
8. Did anyone in the household get bitten by a dog during the last year? 1. Yes 2. No
9. How many cases of dog bites happened?
10. Did the skin get penetrated? 1. Yes 2. No
11. Did that person seek medical care? 1. Yes 2. No

12. What kind of injections did the person get? 1. Tetanus anti toxoid , 2. Anti rabbis vaccine , 3. Antibiotics , 4. unknown.

13. Did the bitten person get a completed dose of anti-rabies vaccination? 1. Yes 2. No

14 What happened to the person that was bitten afterwards? 1. Healed 2. disable 3. die ,4. unknown

15 Was the dog that bit vaccinated against rabies before the incident? 1. Yes 2. No

If yes:

16 How did you get to know that? 1. I see the certificate 2. owner of the dog told me

17 What happened to the dog afterwards? 1. Very agitated, 2. hydrophobic 3. nothing happened 4. die 5. killed for investigation

18. Did you know the dog? 1. Yes 2. No

19.Would you seek medical care if bitten by a dog? 1. Yes 2. No

If yes:

20. Why would you seek medical care?

If no:

21. Why would you not seek medical care?

22 . Are your dogs vaccinated against rabies? 1. Yes 2. No

If yes:

23. Can we see the certificate? / Which year did each of the dogs get the last

Vaccination?- dd/mm/yyyy

24. Where did the vaccination? Did you have to pay? a. At veterinary clinic b. At home

If no:

25. Why not? -----

26. Have you heard of rabies before? 1. Yes 2. No

27. Do you consider rabies being a problem in your living-area? 1. Yes 2. No

28. If yes: why?

3. Questionnaire for evaluation of surveillance system-Kolife Keranio sub city ,

Addis Ababa, Ethiopia 2017

1.1 Sub City Level Questionnaire

Respondent _____

Interviewer: _____

Date _____

General

1. Is there a national manual for surveillance? Yes / No
2. **If yes**, describe (last update, diseases included, case definitions, surveillance and control, Integrated or different for each disease):_____.
3. Do you have standard case definitions for the Country's priority diseases like RF, Epidemic typhus, ? Yes / No
4. If yes, **Obs** [1 to n priority diseases] is the standard case definition for each priority disease_____
5. Is the central level responsible for providing surveillance forms to the health facilities? Yes/ No
6. **If yes**, have you lacked appropriate surveillance forms at any time during the last 6 months? Yes / No
7. What are the reporting health facilities for the surveillance system?
 - a. Public health facilities
 - b. NGO health facilities
 - c0. Private health facilities
 - e. Others _____
8. Number of reports in the last 3 months compared to expected number
Weekly: ___/12 times the number of woredas
Immediately: -----/times the number of woredas
9. Number of weekly reports received on time: ___/12 times the number of woredas
10. Was there any report of the immediately reportable diseases in the past 1 month? Yes/ No
11. If yes, with in what time is the report received after detection of the case/diseases?
 - a. Less than 1 hour
 - b. 2-24 hour
 - c. 1- 2 days
 - d. 3- 7 days
 - e. After 1 week
12. How do you report to the next high level? a. Mail b. Fax C. telephone d. Radio e. Electronic f. Other
13. Does the zone level describe data by person (case based, outbreaks, and sentinel)? Yes/ No
If yes, (Obs) Observed description of data by age and sex

14. Describe data by place, time and person? Yes/No
15. Perform trend analysis? Yes/ No
If yes, Obs , line graph of cases by time and list disease(s) for which line graph is
16. Observed a. _____ b. _____ c. _____ d. _____ e. _____
17. Do the sub city have an action threshold defined for Epidemic typhus? Yes / No
18. Who is responsible for the analysis of the collected data? _____
19. How often do you analyze the collected data?
a. Daily b. Weekly c. Every 2 weeks d. Monthly e. Quarterly f. As needed
20. Do you have an appropriate denominators establish the threshold? Yes / No
21. **If yes, Obs** presence of demographic data (E.g. population by woreda and hard to reach groups)

Outbreak Investigation

22. Is there any outbreak in the zone in the last year? Yes/No
If yes, number of outbreaks investigated: _____
23. List of diseases: _____.
24. Number of outbreaks investigated and in which risk factors were looked for: ____.
25. Number of outbreaks in which findings were used for action [Observe report] _____
26. Number of woredas that looked for risk factors [observe in reports]
27. Number of woredas that used the data for action [observe in final report] _____

Epidemic preparedness(relevant for epidemic prone diseases

28. Dose the zone established epidemic management committee? Yes/No
29. Do you have plan for epidemic preparedness and response? Yes/No
If yes, Obs, a written plan of epidemic preparedness and response
30. Has the zone had emergency stocks of drugs, vaccines, and supplies at all times in past 1 year? Yes/ No
31. Has the zone experienced shortage of drugs, vaccines or supplies during the most recent epidemic (or outbreak)? Yes/ No
32. Doses the standard case management protocol for malaria and measles exists in all health facilities? Yes/No
33. Is there a budget line for epidemic response? Yes / No
If yes, Obs. minutes (or report) of meetings of epidemic management committee
34. Does the region have a rapid response team for epidemic? Yes/No

Response to epidemics

35. Dose the epidemic responded within 48 hours of notification from zone level? Yes/No
If yes, Obs (from written reports with trend and intervention)

Feedback

36. Dose a report is regularly produced to disseminate surveillance data from the zone?
Yes/No
If, yes Obs: the presence of a report of surveillance data
37. How many feedback reports has the zone level produced in the last year? _____

Supervision

38. Did you conduct supervision last 6month? Yes/No
39. If yes, how many supervisory visits have you made in the last 6 months? _____
40. If no , what is reasons for not making all required supervisory visits.
(Text)_____

Training

41. Have you received any post-basic training in epidemic management? Yes/No
If yes, specify when, where, how long, by whom? _____
42. How many of your staffs trained in surveillance? _____

Resources

43. For data management
a) Computer & Printer Yes/No
b) Photocopier Yes/No
c) Data manager Yes/No
d) Statistical package Yes/No
44. Communications availability
a) Telephone service Yes/No
b) Fax Yes/No
c) Radio call Yes/No
d) Internet Yes/No

Surveillance

45. Is there a budget line for surveillance in at zone? Yes/No
If yes, is it sufficient Yes/No
46. If No, what option did you use at zonal level? _____
How could surveillance be improved? _____
_____.
47. What opportunities are there for integration of surveillance activities and functions (Core activities, training, supervision, guidelines, resources etc.)?
a. _____
b. _____
c. _____

Attributes and level of

a) Usefulness:

48. Total population under surveillance in the zone _____
49. How many cases and deaths reported in the zone last year?
Epidemic typhus cases _____ Deaths _____
50. Does the surveillance system help?
a) To detect outbreaks of these selected priority diseases early? Yes / No
b) To estimate the magnitude of morbidity, mortality and factors related to these diseases? Yes/ No
c) Permit assessment of the effect of prevention and control programs? Yes/ No

b) Simplicity:

51. Do you feel that additional data collected on a case are time consuming? Yes/No

52. How long it takes to fill the format? a, <5 minute b-10-15minuts c- >15 minutes

c) Flexibility:

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

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

If yes, how? _____

d) Data Quality:

55. Are the data collection formats for these priority diseases clear and easy to fill for all the data

collectors/ reporting sites? Yes/ No

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

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

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

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

e) Acceptability:

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

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

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

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

b) No feedback / or recognition given by the higher bodies for their contribution; i.e. no dissemination of the analysis data back to reporting facilities

c) Reporting formats are difficult to understand

d) Report formats are time consuming

e) If Others: _____.

f) Representativeness:

61. What is the health service coverage of the woreda/ **zone**/ region? _____%

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

g) Timeliness:

63. What proportion of woredas reports in acceptable time? -----%

h) Stability

64. Was the new BPR restructuring affect the procedures and activities of the surveillance of these diseases? Yes/No

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

Woreda (Intermediate Level) Questionnaire

Woreda _____

Respondent _____

Date _____

Interviewer _____

General Information

1. Is there a national PHEM /IDSR Guide line Or manual at this site? Yes/No
If yes, **Obs** national PHEM /IDSR Guide line/manual: _____
2. Does the woreda have the **capacity** to transport specimens to a higher level lab? Yes/No
If No, Reason _____
3. Does the woreda have guidelines Or SOP for specimen collection, handling and transportation to the next level? Yes / No
4. Have you lacked forms recommended for the country at any time during the last 6 months?
Yes/ No
5. Number of reports received in the last 3 months compared to expected number
Weekly: _____ /12 times the number of health facilities
Immediately: _____ / times the number of health facilities
6. Number of weekly reports submitted on time: ____/12 times the number of health facilities (**On Monday**)
7. Number of immediately reports submitted on time: _____/3 times the number of health facilities (**within 30minutes of events**)
8. How do you report Weekly or immediately to the next level?
a/ Mail b/Telephone c/ Fax d/Radio e/ Electronic f/ Other
9. How can reporting system be improved?

-
10. Did you analysis IDSR data? Yes / No
 a) If yes, Is data describe by person for any case based, outbreaks or sentinel? Yes / No
If yes, Obs description of data by age and sex
 b) Is description of data by place (locality, village, work site etc)? Yes / No
If yes,Obs. description of data by Place
 c) Is the description of data by time? Yes / No
If yes, Obs observed description of data by time?
11. Is there a trend analysis for epidemic Typus?
 If yes, **Obs.** line graph of cases by time
12. Do you have an action threshold for any of the country priority diseases? Yes/ No
If yes, what is it? _____ cases _____% increase _____ rate
 (Obs for 2 priority diseases)_____
13. Did you have appropriate denominators? Yes/ No
 If yes, Obs. demographic data at site (E.g. total population by village, <5 yrs,---)
14. Who is responsible for IDSR data analysis? _____

15. How often do you analyze the IDSR data?

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

Outbreak investigation

16. Is there any Outbreak or suspected in the woreda in the past year6 months? Yes / No

If yes, number investigated_____ (Observe reports and take copies if possible)

Epidemic preparedness

17. Dose the woreda epidemic preparedness plan? Yes / No

If, yes,(Obs) a written plan of epidemic preparedness and response.

18. Has the woreda had emergency stocks of drugs and supplies at all times in past 1 year?
 Yes / No

If yes, Obs, Observed the stocks of drugs and supplies at time of assessment

19. Has the woreda experienced shortage of drugs, vaccines or supplies during the most recent epidemic (or outbreak)? Yes / No

20. Is there a budget line or access of funds for epidemic response? Yes / No

21. Does the woreda have a rapid response team for epidemics? Yes / No

If yes, **Obs** Observed minutes (or report) of meetings of epidemic management

22. Didepidemic response team evaluated their preparedness and response activities during the past year? Yes / No

If yes, (observe written report to confirm)

Responses

23. Has the woreda implemented prevention and control measures based on local data for at least one reportable disease or syndrome? Yes / No

24. Present of epidemic that responded by woredas within 48 hours of notification of most

recently reported outbreak? _____

Feedback

25. How many feedback written reports has the woreda produced in the last year? _____

Obs Observed the presence of a written report that is regularly produced to disseminate

Supervision

26. Did you supervise the health facilities in the last 6 months? Yes / No

If yes, how many times have you been supervised in the last 6 months? _____

(Obs supervision report)

27. If No, the most usual reasons for not making all required supervisory visits.

(Text)

Reason 1 _____

Reason 2 _____

Reason 3 _____

Training

28. Have you trained PHEM/IDSR disease surveillance? Yes/No

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

29. What percent of your staffs in the woreda trained on PHEM/IDSR surveillance? ____%

Resources

30. Logistics Available

a) Bicycles Yes/No

b) Motor cycles Yes/No

c) Vehicles Yes/No

d) Stationery Yes/No

e) Computer & Printer Yes/No

31. Communication available

a) Telephone service Yes/No

b) Fax Yes/No

c) Radio Yes/No

d) Computers that have modems Yes/No

32. Information education and communication materials

a) Posters Yes/No

b) Megaphone Yes/No

c) TV Screen Yes/No

d) Projector (Movie) Yes/No

39. Availability of hygiene and sanitation materials

- a) Spray pump Yes/No
b) Disinfectant Yes/No

Surveillance

40. Is there a IDSR focal person in the woreda epidemic management committee? Yes/ No
41. Are you satisfied with the current surveillance system? Yes /No

If no, why? _____.

Attributes

a) Usefulness

42. Total population of the woreda under surveillance _____
43. How many cases and deaths reported in the woreda from the following disease past 6 months?
a) Typhoid cases _____ Deaths _____
b) Relapsing fever cases ___ Deaths _____
44. Does the surveillance system help?

- a) To detect outbreaks of these selected priority diseases early? Yes / No
b) To estimate the magnitude of morbidity, mortality and factors related to these diseases? Yes/ No
c) Permit assessment of the effect of prevention and control programs? Yes/ No

b) Simplicity:

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

c) Flexibility:

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

If yes ,how _____.

d) Data Quality:

49. Are the data collection formats for these priority diseases clear and easy to fill for all the data collectors/ reporting sites? Yes/ No
50. Are the reporting site / data collectors trained/ supervised regularly? Yes/No
If, **Obe**: Review the last months report of these diseases
51. Average number of **unknown or blank responses** to variables in each of the reported forms _____
52. Percent of reports which are complete(that is with no blank or nknown responses) from the total reports _____

e) Acceptability:

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

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

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

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

e) If Others: _____.

f) Representativeness:

54. What is the health service coverage of the woreda? _____%

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

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

g) Timeliness:

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

h) Stability:

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

If yes, how did you manage it? _____

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

Health facility Questionnaire (Hospital /Health center)

Identifiers

Woreda _____

Name of health facility _____

Type of health facility _____

Respondent _____

Date _____

Interviewer: _____

General Information

1. Is there PHEM/IDSR national Guide line or manual at this site? Yes / No

If yes, **Obs**; for the existence **PHEM/IDSR** national guide line or manual

2. Is there a clinical register in health facilities? Yes/ No

If yes, **Obs** the existence of a clinical register

3. Is there the health facilities correctly register cases during the previous 30 days?

Yes / No

If yes, **Obs**; the clinical register

4. Do you have a standard case definition for: (each priority disease)

a) Typhoid Yes / No

b) Relapsing fever Yes / No

If yes, **Obs** the standard case definition for: (each priority disease)

5. Dose of health facilities use standardized case definitions for the country's priority

diseases. Yes/ No

If yes, Obs; the respondent correctly diagnosing one of the country's priority diseases using a standard case definition (Interview about of these)

6. Do the health facilities have the capacity to collect the following specimens?

- a) sputum Y N N/A
- b) Stool Y N N/A
- c) Blood Y N N/A
- d) CSF Y N N/A

7. If yes, Obs the presence of materials required to collect

- a) Stool Yes No N/A
- b) blood/serum Yes No N/A
- c) CSF Yes No N/A

8. Do you have the capacity to handle sputum, stool, blood/serum and CSF until shipment at this facility? Yes No N/A

If yes, Obs the presence of status cold chain at health facility

9. Do the health facility that has the capacity to ship specimens to a higher level lab?

Yes No N/A

If yes, Obs presence of transport media for stool at health facility.

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

Yes No N/A

If yes, what the reason? _____

11. Observed that the last monthly report agreed with the register for 4 diseases (1 for each

Targeted group [eradication; elimination; epidemic prone; major public health importance]

- a. **Obs** Typhoid Yes No N/A
- b. **Obs** Relapsing fever Yes No N/A

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

Obs Weekly: _____ /12 times the number of health post sites

Obs immediately: _____ /--- times the number of health post sites

13. **On time (use national deadlines)**

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

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

14. How do you report?

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

15. How can reporting be improved? Your suggestion

16. Describe data by person, place and time (outbreaks, sentinel) Yes _____ No _____

If yes, Obs data

17. Is there trend analysis Performed? Yes _____ No _____

If yes, Outline graph of cases by time

18. Do you have an action threshold for any of the priority diseases? Yes ____ No ____

19. **If yes**, what is it (Ask for 2 priority diseases)?

Relapsing fever cases ____ % increase

Typhoid cases ____ % increase

20. Who is responsible for data analysis? _____

21. How often do you analyze the collected data?

a) Daily b) Weekly c) Every 2 weeks d) Monthly e) Quarterly

f) As needed.....

22. Presence of demographic data at site (E.g. population <5 yr., population by village, total Population) Yes ____ No ____

Epidemic preparedness

23. Is there standard case management protocol for epidemic prone diseases at health facilities? Yes ____ No ____

If yes, Outline the existence of a written case management protocol for 1 epidemic prone disease

Epidemic response

24. Has the health facility implemented prevention and control measures based on local data for at least one epidemic prone disease? Yes ____ No ____

Feedback

25. Have you received feedback report in the last year from higher level? Yes/No

If yes, how many feedback reports has the health facility received in the last year? ____

Obs; at least 1 report received

26. Have you conduct meeting with community in the last 6 month? Yes ____ No ____

If yes, how often? a) Weekly b) every two weeks c) monthly d) quarterly e) as needed

Supervision

27. Did you supervise health posts in the last 6months? Yes ____ No ____ N/A ____

28. If yes, how many times have you been supervised in the last 6 months? _____

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

29. Did you get any supportive supervision from higher level in the last 6 months?

Yes ____ No ____

30 **If yes, Obs;** supervision report or any evidence for appropriate review of surveillance

Training

31. Have you trained in disease surveillance and epidemic management? Yes ____ No ____

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

32. Number of Staffs trained in disease surveillance and epidemic management _____.

Resources

33. Logistics

a) Electricity Yes/No

b) Bicycles Yes/No

c) Motor cycles Yes/No

d) Vehicles Yes/No

34. For data management

a) Stationery Yes/No

b) Calculator Yes/No

c) Computer Yes/No

d) Software Yes/No

e) Printer Yes/No

35. Communications available

a) Telephone service Yes/No

b) Fax Yes/No

c) Radio call Yes/No

d) Computers Yes/No

36. Information education and communication materials

a) Posters Yes/No

b) Megaphone Yes/No

c) TV Yes/No

d) Other: Yes/No

37. Hygiene and sanitation materials

a) Spray pump Yes/No

b) Disinfectant Yes/No

38. List Personal Protection materials (PPE) available in health facility

Attributes

a) Usefulness

39. Total population of the woreda under surveillance _____

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

a) Relapsing fever cases _____ Deaths _____

b) Measles cases _____ Deaths _____

41. Does the surveillance system help?

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

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

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

b) Simplicity

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

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

c) Flexibility

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

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

If yes ,how _____.

d) Data Quality

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

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

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

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

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

e) Acceptability

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

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

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

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

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

h) Reporting formats are difficult to understand

i) Report formats are time consuming

j) If Others: _____.

f) Representativeness

52. What is the health service coverage of the woreda? _____%

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

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

g) Timeliness

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

h) Stability

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

If yes, how did you manage it? _____

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

4. Sample of English Questionnaire used in survey for diabetes.

Name: -----

Respondent's code number -----

Father' name: -----

I am a resident field epidemiology of Addis Ababa University, preventive medicine Dept. I would like to request your participation in this study that will involve asking you some questions and conducting some tests. Before we proceed, I will request you to listen carefully to what I am going to read to you about the purpose of this study and what it involves and tell me whether you are willing to participate in this research or not.

CONSENT FORM

The purpose of this study is to find out how many residents in kolife Keranio sub-city have diabetes and to determine the possible risk factors of getting diabetes. Diabetes is a serious long-term condition, which can result in severe disability or even death if not properly managed. However, early detection and control of the blood sugar have been found to markedly reduce the risk of complications, this survey will contribute to the literatures by estimating the prevalence of diabetes and exploring its associated risk factors.

The survey will be made up of three parts as follows: Ask you some questions that have been found to be associated with the disease. Take some body measurements such as weight, height and blood pressure. Do a simple blood test to check your blood sugar level, and so determine if you are at risk of developing the disease now or in future.

The whole test will take about one and half hours and you will be asked to have nothing to eat or drink except plain water from midnight before the test.

We would like to assure you that the information obtained will be strictly for our research use and you and not your employer will be informed of the test result. Your name will not be used in our report and the information obtained will not be used in any way that will identify you.

The interview is voluntary. Your participation/ non-participation, or refusal to answer questions will have no effect now or in the future on services that you or any member of your family may receive from health service providers.

Are you willing to participate in this study?

Yes. No

Date of interview:

----Day----month----year

Name/signature of data collector: -----

Step 1 A. Sociodemographic Information of Respondent				
No	Questions	Alternative Choices for Response		Code
1	Sex	1. Male 2. Female		
2	Age(enter number)	-----Years		
3	Date of birth	-----/-----/----dd/Mth/yr(Ethiopian calendar)		
4	Religion	1. Orthodox Christian 2. Protestant 3. Catholic 4. Moslem 5. Other, specify -----		
5	To which ethnic group do you belong?	1. Amhara 2. Oromo 3. Tigre 4. Gurage 88. Other, specify -----		
6	Education status	1. Literate (can read and write) 72. Illiterate (cannot read and write) Skip to Qn. 8		
7	If literate, highest level of completed Education	----- (grade)		
8	What is your profession	-----		
9	What is your family's total monthly income	1. ----- Birr 2. Don't know		
10	About your family's medical history. Do you or any first-degree relative* of yours suffer from any chronic disease such as hypertension or diabetes?	1. Yes 2. No ⇒ Skip to Qn. 12 3. Don't know		
11	If yes to Qn 10, specify which relative(s) and nature of disease(s) from the following list.	Relative	Nature of Disease	
	1. Diabetes 2. Hypertension or Heart disease 3. Don't know nature of disease 4. Others, (specify			
A first-degree relative refers to: your actual father/mother (not step-), full brother/sister and				

full child.			
B. Concerning Smoking or Tobacco Use			
12	Have you ever smoked on a regular basis?	1.Yes, daily 2.Yes, but not daily 3.No, never daily	
13	Do you currently smoke any tobacco product such as cigarettes, cigars, or pipes?	1. Yes 2. No ⇒Skip to Qn 16	
14	When did you start smoking daily? (Select one answer only)	1. Since the last-----years 2. Since the last-----months 3. Since the last-----weeks 4.On -----/-----/-----Date (Day/mth/yr) 5. At -----years of age	
15	On the average, how many of the following listed items do you smoke each day?	1. -----no of factory-produced cigarettes per day 2. -----no of hand-rolled (local) cigarettes per day 3. -----no of local pipes ('gaya') full of tobacco per day 4. -----no of cigars per day 5.Other ----- (specify type ,and no per day) e.g.'sisha'	
16	Do you currently use smokeless tobacco product such as snuff, chewing tobacco, etc?	1. Yes, daily 2. Yes, sometimes 3. No, not at all	
17	Do you chew Khat?	1. Yes, daily 2. Yes, sometimes 3. No, not at all	
C. Concerning Alcohol Consumption			
18	Have you ever taken any type of alcoholic drink? (Beer, wine, spirit, 'tella', 'tej' etc)	1. Yes 2. Yes, but not in the past 12 months 3. No, I have never ⇒Skip to Qn.23	
19	In the past one month, how frequently have you taken at least one alcoholic drink ?* *This refers to one 'standard drink' (see below)	1. 5 or more days a week 2. 1-4 days a week 3. Less than three days this month 4. Less than every month	

20	When you drink alcohol, what is your average consumption at a sitting?	----- (number of drinks)	
D Concerning Feeding			
21	How many times per day do you usually take fruits? (Select one response)	<ol style="list-style-type: none"> 1. Don't eat fruits at all 2. Don't eat fruit everyday 3. I take fruits once a day 4. I take fruits 2-4 times per day 5. I take fruits 5 or more times per day 	
22	How many times per day do you usually eat vegetables? (Select one response)	<ol style="list-style-type: none"> 1. Don't eat vegetables at all 2. Don't eat vegetables everyday 3. I eat vegetables once a day 4. I eat vegetables 2-4 times per day 5. I eat vegetables 5 or more times per day 	
<p>Note;</p> <p>[*One 'standard drink' is the equivalent of * one glass, can or bottle (330ml) of regular beer (which contains about 5% alcohol), * one measure (40ml) of spirit, or one glass of wine]</p> <p>[One helping of fruit includes one banana, one orange, one apple or one slice of pineapple etc].</p>			
E Concerning Physical Activity			
23	Work-related physical activity: Firstly, how many hours do you typically spend at work each day?	-----no of hours	
24	<p>During these hours, how frequently do you practice the following? (Fill 1-4 from the response choices in the space provided)</p> <p>A. Mostly Sitting or Standing with only a short walking distance ----- (mild exercise)</p> <p>B. Activities that require the same physical effort as walking long distance or backyard gardening ----- (moderate exercise)</p> <p>C. Activities that require the same effort as lifting heavy weights or heavy construction work ----- (heavy exercise)</p>	<ol style="list-style-type: none"> 1. Always 2. Usually/Often 3. Sometimes 4. Never 	
25	How often do you use the following transportation methods on a typical day?)	1. Always	

	<p>A. Private car or taxi -----</p> <p>B. Public transport such as city bus, factory bus, minibus or train -----</p> <p>C. Motorbike or bicycle -----</p> <p>D. Walking (on foot) -----</p> <p>E. 'Geri' (horse-drawn carriage) -----</p>	<p>2. Usually/Often</p> <p>3. Sometimes</p> <p>4. Never</p>	
26	<p>Outside the working hours or transportation time, how often do you practice the following activities? (Fill 1-4 from the choices in the space provided)</p> <p>A. Mostly Sitting or Standing with only a little walking ----</p> <p>B. Activities that require the same effort as walking long distance, or backyard gardening, or climbing upstairs ----</p> <p>C. Activities that require the same effort as lifting heavy weight or strenuous exercise ----</p>	<p>1. Always</p> <p>2. Usually/Often</p> <p>3. Sometimes</p> <p>4. Never</p> <p>If answer to Qn 26 is always (1) or often (2), specify the time spent on these activities.</p> <p>-----hours OR</p> <p>-----mins</p>	
Step 2. Physical Measurements			
27	Pulse Rate (measured 3 times)	<p>1st -----beats per min (bpm)</p> <p>2nd -----beats per min</p> <p>3rd -----beats per min</p>	
28	Blood Pressure (measured 3 times)	<p>1st -----mmHg (systolic/diastolic)</p> <p>2nd -----mmHg (systolic/diastolic)</p> <p>3rd -----mmHg (systolic/diastolic)</p>	
29	Height (measured 2 times)	<p>-----cm</p> <p>-----cm</p>	
30	Weight (kg)	-----Kg	
31	waist circumference or abdominal girth (measured 3 times)	<p>-----cm</p> <p>-----cm</p> <p>-----cm</p>	
32	Hip circumference (measured 3 times)	<p>-----cm</p> <p>-----cm</p> <p>-----cm</p>	
Step 3. Biochemical Tests			
33	Checking Fasting status.	_____hrs	

	When did you last take any food of fluids? (Excluding plain water)	_____ min	
34	Blood glucose analysis ; Fasting blood sugar	Result: _____mmol/l	
Comments:-			

