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

Ethiopian Field Epidemiology Training Program (EFETP)

Compiled Body of Works in field Epidemiology

By

Abebe Gelaw Tegegne

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

07-June-2017

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Approval by Examining Board

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Advisor

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Examiner

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Examiner

Acknowledgment

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Acronyms

0C	Degree Centigrade
AIDS	Acquire immunodeficiency syndrome
ANC	Antenatal Care
AOR	Adjusted Odd Ratio
ART	Anti-Retroviral Therapy
AWD	Acute Watery Diarrhea
BCG	Bacilli Chalmette-Guerin
CBN	Community Base Nutrition
CC	Community Conversation
CDC	Centers for Diseases Controls
CHD	Community Health Day
CHW	Community Health Workers
Cm	Cent Meter
CO2	Carbon Di Oxide
COR	Crude Odd Ratio
CTC kit	Cholera Treatment Center kit
EC	Ethiopian Calendar
EFTP	Ethiopian Field Epidemiology Training Programme
EFY	Ethiopian fiscal year
EPI	Expanded Program on Immunization
FAO	Food and Agriculture Organization
FMoH	Federal Ministry of Health
FP	Family Planning
GAM	Global acute malnutrition
GC	Gregorian calendar
GDP	Growth and Development
GOV	Government
H1N1	Hemagglutinin Type 1 and Neuraminidase type one
HC	Health Center
HEW	Health Extension Workers
HF	Health Facilities
HH	House Hold
HIT	Health Information Technology
HIV	Human Immunodeficiency Virus
HO	Health Officer
HP	Health Post
IDA	Iron Deficiency Anemia
IDD	Iodine Deficiency Disorder
IRS	Indoor Residual Spray
ITNs	Insecticide Treated Net
KM	Kilo Meter

MAM	Moderate Acute Malnutrition
MCH	Maternal and Child health
MUAC	Mid Upper Arm Circumference
NGO	Non-Governmental Organization
ODF	Open Defecation Free
OPD	Out Patient Department
OPV	Oral Polio Vaccine
OTP	Outreach Therapeutic Program
PCV	Pneumococcal Conjugative Vaccine
PITC	Provider Initiated Test and counseling
PLW	Pregnant and Lactating Women
PLWHA	People Living With HIV/ADS
PMTCT	Preventing Mather to Child Transmission
PNC	Post Natal Care
PSNP	Productive Safety Net Program
PTB	Pulmonary tuberculosis
RDT	Rapid Diagnostic Test
RUTF	Ready to Use therapeutic Food
SAM	Sever Acute Malnutrition
SC	Stabilizing Center
SSA	Sub-Sahara Africa
STD	Sexual Transmitted Disease
TB	Tuberculosis
TBA	Traditional Birth Attendant
TSF	Targeted Supplementary Food
TSFP	Target supplementary program
TTBA	Trained Traditional Birth Attendant
UNICEF	United Nations International Children's Emergency Fund
VAD	Vitamin A Deficiency
VCT	Voluntary Counseling Test
Vit A	Vitamin A
WHF	Weight for Height
WHO	World Health Organization

Executive Summary

Ethiopia Field Epidemiology Training Program (EFETP) is competency training program in field epidemiology modeled from on the mode of the United State Center for Disease Control and prevention (CDC) Epidemic Intelligence Service (EIS). The program is designed to assist Ministry of Health in building or strengthening health systems by producing public health professionals with skills and competencies developed through applied learning. FETP consists of 25% class-based learning and 75% at a field base where residents are expected to apply the principles learned in class to solve real world public health issues. The EFETP residents spent 2 years in a field epidemiology training program focusing on investigating outbreaks, analysis and evaluation of surveillance systems, and other public health activities and residents compile a body of works consisting of their outbreak investigation reports, surveillance analyses, etc. This compiled body of works contains many outputs which all of them were done during my residency time in the program. The body of works is categorized in to nine chapters as follow:

The first chapter contains two outbreak investigations: the first outbreak investigation conducted was Scabies outbreak in Wadela district, North wollo zone, Amhara, February 2017. The second investigated outbreak was Pandemic Flu outbreak in Bati district, Oromia zone, March 2016.

The second chapter is surveillance data analysis of Magnitude of sever acute malnutrition in relation to crop production & climate variability in under five children years age, Waghimira zone, Ethiopia, 2012-2015.

The third chapter is evaluation of malaria surveillance system in N/Wollo Zone, Ethiopia, 2016

The fourth chapter is description of Health profile of Jile timuga district in Oromia zone, 2016.

The fifth chapter is development the Manuscript on Outbreak investigation of Scabies cases in Wadela district North wollo, Amhara, Ethiopia, 2017.

The sixth chapters are development of abstracts for scientific presentations namely: Outbreak Investigation of Scabies Disease in Wadela District, North Wollo zone, Amhara, Ethiopia, 2017: and Sever Acute Malnutrition Relationship to Crop Production and Climate Variability in Under 5 years Children, Waghimira, Ethiopia, 2012-2015

The seventh chapter is Belg humanitarian need assessment which was conducted in selected districts of North wollo and North Shewa, Amhara, Amhara region on June 2016.

The eighth chapter is an Epidemiologic Protocol/Proposal for Epidemiologic Research Project namely: Malaria prevalence and associated risk factors in Jile timuga district, Oromia zone, Ethiopia, 2017.

Chapter I- Outbreak/Epidemic Investigation

1.1 Outbreak investigation of Scabies disease, Wadela district, North wollo zone, Amhara, Ethiopia, February 2017

Abstract

Background: Scabies is a neglected parasitic disease that is a major public health problem worldwide and particularly in resource-poor regions. It is endemic in many tropical and subtropical areas, such as Africa, Egypt, Central and South America, northern and central Australia, the Caribbean Islands, India, and Southeast Asia. Approximately 300 million cases are reported worldwide each year. Scabies affects people of all countries, particularly, children in developing countries are most susceptible, with an average prevalence of 5–10%.

Objective: To investigate the contributing factors for the occurrence of the outbreak and provide appropriate control & prevention measures of the disease to stop the spread of outbreak.

Method and materials: We conducted 1:2 unmatched case-control study from February 10-25, 2017. 120 samples (40 cases and 80 controls) was selected simple random sampling and interviewed with structured questionnaire and all cases were collected through line list. Statistical analysis was made using MS- Excel plus 2013, Epi info™ 7, IBM SPSS statistics 20, and ArcMap 10.2.2. Then, Odds Ratio, 95% CI and P-value used to measure the significance of association in bivariate and multivariate analysis

Result: Of 6760 reported cases, 3772 (56 %) were males while the rest 2988 (44 %) were females in the district. No death reported throughout the outbreak. Majority of 543 (AR 23%) scabies cases were occurred from Gashena town kebele and the younger age group 6-14 years was more affected by the disease with an age specific attack rate (ASAR) of 6%. The mean age of cases was 13 (range, 5-45 years), the SD was ± 8.47 years and the mean of age controls was 41.3(Range, 10-81 years), the SD was ±17.13 years. The overall attack rate (AR) was 5 % in the district. Sleeping with contracted scabies case(AOR: 25.3,95% CI: 8.7-73.4 ,P: 0.0001), without soap take shower(AOR: 8.3, 95% CI: 1.7-40.7 ,P: 0.009), sleeping with other(AOR: 9.6, 95% CI: 2.3-40.1, P: 0.002), more than a week wash clothes(AOR: 3.8, 95% CI: 1.3-11.2, P: 0.02), more than a week change clothes(AOR: 6.3, 95% CI: 2.3-17.3, P: 0.0001) were significantly associated with scabies disease.

Conclusion: In this study, we found poor hygienic practices, overcrowding family member, sharing of clothing materials, sleeping with contracted scabies associated with higher frequency

of scabies disease. Therefore, it seems that awareness creation about the signs, transmission, prevention and control methods of this disease to high risk groups help greatly to reduce the prevalence of scabies and prevent probably future epidemic.

Key words: Scabies, case-control, Wadela, Ethiopia, 2017

Introduction

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

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

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

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

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

Scabies has been classified as a water shortage disease because of its association with inadequate water supply leading to poor personal hygiene and thus increased risk of transmission (8).

Treatment of scabies infection is includes topical or oral administration of a scabicidal agent, an antipruritic agent such as an antihistamine, and an appropriate antimicrobial agent if secondarily infected (9) .

Scabies is commonly observed in very young children followed by older children and young adults (10) . Some immunocompromised, elderly, disabled, or debilitated persons are at risk for a severe form of scabies called crusted, or Norwegian, scabies. Persons with crusted scabies have thick crusts of skin that contain large numbers of scabies mites and eggs (11).

Multiple factors like poverty, low socioeconomic conditions, poor hygiene, illiteracy, lack of access to health care, frequent population movements, inadequate treatment, malnutrition, social attitudes, overcrowding, poor public health education , sleeping habits, and overcrowded sleeping space, sharing of clothes and sharing of towels have frequently been cited as risk factors for scabies throughout the world (12) .

Scabies affects people of all countries, particularly, children in developing countries are most susceptible, with an average prevalence of 5–10%. The highest incidence is in tropical climates, with rates of up to 25% overall and up to 50% in some communities in the South Pacific and northern Australia. Poverty and overcrowding are the main risk factors, and outbreaks in institutions and refugee camps are common. Scabies causes intense itch, severely affecting sleep and quality of life. Crusted scabies, a severe infestation with thousands of mites, is associated with extremely high risk of contagion and causes considerable morbidity (13) .

Scabies is endemic in many tropical and subtropical areas, such as Africa, Egypt, Central and South America, northern and central Australia, the Caribbean Islands, India, and Southeast Asia. Scabies is list among the top 50 most prevalent diseases worldwide, with a global prevalence of 100,625,000 in 2010 (1.5% of the world population)(14). The International Alliance for the Control of Scabies (IACS) is a recently formed group from across the globe to advance the agenda of scabies control. The alliance is committed to the control of human scabies infestation, and to promoting the health and well-being of all those living in affected communities (15).

Objectives

General objective

- To identify the risk factors for the occurrence of the outbreak and provide appropriate control & prevention measures of the disease

Specific objectives

- To verify the existence of the outbreak
- To describe the outbreak by time, place and person
- To investigate the risk factors of the outbreaks.

Methods and Materials

Study area and population:

The outbreak investigation was conducted in Gonchere kebeles of Wadela district, North wollo zone, Amhara regional. Gonchere kebele is one of the 29 kebeles of Wadela district. Wadela district is located 127kms far from Woldiya town and 252km far from the regional town Bahir Dar. The district shares with the Delanta district to East, Mekit district to the West, Gazo district to the North and Dawnt district to the South. The total population of the district is 166,209 (154,866 for rural and 11,343 for Urban) and males which account 83,936 (50.5%) of the population. The climate condition of the district is Dega 59.9%, Woyina dega 34.6%, Wurchi 7.7% and Kola 3.8%. The mean annual rain fall is with range 800-1200mm, median temperature of with the range of ^{0}c and Altitudes with range 1501-2600mm. Topography of the district shows that 75% is flat and 25% mountainous. The religious composition is 99% orthodox tewahido followers and 1 % is followers of other religious. The district has 28 health posts, 7 health centers and 1 under construction district hospital. The physical health service coverage of the district is 100%. The district water coverage is 48% and latrine coverage is 51%.

Study period: the investigation was conducted from February 10-25, 2017

Study Design: Unmatched case-control study was used to conduct.

Target population: All population in Wadela district where cases and controls selected

Study population: All cases and populations from which controls were selected

Study frame: All cases of line list in Ganchere kebele of Wadela district onset of itching in the last 6 weeks.

Sample size: Sample size was calculated Epi-info 7 statCalc function for unmatched case-control study using the following assumptions. These are:-
Two sided Confidence level =95%

Power (percent of chance of detecting) = 80%

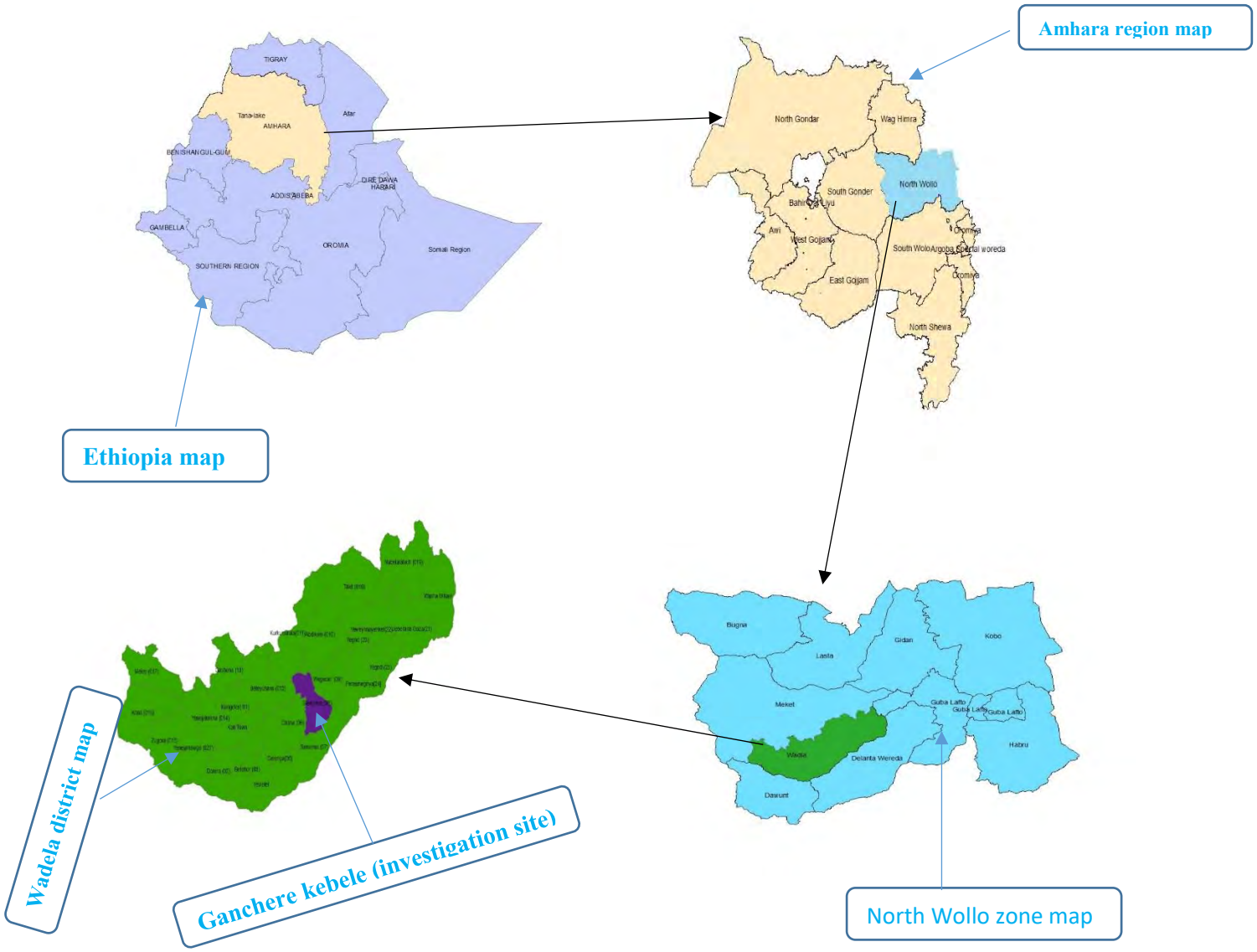
Ratio of controls to case= 1:2

Proportion of controls with exposure = 10 %(16)

Odds ratio = 4.5 (17)

Proportion of case with exposure = 33.3 %

Therefore, the sample size was calculated using Epi info statCalc, 120 samples of 40 cases and 80 controls were selected



Maps 1: Location of Scabies outbreak conducted in Wadela district, Ethiopia, 2017

Abebe Gelaw **7th cohort EFETP** abebegelaw80@gmail.com **2017**

Sampling techniques and procedures: We had conducted simple random sampling techniques because of we want to draw a sample of a scabies outbreak who were already identified and put on line list of cases by cluster health center personnel provided with onset of itching in the last 6 weeks to conduct a satisfaction of this study included. Procedures of selected sample units as follow:-

First, Sample size was calculated Epi-info 7 statCalc function for unmatched case-control study used different assumption, then we had calculated total sample size (n) is 120 (40 cases and 80 controls).

Second, sampling frame was created, which means for cases from the collected line list names of all scabies cases who were identified in the last 6 weeks and for controls from neighbors of selected cases who did not develop scabies during the period of the study.

Third, assign a number to each of the names of scabies cases in the sampling frame (line list of the cases). This could be done using a Microsoft excel sheet.

Forth, we were randomly selected 40 cases of them by using Microsoft excel plus 2013 on data analysis.

Fifth, these selected cases were divided based on the number of data collectors and given for them after that regarding to the list of cases each data collectors with one community member are going to the selected kebeles through house to house searching and recruited into the study. Controls were neighbors of cases who did not develop scabies during the period of the study.

Inclusion criteria &Exclusion criteria

Inclusion criteria: - For Cases selected by simple random from the line lists of Ganchere kebele and Wadela district who have sign and symptoms of scabies infection and who agreed to participate in the study was included. However, control was resident of Ganchere kebele of Wadela district during the study period who was a neighbor to a case and who did not develop signs and symptoms of scabies and zero case in family.

Exclusion criteria: - Both cases and controls that not agree to participate in this study were excluded in the selected kebele.

Case Definitions: We used the WHO standard case definition. These are:-

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

Confirmed case: A person who has a skin scraping in which mites, mite eggs or mite feces have been identified by a trained health care professional

Contact: A person without signs and symptoms consistent with scabies who had direct contact with a suspected or confirmed case in the two months preceding the onset of scabies signs and symptoms in the case.

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

Variables

Dependent Variable

Scabies cases

Independent Variables

Age

Sex

Size of family member

Contact of the respondents

Hygiene practices/Habit

Data collection method

The investigation was conducted through house-to-house searching for scabies case in selected kebeles. We used semi-structured questionnaires which adopted and modified from previously used and interviewed cases and controls, and collected data. Data was collected by principal investigator, 1 district PHEM officer, and 2 heath center worker. Orientation was given for data collectors on the questionnaire. The collected data was checked and when entering the data in to the computer the missing variables and consistency of filling of questionnaires and completeness of data checked out carefully.

Data entry and Analysis

Data was checked, entered and analyzed on computer using MS- Excel plus 2013, Epi info™ 7, IBM SPSS statistics 20, and ArcMap 10.2.2 were used. We are used MS-Excel for sampling technique and procedures, and descriptive analysis, Arc GIS for mapping of study area and spot map analysis, Epi info for data checking and entry and SPSS for statistical data analysis in our study. Descriptive and advanced statically analyses were under taken. Logistic regression

analysis was conducted to find association of diseases with risk factors and exposure outcome were measured and tested using OR, 95% Confidence Interval and P-value.

Results

Descriptive Epidemiology

Out of 29 kebeles of Wadela district, 27(93%) kebeles were affected by the scabies outbreak. A total of 6760 cases of scabies with no death were identified in the district. Majority 543 (AR 23%) scabies cases were reported from Gashena town kebele and followed by Gashena rural kebele 408 scabies cases (AR 14%) and Dele/Dega kebele 432 scabies cases (AR 11%) among the affected kebeles in the district. Of the cases 3772 (56 %) were males while the rest 2988 (44 %) were females.

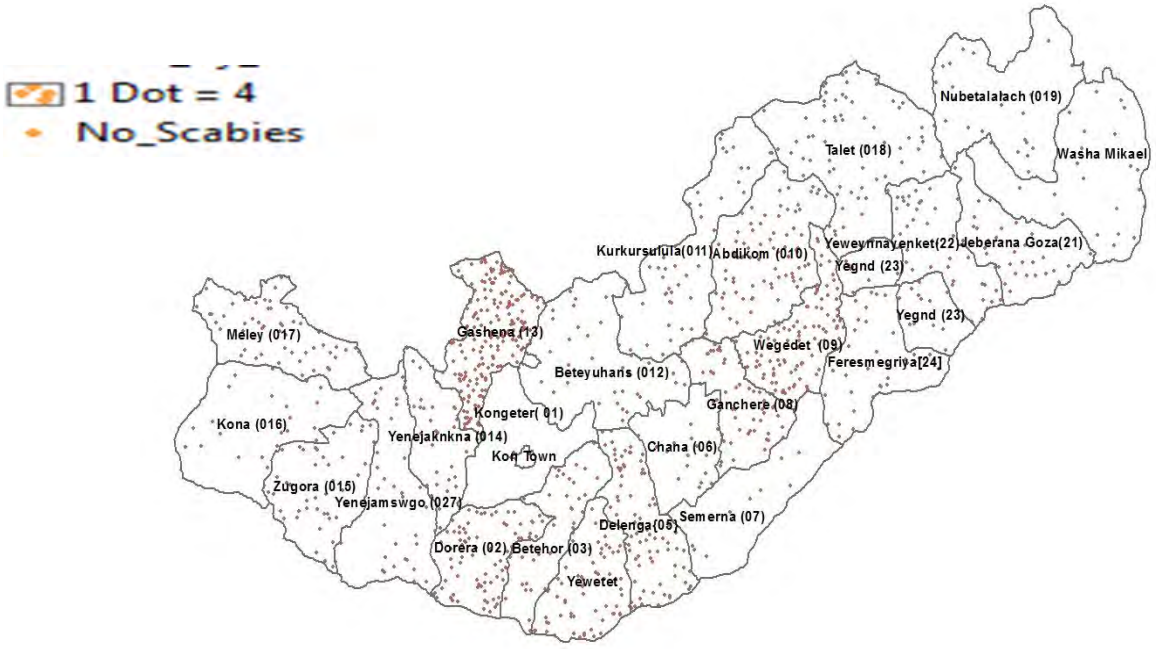
The younger age group 6-14 years was more affected by the disease with an age specific attack rate (ASAR) of 6% followed by age group >= 15 years of 5% and the children age groups 2-5 years of 4%. Case control study was conducted, there were 40 scabies cases (20 males and 20 females) with mean age of cases was 13 (range, 5-45 years), the SD was ± 8.47 years and 80 controls (22 males and 58 females) with mean of age of 41.3(Range, 10-81 years), the SD was ±17.13 years.

Table 1: Age specific attack rate, Wadela district, North Wollo zone, Ethiopian 2017

Age Group (year)	Number of cases	Total No of population	Age specific Attack rate (%)
< 2	164	7056	2%
2-5	455	11982	4%
6-14	2362	41209	6%
>= 15	3779	80879	5%
Total	6760	141126	5%

Table 1: Distribution of Scabies cases by sex in Wadela district, Ethiopia, 2017

Sex	Frequency	Population	Rate
Male	**3772 (56%)**	**71269**	**5.3%**
Female	**2988 (44%)**	**69857**	**4.3%**
Total	**6760**	**141126**	**4.8%**



Maps 2: Scabies case distribution in Wadela district, N/Wollo, Amhara, 2017

In Ganchere kebele the first date of onset of itching was presumed on January 01/2017 and the district was reported it incorporated with others reports in weekly report. The outbreak investigation was started February 11/2017 and intervention was under taken.

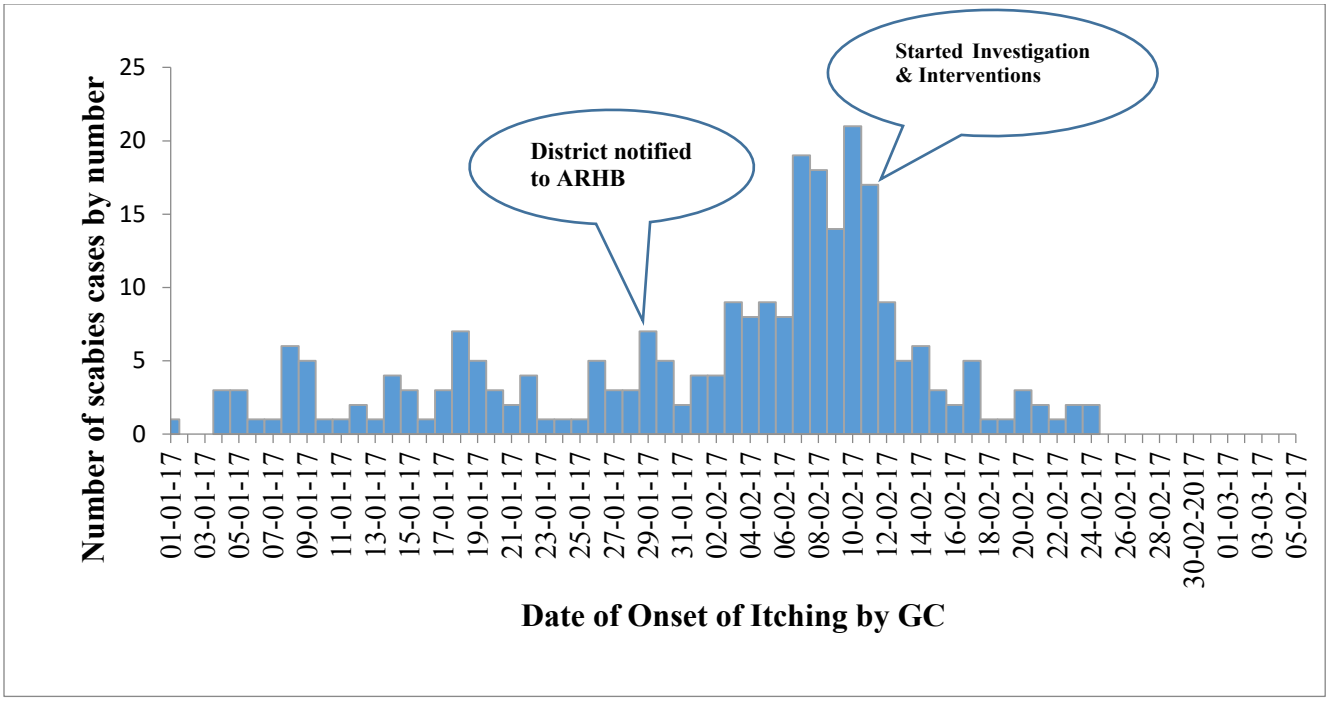


Figure 1: Epi curve of scabies disease outbreak in Ganchere kebele, Wadela district, N/ wollo zone, 2017

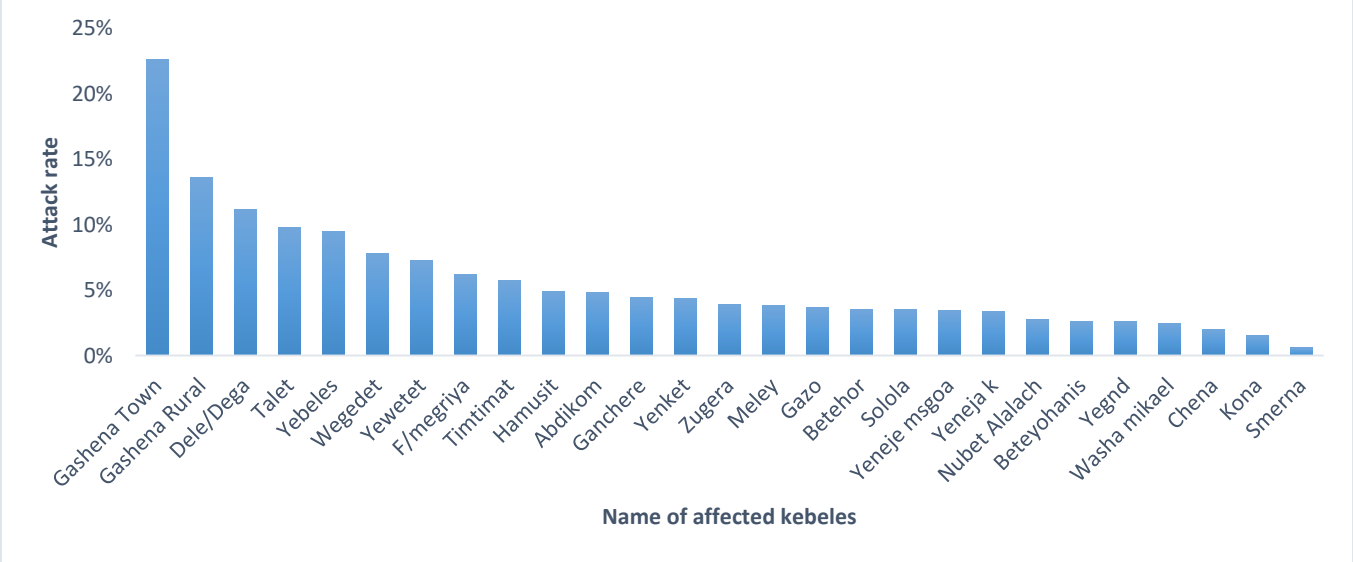


Figure 1: Rate of Scabies cases by kebeles in Wadela woreda, N/wollo zone, Ethiopia, 2017

All 40 (100%) scabies cases first experienced sign and symptoms were manifested with itching and 100% intensity of itching is high at night. The body part mainly affected during the outbreak investigation were finger webs 20 (50 %), ulnar border of the hand 9 (22.5 %), inner aspects of thighs 7 (17.5 %), face palm and sole 3 (7.5 %) and Inter- Gluteal 1 (2.5 %). When we observed

scabies infection skin examination form 40(100%) were seen scabies lesion and from these eight cases (20%) developed with crusted/Norwegian scabies.

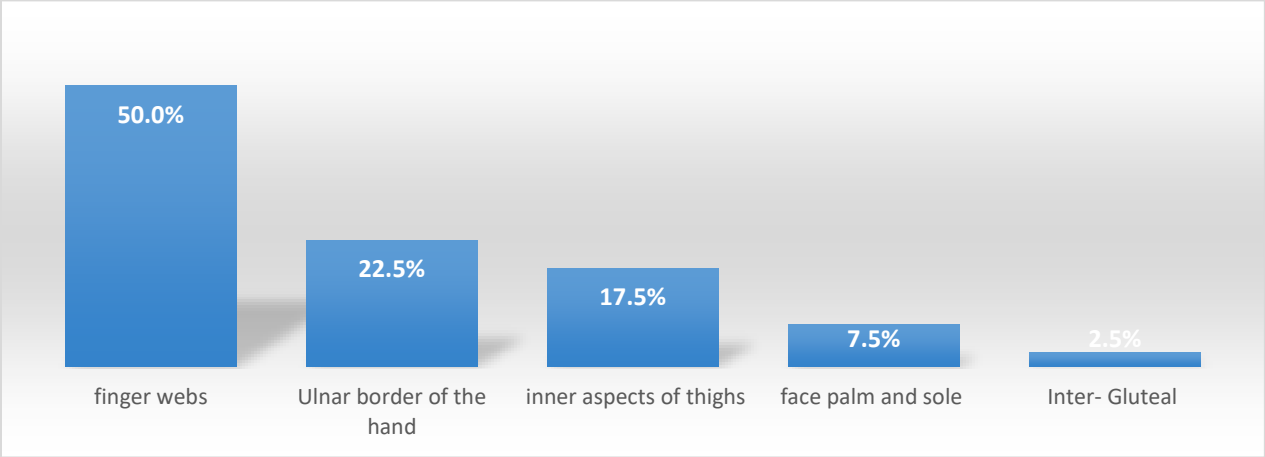


Figure 2: Distribution of respondents their affected body parts, Wadela woreda, Ethiopia, 2017

Marital status of the respondents (cases and controls) were 64(53.3%) married, 49(40.8%) single and the remaining were divorced and widowed. All respondents were follower of orthodox religion. Occupational status of the respondents 17(33.3%) were 81 (67.5%) farmer and 18(15%) students. Education level of the respondents were 100(83.3%) not educated, 14(11.7%) elementary students and 6(5%) reading and writing.

Table 2: Distribution of respondents according to their marital status, Wadela woreda, 2017

Marital status	Frequency		Cumulative Percent
	Number	%	
Single	**49**	**40.8**	**40.8**
Married	**64**	**53.3**	**94.2**
Divorced	**4**	**3.3**	**97.5**
Widowed	**3**	**2.5**	**100**
Total	**120**	**100**	

Table 3: Distribution of respondents according to their occupation, Wadela woreda, 2017

Type of occupation status	Frequency		Cumulative frequency
	Number	%	
Farmer	81	67.5	67.5
Student	18	15	82.5
Housewife	13	10.8	93.3
Merchant	1	0.8	94.2
Other/Kids	7	5.8	100
Total	120	100	

Table 4:Distribution of the respondents by their level of education, Wadela Woreda, 2017

Level of education	Frequency		Cumulative frequency
	Number	**%**	
Elementary	**14**	**11.7**	**11.7**
Reading & writing	**6**	**5**	**16.7**
No educated	**100**	**83.3**	**100**
Total	**120**	**100**	

Analytic epidemiology

We selected 40 scabies cases with 80 controls. The mean age of the cases and controls was 31.8, range was 5-81 years old and SD ± 19.95. The statically significant variables in bivariate analysis are sleeping with contracted scabies disease COR[26.7(CI 9.63-74.14),P =0.001] , wearied clothes of someone who was diseased in the previous six weeks COR [3.4 (CI 1.32-8.6), P=0.011] , sleeping with other COR [6 (CI 1.95-18.49), P =0.002] , more than a week take shower COR [3.8 (CI 1.33-10.7), p =0.013], without soap to take shower COR [7.5(CI 1.89-29.37), P = 0.004] , more than a week wash clothes COR [4.1(CI 1.61-10.25), p=0.003] , more than a week change clothes COR [5.7 (CI 3.5- 20), P =0.001] were potential risk factors of an outbreak of scabies diseases but age COR [0.3(CI 0.1-0.85),P=0.02], sex COR [0.4(CI 0.17-0.84),P=0.01], weekly taking shower COR [0.2(CI 0.07-0.64),P=0.006], weekly washing clothes COR [0.2(CI 0.08-0.54),P=0.001] ,change clothes every week COR [0.2(CI 0.12-

0.54),P=0.001] , sleeping alone COR [0.2(CI 0.05-0.51),P= 0.002] , Use detergent to take shower COR [0.2(0.07-0.74),P = 0.01] were preventive factors.

Table 5: Bivariate analysis of risk and preventive factor for Scabies cases outbreak, Wadela district, 2017

Variables		Case (N=40)	Control (N=80)	COR(95% CI),p-value
Without soap take shower	Yes	9(75%)	3(25%)	7.45(1.89-29.37), P = 0.004
	No	31(28.7%)	77(71.3%)	
Sleeping with other	Yes	36(42.9%)	48(57.1%)	6(1.95-18.49), P =0.002
	No	4(11.1%)	32(88.9%)	
More than a week take shower	Yes	35(40.2%)	52(59.8%)	3.77(1.33-10.7), p =0.013
	No	5(15.2%)	28(84.8%)	
More than a week wash clothes	Yes	33(43.4%)	43(56.6%)	4.06(1.61-10.25), p=0.003
	No	7(15.9%)	37(84.1%)	
More than a week change clothes	Yes	25(58.1%)	18(41.9%)	5.74 (3.5- 20), P =0.001
	No	15(19.5%)	62(80.5%)	
Wearied clothes of someone else with the diseases in the previous six weeks	Yes	13(56.5%)	10(43.5%)	3.37(1.32-8.6, P=0.011
	No	27(27.8%)	70(72.2%)	
Sleeping with contracted scabies disease	Yes	33(73.3%)	12(26.7%)	26.71(9.63-74.14),P =0.001
	No	7(9.3%)	68(90.7%)	
Use soap take shower	Yes	31(29.2%)	75(70.8%)	0.23(0.07-0.74),P = 0.01
	No	9(64.3%)	5(35.7%)	
Sleeping alone	Yes	4(11.1%)	32(88.9%)	0.17(0.05-0.51),P= 0.002
	No	36(42%)	48(58%)	
Weekly take shower	Yes	4(12.5%)	28(87.5%)	0.21(0.07-0.64),P=0.006
	No	36(41%)	52(59%)	
Weekly wash clothes	Yes	6(14%)	37(86%)	0.21(0.08-0.54),P=0.001
	No	34(44.2%)	43(55.8%)	
Weekly change clothes	Yes	15(20.8%)	57(79.2%)	0.24(0.12-0.54),P=0.001
	No	25(52%)	23(48%)	

Number of family	<4	5(16%)	26(84%)	0.3(0.1-0.85),P=0.02
	≥4	35(39.3%)	54(60.7%)	
Sex	Female	20(47.6%)	22(52.4%)	0.38(0.17-0.84),P=0.01
	male	20(25.6%)	58(74.4%)	
Age	<15	20(46.5%)	23(53.5%)	0.3(0.1-0.85),P=0.02
	≤15	20(26%)	57(74%)	

Potential risk factors that remained statistically significantly associated with the disease in multivariate logistic regression analysis were sleeping with contracted scabies case AOR [25.3(CI 8.7-73.4), P =0.0001], without soap take shower AOR [8.3(CI 1.7-40.7), P = 0.009], sleeping with other AOR [9.6(CI 2.3-40.12), P =0.002], more than a week wash clothes AOR [3.8(CI 1.3-11.2), p=0.02] and more than a week change clothes AOR [6.3(CI 2.3-17.3), P =0.0001]. On the other hand, protective factors that remained statistically significantly associated with the diseases on multivariate logistic regression analysis were age AOR [0.4(CI 0.15-0.8), p=0.01], use soap to take shower AOR [0.2(CI 0.03-0.74), P = 0.02], sleeping alone AOR [0.1(CI 0.02-0.4), P= 0.001], weekly wash clothes AOR [0.2(CI 0.06-0.6),P=0.004] and weekly change clothes AOR [0.2(CI 0.07-0.6),P=0.002].

Table 6: Multivariate analysis of risk and preventive factors of scabies cases outbreak, Wadela district, North Wollo Zone, Ethiopian, 2017

Variables		Case (N=40)	Control (N=80)	AOR(95% CI),p-value
Without soap take shower	Yes	9(75%)	3(25%)	8.3(1.7-40.7), P = 0.009
	No	31(28.7%)	77(71.3%)	
Sleeping with other	Yes	36(42.9%)	48(57.1%)	9.6(2.3-40.12), P =0.002
	No	4(11.1%)	32(88.9%)	
More than a week wash clothes	Yes	33(43.4%)	43(56.6%)	3.8(1.3-11.2), p=0.02
	No	7(15.9%)	37(84.1%)	
More than a week change clothes	Yes	25(58.1%)	18(41.9%)	6.3(2.3-17.3), P =0.0001
	No	15(19.5%)	62(80.5%)	
	Yes	33(73.3%)	12(26.7%)	25.3(8.7-73.4),P =0.0001

Sleeping with contracted scabies case	No	7(9.3%)	68(90.7%)	
Use soap take shower	Yes	31(29.2%)	75(70.8%)	0.16(0.03-0.74),P = 0.02
	No	9(64.3%)	5(35.7%)	
Sleeping alone	Yes	4(11.1%)	32(88.9%)	0.09(0.02-0.4),P= 0.001
	No	36(42%)	48(58%)	
Weekly wash clothes	Yes	6(14%)	37(86%)	0.2(0.06-0.6),P=0.004
	No	34(44.2%)	43(55.8%)	
Weekly change clothes	Yes	15(20.8%)	57(79.2%)	0.2(0.07-0.6),P=0.002
	No	25(52%)	23(48%)	
Sex	Fem	20(47.6%)	22(52.4%)	2.6(1.2-5.9),p=0.03
	male	20(25.6%)	58(74.4%)	
Age	<15	20(46.5%)	23(53.5%)	0.35(0.15-0.8),p=0.01
	≤15	20(26%)	57(74%)	

Intervention under taken

In a district or village with prevalence less than 15% the recommend treatment will be individual and contact (family member) management. Thus in Wadela district the prevalence rate was 5% so we declare to give treatment for all cases and contact. Treatment was given for adult 71% Ivermectine, 24% sulfur and 4% BBL in the campaign. In addition to that, we were given health education on mode of transmission, prevention and control measures of scabies diseases for the affected communities in the district

Discussion

A community-based study from Brazil showed prevalence of 9.3% with 15.5%, of their patients <15 years old (3) and in rural India 13%(18). A hospital based observational study in Tando Muhammad Khan showed that 50% of their patients were children under the age of 14 years was 6%(19). Based on a study conducted Egyptian on children, the prevalence of scabies cases was estimated to be 5%(15) which is compatible to our study, where the cases under the age 15 years were 5%. All the above results and comparisons that scabies is most common in children as compared to adults that might be due to low immunity level or direct physical contact with their families.

In a cross sectional study was conducted in Bangladesh in which female frequency was less than males (16). As compared to our study, about 56% of patients affected from scabies were males as compared to females who were 44%. The slight difference to females might be due to the fact that most of the males were cowherd and busy working throughout the day in our socioeconomic setting, and not giving due importance to the illness.

Major symptoms which identified in this outbreak were itching and worse at night. Generally Itching is the main symptom of scabies. This is often severe and tends to be in one place at first (often the hands), and then spreads to other areas.

Frequency of patients of scabies was approximately 74% in houses where the people living were six or more as compared to 26% in houses where people living per household were five or less (20) .

Family size was associated with the occurrence of scabies in our study, 87.5% cases in houses where the people living were four or more as compared to 12.5% in houses where people living per household were less four. This finding might be, crowded living conditions, in particular overcrowding for sleeping space, and sleeping habits have been important contributory risk factors for scabies.

The potential risk factors included in our study were those pertaining to personal hygiene practices, living conditions and knowledge of mode of transmission, prevention and control scabies disease. Low level of education was found in our study to be one of the risk factors contributing towards development of scabies. Less-educated individuals were more prone to having scabies. The reason is probably that less-educated people are less conscious of the importance of personal hygiene and the role of poor hygiene in the spread of communicable diseases.

Conclusion

In this study, we found that late detection of the outbreak and not given case treatment of infected persons in the affected kebele during the study period. In addition to that, we found that the aggravate factors of the scabies outbreak those are poor hygienic practices, overcrowding family member, sharing of clothing materials, sleeping with contracted scabies associated with higher frequency of scabies cases in the investigated area.

Recommendation

- Active surveillance should be improve to early detect the cases and to give prompt response in the community.
- Provision of education on scabies shall be given in the community to promote the awareness of the community on the modes of transmission scabies and prevention measures.
- Prompt treatment should be given for the cases and contact to stop the spread of disease outbreak and complicated scabies.

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1.2 Outbreak Investigation of Pandemic Flu (H1N1) in Bati district, Oromia zone, Amhara, Ethiopia, March 2016.

Abstract

Background: H1N1 influenza is an infectious disease caused by a Type A strain of influenza virus. H1N1 flu virus is a new human flu virus which causes respiratory illness in people, affecting the nose, throat and lungs. As of October 17, 2009, worldwide there have been more than 414,000 laboratory confirmed cases of pandemic influenza H1N1 and nearly 5000 deaths.

Objective: The study was conducted to verify and control the outbreak in Bati district and recommend control measures for epidemics of the disease in the area.

Methods: A descriptive study was conducted in Bati district March, 2016. Thirty eight cases (cases which shown early onset of disease) was selected conveniently and interviewed with structured questionnaire and all cases of line list was collected and five throat swab specimen samples of active cases was taken & sent to EPHI for laboratory testing. Data collected from interview was entered into Epi Info and all line lists of cases also transcribed to Microsoft Excel from hard copy, and checked for completeness. Then statistical analysis was made using Microsoft Excel and Epi info.

Results: According to my investigation a total of 698 cases of pandemic Flu (H1N1) were identified in line list. Of the 698 cases, 98% were from Bati district and 2% were from Kalu district and Afar region. Among the total kebeles 22 (84.6%) kebeles were reported H1N1 influenza A cases during the outbreak period in Bati district. From the total cases, 364(52%) of the cases were males and the majority of cases 356 (51%) were those between 15-64 years old. Of five throat swab samples four (80%) cases were positive for H1N1 Flu virus. The first date of onset of illness was on January 12/2016; however, the first case was seen at health facility on February 19/2016. The highest percentage 8.7 %(61) of cases were seen on Feb-20-2016. The overall attack rate was 0.7% and the major symptoms/signs among the interviewed group (n=38) were fever, cough, headache, sore throat, and shortness of breath. 97.37 % (37 cases) of the interviewed cases have contact history with suspected ILI, of whom 91.9 %(34 cases) from families and 8.1 %(3 cases) from neighbor have contact. Among the total interviewed patients were ventilated their house only 15.8% (6 patients houses) and only 29 %(11 patients) were heard about pandemic flu.

Conclusion and recommendation

According to the laboratory test result revealed that the cause of outbreak H1N1 Flu was positive of H1N1 virus and the others are epidemiological link of confirmed pandemic flu (H1N1). This virus was highly transmittable which can infect people easily and spread from person to person in the district. Provision of health education to the community should be started on the cause, mode of transmission and prevention of pandemic flu (H1N1).Strengthening close communication with communities especially for those found in affected areas and immediate reporting of events to the next level is necessary. Finally, availing vaccine is mandatory if possible.

Key words: outbreak, pandemic flu (H1N1), Bati district, 2016

Introduction

Influenza is an acute viral respiratory tract disease characterized by fever, headache, myalgia, prostration, coryza, sore throat and cough. It is indistinguishable from other respiratory viral diseases without laboratory confirmation (1).

There are three types of influenza viruses: A, B and C depending upon the virus structure. These viruses are negative-sense single-stranded RNA viruses that belong to the family of Orthomyxoviridae (2). Among these, Type A can cause H1N1 influenza whereas types A, B and C can cause seasonal influenza in humans (3).

H1N1 influenza is an infectious disease caused by a Type A strain of influenza virus (4).

H1N1 flu virus is a new human flu virus which causes respiratory illness in people which affecting the nose, throat and lungs. It is called pandemic flu because it is a new stain of flu virus that humans have no natural immunity and because it has spread quickly too many people all over the world since it was first identified in April 2009 (3).

The most common clinical findings of pandemic H1N1 influenza A have cough, fever , sore throat , fatigue, headache, loss appetite, runny nose, nausea, and sometimes vomiting and diarrhea. Once you are infected, symptoms usually develop within 2 to 7 days

Most cases are mild and people recover well on their own at home with full recovery within 1 to 2 weeks. The higher risk groups for H1N1 infection are children, elder, pregnant women, people with underlying disease, Living in remote or isolated communities, and living in overcrowded conditions (5). The main route of human-to-human transmission of the new Influenza a (H1N1) virus is via respiratory droplets, which are expelled by speaking, sneezing or coughing. Any

person who is in close contact with someone who has influenza-like symptoms (fever, sneezing, coughing, running nose, chills, muscle ache etc.) is at risk of being exposed to potentially infective respiratory droplets (6).

In the twentieth century, there were three pandemics of type A influenza viruses: the Spanish flu of 1918, the Asian flu of 1957, and the Hong Kong flu of 1968, identified by their presumed sites of origin". The Spanish flu of 1918 caused approximately twenty million deaths worldwide (3).

The pandemic of influenza A virus subtype H1N1 (A[H1N1]pdm09) infection emerged in March and early April 2009 in Mexico and the United States and spread quickly via human-to-human transmission to produce substantial morbidity and mortality worldwide (7). On 11 June 2009, the World Health Organization (WHO) declared phase 6 of the pandemic, and, together with its Member States and partners, strengthened preparedness and response activities. While the current swine flu outbreak is believed to have started in Mexico, it is important to realize that air travel has accelerated the spread of swine flu globally. New cases have been reported or are suspected in nations across the globe (8).

October 17, 2009, worldwide there have been more than 414,000 laboratory confirmed cases of pandemic influenza H1N1 2009 and nearly 5000 deaths (9).

July 23, 2009, a total of 43,677 laboratory confirmed infections with pandemic (H1N1) 2009 had been reported in the United States by the 50 states and the District of Columbia, including 5,009 hospitalizations and 302 deaths (10).

The 2009 flu pandemic hit Africa two months later than other continents with the first case reported in Cairo, Egypt on 2 June, 2009, in a 12 year old girl coming from the US with her mother. Only the girl was infected and the officials caught the case before letting her out of the airport (11).The pandemic flu was confirmed in 21 African countries: Egypt, South Africa, Morocco, Algeria, Tunisia, Ethiopia, Côte d'Ivoire, Seychelles, Cape Verde, Libya, Kenya,[206] Uganda, Botswana, Zimbabwe, Tanzania, Mauritius, Somalia, Sudan, Namibia, Zambia, Gabon, and Rwanda in 2009 (12)

On June 19, 2009 the Ethiopian government reported two cases of pandemic flu. They were both in girls who had returned from school in the United States for summer break (13).

Event narration

On Monday 14/2/2016 the ARHB/PHEM received an emergency call from Oromia health department PHEM case team which informed as a rumor some cases of common cold (influenza like illness) with symptoms of fever, cough, chest pain, difficulty of breathing, and so on the first rumors were happened in Hato and Kebelle Bati district. A team from ARHB/PHEM including EFETP residents, zonal PHEM officer, Dessie regional laboratory officer and WHO surveillance officer were mobilized and arrived in the district on February, 16/2016.

Objectives

General Objective:

To verify and control the outbreak in Bati district and recommend control measures for epidemics of the disease in the area.

Specific Objectives:

- To verify the outbreak in Bati district
- To describe the outbreak by person, place and time
- To generate hypotheses risk factors contributing to occurrence of outbreak pandemic flu

Methods and Materials

Study area and population

Bati district is one of seven administrative districts of Oromia zone. The district is divided to 26 rural kebeles. The district's total population is 93968 of which 46326 (49.3%) males and 47642 (50.7%) females. The district shares border with Werebabo district to the North, Afar region to the East, Dewe harewa district to the South and Kalu district to the West The capital of the district, Bati Town, is about 420 Km far from Addis Ababa and 542 KM far from Bahirdar.

Case definitions

We are used PHEM case definition

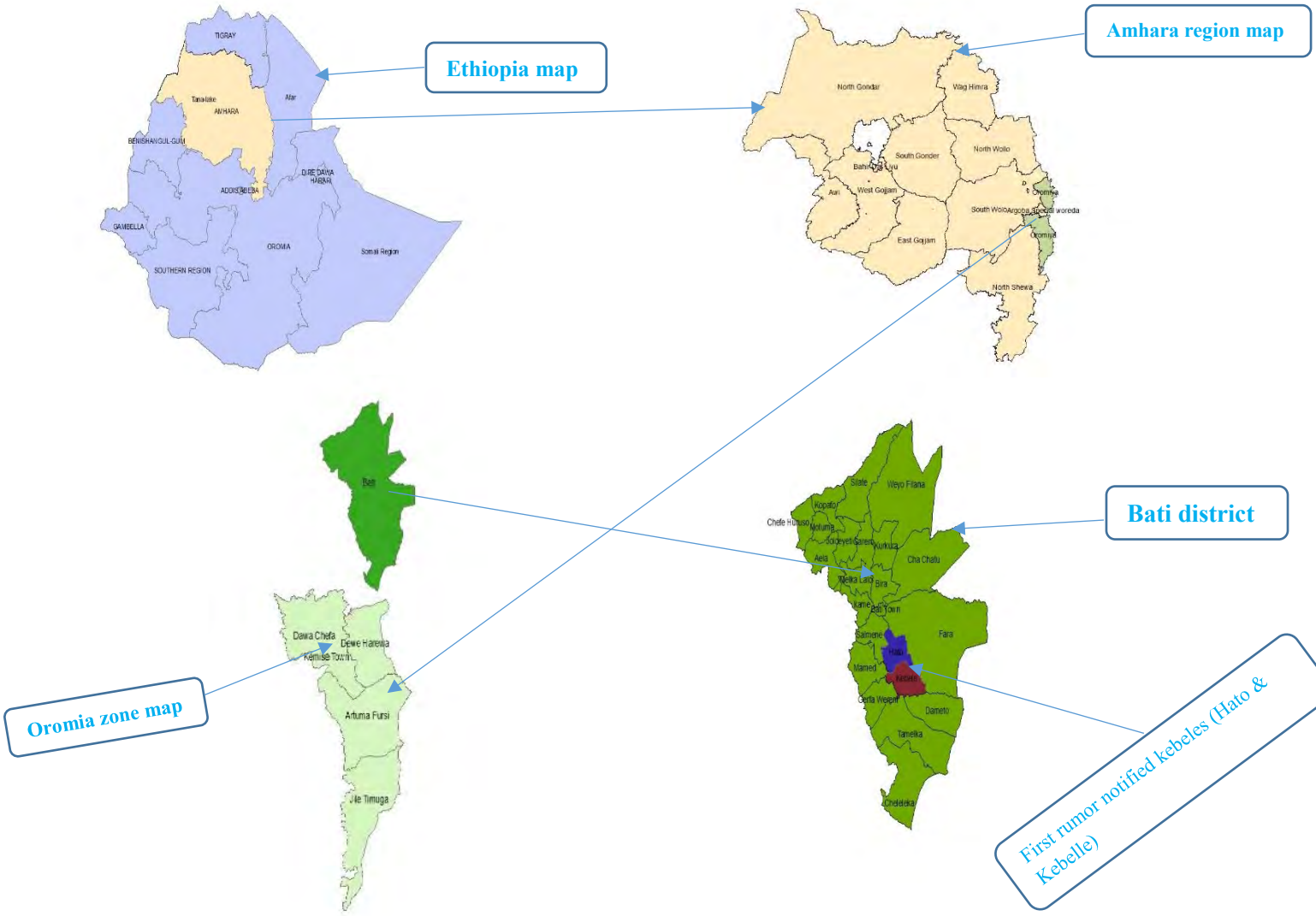
A Suspected Case

A person with acute febrile respiratory illness with fever, cough, sore throat, shortness of breath, difficulty in breathing or chest pains with onset within 7 days of close contact or travel history with a person who is active influenza like illness cases .

A confirmed cases: An individual with laboratory confirmed new influenza A (H1N1) virus infection by real-time RT-PCR.

Study design, sampling and data collection

A descriptive study was conducted in Bati district March, 2016. Thirty eight cases from all cases was selected conveniently and interviewed with structured questionnaire which we prepared from its line list and literature review in Bira kebele and all cases of the district was collected by line list and five throat swab specimen samples of active cases and before starting antibiotic treatment was taken in Bira kebele & sent to EPHI for laboratory testing. Interviewed data was entered into Epi Info and all line lists of cases also transcribed to Microsoft Excel from hardcopy, and checked for completeness. Then analysis was made using Microsoft Excel and Epi info.



Maps 3: Location of pandemic flu (H1N1) outbreak, Bati district, Amhara, Ethiopia, 2016

Abebe Gelaw **7th cohort EFETP** abebegelaw80@gmail.com **2017**

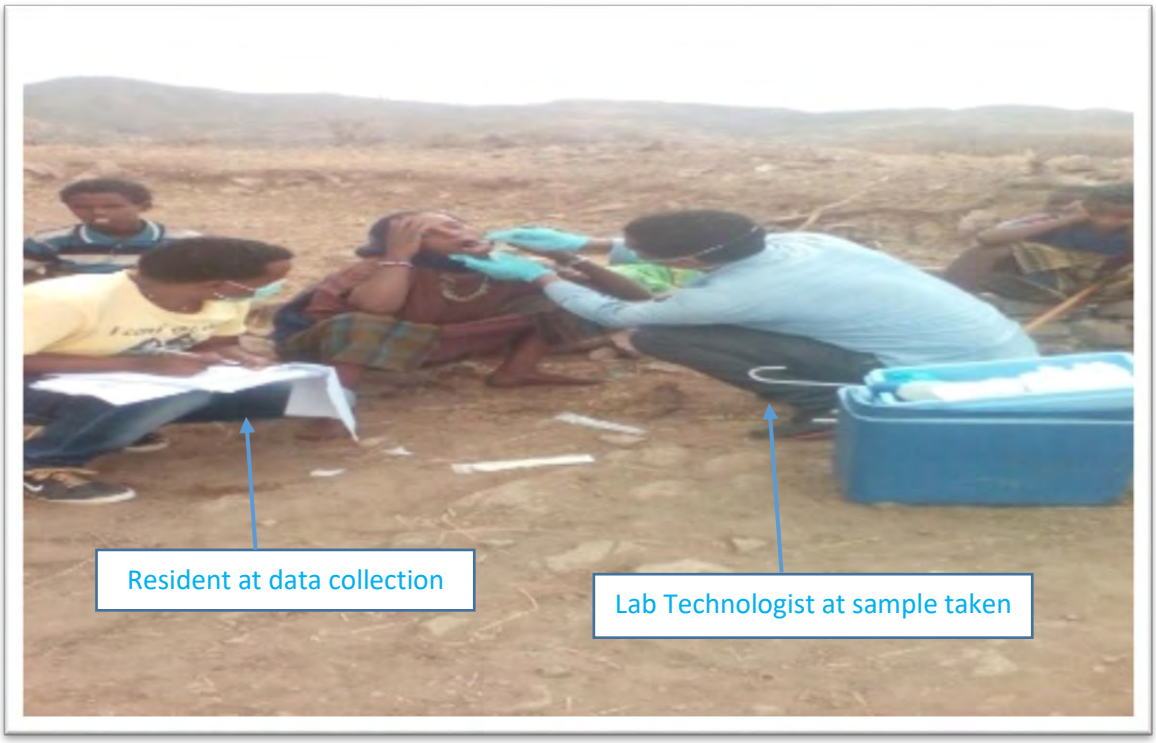


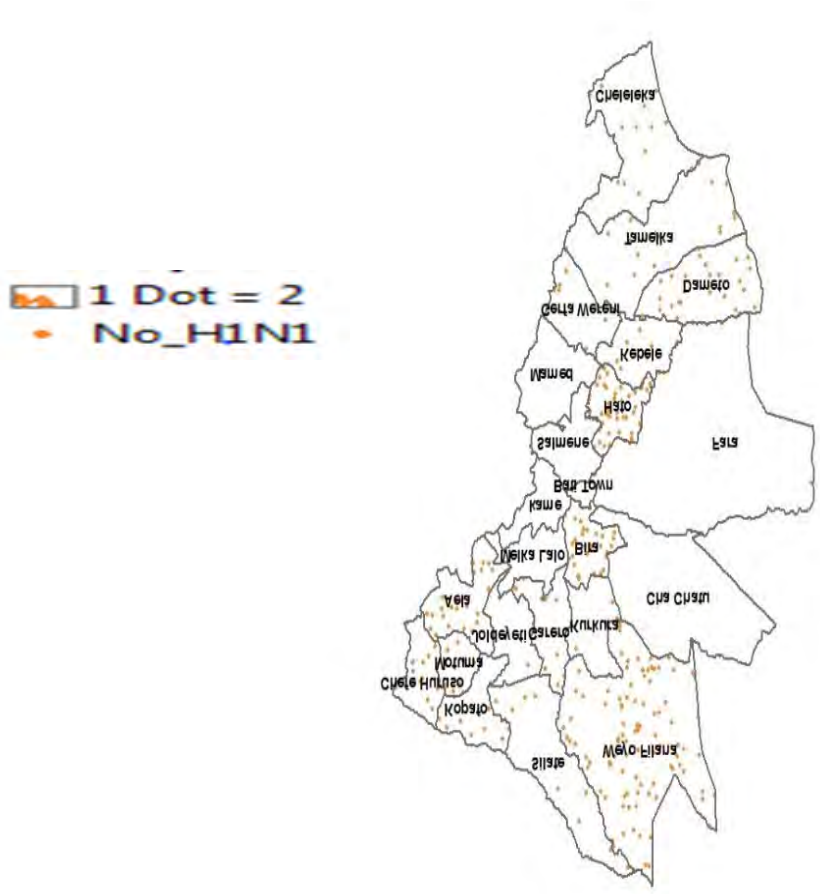
Figure 3: Data collection and specimen taken at outbreak site (Bira kebele), Bati district, Amhara, 2016

Results

According to investigation a total of 698 cases of pandemic Flu (H1N1) were identified in line list. Of 698 cases, 681(98%) were from Bati district and 17(2%) were from Kalu district and Afar region. Among the total kebeles 22 (84.6%) kebeles were affected by H1N1 influenza A type during the outbreak period in Bati district. Of whom 364(52%) of the cases were males and the majority of cases 356 (51%) were those between 15-64 years old. Of five throat swab samples four (80%) cases were positive for H1N1 Flu virus.

Table 7: Distribution of pandemic flu by place (district), Amhara, Ethiopia, 2016

District name	Number of cases by sex		
	Female	Male	Total
Afar	1	2	3
Bati	326	355	681
Kalu	7	7	14
Total	334	364	698



Maps 4: Pandemic flu cases distribution in Bati district, Oromia zone, Amhara 2016

The first date of onset of illness was on January 12/2016; however, the first case was seen at health facility on February 19/2016. This showed that there was delaines a patient who seen at health facilities. These were identified by interviewing early active cases and arrived at the place. However the information from cases which show symptom of illness early (index cases) was not found to be different from other cases because of most of recovered.

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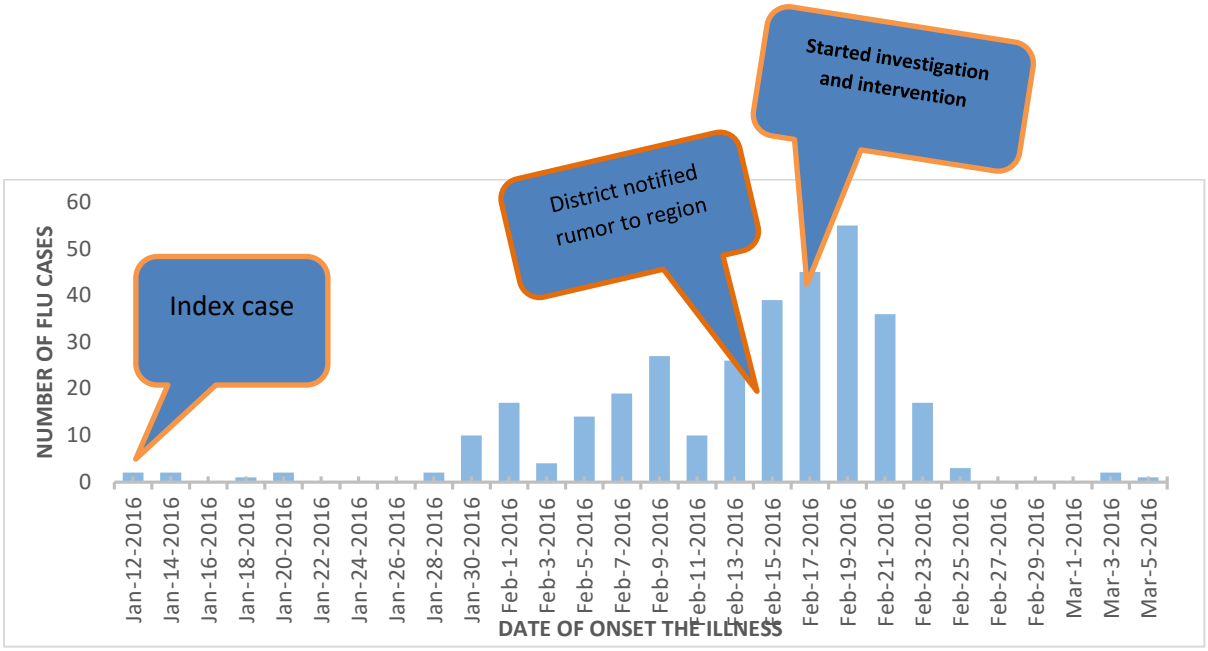

Figure 4: Epidemic curve by date of onset of illness, Bati district, Oromia zone, Amhara, 2016

The highest percentage (8.7 %(61)) of cases were seen on Feb-20-2016 (figure 5). The crude attack rate was 0.8% and the children age group 2-4 years was more affected by the disease with an age specific attack rate 2.1% followed by children age groups < 2 years 0.9%. The age groups of 5-14 years were less affected with 0.7%.Among the affected kebeles, Gure kebele residents were most affected by the diseases with attack rate was 5.8% and followed Hato kebele residents were affected by the diseases with AR as 3.3%. Mamud kebele residents were less affected by diseases with AR was 0.04%.

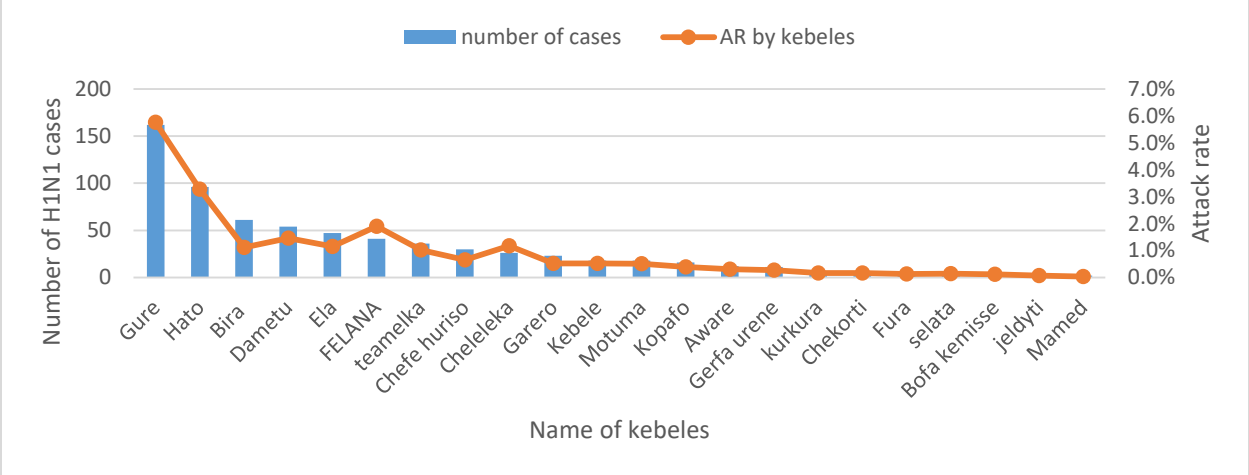

Figure 5: pandemic flu case distribution by affected kebeles, Bati district, Oromia zone, Amhara, 2016

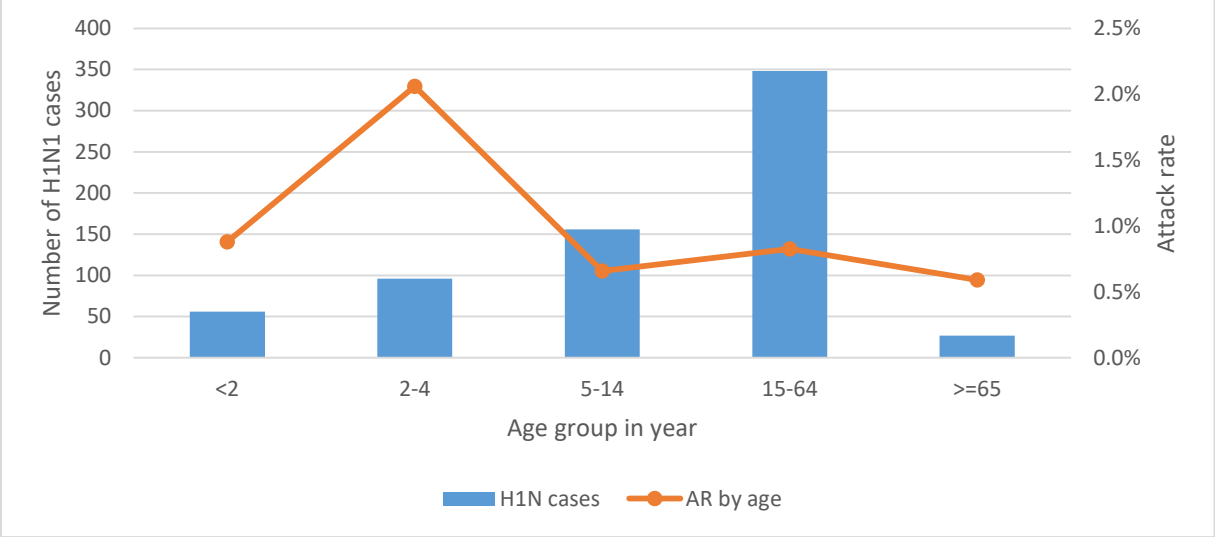

Figure 6: Distribution of H1N1 diseases by number and AR in age specific group, Bati district, Amhara, Ethiopia, 2016

The major symptoms/signs among the interviewed group (n=38 were fever, cough, headache, sore throat, and shortness of breath.

Table 8: Signs and symptoms among the interviewed group (n=38) of pandemic flu in Bira kebele, Bati district, Amhara, 2016

Signs and symptoms	Frequency	Percent
Fever	38	100.00%
Cough	38	100.00%
Headache	31	81.58%
sore throat	26	68.42%
shortness of breath	9	23.68%
Vomiting	6	15.79%
Chills	5	13.16%
difficulty of breath	5	13.16%
Diarrhea	4	10.53%
chest pain	4	10.53%
Sneezing	2	5.26%
joint pain	1	2.63%

From the total interviewed patients, 97.37 % (37 patients) have contact history with suspected ILI, of whom 91.9 %(34 cases) have contact with families and 8.1 %(3 cases) with neighbor. Of the 38 patients, only 15.8 %(6 cases houses') have ventilated their houses. (Table 3).

Table 9: Frequency of risk factors for pandemic flu outbreak at Bira kebele, Ethiopia, 2016

Sr.number	Risk factors	Frequency (n=38)	Percent
1	Patients have vaccinated status	0	0.00%
2	Patients have contact history	37	97.37%
3	patients have ventilated their house	6	15.79%
4	there death of birds or chicken in the kebeles	0	0.00%
5	Patients have travel history	0	0.00%

Of 38 cases only 11 cases (29%) were heard about ILI, of whom 4 cases (10.53%) heard with health workers and also 4 cases (10.53%) with friends. The results of the investigation showed that the patients at affected place have a poor knowledge about H1N1 influenza.

Table 10: Assessment of knowledge of patients on pandemic flu in Bira kebele, Bati district, Amhara, 2016

Sr. Number	Knowledge of patient on ILI	Frequency (n = 38)	Percent
1	Do you hear about ILI		
	Yes	11	28.95%
	No	27	71.05%
2	From whom did you heard		
	HEWs	1	2.63%
	Teacher	0	0.00%
	Health workers	4	10.53%
	Family members	2	5.26%
	Friends	4	10.53%
3	Do you know the causes of ILI		

	Yes	2	5.26%
	No	36	94.74%
4	What are the signs and symptoms Of ILI		
	Cough	29	76.32%
	Fever	26	68.42%
	Headache	11	28.95%
	Chills	8	21.05%
	chest pain	7	18.42%
	nasal discharge	7	18.42%
	loss of appetite	6	15.79%
	Fatigue	5	13.16%
	Vomiting	4	10.53%
	Diarrhea	2	5.26%
	don't know	9	23.68%
5	What are the transmission from person to person		
	sneezing/coughing	7	18.42%
	contact with patient	4	10.53%
	Wind	24	63.16%
	don't know	10	26.32%
6	What are the prevention methods of ILI		
	don't touch any dead poultry	0	0.00%
	cover mouth and nose during coughing and sneezing	4	10.53%
	limit your contact with others	6	15.79%
	don't know	8	21.05%
	hot fluid drinking	28	73.68%
	hand washings	0	0.00%

Laboratory confirmation

Laboratory confirmation of pandemic influenza type A (H1N1) virus was performed using throat swabs collected into virus transport medium. Five samples were taken & sent to EPHI for laboratory testing, using real-time RT-PCR assays for detection of influenza A. Therefore, of five throat swab sample four cases (80%) were positive for H1N1 Flu virus.

Discussion

The first onset cases of influenza A (H1N1) in Bati district were notified in January 12/ 2016. The main epidemic occurred during 4 weeks (from the beginning of February until the end of February) and 650 (93%) of the influenza A (H1N1) cases were reported in this time period. The peak of epidemic curve was seen on Feb 20/2016 which was on the one month of the first onset and the curve fall dawn within two weeks after getting its peak. Similarly, during the spring of 2009, a novel strain of influenza A (H1N1) virus appeared globally (3). The reason for the seasonality is unknown but could be due to virus transmissibility resulting from favorable conditions for virus survival during the cooler seasons, or increased transmission due to indoor crowding during cold and windy weather.

The overall attack rate was 0.7%. The major symptoms/signs among the interviewed group (n=38 were fever, cough, headache, sore throat, and shortness of breath.

The age distribution showed that 356 (51%) cases between 15-64 years old were predominately affected (mean age, 26.8 years; SD, 22.4 years; median age, 32 years). Only 4% of the influenza cases were ≥ 65 years. Similarly, the age distribution showed that younger persons were predominately affected (mean age, 28 years; SD, 17.4 years; median age, 25 years). Only 2% of the influenza cases were ≥ 65 years pandemic A (H1N1) 2009 influenza in Uppsala County, Sweden (14).

According to the interviewed study group 97.37 % (37 cases) of the interviewed cases had contact history with similar illness, of whom 91.9 %(34 cases) from families and 15.8 %(6 cases houses') was well ventilated. This might be an indication for extensive transmission through the epidemic curve could show a characteristic of propagated person to person type transmission.

Risk factors was shown in table 3 couldn't be tested analytically; however they might have a potential contribution for the occurring of H1N Flu outbreak in Bati district.

According to the laboratory result, Influenza virus type A was identified from four cases who was the family member in that specific epidemic site.

The results of investigation showed that the patients in Bati district have a poor knowledge about H1N1 influenza. The majority of the patients not know about symptoms, transmission, treatment and prevention of H1N1 influenza.

Conclusion

According to the laboratory test result showed that the cause of outbreak H1N1 Flu was positive of H1N1 virus and the others are confirmed by epidemiological link of confirmed pandemic flu (H1N1). A virus was highly transmitted which are able to infect people easily and spread from person to person in the district. Because of living style of their residents which was near together and not ventilated of house condition.

Recommendations

Provision of health education to the community should be started on the cause, transmission and prevention of pandemic flu (H1N1).Strengthening close communication with communities especially for those found in affected areas and immediate reporting of events to the next level is necessary. Finally, the FMOH should provide vaccination of pandemic flu (H1N1) in affected area if it is available.

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Chapter II- Surveillance Data analysis

Magnitude of sever acute malnutrition in relation to crop production & climate variability in under five children aged, Waghimira zone, Ethiopia, 2012-2015.

Abstract

Introduction: Severe acute malnutrition remains a major killer of children under five years of age. Directly or indirectly, malnutrition contributes to 53% of deaths of children under-five in developing countries. Globally, every year, severe acute malnutrition (SAM) affects nearly 20 million children under five, 3.5 million children die of malnutrition-related causes.

Rational: Sever acute malnutrition is one of the main public health problems facing in under five years children in Ethiopia. The El-Nino effect had manifested with shortage of rainfall and increasing of temperature which lead to drought have further exacerbate the already existing poor nutritional status of the most vulnerable group. Waghimira zone had more affected with recurrent rain fall shortage and also chronically food in secured among the zones where found in the region.

Objective: To characterize the pattern and magnitude of sever acute malnutrition interrelationship between annual crop production and climate variabilities in under five year's children at Waghimira zone, Ethiopia, in 2012-2015

Methodology: Descriptive study was used to describe the pattern and magnitude of sever acute malnutrition cases in relation to crop production and climate variabilities in under five year's children aged, Waghimira zone, 2012-2015.

Result: Of 17664 reported cases, 98.2% of them were MUAC less than 11 cm. The zonal prevalence of SAM was 65.5/1000 aged from 6-53 months. The highest of SAM case was reported 5023 (28.4%), rate 73/1000 per risk children in 2014. A mean of SAM 2944, range between 776 and 5182 cases, and standard deviation (SD) 1613.5. The standard error of the mean was 658.7 and 95% CI 2285.3-3602. the highest prevalent of SAM in the district was Ziquala 7.9% and followed by Abergele 7.7% and Gazgibla 6.6% among the target of aged from 6 -53 months in the years.

The value of the highest volume of rainfall which was recorded in 2014 was 139.3mm while the lowest was recorded in 2015 with value of 14.6mm and the mean and standard deviation of the

rainfall data in the zone from 2012-2015 are 49.5mm and 25.8mm respectively. The minimum temperature (16.5^{o}C) recorded in 2013 and maximum temperature (32.8^{o}C) recorded in 2014. The mean value of temperature and its standard deviation over the period are 23 ^{o}C and 4.9 ^{o}C respectively. Annual crop production record in the zone shows that decrement from 2013-2015.The correlation coefficient of sever acute malnutrition cases and crop production was negative 0.3 and the correlation coefficient of rain fall and crop production was 0.6.

Conclusion: The zone has highly prevalent of sever acute malnutrition cases aged 6-53 months' children. Sever acute malnutrition cases, crop production and climate variability have a reasonable relationships between them. Sever acute malnutrition cases and crop production has negative relationship because of its correlation coefficient was negative value and crop production and climate variability have positive relationships because of its correlation coefficient was positive value. Therefore, Strength the ongoing Targeted Supplementary Feeding Programme (TSFP) should supply to continue for vulnerable groups (6-59 months children).

Key words: Sever acute malnutrition, Crop production, Climate variability, Ethiopia, 2012-2015

Introduction

Malnutrition is a state in which a deficiency, excess or imbalance of energy, protein and other nutrients causes measurable adverse effects on tissue/body form (body shape, size and composition), function or clinical outcome (1). It is a major direct and indirect cause of infant and childhood mortality and morbidity. Besides children, other vulnerable individuals such as people living with HIV and AIDS (PLWHA) have high nutrient requirements (2). Malnutrition affects physical growth, morbidity, mortality, cognitive development, reproduction, and physical work capacity, and it consequently impacts on human performance, health and survival (4,5) Malnutrition can encompass both over nutrition/obesity and undernutrition (1). Millions of children living in low-income countries suffer from undernutrition; undernutrition contributes to one-third of the deaths in young children (6). Undernutrition are classified as sever acute malnutrition, chronic malnutrition and micronutrient deficiency (1).

Severe Acute Malnutrition (SAM) is defined globally as a very low weight for height (below -3z scores of the median World Health Organization (WHO) growth standards, or below 70% of the median of National Centre for Health Statistics standard) or child's MUAC is less than 11 cm and by the presence of nutritional oedema (7).According to WHO, children suffering from SAM have a 5–20 times greater risk of death than well-nourished children. SAM can directly

cause death or indirectly increase the fatality rate in children suffering from diarrhea and pneumonia (7).

Severe acute malnutrition remains a major killer of children under five years of age (4) Directly or indirectly, malnutrition contributes to 53% of deaths of children under-five in developing countries (8). Globally, every year, Severe acute malnutrition (SAM) affects nearly 20 million children under five (9) ,3.5 million children die of malnutrition-related causes. Among this, severe acute malnutrition contributes to 1 million deaths of children annually (Dereje, 2014) in 2011, about 6.9 million children under the age of five died and about one third of these deaths are linked to malnutrition (11).

Severe acute malnutrition (SAM) is a major public health problem facing most developing countries in Africa, Asia, Latin America and the Caribbean (Abdul-latif & Nonvignon, 2014) . United Nations International Emergency Fund (UNICEF) estimates, around 26 million under five children suffer from SAM in developing counties (8). Worldwide, only 36 countries accounted for 90% of all stunted children. Under nutrition remains a major cause of disability and mortality, ranked as the top cause of global burden of disease and underlying 53% of deaths in children under five years (12).

Ethiopia is the seventh wasting burden country from the ten most affected countries. The nationwide magnitude of wasting is almost 10% (12). According to the recently released Ethiopian Demographic and Health Survey 2011 report, the prevalence of child stunting, underweight and wasting were 44% stunted, 10% wasted and 29% underweight. When this data is further disaggregated by region, the prevalence of stunting in Amhara region was second to nine (52%) (13).

Ethiopia is one of the countries with highest under-five child mortality rate, with malnutrition underlying to 57% of all children deaths. The latest Ethiopia Demography and Health Survey stated that stunting, wasting and underweight among under-five children in Tigray region are 51.4%, 10.3% and 35% respectively (8).

Recently, studies have shown that greenhouse gases such as carbon dioxide (CO2) lead to changes in climate conditions. These climatic changes may be having adverse effects on ecological systems, agriculture, human health, and the economy (14) . Climate change impacts food security through multiple pathways. These include altering the availability of food that depends on the agricultural production and influencing the stability of food supplies due to

extreme weather events. Moreover, climate impacts are observed through influencing access to food and utilization (15).

The failure of rain results in crop failure, impact food productions and usually results in food shortages in vulnerable parts of the population. Rainfall is hence, one of the most important factors influencing livelihoods of subsistence farmers and pastoralists. Failures or irregularities of the rainy season have a direct link to reduced household food availability. The influence is substantial in developing countries, such as Ethiopia, which are largely dependent on rain fed agriculture (15).

According to Food and Agriculture Organization (FAO), food security exists when all people, at all times, have physical and economic access to sufficient, safe, and nutritious food to meet their dietary needs and food preferences for an active and healthy life. Food security has three components, viz., availability, access, and absorption (nutrition). The three are interconnected. Many studies have shown that improvement in nutrition is important, even for increase in productivity of workers. Thus, food security has intrinsic (for its own sake) as well as instrumental (for increasing productivity) value (16).

Climate change impacts on agriculture include crop losses, lower yields in both crop and livestock production, increased livestock deaths, increases in insect infestation and plant and animal diseases, damage to fish habitat, forest and range fires, land degradation and soil erosion. Its impacts on human health include increased risk of food and water shortages, increased risk of malnutrition and higher risk of water- and food-borne diseases.

Rational

Sever acute malnutrition is one of the main public health problems facing in under five years children in Ethiopia. The main underlying causes of sever acute malnutrition include drought, flooding, household food insecurity, inadequate social and care environment, inadequate access to health services and environmental factors. Nowadays, the global climate information indicated that there have an El-Nino effect which affects many countries globally including Ethiopia. The El-Nino effect had manifested with shortage of rainfall and increasing of temperature. Our country have some of populations are affected by the shortage of rain which lead to drought have further exacerbate the already existing poor nutritional status of the most vulnerable group mainly children, pregnant and lactating women. Waghimra zone is located in the dry lowlands of northern Amhara region, at the border with Tigray region, Waghimra zone was affected by

El-Nino effect among the zone where found in the Amhara region and also which was chronically food insecure, most severely affected with recurrent droughts. Therefore this study generating information that could help to guide intervention to halt the health and economic problem of the event is important.

Objectives

General objective

To characterize the pattern and magnitude of sever acute malnutrition interrelationship between annual crop production and climate variabilities in under five year's children at Waghimira zone, Amhara region, Ethiopia, in 2012-2015.

Specific objectives

- To describe the magnitude of sever acute malnutrition for under five years children by place and time.
- To characterize the pattern of annual climate variability and yield production 2012-2015 by time.
- To describe the interrelationship of sever acute malnutrition, climate variability and annual crop production 2012-2015.

Methods and Materials

Study period: It was conducted from 1–15, February 2016 in Waghimira zone.
Study design: we are conducted descriptive cross sectional study.

Case definition: Children age from 6 to 53 months with very low weight for height (below -3z scores of the median World Health Organization (WHO) growth standards, or below 70% of the median of National Centre for Health Statistics standard) or MUAC less than 11cm and/or children with nutritional bilateral oedema

Study population: all eligible children's from 6 months to 53 months age in Waghmira zone, Amhara region, Ethiopia, 2012-2015.

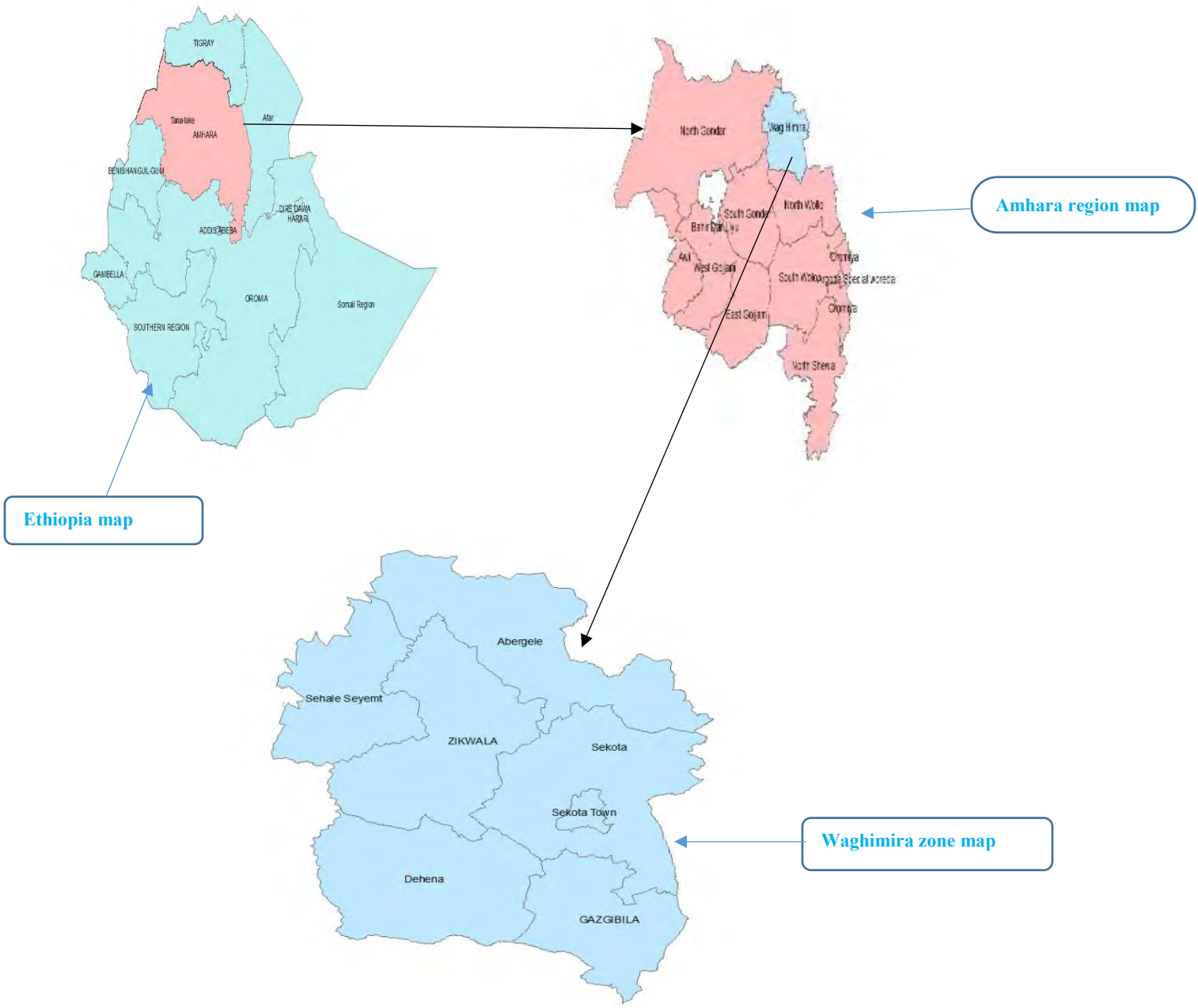
Target population: sever acute malnutrition children 6-53 months age in waghmira zone, Ethiopia, 2012-2015

Sample size: all admission of sever acute malnutrition aged 6-53 months children at OTP attended in a four consecutive year's period in, waghmira zone, Ethiopia, 2012-2015

Data collection and procedure: we are collected data on sever acute malnutrition from Waghimira zonal health department, data on climatic variables such as annual temperature,

rainfall, and relative humidity from the national meteorology agency Kombolcha branch office and data on annual crop yields from Waghimira zonal agriculture department.

Data processing and analysis: After we checked the data for its completeness and cleanness, Microsoft Excel was used to organize and analyze the data appropriately.



Maps 5: Location of Secondary data analysis conducted in Waghimira zone, Ethiopia, 2012-2015

Result

A total of 17664 sever acute malnutrition cases reported in OTP program during the four years period. Of whom, 17350 (98.2%) and 314(1.8%) was reported MUAC less than 11cm and oedema respectively. A mean of SAM 2944, range between 776 and 5182 cases, and standard deviation (SD) 1613.5. The standard error of the mean was 658.7 and 95% CI 2285.3-3602.7. From the total SAM cases reported zonal prevalence of SAM was 7%, the highest prevalent of SAM in the district was Ziquala 7.9% and followed by Abergele 7.7% and Gazgibla 6.6% among the target of aged from 6 -53 months in the years. During 2012-2015, the highest of SAM case was reported 5023 (28.4%), rate 73/1000 per risk children in 2014 with followed by 4866 (27.5%), rate 66.3/1000 per risk children in *2015* and 4575 (25.9%), rate 69.1/1000 per risk children in *2012*.

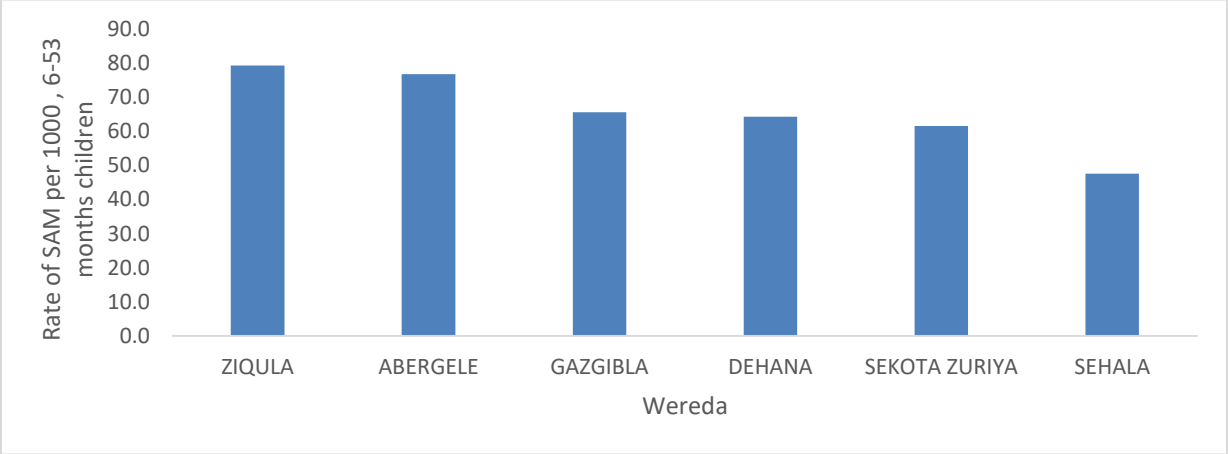


Figure 7: Rate of sever acute malnutrition cases per 1000, 6-59 months children aged by wereda in Waghimira zone, 2012-2015

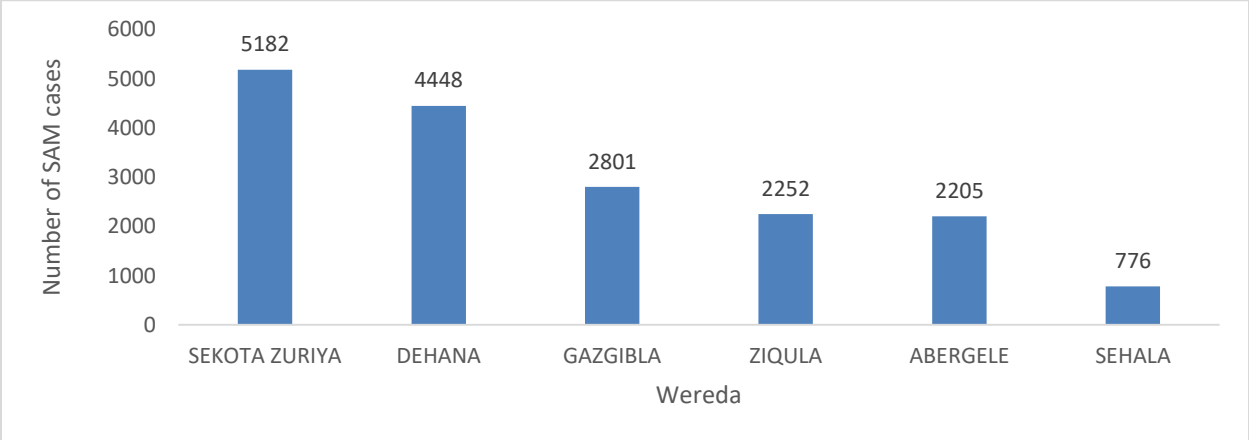


Figure 7: Number of sever acute malnutrition cases by wereda in Waghimira zone, 2012-2015

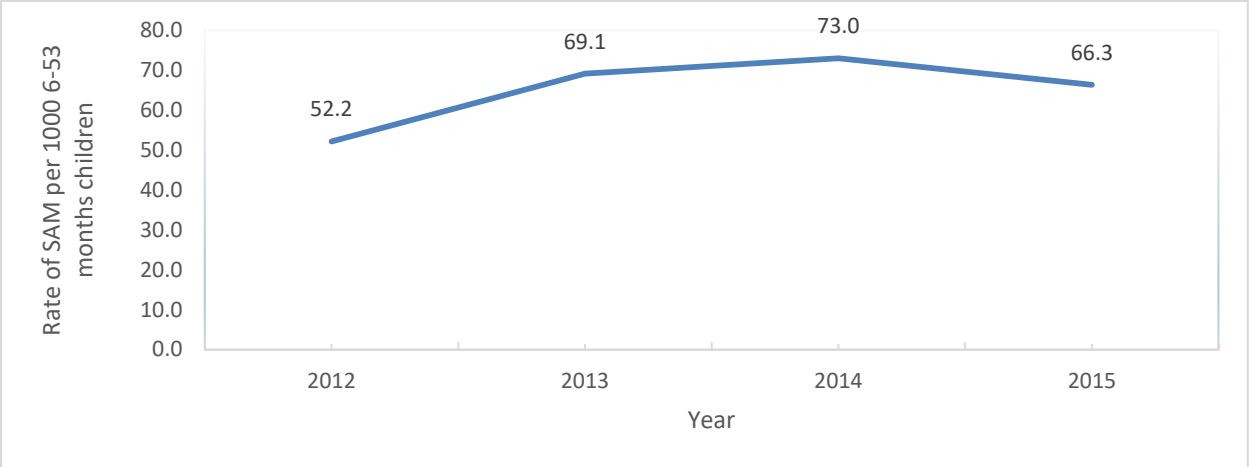


Figure 8: Trend of SAM rate per 1000, 6-59 months children aged by year in Waghimira zone. 2012-2015

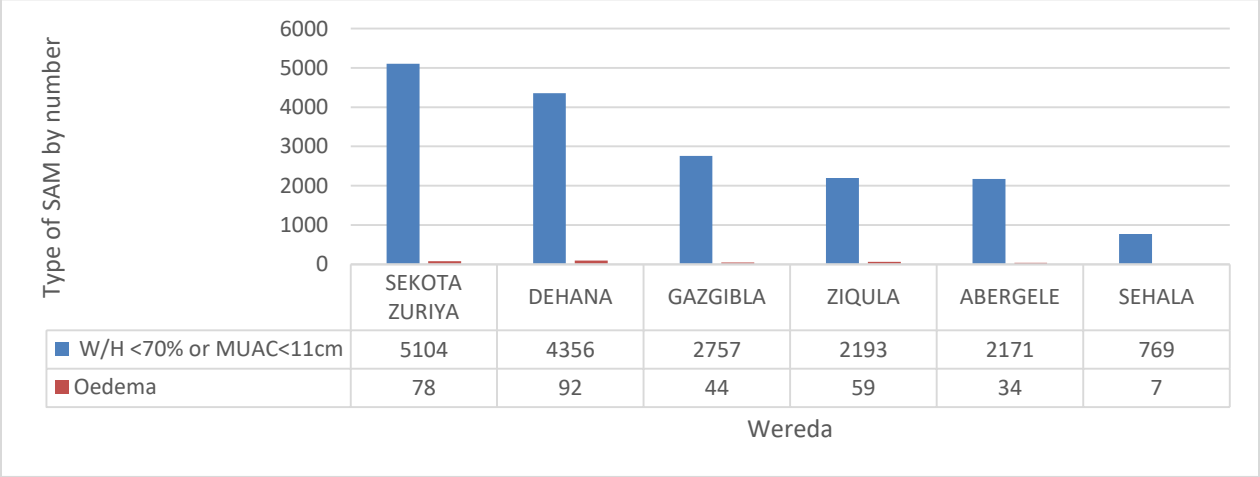


Figure 9: Trend of sever acute malnutrition type by wereda in Waghimira zone, 2012-2015

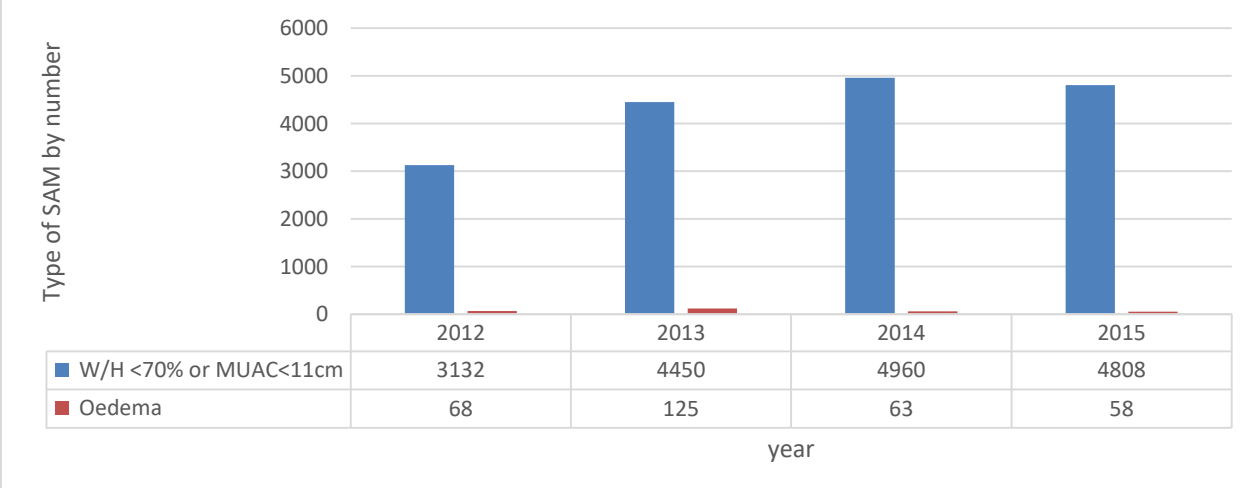


Figure 10: Trend of sever acute malnutrition type by year in Waghimira zone, 2012-2015

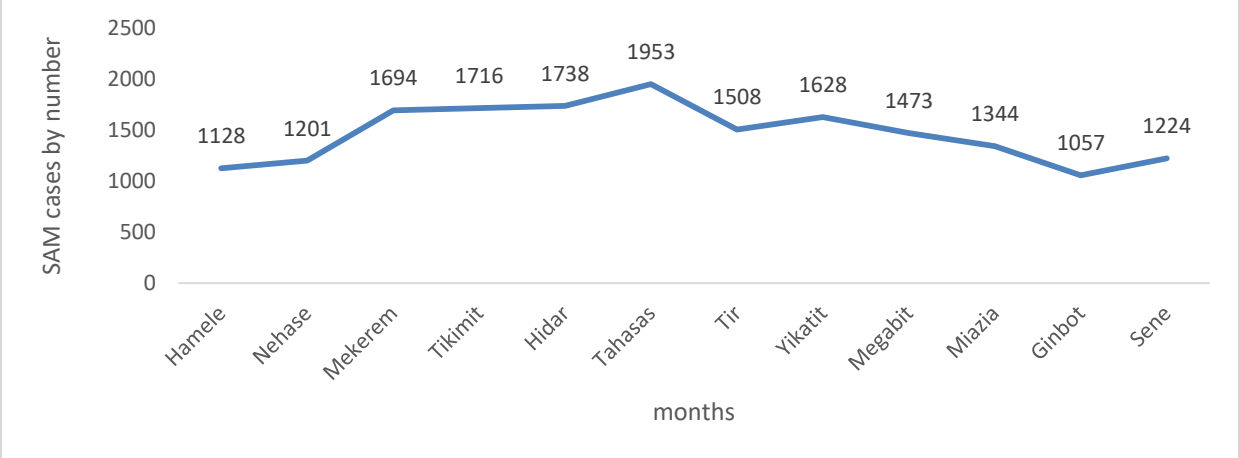


Figure 11: Trend of sever acute malnutrition by months in waghimira zone, 2012-2015

The value of the highest volume of rainfall which was recorded in 2014 was 139.3mm while the lowest was recorded in 2015 with value of 14.6mm and the mean and standard deviation of the rainfall data in the zone from 2012-2015 are 49.5mm and 25.8mm respectively. The minimum temperature (16.5ºC) recorded in 2013 and maximum temperature (32.8ºC) recorded in 2014. The mean value of temperature and its standard deviation over the period are 23 ºC and 4.9 ºC respectively.

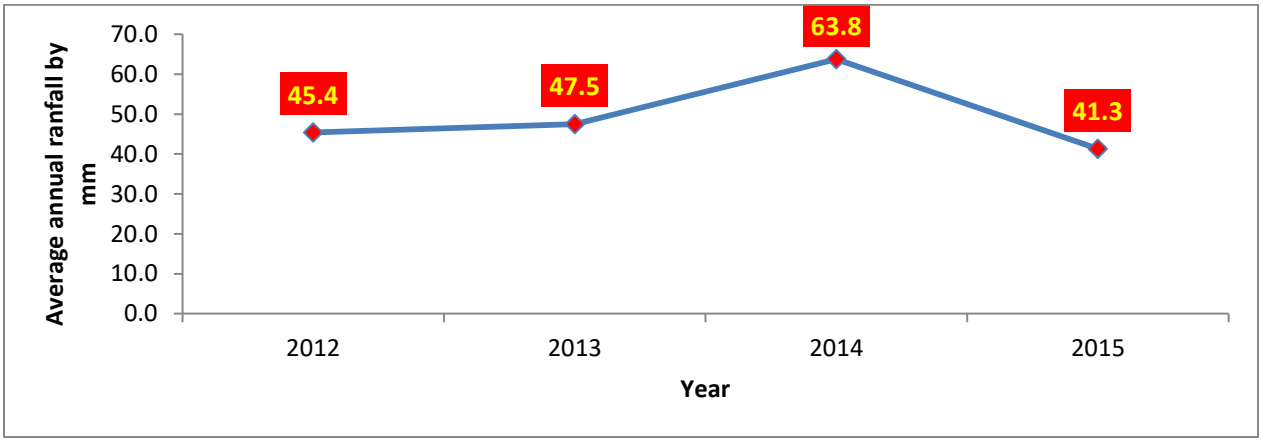


Figure 12: Trend of average annual rainfall by year in Waghimira zone, 2012-2015

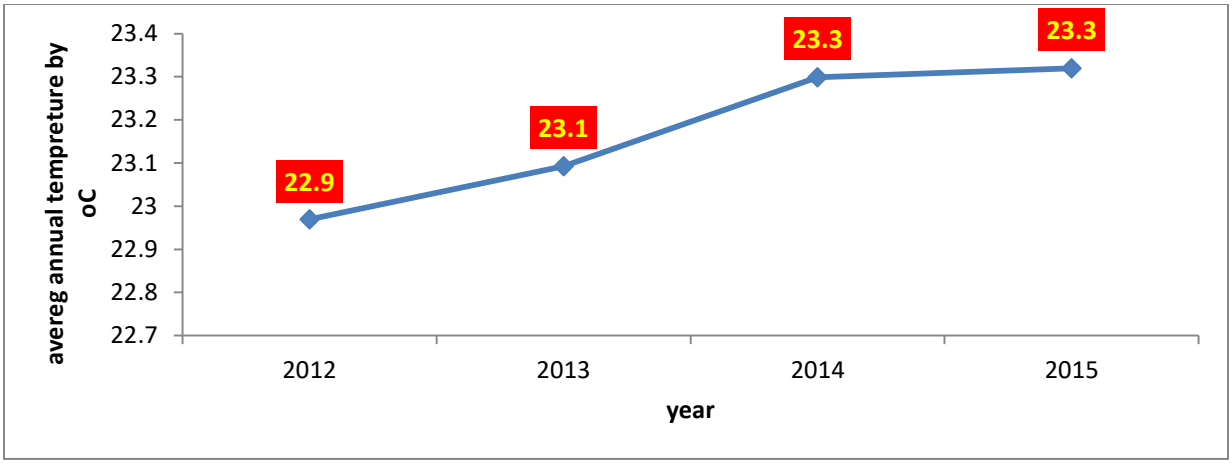


Figure 13: Trend of average annual temperature by year in Waghimira zone, 2012-2015

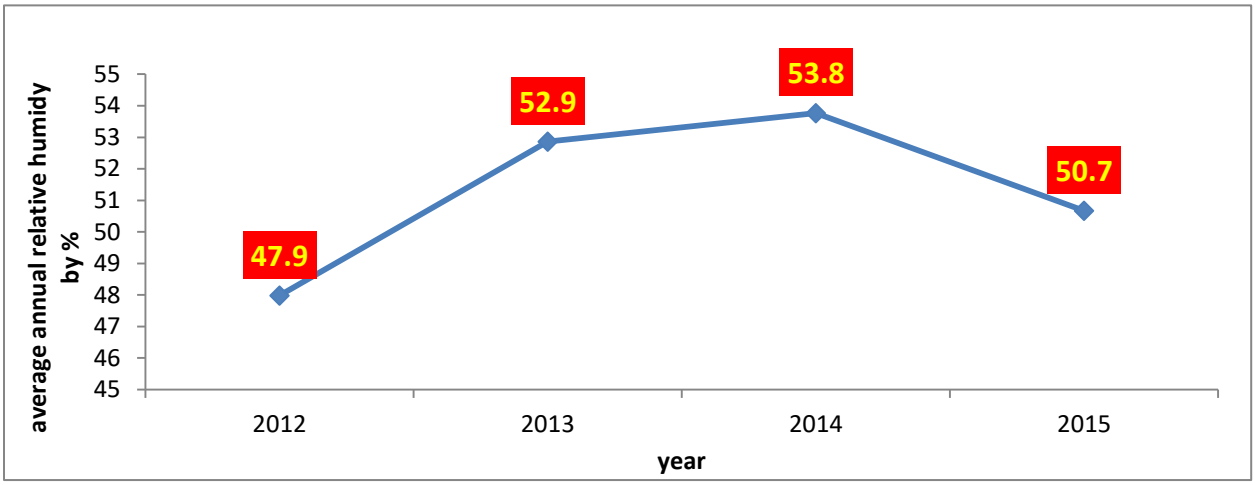


Figure 14: Trend of average relative humidity by year in Waghimira zone, 2012-2015

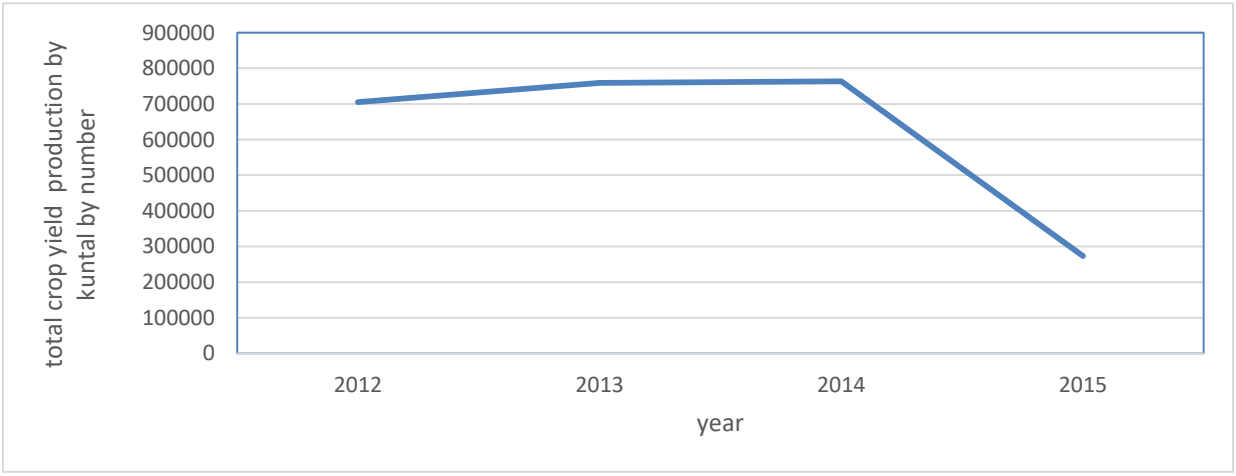


Figure 15: Trend of total annual crop yield by year in Waghimira zone, 2012-2015

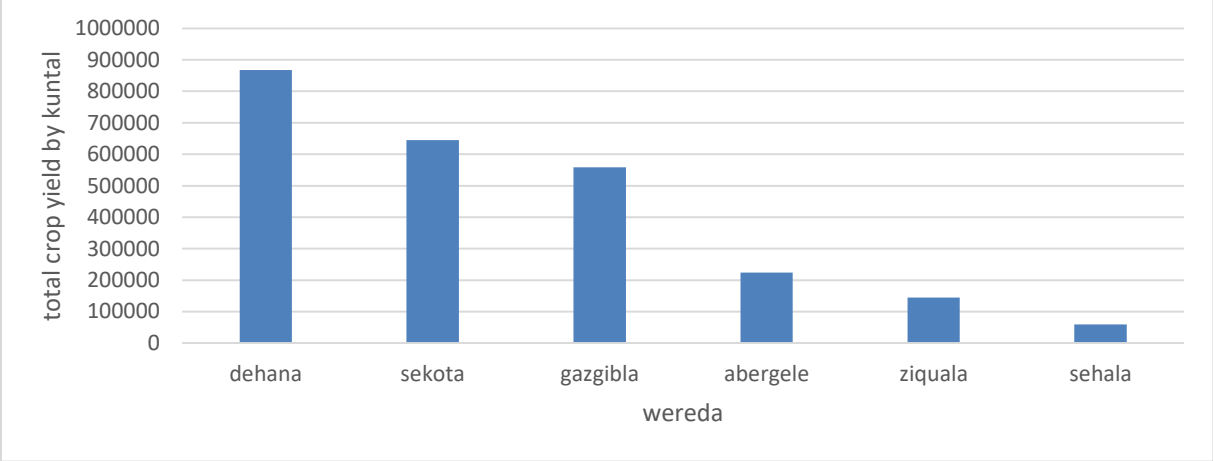


Figure 16: total Annual crop yield production by wereda in waghimira zone, 2012-2015

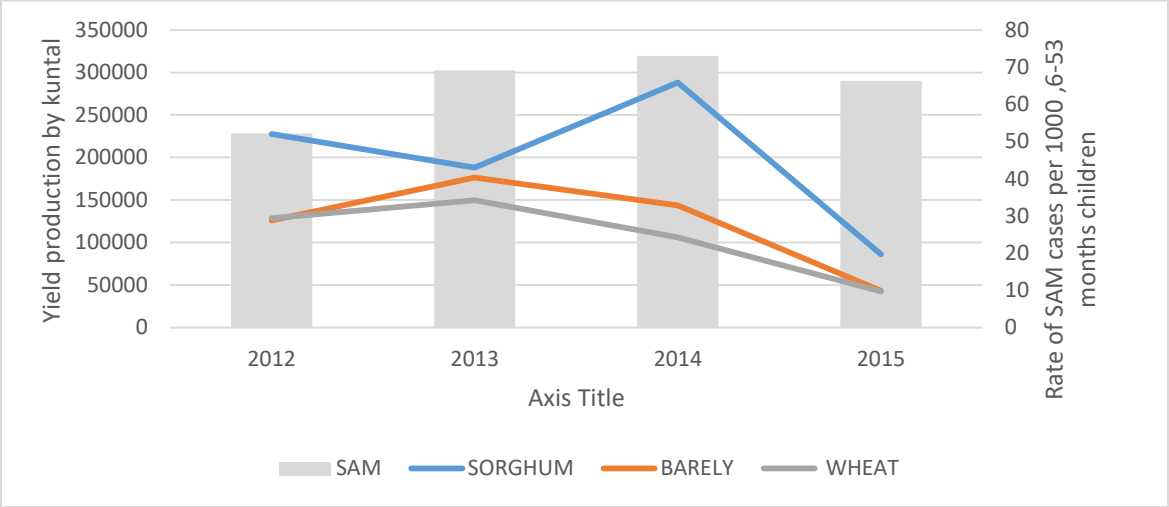


Figure 17: Trend of crop type yield Vs rate of SAM cases by year in Waghimira zone, Ethiopia, 2012-2015

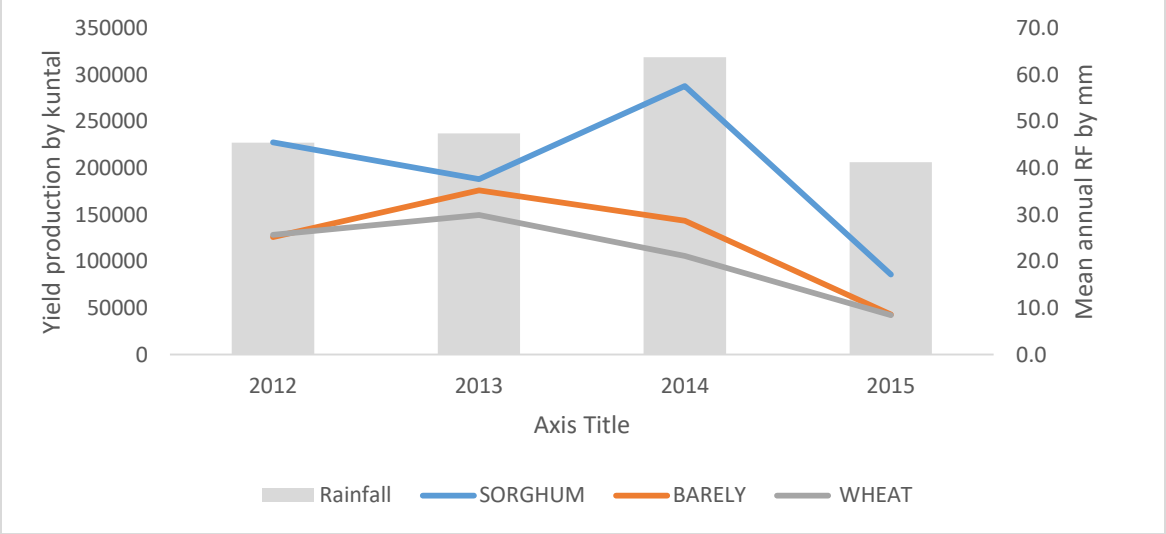


Figure 18: Trend of crop type yields Vs mean annual rainfall by year in Waghimira zone, Ethiopia, 2012-2015

The correlation coefficient between the total annual crop yield and sever acute malnutrition cases were negative and insignificant, r= -0.3 in the four consecutive years from 2012-2015 Waghimira zone. The major crop yield production in waghimira zone was Teff, Barely, Wheat and Sorghum crops and the relationships between these crops yield with sever acute malnutrition as follow.

Table 11: correlation coefficients of different type of crops, climate variabilities and SAM in Waghimira zone, Ethiopia, 2012-2015

		Teff	Barely	Maize	Wheat	Sorghum	Mean annual RF	Mean of annual RH	Mean of annual T°	SAM
Teff	r	1.00					1.000**	0.800	-0.105	-0.800
	Sig. (2-tailed)							0.200	0.895	0.200
Barely	r						0.800	0.600	-0.211	-0.400
	Sig. (2-tailed)						0.200	0.400	0.789	0.600
Maize	r						0.200	-0.400	-0.949	-0.400
	Sig. (2-tailed)						0.800	0.600	0.051	0.600
Wheat	r						0.400	0.000	-0.738	-0.200
	Sig. (2-tailed)						0.600	1.000	0.262	0.800
Sorghum	r						0.800	0.400	-0.105	-1.000**
	Sig. (2-tailed)						0.200	0.600	0.895	
Mean annual RF	r	1.000**	0.800	0.200	0.400	0.800	1.000	0.800	-0.105	-0.800
	Sig. (2-tailed)		0.200	0.800	0.600	0.200		0.200	0.895	0.200
Mean annual RH	r	0.800	0.600	-0.400	0.000	0.400	0.800	1.000	0.632	0.400
	Sig. (2-tailed)	0.200	0.400	0.600	1.000	0.600	0.200		0.368	0.600
Mean annual T°	r	0.105	-0.211	-0.949	-0.738	-0.105	0.105	0.632	1.000	-0.105
	Sig. (2-tailed)	0.895	0.789	0.051	0.262	0.895	0.895	0.368		0.895
SAM	r	-0.800	-0.400	-0.400	-0.200	-1.000**	-0.800	-0.400	-0.105	1.000
	Sig. (2-tailed)	0.200	0.600	0.600	0.800		0.200	0.600	0.895	

Table 12: The relationship between sever acute malnutrition cases and total crop yield in Waghimira zone, 2012-2015

	crop production by quintal(x)	*Sum of SAM(y)*
Total crop yield by quintal(x)	1	
Sum of SAM(y)	-0.254651457	1

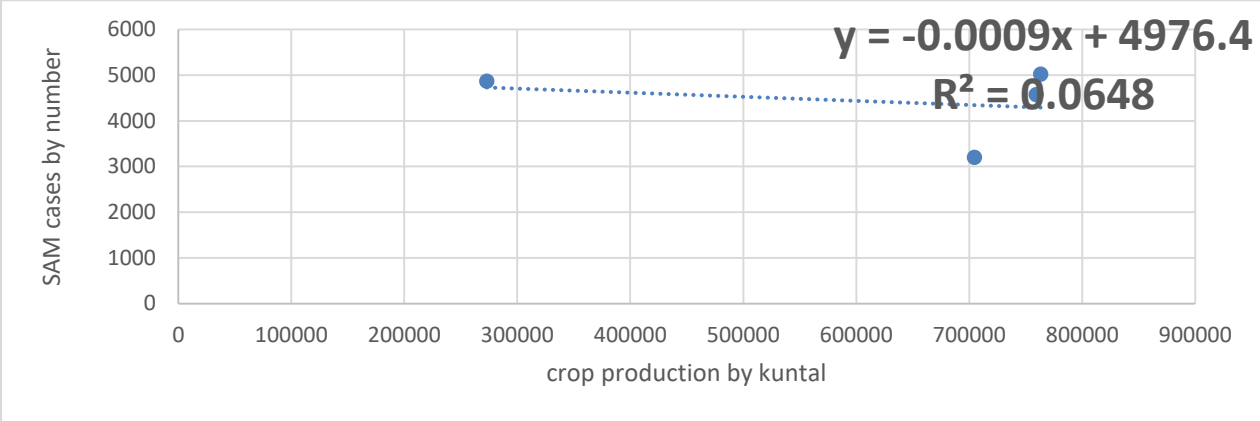


Figure 19: The relationships between SAM cases and total crop yield in waghimira zone, 2012-2015

Table 13: The relationship between total crop yield and annual average rainfall in Waghimira zone, 2012-2015

	crop production by quintal(x)	*Rainfall*
Total crop yield by quintal(x)	1	
Rainfall	0.61086599	1

Abebe Gelaw **7th cohort EFETP** abebegelaw80@gmail.com **2017**

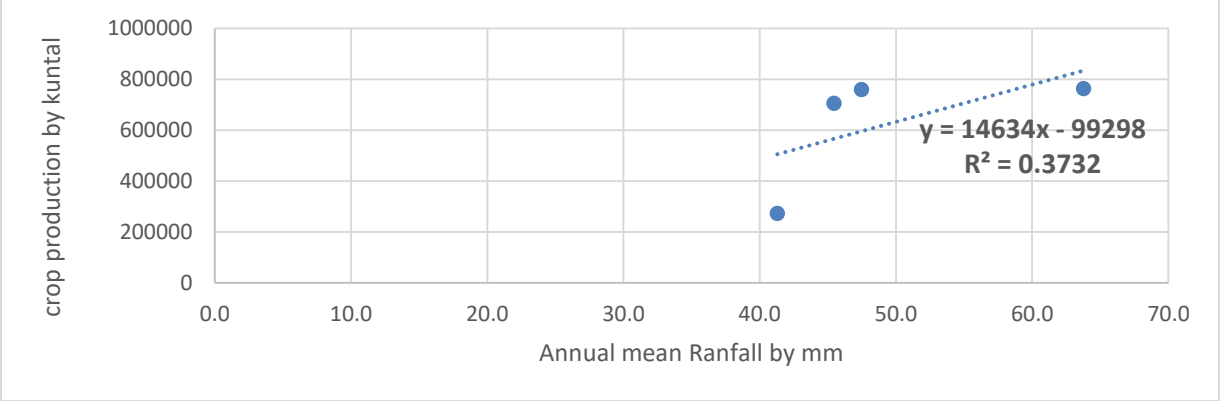


Figure 20: The relationships between total crop yield and average annual rainfall in Waghimira zone, 2012-2015

Discussion

Ethiopia has long history of food insecurity and nutritional problems affecting large proportion of the population caused by successive droughts (17). In our study area (Waghimira zone) rain shortage has become more frequent and severe affected areas particularly in study period. Rain shortage ranks as the single most common cause of severe food shortages, particularly in rain depended countries, and represents one of the most important natural triggers of malnutrition and famine (14).

This study shows that among OTP programme attended children the number of sever acute malnutrition cases were increased by year to year and the zonal prevalence of SAM was 7% in 6-59 months children during 2011-2015.it is higher when compared with WHO classification., hence it is critical situations (18). Of 17664 reported cases, 98.2% of them were MUAC less than 11 cm. The highest of SAM case was reported 5023 (28.4%), rate 73/1000 per 6-59 months children 2014. Among the district Ziqual district have the highest SAM prevalence , which account 7.9% and Abergele and Gazgibla districts was followed , they accounts 7.7% and 6.6% , respectively in 6-59 months children 2011-2015.

One of the emerging issues in food security is climate change and its impact on agriculture (19). The vast majority of Ethiopia's population depends on climate-sensitive sectors like agriculture. The pattern of the assessment result revealed that the annual temperature was increased and annual rainfall and relative humidity decreased in the study place 2011-2015. Average annual rainfall in zone between 2011- 2015 shows that unbalanced (changeable) pattern with the highest in 2014 and lowest in 2015. The mean and standard deviation of the rainfall data in the zone from 2011-2015 are 49.5mm and 25.8mm respectively. Indeed there is a large variability in the

amount of rainfall from year to year. Data on average monthly temperature from 2011-2015 shows that slowly an increasing trend with the minimum temperature (16.5^{o}C) recorded in 2013 and maximum temperature (32.8^{o}C) recorded in 2014. The mean value of temperature and its standard deviation over the period are 23 ^{o}C and 4.9 ^{o}C respectively. This implies that there is a slim variability in temperature values from year to year.

The annual crop production showed that decrement from year to year in the study period in the zone.

The correlation coefficient of sever acute malnutrition cases and crop production is negative 0.3 because of this the production of crop is negative relationship to sever acute malnutrition. The correlation coefficient of rain fall and crop production is 0.6 because of this Climate variability change is positively relationship to crop production Therefor rainfall has a direct relationship with yield production implying that rainfall better will result to corresponding yield production also better. But the annual crop productivity record from the Waghimira zone shows that decreasing from year to year (2013-2015) due to scarcity of rainfall. Therefore, due to this problem, the food security situation of the area is expected to deteriorate more and more.

Conclusion

In conclusion, the zone have critical situation of sever acute malnutrition cases and highly prevalent. And also a reasonable relationship between SAM cases, crop yield and climate variability, particularly the temporal change in rainfall and temperature amount has been established. Therefore the zone was seen climate change during the study period so it was affected the crop yield production impacting the food security situation of the area thus at risk children are more affected by malnutrition.

Recommendation

- Strength the ongoing Targeted Supplementary Feeding Programme (TSFP) should supply to continue for vulnerable groups(6-59 months children)
- Government and NGOs working in the area should support the community by changing the income generating activities (like skills training on non-agricultural activities).
- Relevant sectors like the Health, Agricultural, water supply and development and other institutions should work in collaboration and coordination

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Chapter III- Evaluation of Surveillance System

Surveillance Evaluation of Malaria disease in North Wollo Zone, Amhar, 2016

Abstract

Background: Public health surveillance is the ongoing, systematic collection, analysis, interpretation, and dissemination of data regarding a health-related event for use in public health action to reduce morbidity and mortality and to improve health.

Rational of the study: Malaria is major public health importance and epidemic prone in Ethiopia as well as in districts of North Wollo zone and surveillance system evaluation was not done before it.

Objectives: To describe the existing malaria surveillance system attributes done efficiently and effectively in North Wollo zone, Ethiopia, 2016

Materials and Method: cross sectional descriptive study was used to describe the malaria surveillance system for two districts in North Wollo zone from December 04 - 19/2017. Data was entered and analyzed with MS Excel and results were presented using rates, frequencies, charts and graphs.

Result: Surveillance reporting channels from the health facilities to the national level was found and functioning at all levels. When a suspected malaria case presents to the health facility, the health workers diagnose based on malaria case definition and confirmed using RDT and microscopy for malaria. In 2016, 13816 confirmed malaria cases were reported from all districts of the zone of this 20% were from Raya kobo and 8% from Habru district. In North wollo zone public health emergency management targets all (1,643,251) population to be under surveillance. Health facilities and districts health office have prepared and used to malaria-monitoring chart. A total of 634 pandemic flu cases (AR 0.5% Bugna and AR 0.2% Lasta district) and 34,854 scabies cases (attack rate 3 %) outbreaks had occurred in the zone. In all visited health centers is done blood film test and in health posts have RDT for the diagnosis of malaria accordingly to national malaria guideline. In 2016, 71760 suspected malaria cases were examined by microscopy and RDT and 13816 samples were positive for malaria with positive predictive value of 19.3% in North Wollo zone.

Conclusion: Guidelines not only of malaria and also any guidelines must be put in the right place and in the right person. Finally, the monitoring and evaluation system of surveillance from districts to health facilities were not strong which means the districts are not conducted

programmatic (specific) supervision and written feedbacks in health facilities. **Recommendation:** We were recommended that different type of guideline should be put in the right way and used as reference at any time to keep standard procedures and before sending any report to the next level should be checking content completeness.

Introduction

Public health surveillance is the ongoing, systematic collection, analysis, interpretation, and dissemination of data regarding a health-related event for use in public health action to reduce morbidity and mortality and to improve health. Data disseminated by a public health surveillance system can be used for immediate public health action, program planning and evaluation, and formulating research hypotheses. It is carried out through a system which has legal support and extending from the central health authorities down to the peripheral health facilities and community level through sets of communication channels. These sets include upward and down ward reporting and feedback mechanism. These systems vary from a simple system collecting data from a single source, to electronic systems that receive data from many sources in multiple formats, to complex surveys (1).

A communicable disease surveillance system serves two key functions; early warning of potential threats to public health and programme monitoring functions which may be disease specific or multi-disease in nature. The components of surveillance and response systems targeted for monitoring and evaluation comprise: the priority diseases targeted for surveillance, the structure of the system, core functions of the system, support functions of the system and quality of the system (2).

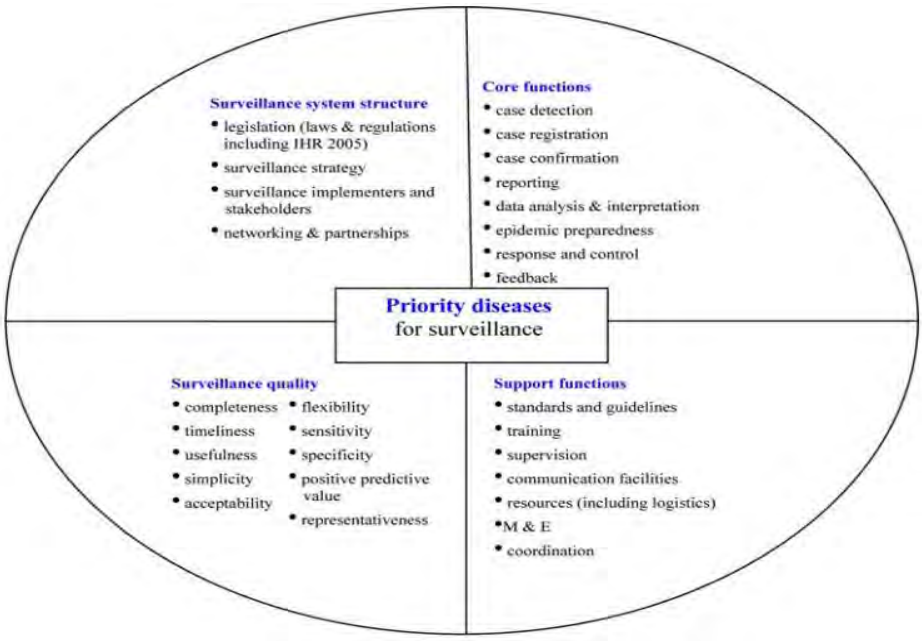


Figure 21: Components of surveillance and response systems for monitoring and evaluation

In Ethiopia public health surveillance was performing by different system. Before 1998 it was named by multiple surveillance. In 1998, Member States in the WHO African region adopted the Integrated Disease Surveillance (IDS) strategy through resolution AFR/RC48/R2. The IDS strategy aims to strengthen national surveillance systems by improving the availability and use of surveillance and laboratory data to control priority infectious diseases (3).

In Ethiopia, during IDSR nationally were monitored 23 selected diseases. Currently, since 2008 the FMoH launched a reform and restructuring of the health sector into different core processes, and in particular the disease surveillance and response with the concept of Business process reengineering (BPR). This new structure is extended down to the district level in their capacities. Moreover, as member state of the WHO, Ethiopia is on preparatory phase to implement the International Health Regulation (IHR) which was declared by member states in 2005. These are some of the good opportunities to strengthen surveillance. The FMoH/ PHEM of Ethiopia identified 20 top priority diseases which are epidemic prone, of international concern and diseases on eradication and elimination programs for surveillance activities4. These diseases are monitored by a designated bodies through available means of communication- telephone, paper based reporting etc. These diseases are set to be reported as mandatory notification (which are immediately reportable) diseases and routine surveillance (which are to be reported weekly). Malaria disease is one of these 20 priority diseases reported as weekly in Ethiopia (4).

Malaria is a life threatening parasitic disease transmitted by mosquitoes. It was transmitted from person to person through the bite of female anopheles mosquito. The agent transmitted was found to be a one-celled parasite called plasmodium. There are four types of human malaria, *Plasmodium vivax, P. malanae, P. ovale* and *P. falciparum.* Malaria parasite enters the human host when an infected Anopheles mosquito takes a blood meal. Inside the human host, the parasite undergoes a series of changes as part of its complex life-cycle. Malaria symptoms appear 9-14 days after the bite of an infectious mosquito (5)

Malaria is one of the most severe public health problems worldwide. P. falciparum and P. vivax are the most common and falciparum the most deadly type of infection. P. falciparum is most common in sub-Saharan Africa. It is a leading cause of death and disease in many developing countries, where young children and pregnant women are the groups most affected, 3.2 billion people (half the world's population) live in areas at risk of malaria transmission in 106 countries and territories in 2012, malaria caused an estimated 207 million clinical episodes, and 627,000 deaths. An estimated 91% of deaths in 2010 were in the African Region (6).

Today, approximately 40% of the world population, mostly those living in the world's poorest countries, is at risk of malaria. This is mostly the tropical and subtropical regions of the world (7).

Ethiopia is one of the most malaria epidemic-prone countries in Africa and is one of the few African countries that have a history of malaria control strategies for more than 40 years. The problem of malaria is very severe in Ethiopia where it has been the major cause of illness and death for many years. In Ethiopia malaria transmission are unstable. Because of it, malaria epidemic is serious public health emergencies. According to records from the Ethiopian Federal Ministry of Health, 75% of the country is malarious with about 52 million people (68%) of the total population living in areas at risk of malaria (8).

In malaria endemic areas, it attacks during planting and harvesting seasons, reducing productive capacity at a time when there is the greatest need for agricultural work. Malaria is public health priority problem in Amhara Region. North wollo zone is one of malaria endemic zone of the region.

Rationale of the study: Malaria is major public health importance and epidemic prone in Ethiopia as well as in North wollo of Amhara Region in which most parts of its population are at risk of malaria. Malaria surveillance system is weekly reportable disease. The information generated from surveillance evaluation have important to understand gaps, give possible

intervention and help to improve public health service system. So that, evaluating public health surveillance systems helps to identify the problems of public health importance surveillance system and to provide solution for the problems.

Objectives

General objective

- To describe the existing malaria surveillance system attributes done efficiently and effectively in North Wollo zone , Ethiopia ,2016

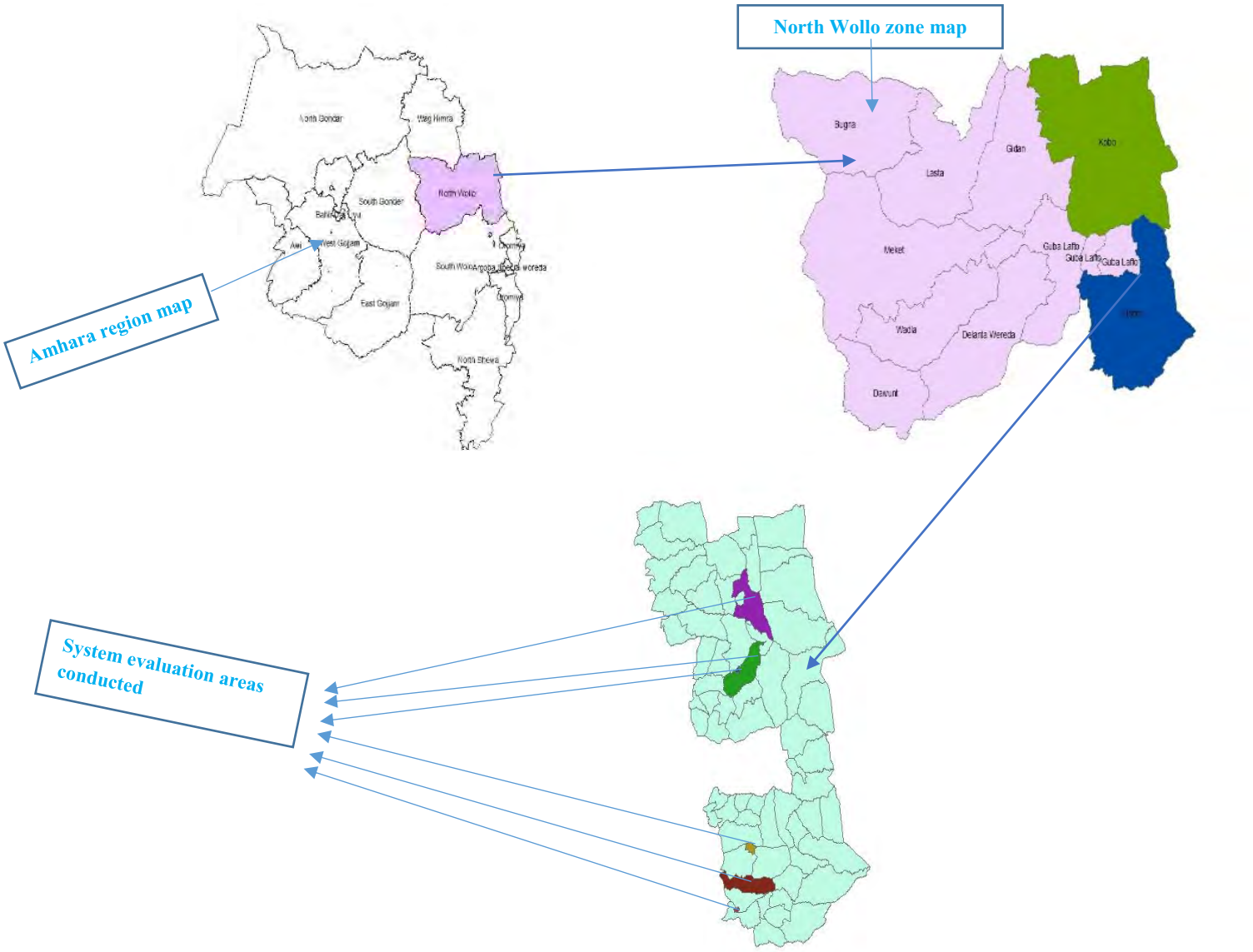
Specific objectives

- To assess the core tasks of surveillance system (case detection, reporting, analysis and feedback) in North Wollo zone
- To describe the malaria disease surveillance system achievements
- To evaluate the key attributes of surveillance system

Materials and methods

Study area: It was done in North Wollo zone of Amhara regional. North wollo zone is bordered on the south by South Wollo zone, on the North by Waghimira zone , on North of East by Tigray region, on the west by South Gonder zone and on the East by Afar region with 1,643,251 total population of them 813,409(49.5%) are males. Total population is targeted under the surveillance system. The zone has three hospitals, 65 health centers, 275 health posts and 50 private clinics.

Selection of study areas: Purposefully was used to choose the study areas for surveillance evaluation system. Two districts (Raya kobo and Habiru district) were selected purposively by discussing with the zonal PHEM officers depending on their achievements. Health facilities were selected by discussing with district PHEM officers one health center and one health post from each district were included in the evaluation similarly health centers were included based on their PHEM performance selected by convenience.



Maps 6: Map of surveillance system evaluation conducted districts in North Wollo, Amhara, 2015/16.

Study design and period: The cross sectional descriptive approach was employed from December 04 - 19/2017.

Data collection: The CDC Guideline for evaluating public health surveillance system tool was updated and used for interviewing of zonal and district PHEM officers, health center focal persons and health extension workers. Review of reports and records was also used as part of the data collection system. The most issued activities and elements included were case definition, case detection, data collection, storage, reporting, information analysis, interpretation and result dissemination. The attributes of surveillance system, including usefulness, simplicity, sensitivity, flexibility, acceptability, representativeness, data quality and stability are used as main pillars to evaluate the organization.

Data Analysis: Data was entered and analyzed with MS Excel and results were presented using rates, frequencies, charts and graphs.

Case definitions

Case definitions According to the Ethiopian public health emergency management guideline case definitions are classified into two i.e. standard and community case definitions (4). A case definition is a standard set of criteria for deciding whether an individual should be classified as having the health condition of interest.

Standard case definition: is a case definition that is agreed upon to be used by everyone within the country.

Community case definitions: is a case definition of disease an condition adapted to suit to health extension workers (HEWs) and community members including community health workers, traditional healers, birth attendants, kebele administration, agricultural workers, teachers, drug outlets, etc.

Standard case definition

Malaria

Suspected: Any person with fever or fever with headache, rigor, back pain, chills, sweats, malign, nausea, and vomiting diagnosed clinically as malaria

Confirmed: A suspected case confirmed by microscopy or RDT for plasmodium parasites.

Community case definitions :any person with fever or headache, back pain, chills, rigors, sweating ,muscle pain, nausea and vomiting or suspected case confirmed by RDT

Results

A simplified flow chart of the surveillance system showing data transmission channels from the health facilities to the national level has been found and functioning at all levels. When a

suspected case presents to the health facility, the health workers diagnose based on case definition and confirmed using RDT and microscopy for malaria. Using weekly reporting form health facilities report cases to the district level on Monday of each week. Reports from health facilities are compiled at the district and submitted to the zonal level on Tuesday. Reports from districts are compiled at zone and the summary reported to region till mid Wednesday. At the regional level reports are compiled and sent to the Ministry of Health on Thursday using standard PHEM weekly reporting forms. In case of rumors and immediately reportable diseases all respondents replied that reports sent to the next level within 30 minutes.

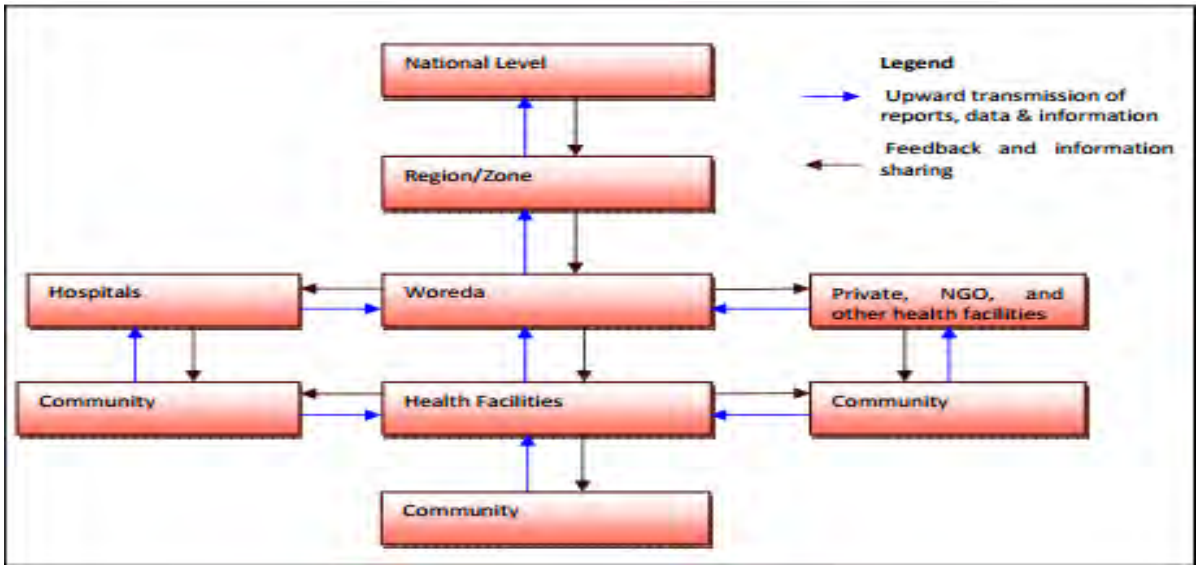


Figure 22: Diagram illustrating the formal and informal flow of surveillance data and information throughout a health system

Malaria: In 2016, 13816 confirmed malaria cases were reported from all districts of the zone of this 20% were from Raya kobo and 8% from Habru district. The zone is known of endemic malaria. In North wollo Zone, all districts (12) and 224 kebeles are malarious. 1,162,708 populations are at risk of malaria that lives in these areas. In 2015/16, from total confirmed malaria cases, 8207 (59%) and 5609 (41%) were plasmodium falciparum and plasmodium vivax respectively. Malaria contributes proportion was 2% from the total outpatient cases visited. Of the total malaria cases 806 (6%) were under five children, 2659(19%) were from 5-14 years and 10349(75 %) were above 15 years old. Due to malaria cases 5 patients were death occurred in the areas.

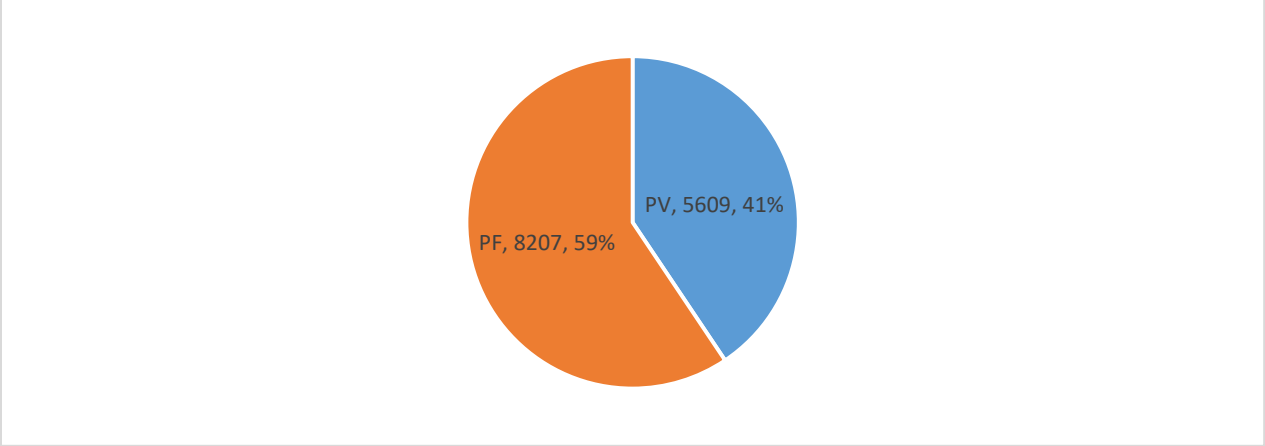


Figure 22: Proportion of species type in North wollo zone, Amhara, Ethiopia, 2016

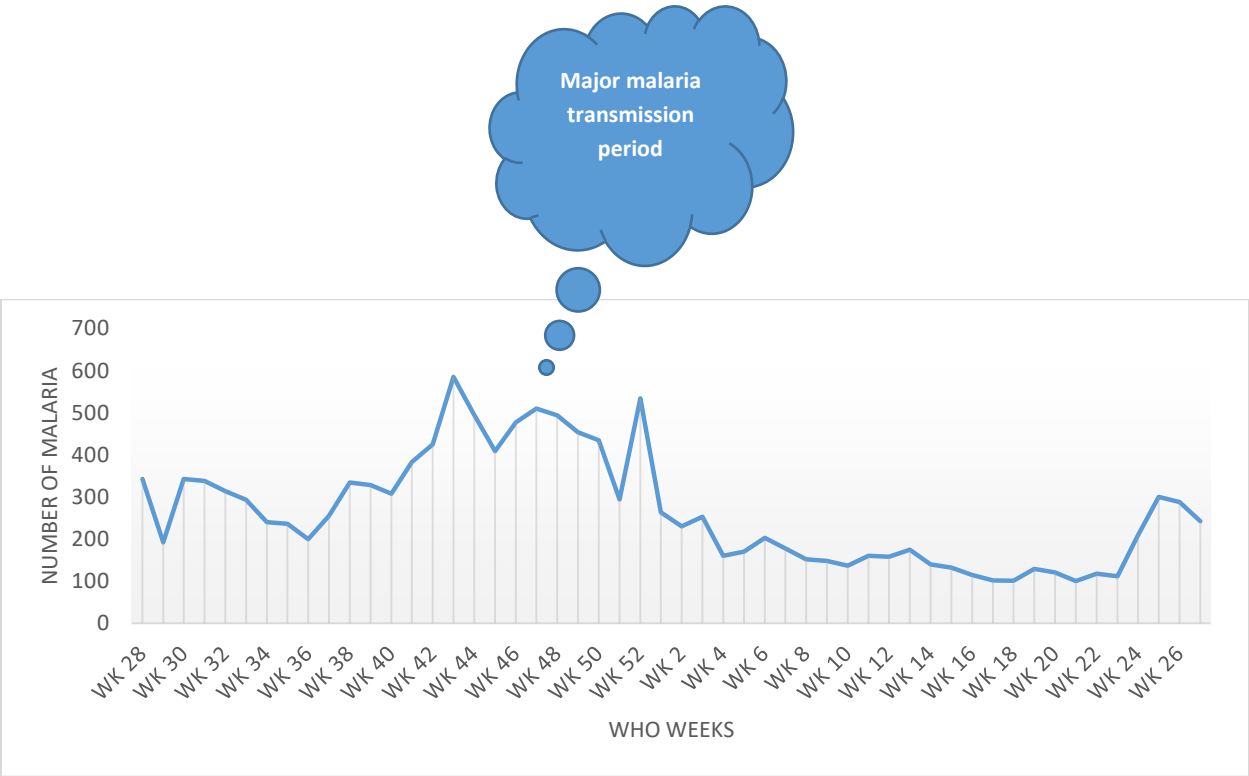


Figure 23: Trend of confirmed malaria case by WHO weeks in North wollo, Amhara, Ethiopia, 2016

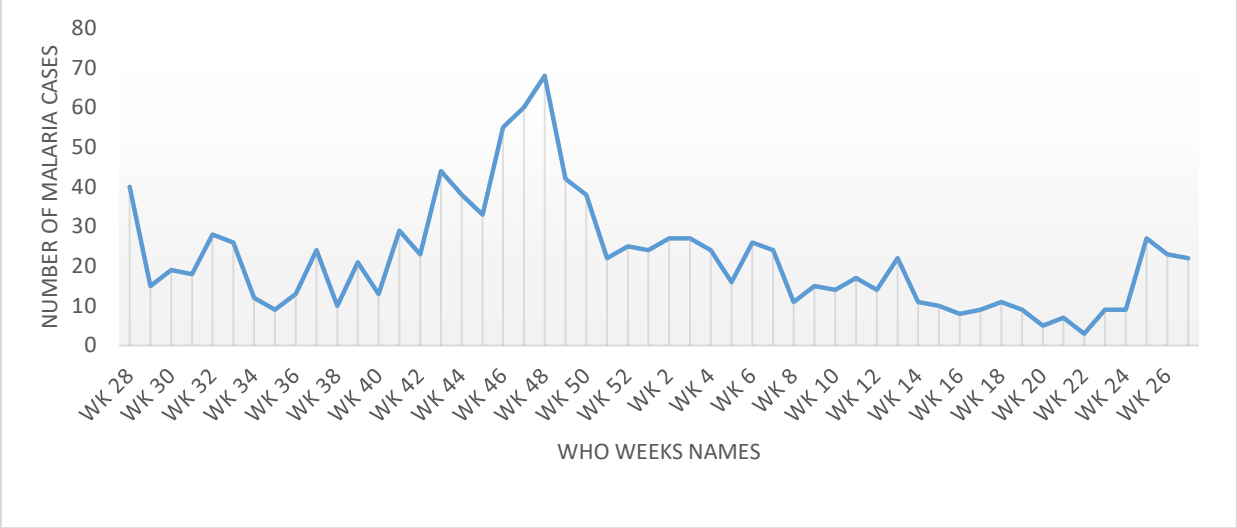


Figure 24: Trend of confirmed malaria case by WHO weeks in Habru district, 2016

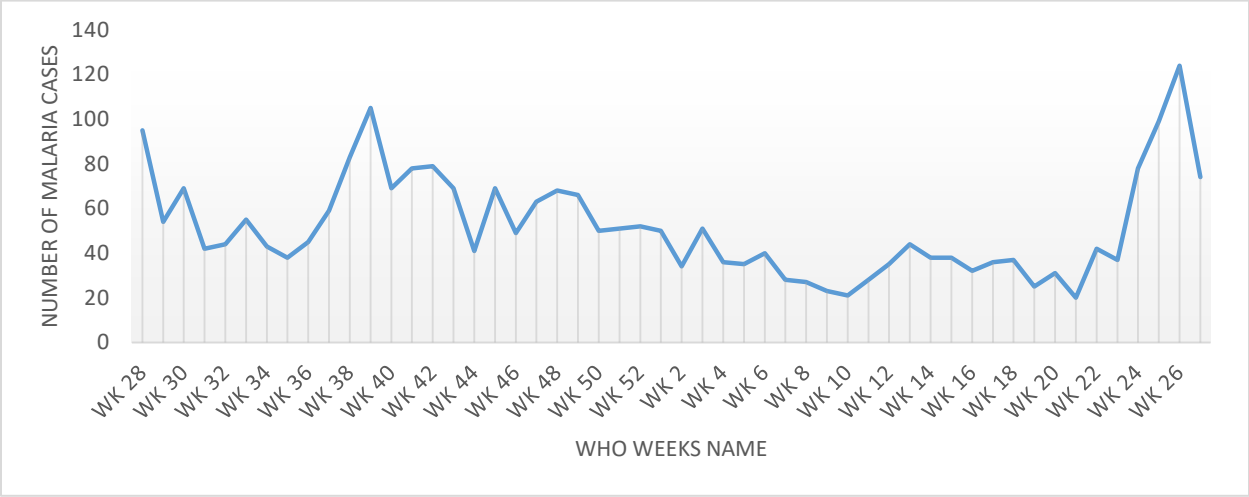


Figure 25: Trend of confirmed malaria case by WHO weeks in Raya Kobo district, 2016

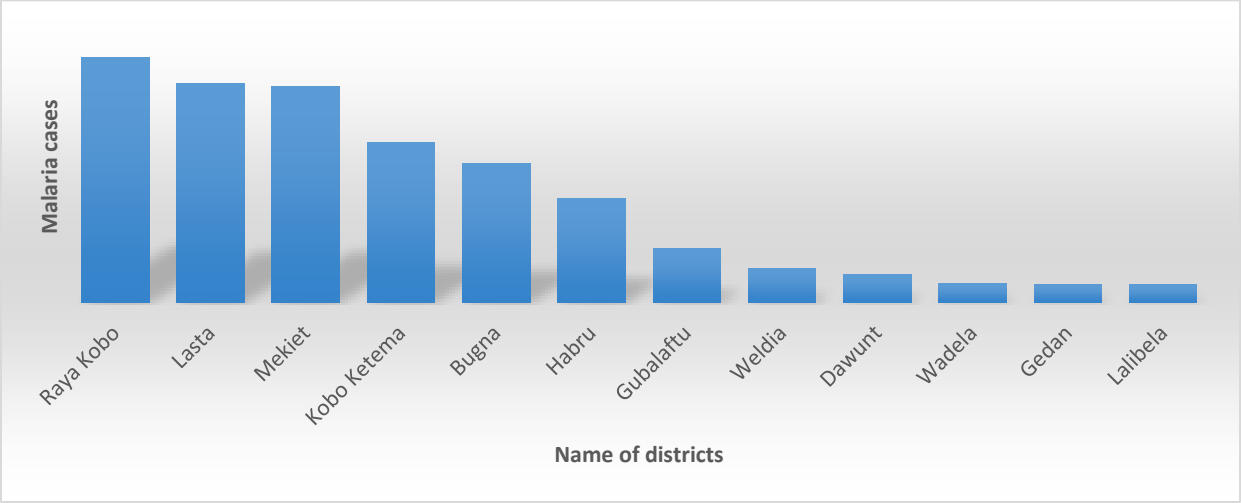


Figure 26: Percentage of malaria contribution from each districts to zones in N/Wollo zone, 2016

Targeted diseases under surveillance: The national PHEM guideline stated that malaria is one of the 21 priority diseases set to be under the surveillance of the population living throughout the countryside. In addition, the Amhara national regional state includes Leishmaniosis in the weekly surveillance system. Of these, nine diseases (malaria, meningitis, dysentery, typhoid fever, epidemic typhus, relapsing fever and SAM, MDSR ,Leishmaniosis) were reported on weekly base and 13 diseases (Guinea warm, Viral hemorrhagic fever, Rabies, Small pox, Yellow fever, Polio, NNT, Measles, Cholera, Anthrax, Avian human influenza, Sever acute respiratory syndrome and Pandemic influenza) have been reported as immediately.

Performance of the existing surveillance system

Population under surveillance: In North wollo zone public health emergency management targets all (1,643,251) population to be under surveillance for all prioritize diseases (weekly and immediately reportable diseases).

Availability of surveillance tools

Case definition: The standard cases definition of malaria was available and posted on wall in all visited health facilities in study areas (Raya kobo and Habru districts) but community case definition has no in the visited health posts at the time of visit. PHEM officers and focal persons have good understanding on surveillance and objectives of surveillance.

Registration: Registration of malaria diagnosis was found adult OPD and IPD in all visited health centers in addition to this health posts have also prepared by local books and provided with its ICCM registration. Rumer log book registration was available in districts and zone levels but at districts have inconsistency of record any rumors events.

Reporting formats: There were no shortage of reporting formats in the past 6 months in all visited levels (district and health facilities level). They used the regional health bureau prepared and distributed PHEM reporting pad for weekly reporting. In addition to this, all levels (zone, districts and health centers) have line lists and cases based reporting formats. In zonal level have been used to weekly reporting data base format (electronically system). Regarding to different reporting tools we observed a problem of appropriate place storage and quality of recording items in all visited levels. Regarding the reporting entities for surveillance system are provided public health facilities and private health facilities in North Wollo zone. In the last year in North Wollo zone AFP, measles, NNT, pandemic flu, rabies, SAM and scabies cases were reported

from district to the zone and the zone reported to the region as immediately and weekly depend on the cases. Communication tools have received and sent through telephone, reporting format and email access weekly but In case of emergency occurred communicate on daily. All visited health posts have been sent weekly report using telephone and reporting format to cluster health center on morning Monday. Health centers have been also send their aggregate catchments health posts report to district on Monday and reports sent from district to zonal health department on Tuesday, finally the zone aggregates and sent to the region on Wednesday by email. The weekly reporting completeness of the past six month was 99.7% the health facilities used telephone or reporting formats to send report the next higher level

Data analysis: In visited districts and zone have assigned trained and responsible PHEM officers and focal persons also have in each visited health centers and health posts. In all visited health facilities and districts health office have prepared and used to malaria monitoring chart.

Outbreak investigation: There were outbreak of pandemic flu and scabies in the zone. A total of 634 pandemic flu cases (AR 0.5% Bugna and AR 0.2% Lasta district) and 34,854 scabies cases (attack rate 3 %) in the zone. The outbreaks were investigated by zonal staff and residents used organized outbreak investigation check lists and intervention undertaken based on the diseases.

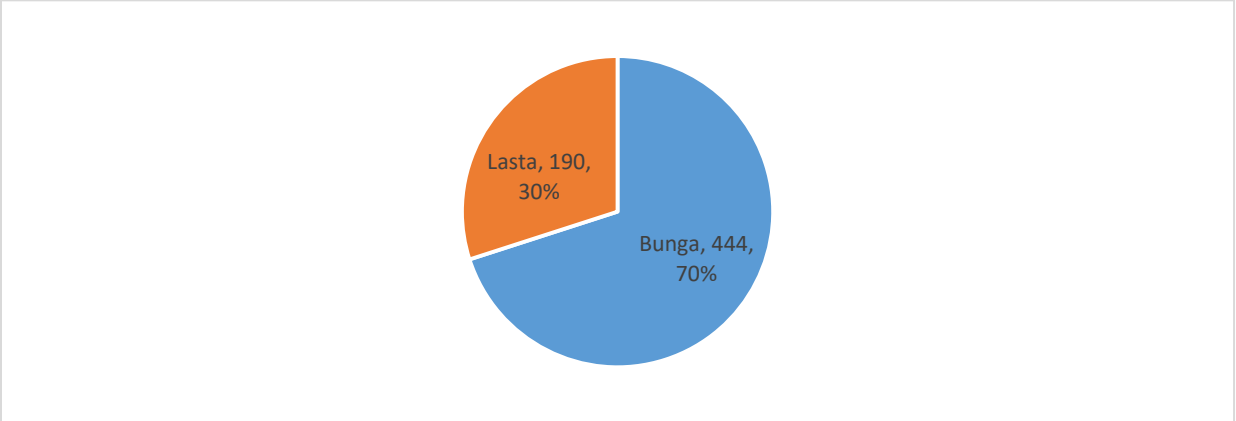


Figure 27: Proportion of pandemic flu outbreak occurred by districts in North Wollo zone, Amhara, 2016

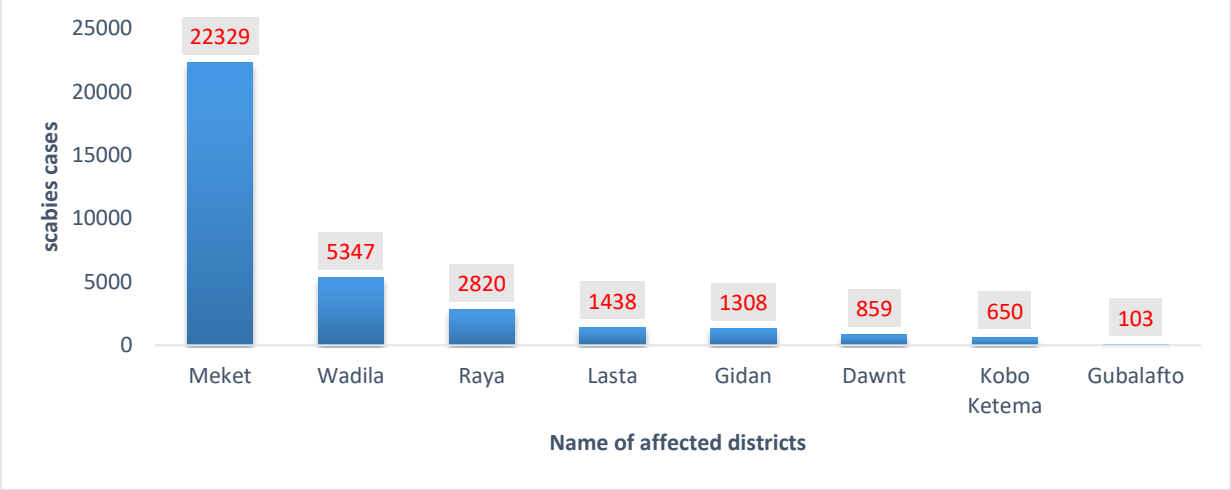


Figure 28: Proportion of scabies cases outbreak by districts in North Wollo zone, Amhara, 2016

Epidemic preparedness and response: In all visited districts and zone have prepared epidemic preparedness and response plan but it is not budget allocated, However, if the emergency will be happen in the district, the administrative bodies can allocate a budget immediately based on the magnitude of emergency or events.. The facilities have rapid response team (RRT) established but it is activated during an outbreak or other events occurred. Emergency preparedness and response task force is established at zonal and district level and conducts meeting irregularly in all levels.

Supervision and feedback Supervisions and feedback are major activities of monitoring and evaluation of the performance of the activities that helps to improve the system. There is written feedback system to the visited health facilities. Zonal and district level supervisions were conducted as integrated supportive supervision in each quarter. Zonal levels gives feedback for districts weekly but at district levels did not give feedback weekly, however, if the district will be performed a supervision, then it will give a written feedbacks.

Training: In all visited areas who found officers and focal persons have trained staffs on basic disease surveillance and epidemic management but the health extension workers were trained on surveillance together with the integrated refreshment training but they had not received training specifically for surveillance.

Laboratory diagnosis: In all visited health centers is done blood film test and in health posts have RDT for the diagnosis of malaria accordingly to national malaria guideline. Health facilities personnel have a knowledge to collect and transport specimen (AFP, measles) to regional

laboratory (Bahirdar regional laboratory and research Institute) accompanied with case based reporting form for further analysis and investigation.

Description of each system attributes

Usefulness: All personnel's from visited zonal health department ,district health offices and health facilities understood that the surveillance system is useful to detect outbreaks, to estimate the magnitude of morbidity and mortality and to assess the effect of prevention and control programs.

Simplicity: The simplicity of a public health surveillance system refers to both its structure and ease of operation. Surveillance systems should be as simple as possible while still meeting their objectives. The simplicity of surveillance system is explained by the case definition because it is important to detect early the disease or condition under surveillance. Hence, cases definition should be easily understandable by all levels of professionals. All respondents of the study replied that the case definitions of malaria is easily understandable. All visited health facilities, health agreed that the case definitions of malaria for identification of suspected cases are easy to understand and possible to apply by all level health professional.

Flexibility A flexible public health surveillance system can adapt to changing information needs or operating conditions with little additional time, personnel, or allocated funds. Flexible systems can accommodate, for example, new health-related events, changes in case definitions or technology, and variations in funding or reporting sources. In addition, systems that use standard data formats (e.g., in electronic data interchange) can be easily integrated with other systems and thus might be considered flexible. PHEM officers and focal persons at health offices and facilities said that the current reporting format is used for other newly occurring health event without much difficulty. Any change in the existing procedure of case detection and reporting will not be difficult for implementation.

Report timelines and completeness: When we assessed the timeliness and completeness report of the facilities is complete they give reports in a weekly .Generally the report timelines and completeness of all visited types of facilities is above the minimum standard thresholds of WHO.

Sensitivity: The sensitivity of a surveillance system can be considered on two levels. First, at the level of case reporting, sensitivity refers to the proportion of cases of a disease (or other health related event) detected by the surveillance system. Second, sensitivity can refer to the ability to detect outbreaks, including the ability to monitor changes in the number of cases over time. This is the case definition of malaria well established, easy and can identify all malaria

cases. Sensitivity of the system is the proportion of the cases meeting the case definition (regardless of the sensitivity of the case definition itself) that are detected and notified as they should. Accordingly, all the cases reported to the higher levels fulfilled the case definition of malaria as seated on the guideline.

Acceptability: Willingness of persons and organizations to participate in the surveillance system. It encompasses the willingness of persons on whom the system depends to provide accurate, consistent, complete, and timely data. All reporting focal persons were accept and well engaged to the surveillance activities the report completeness status of reporting agents is 100% for health centers, 100% for health posts and 99 % for private health facilities

Representativeness A public health surveillance system that is representative accurately describes the occurrence of a health-related event over time and its distribution in the population by place and person. It is assessed by comparing the characteristics of reported events to all such actual events.

Positive predictive value: Predictive value positive (PVP) is the proportion of reported cases that actually have the health related event under surveillance. All malaria suspected was examined by RDT or microscopy. In 2016, 71760 suspected malaria cases were examined by microscopy and RDT and 13816 samples were positive for malaria with positive predictive value of 19.3% in North Wollo zone.

Stability: refers to Stability refers to the reliability (i.e., the ability to collect, manage, and provide data properly without failure) and availability (the ability to be operational when it is needed) of the public health surveillance system. The surveillance system helps to collect manage and provide data properly and it was operational at any time, but the continuity of the system was interrupted at health post level when health extension workers were not available.

Discussion

Case definitions and reporting formats were available in most of the visited health facilities at the time of visit but in the future reporting formats will be empty because of it was available small number of pads. The availability of national malaria guidelines and other essential guidelines were present but the storage of it inappropriate place and some focal persons taken his or her house after rotate into other institutions. Content report completeness at all visited health facilities were not appropriate record in each items. As compared the report completeness and timeliness status of the districts (99.7%) is good track which above the level threshold of the

WHO minimum targeted (80%) for both public and private facilities. The challenges in the reporting system were the inconsistency flow because of communication utilities was obstacles like telephone, network access and vehicle transport from facilities to districts. The average reporting completeness of for the year 2016 is 99.7%. Analyzing and interpreting of surveillance data was not conducted at district and health facilities but at zonal level it is conducted a good manner, therefore, the zone PHEM officer should be give training about how to analyze of surveillance data and follow up as usual tasks for districts PHEM officers and focal persons of health facilities until they will be skilled up.. Emergency preparedness and response plan is available in all visited districts and zone but not allocated budget. However, emergency budget will be allocate immediately if at any emergency happen in zone or districts accordingly the magnitude of the events. Rapid response team are established in all visited health facilities but they are not functional hence they must be active always as routine tasks. Laboratory diagnosis for malaria was available at all visited health facilities level based on their capacities like in health centers was malaria diagnosed by golden standard (Microscopy) and in health posts by rapid diagnostic tests (RDT). In order to improve, strengthen and consistency the surveillance system monitoring and evaluation must be conducted as planned in provide with regular tasks. Supervision and feedback is good manner at zonal level but districts and health centers does not give feedback regularly and supervisions are conducted as integrated supportive supervision but no program specific supportive supervision were conducted both from districts to all health facilities.

Conclusion

In all visited zone, districts and health facilities (publics and private facilities) their weekly report completeness and timeliness were excellent track which above the minimum WHO target both public and private facilities but content completeness and quality must be improve from districts and health facilities. Malaria diagnosis was given accordingly to national malaria guideline procedures but the guidelines not only of malaria and also any guidelines must be put in the right place and in the right person. At all visited levels rapid response teams are established but they had not activated. The emergency preparedness and response plan was not budgeted in the districts and zone. Finally, the monitoring and evaluation system of surveillance from districts to health facilities were not strong which means the districts are not conducted programmatic (specific) supervision and written feedbacks in health facilities. Generally, the surveillance

activities of the zonal level were conducted by skilled, organized and motivated PHEM officer's but in districts and health facilities was not as like zone type.

Recommendation

- Different type of guideline should be put in the right way and used to as reference at any time to keep standard procedures
- Before sending any report (immediately or weekly or routine activities) to the next level should be checking content completeness. Therefore, missing or dash type in report formats under surveillance data is meaningless (not understandable).
- At districts and health facilities levels should be conduct data analysis by person, place and time and the information must be disseminate for their respective bodies for decision making.
- Rapid response teams should be functional because they gives early detection a problems and prompt response based on their findings.
- The emergency budget must be allocate because of early respond the outbreaks or any emergencies
- Programmatic (specific) supervisions and feedbacks should be perform regularly in order to improve a gaps and give corrected actions.

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Chapter IV-Health Profile

Jile timuga Health Profile Description, Oromia zone, Amhar, March, 2015/16.

Abstract

Introduction: Health profile is to provide overview and discussion of health related data and important health related indicators to describe the health and related social, economic, political and cultural factors in the geographic area. It is vital for identifying and prioritizing prominent health and health related problems of the community at any level of health system to make decision for action.

Rationale of the study: So far the health and Health related information was not well described in the woreda. Therefore, describing the health profile of Jile timuga district is helpful to give evidence based information for prioritizing and instituting appropriate public health interventions.

Objective: To assess and describe the current health profile of Jile timuga district Amhara, Ethiopia, 2015/16.

Method: Data was collected by structured questionnaire from Oromia zone, jile timuga district health office and other relevant respective sectors from 10/02/2016 to 25/02/2016. Microsoft Excel 2007 was used for data entry and analysis and Arc-GIS version 10 for mapping the district.

Result: The 2014/15 population estimate for the district was 84983 of which females constituted 51% (43341) with 10.8% (9152) of the district population living in urban. Of these total population women under reproductive age group (women 15-49 years of age) constituted 23.6 % (20039) and 42.6% (36228) of the population was under 15 years of age. The physical health service coverage of the district is 100% which is based on an estimate of five health post and one health center as giving service for 25000 people. With ratio of 1:21246 health centers to population ratio and 1:4249 health posts to population ratio. Drinking water service coverage was reached 45% and the latrine service coverage is 57.3% and latrine utilization is 99% in the district. The students' dropout rate was 2.6% and 90 % of total educational coverage in the year. The leading cause of outpatient visit morbidity in adult was acute upper respiratory tract infection which accounts 22.9% and non-bloody diarrhea which accounts 34.4% in children. Malaria Slide positivity rate was 19% and API 45.9 per 1000 at risk population and TB case detection rate in 2015/16 was 77.3% % in the district. The overall AR of HIV/AIDS was 3.87 per 1000 population. Males experienced 5.1/1000 higher incidence HIV/AIDS than Females who have

3.57/1000. There were a total of 2349 of people living with HIV/AIDS (PLWHA) at prevalence of 2.76%.

Conclusion: There are good achievements of some health indicator but communicable diseases are prevalent in the district. Therefore, prevention and control measure should be strength to reduce morbidity due to communicable diseases and other priority diseases.

Introduction

Health profile is to provide overview and discussion of health related data and important health related indicators to describe the health and related social, economic, political and cultural factors in the geographic area. It is vital for identifying and prioritizing prominent health and health related problems of the community at any level of health system to make decision for action (1). It is basic for planning and appropriate intervention; and baseline information for operational research. Partners in health and health related areas of the community will have evidence based information from well compiled health profile. The purpose of this document is to assess and describe the health and health related issues in the Wereda and communicate the local burden of disease and other health related information.

Rationale of the study

Health profile assessment is important for prioritizing health and health related problems of the community at any level. Based on this in the previous time there was not prepared and information on the health profile of the woreda was not documented, compiled and organized. Therefore describing the health profile of Jile timuga Woreda is helpful to give evidence based information for prioritizing and instituting appropriate public health interventions in the Woreda.

Objective

General Objective

- To assess and describe the current health profile of Jile timuga district Amhara, Ethiopia, 2015/16.

Specific objectives

- To summarize the socio-demographic information of Jile timuga.
- To describe an existing health status and infrastructures of Jile timuga Woreda
- To assess human resources of the district
- To assess primary health care coverage of the district

- To describe and identify priority endemic diseases as well as its control and prevention program in the district

Method and Materials

Study area

This health profile assessment was conducted in Jiletimuga woreda. It is one of the seven districts in Oromia zone which is found in Amhara regional state. Jiletimuga district was established as district in 1994EC. The district has 2 urban and 19 rural Kebeles and according to the 2014/15 population estimate for the district was 84983 of which females constituted 51% (43341) with 10.8% (9152) of the district population living in urban.

Study period

The assessment was conducted from 10/02/2016 to 25/02/2016.

Study Design

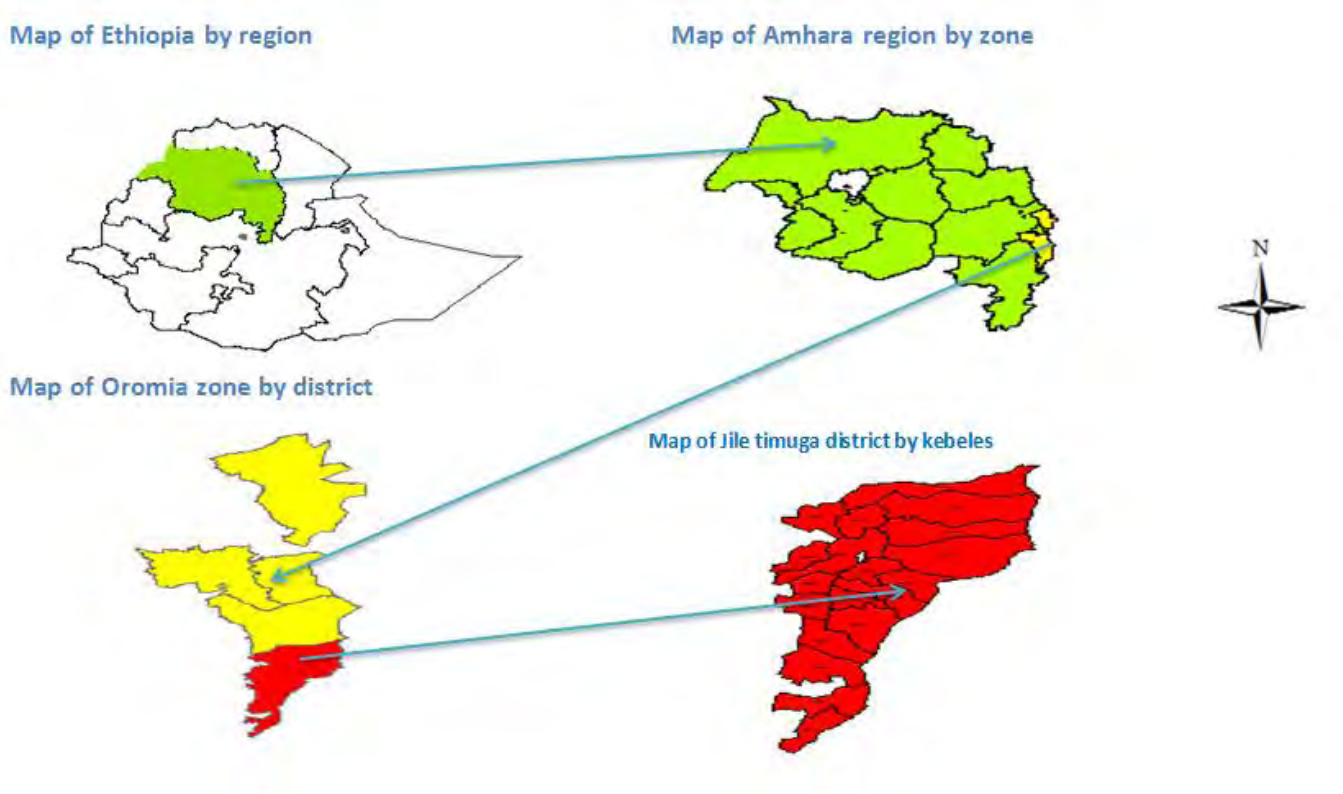
Descriptive Cross Sectional study was conducted in Jile timuga district

Data collection

Data was collected from Oromia zone health department, jile timuga district health office and other respective sectors like administration, water sector, agriculture office, education office and others by reviewing available data from those mentioned sectors by using structured questioner and interviewing different concerned individuals. In addition to this, data that could not be collected during the field visit was obtained by phone communication from the respective focal persons.

Data Analysis

Finally the data collected in hard copy was converted to electronic version and prepared for analysis. Microsoft Excel 2007 was used for data entry and analysis and Arc-GIS version 10 for mapping the district.



Maps 7: Map of Jile timuga district, Oromia zone, Ethiopia, 2014/15.

Result

Historical Background and culture

According to the Woreda culture and truism office mentioned orally, it was established before 92 years ago (1915EC) during emperor liji Eyasu regime. The name of the Woreda derived from the combination of two words namely Jile and Timuga. As history talker says Jile was a name of man who was founder and resident of a place in the first time and also Timuga means house constructing material locally they call it "sensal leaf". During the Derg regime, the name of wereda was "Efratana Timuga" and during the beginning of FDRE regime the previous wereda name reestablished and gave "Jile Artuma" wereda. Then in 1994EC, Jiletimuga Wereda was established as wereda with 2 urban and 19 rural kebeles.

In the district there are a number of natural and manmade historical places like Awayitu hot water, Yefeki Abas mosque and Senbete market are the main tourist place found in a district.

Geography & climate

Senbete, the district town is found on highway 605 kilo meters North West of Bahir-Dar, the capital of Amhara regional state and 265 kilo meters south west of Addis Ababa. Jile timuga

wereda shares boarders with on the North with Artum fursi district, on the south with Kewet district, on the East with Afar region and on the west with Efratagidim. The total catchment area of the wereda is 59,116 Km2. It has altitude range 1300-2000 meters above sea level. It has two Climatic zones, which is 95% Kola and the rest 5% is Weyina dega. It has on average 27 oC annual temperatures, maximum of 30 oC and minimum 24 oC. In addition it has Annual rain fall on average 1500 mm and ranges 1800 - 1200 mm. Topography in this woreda shows that 40% is flat, 31% valleys, 22% mountainous, 7% hills.

Administrative &political structure

Jile timuga wereda is divided into 4 clusters, and has 19 rural and 2 urban kebeles. All sector offices found in the town Senbete. There are supporting NGOs working together with the wereda health office, namely World vision, EMERDA and Carter center, etc. These nongovernmental organizations mainly support the wereda on malnutrition, Hygiene and sanitation, Maternal and child health, HIV/ADS and Trachoma. They provide material support and give training for health professionals.

Demographic information

The 2014/15 population estimate for the district was 84983 of which females constituted 51% (43341) with 10.8% (9152) of the district population living in urban. In addition to that male to female sex ratio is 1:1. Of these total population women under reproductive age group (women 15-49 years of age) constituted 23.6 % (20039) and 42.6% (36228) of the population was under 15 years of age.

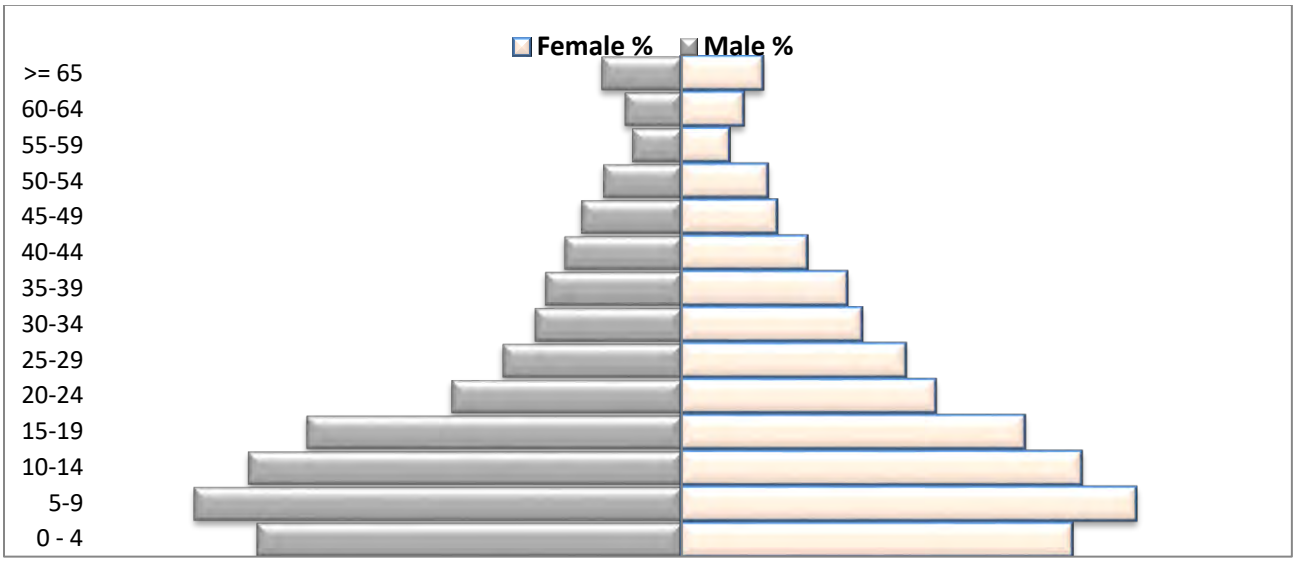


Figure 29: Population pyramid of Jile timuga district, Oromia zone, Amhara region, 2014/15.

Senbete kebele has the largest population size (7047) in the district followed by Merewa (5799) and Goda (5715), the least population is found in Bete town (2101). Senbete and Bete are the only urban kebelles of the district.

Table 14: Population size by kebele of Jile timuga district, Amhara region, based on 2014/15 estimation

Ser. no.	Name of kebele	Total population of the kebele	Male	Female
1	Senbete	7047	3453	3594
2	Merewa	5799	2842	2957
3	Dula	4994	2447	2547
4	Ezigiye	2280	1117	1163
5	Alala	4019	1969	2050
6	Bete urban	2101	1029	1072
7	Bete rural	4259	2087	2172
8	Goda	5715	2800	2915
9	Gangaha	5087	2493	2594
10	Werelencha	3848	1886	1962
11	Mudi fecha	4113	2015	2098
12	Balichi	5340	2617	2723
13	Wesen kurkur	2534	1242	1292
14	Gerbi dire gelim	3041	1490	1551
15	Gerbi mudi wach	2721	1333	1388
16	Fugna denbi	3386	1659	1727
17	Kodma	3086	1512	1574
18	Awilal	3259	1597	1662
19	Lugo	4818	2361	2457
20	Metehora	3910	1916	1994
21	Arbawayu	3626	1777	1849
	Total	84983	41642	43341

Religion composition of the district is Muslims 99% and Christians 1%. From the total population Oromo ethnic accounts 85% of the population, Amhara and Argoba 14% and the rest 1% others ethnics. Oromic language is the official language in the woreda.

Facilities and infrastructure

The health service coverage of the district is 100% which based an estimate of five health post and one health center as giving service for 25000 people. There are 20 health posts, 4 health centers and no hospital in Jile timuga wereda. In the district except Gerbimudi wacho, Muti fecha and Wesen kurkur all kebele have road access with gravel and asphalt road type. Regarding

communication, all urban and rural kebeles have accessed with mobile telephone services. Moreover, 3 kebeles supplied with wireless type of telephone. In addition, the district has one agent type of postal services and one commercial bank in Senbete town and five kebeles only of the district had supplied with electric power. Hund dug well, shallow well, deep well and spring were the main source of water supply for the district. According to data obtained from water resource office, the woreda drinking water service coverage was reached 45%.

Table 15: Number of health facilities by type in Jile timuga district, 2014/15

S.NO	Type of health institution		No of institutions
1	Number of Health Centers	with sustainable/ 24 hour /electric power	3
		without sustainable/ 24 hour /electric power	1
		with telephone service(cable based/mobile)	3
		without telephone service (cable based/mobile)	1
		with piped water supply	2
		Without piped water supply	2
2	Number of Health centers		4
3	Number of Health post		20
4	Number of private clinic	Lower	4
		medium	1
		higher	0
5	Number of Drug vendors		0
6	Number of Drug stores		4
7	Number of Pharmacies		1
8	Number of Diagnostic laboratories		1
9	Health center to population ratio		1:21246
10	Health posts to population ratio		1:4249
11	Physical health service coverage		100%

Table 16: Functional water supply type and number by kebeles Jile timuga district, Amhara region based on 2014/15.

Ser. no.	Name of kebele	Type of main water supply sources		
		Deep well	Shallow well	Hand dug well
1	**Senbete**	1	1	0
2	**Merewa**	0	0	20
3	**Dula**	0	0	8
4	**Ezigiye**	0	0	4
5	**Alala**	0	0	7
6	**Bete urban**	1	0	0
7	**Bete rural**	0	0	5
8	**Goda**	0	1	0
9	**Gangaha**	0	0	10
10	**Werelencha**	0	0	7
11	**Mudi fecha**	0	1	0
12	**Balichi**	0	1	0
13	**Wesen kurkur**	0	0	1
14	**Gerbi dire gelima**	1	0	2
15	**Gerbi mudi wacho**	0	0	3
16	**Fugna denbi**	1	0	11
17	**Kodma**	0	0	2
18	**Awilal**	0	0	5
19	**Lugo**	0	0	9
20	**Metehora**	0	0	6
21	**Arbawayu**	1	0	3
	Total	5	4	103

Education

In the district there are 43 preprimary schools (zero class), 43 primary schools (1-8) with a total of 17620 students (9353 male and 8267 female), two high schools (9-10) with a total of 833

students (526 male and 307 female) and one preparatory school (11-12) with a total of 82 students (48 male and 32 female) currently attended their education. There are no higher educational institutions such as colleges and technical and vocational education training (TVET) schools in the wereda.

The school dropout of students in the wereda was 2.6%. The highest and lowest dropout rate was seen in secondary school students (16.3%) and primary school students (1.9%) grade levels respectively.

In the district, 35 schools have latrine. Of which 30 have separate latrine for male and female. Only five schools had access for tape water with pipe. The total educational coverage of the wereda is 90 % in the year.

Table 17: School type and performance status of Jile timuga district in 2014/15.

Schools	Performance status								
	Plan			Enrolled			Drop out		
	Male	Female	Total	Male	Female	Total	Male	Female	Total
primary school(1-8) students	10130	9231	19361	9353	8267	17620	154	183	337
secondary school(9-10) students	705	607	1312	526	307	833	93	43	136
preparatory school (11-12) students	90	58	148	48	32	80	5	4	9
Total	10925	9896	20821	9927	8606	18533	252	230	482

Productivity and income

From the total area of 88,256 hectares 12,000 is suitable for agriculture. The rest of the area is used for grazing, forestry and resident. About 95% of the total population is engaged in farming, animal husbandry, and cultivation of gardens. The remaining 5% depends on merchandise, governmental and NGO employees. In addition to this the district resident's income was generated from their daughters or sons emigrated to Middle East counters for working.

District health system

Health status

The district has four health centers and 20 health posts; with ratio of 1:21246 health centers to population ratio and 1:4249 health posts to population ratio. Health center and health post coverage was above 100% in the district. In the district facilities, there are 50 Nurses, 9 Laboratory professionals, 9 Pharmacy technicians, 14 health officers, 0 Environmental health professional and 27 health extension workers.

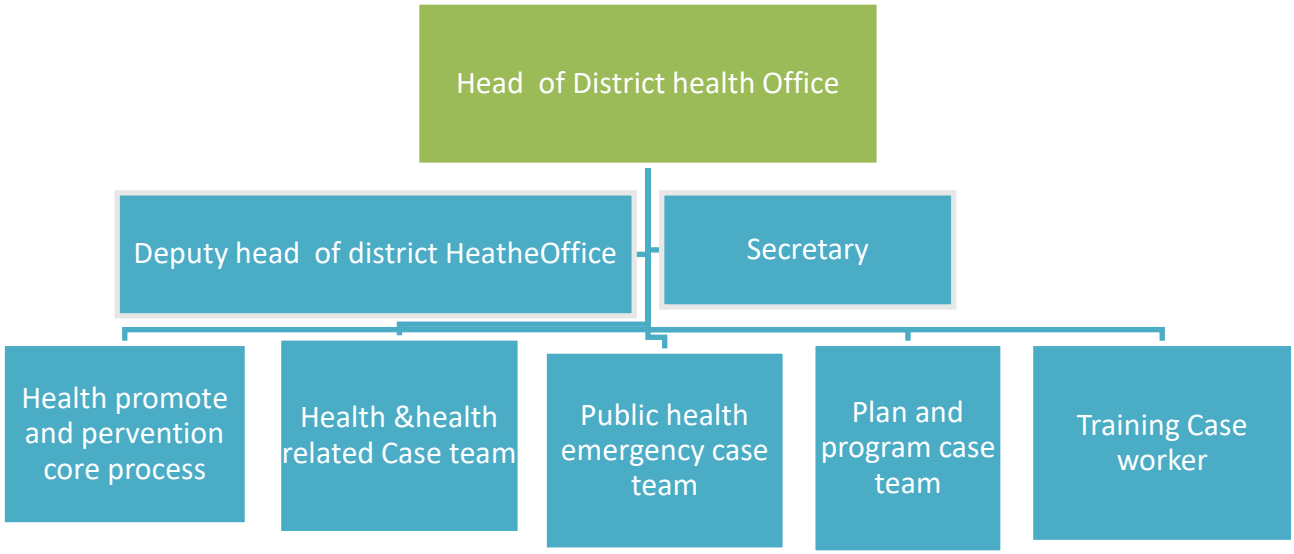


Figure 30: Organizational structure of Jile timuga district, Oromia zone, Amhara region, Ethiopia, 2014/15

Table 18: Number of health professional in Jile timuga district, Amhara region, 2014/15.

Sir No	Type of profession	No of professionals required (minimum profession)	No of professionals diploid	Gaps
1	Health officer	8	14	
2	Nurses	20	50	
3	Midwifery	8	8	
4	Laboratory technologies/ technicians	8	9	
5	Pharmacy technicians/pharmacist	8	9	

6	Environmental health	4	0	4
7	Health information technologist (HIT)	4	1	3
8	Health extension worker (HEW)	38	27	
Total			118	

Table 19: Ratio of health facility and professional to population in Jile timuga district, Amhara region, 2014/15

Sir No	Description	No of health facilities & professionals	Ratio	
			National standard	Jile timuga district
1	Health center: population	4	1:25,000	1:21246
2	Health post: population	20	1:5000	1:4249
3	Health officer: population	14	1:10,000	1:6070
4	Nurse: population	50	1:5,000	1:1700
5	Midwife: population	8	1:5,000	1:10623
6	HEW: population	27	1:2,500	1:3148

Vital Statistics and health indicators

Vital statistics like total death, total births, under one and under five deaths are not recorded in the district and indices for each specific indicator mentioned in the table 7 are from the national estimates, projected from the 2015/16 national census.

Table 20: Distribution of population and vital statistics, Jile timuga district, Amh, 2014/15.

Ser. No.	Parameter	Number (%)	Remark
1	Total population	84983 (100%)	
2	Male	41642(49%)	
3	Female	43341(51%)	
4	Under 1 years old	2642(3%)	
5	Under five years old	11056(13%)	
6	Under 15 years old	36228(43%)	
7	Urban	9152(11%)	

8	Female 15-49 years old	20039(24%)	
9	Pregnancy	2864(3%)	
10	Live birth	2864(3%)	
11	Average house hold size		
12	Dependency ratio	No Data	
13	Maternal mortality rate	No Data	
14	IMR/1000	No Data	
15	Under 5 MR/1000	No Data	
16	CBR/1000/year	No Data	
17	CDR/1000/year	No data	

Health budget allocation

The total budget for the district was 44,445,452 ETH birr from this budget allocate for district heath office including health facility was 7,580,372 in ETH birr in 2014/15. In the district UNCF, WHO, Global fund support the district health office for the implementation of different program.

Immunization coverage

As part of preventing and control vaccine-preventable diseases the district health system delivering vaccination activities for surviving children. Immunization coverage is a key indicator of EPI program performance. In the district the immunization coverage for surviving children is shown in the table below.

Table 21: Vaccination coverage by type of antigen in Jile timuga district, Amhara, 2014/15.

Sir No	Type of antigen	Coverage
1	BCG	80%
2	Penta1	109%
3	Penta3	104%
7	Measles	98%
8	Fully Immunization	96%
9	Penta 3 dropout rate	5%
10	Measles dropout rate	9%

Maternal health service coverage

Maternal health is the health of women safeguard during pregnancy childbirth and the postpartum period. It is one of the components of the millennium development goal which is reducing maternal and child death. To achieve this goal in the district health office were implemented family planning, NC and PNC activities in the district. In the district the maternal health services coverage for women is shown in the table below.

Table 22: Maternal health service coverage of Jile timuga district, Amhara region, 2014/15.

S.No	Type of service	Coverage (%)
1	Antenatal care (ANC) Coverage at least 1 visit (%)	133.8
2	Antenatal care (ANC) Coverage at least 4 visit (%)	47
3	Contraceptive acceptance rate (CAR (%))	55.7
4	Contraceptive prevalence rate (CPR (%))	51.1
5	Post-natal care (PNC) Coverage	60.6
6	Proportion of delivery attended by skilled personnel	40.5
7	TT2+ pregnant	97.7
8	TT2+ non pregnant	25.1

Hygiene and Environmental health services

The safe drinking water coverage of the wereda is 45% and the latrine service coverage is 57.3% and latrine utilization is 99% in the district. . In addition health education was given to the community on different topics such as Malaria, Trachoma, ANC, PNC, post abortion care, EPI, F/P, STD, HIV/AIDS and others health problems for a total of 21669 in 2007 EC at different places like at health facilities, schools, religious areas and others meeting and so on..

Table 23: Distribution of drinking water source in Jile timuga district, Ethiopia, 2014/15.

Sir No	Type of drinking water sources	Number	Functional
1	Hand dug pump	112	103
2	Protected spring	12	8
3	Shallow well	7	4
4	Deep well	5	5
Total		136	120

Leading causes of outpatient visits

In the district among top ten cause of morbidity the most frequently occurred diseases in adult outpatient department was acute upper respiratory tract infection (22.9%) and in under five OPD non bloody diarrhea (34.4%), the other top ten causes of morbidity were indicated in the table below but there was no data about the top ten causes of admission of morbidity and mortality in the district.

Table 24: List of top ten leading causes of morbidity in adult of OPD in Jile timuga district, 2014/15.

Sir No	Disease	Percent (%)
1	Acute upper respiratory tract infection	22.9%
2	Dysentery	16.6%
3	UTI	14.3%
4	AFI	10%
5	Helminthiasis	7.3%
6	Other unspecific infection and parasite diseases	7.7%
7	Mucskoskeletal	7%
8	Schistosomiasis	5.9%
9	Non bloody diarrhea	4.9%
10	Other unspecific diseases of skin	3.3%

Table 25: Top ten diseases of morbidity in under five years OPD in Jile timuga district, Oromia zone, Amhara region, 2014/15.

Sir No	Disease	Percent (%)
1	Non bloody diarrhea	34.4%
2	Acute upper respiratory tract infection	31.8%
3	Pneumonia	12.7%
4	Helminthiasis	6.9%
5	AFI	4.4%
6	Dysentery	3.3%
7	Skin infection	2.2%

8	Other unspecific infection and parasite diseases	2%
9	Other unspecific diseases of skin	1.6%
10	Otitis	1.2%

Endemic Diseases

Malaria

In Jile timuga district, Malaria is prevalent throughout the year and all 20 kebeles are malarious. In the last year 20526 febrile cases were tested among that 3900 cases were showed positive of malaria. From total positive, 3795 (97%) cases of P.falciparm and 1889 (3%) cases of P. vivax of species. From total positives 685 (18%) cases were under five and 3215 (82%) cases adult. The district health office conducts different activities to prevent and control malaria transmissions. Indoor residual spray, case management, environmental management were the main activities done to control and prevent the disease. In 2014/15, 47213(100%) ITN were distributed to all households and coverage of Indoor residual spray (IRS) 74% of households and environment management activities was 59%.In addition to prevention measures curative service were also strengthened in health post and health center. Moreover, there are no cases treated clinically.

Tuberculosis and Leprosy

In 2014/15, from a total of 147 patients were diagnosed with TB among those 27(18.4%) smear positive patients identified and started anti-TB drug and there was one registered leprosy patients. All TB patients were screened for HIV and nine patients were positive for HIV. HIV prevalence rate among TB cases was 6.1%. Table 14 shows tuberculosis data in Jile timuga District in 2015/16.

Table 26: All types of tuberculosis by sex in jiletimuga district, Oromia zone, Amhara, 2014/15

S. No	Cases		Number		
			male	Female	Total
1.	Total of TB cases		86	61	147
2.	Pulmonary TB	smear positive	17	10	27
		Smear negative	37	14	51

3.	Extra pulmonary TB	31	35	66
4.	TB case detection rate			77.3%
5.	TB treatment success rate			95%
6.	TB treatment cure rate			95%
7.	Defaulters	1	0	1
8.	Death	1	0	1
9.	Total TB patients screened for HIV			147
10.	HIV prevalence rate among TB cases	5	4	9
11.	Re-treatment	1	2	3
12.	No of Leprosy cases	1	1	2

HIV /AIDS

The district health office conducts different activities to prevent and control measure of HIV/AIDS those are counselling and testing services, health education and condom distribution services were given to the community. In 2014/15, a total of 6978 clients were screened for HIV among those females 80% (5605). From the total screened 27 (7 males and 20 females) diagnosed positive for HIV. The overall AR was 3.87 per 1000 population. Males experienced 5.1/1000 higher incidence than Females who have 3.57/1000. There were a total of 2349 of people living with HIV AIDS (PLWHA) at prevalence of 2.76%. Of those 252 patients were on ART in 2014/15. Condoms had been distributed to 2045 users. On the other hand there were 245 STI patients in the district.

Discussion

Jile timuga woreda have different topographic and climatic characteristics unlike most of the other districts in Oromia zone, mainly hot and dry low land areas. Traditional farming or agriculture, which is dependent mainly on seasonal rain fall pattern, is the major source of income for more than 95% of the population like many rural districts in the region. In the district the population age pyramid has showed predominately young which account 42.6% are under 15 year and most residents specially young group have been emigrated from their village to Middle East countries because of improve their life style but a lot of residents because of this affected to their social, economic and psychological effect come back to districts.

Infrastructures are the main component of to give quality health services to the society. In the district has limited infrastructure coverage; five of the kebelles have only electricity supply, three kebeles have not accessed road and the wereda drinking water service coverage was 45% w here as more than half of the households in Ethiopia (55%) have access to an improved source of drinking water (2).

As National target, one health center to serve 5 kebeles or 25000 populations and one health post to serve for 5000 population (3). In Jile timuga woreda have one health center served for 21246 populations and one health post served for 4249 population and they meet the national target. But none of health posts have water and electric power supply but all health centers have water supply and electric power in the district.

Regarding to the human personnel the district meets the minimum profession standard required national target set these are HO, Nurse, HEW to population ratio was 1:6070, 1:1700 and 1:3148 respectively.

The leading cause of outpatient visit morbidity in the district was acute upper respiratory tract infection which accounts 22.9% and following dysentery and UTI which constituted 16.6% and 14.3 % of adult OPD visits respectively. But in children the leading causes of morbidity was non-bloody diarrhea which accounts 34.4% and following acute upper respiratory tract infection and pneumonia which accounts 31.8% and 12.7% of OPD visits. In addition, the ten top diseases were not merely the major causes of morbidity in the district but also Malaria, TB/Leprosy and HIV/AIDS had their problem on the community health.

In the district malaria is prevalent throughout the year and all kebeles are malarias. National strategic plan for malaria prevention, control and elimination in Ethiopia 2020 is the slide positivity rate (SPR) of all febrile patients with suspected malaria is less than 5% or the incidence is < 5 per 1000 people at risk, it will be "pre-elimination" (4). But in the district Slide positivity rate was 19% and API 45.9 per 1000 at risk population. TB case detection rate in 2015/16 was 77.3% % and the detection rate is better compared to WHO case detection rate minimum standard or target (70%) in the district (5).

Expanded immunization program is one of preventions and control measures program performed under child health department. WHO set EPI coverage target for the control of vaccine preventable diseases. Jile timuga woreda, the overall EPI performance was achieved to WHO target. On the other hand, the dropout rate of Penta and measles was less than 10% and it is in the acceptable range.

To reduce maternal mortality rate and to achieve millennium development goal, different activities are delivered at health post and health center level in the woreda. ANC service is one of the activities done in all health facilities and 133.8% of the pregnant women in the woreda were taken 1st visit ANC services. On the other hand, 4th visit ANC coverage was 47% and it was revealed that poor quality of service to clients. Jile timuga woreda, coverage of delivery services attended in health facility was very low (40.5%).

Limitations

- Some essential health and economic indicators like maternal mortality, child mortality crude death rate and per capital income were not documented

Conclusion

In the district health facilities was constructed and meets as the national target set (above 100%) but most facilities have not accessed electricity supply, water with pipe, telephone, etc. because of these the service quality was affected. There are good achievement of health indicator in the district like health facilities and personnel to population's ratio, immunization coverage, ANC 1st, contraceptive acceptance rate and TB detection. On the other hand some health indicator under the target or standard and it needs improvement those gap which needs improvement such as ANC 4th, skilled delivery, malaria slide positive rate, annual malaria parasite incidence and IRS coverage were some of the major problems.

Therefore, prevention and control measure should be strength to reduce morbidity communicable diseases and other priority diseases.

Recommendation

- Appropriate essential data recording behavior should be strengthened as the data missed useful for planning, controlling action taking, and preparedness.
- Health facilities should be accessed water pipe, electricity supply, etc. for better quality service.
- Services which was less than the target or expected during the study period should be need improvements for the better health of the community.
- Prevention and control measures should be strengthened to reduce the morbidity of malaria, diarrhea, and other priority diseases in the district.

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Chapter V – Scientific Manuscripts for Peer reviewed Journals

Outbreak investigation of Scabies cases, Wadela district, Amhara, Ethiopia, 2017

Abstract

Background: Scabies is a neglected parasitic disease that is a major public health problem worldwide and endemic in many tropical and subtropical areas, such as Africa, Egypt, Central and South America, northern and central Australia, the Caribbean Islands, India, and Southeast Asia. Approximately 300 million cases are reported worldwide each year. Scabies affects people of all countries, particularly, children in developing countries are most susceptible, with an average prevalence of 5–10%. This study is help to investigate the contributing factors for the occurrence of the outbreak and provide appropriate control & prevention measures of the disease to stop the spread of outbreak.

Method and materials: We conducted 1:2 unmatched case-control study from February 10-25, 2017. 120 samples (40 cases and 80 controls) was selected conveniently and interviewed with structured questionnaire and all cases were collected through line list. Statistical analysis was made using Microsoft Excel, Epi info and SPSS software. Then, Odds Ratio, 95% CI and P-value used to measure the significance of association in bivariate and multivariate analysis

Result: Of 6760 reported cases, 3772 (56 %) were males. No death reported throughout the outbreak. Majority of 543 (AR 23%) scabies cases were occurred from Gashena town kebele and the younger age group 6-14 years was more affected by the disease with an age specific attack rate

(ASAR) of 6%. The mean age of cases was 13 (range, 5-45 years), the SD was ± 8.47 years and the mean of age controls was 41.3(Range, 10-81 years), the SD was ±17.13 years. The overall attack rate (AR) was 5 % in the district. Sleeping with contracted scabies case(AOR: 25.3,95% CI: 8.7-73.4 ,P: 0.0001), without soap take shower(AOR: 8.3, 95% CI: 1.7-40.7 ,P: 0.009), sleeping with other(AOR: 9.6, 95% CI: 2.3-40.1, P: 0.002), more than a week wash clothes(AOR: 3.8, 95% CI: 1.3-11.2, P: 0.02), more than a week change clothes(AOR: 6.3, 95% CI: 2.3-17.3, P: 0.0001) were significantly associated with scabies disease.

Conclusion: In this study, we found poor hygienic practices, overcrowding family member, sharing of clothing materials, sleeping with contracted scabies associated with higher frequency of scabies disease. Therefore, it seems that awareness creation about the signs, transmission, prevention and control methods of this disease to high risk groups help greatly to reduce the prevalence of scabies and prevent probably future epidemic.

Background

Scabies is a neglected parasitic disease that is a major public health problem worldwide and it affects people of all age groups, races and socioeconomic levels. Approximately 300 million cases are reported worldwide each year (1). Human scabies is caused by an infestation of the skin by the human itch mite *Sarcoptes scabiei* var.*hominis* (2). The incubation period before symptoms occur is 3–6 weeks for primary infestation but may be as short as 1–3 days in cases of re-infestation (3). Patients with typical scabies usually have only 10 to 15 live adult female mites on the body at any given time. When diagnosis and treatment are delayed, scabies can develop an unusual or atypical presentation, indicating infestation of hundreds to thousands of mites (4). Infestation is frequently complicated by bacterial skin infection, including impetigo, cellulitis, and abscess due to Streptococcus pyogenes and Staphylococcus aureus. Such bacterial skin infections predispose to serious supportive and non-supportive sequelae (5) .The most commonly affected areas are the hands, feet, the inner part of the wrists and the folds under arms (6).The predominant route of transmission of Scabies is by direct, prolonged skin-to-skin contact with an infected person (7). Scabies has been classified as a water shortage disease because of its association with inadequate water supply leading to poor personal hygiene and thus increased risk of transmission (8).Treatment of scabies infection is includes topical or oral administration of a scabicidal agent (9) .Scabies is commonly observed in very young children followed by older children and young adults (10) . Some immunocompromised, elderly, disabled, or

debilitated persons are at risk for a severe form of scabies called crusted, or Norwegian, scabies (11). Multiple factors like poverty, low socioeconomic conditions, poor hygiene, illiteracy, overcrowded sleeping space, sharing of clothes and sharing of towels have frequently been cited as risk factors for scabies throughout the world (12) .Scabies affects people of all countries, particularly, children in developing countries are most susceptible, with an average prevalence of 5–10%. The highest incidence is in tropical climates, with rates of up to 25% overall and up to 50% in some communities in the South Pacific and northern Australia (13). Scabies is list among the top 50 most prevalent diseases worldwide, with a global prevalence of 100,625,000 in 2010 (1.5% of the world population)(14). The International Alliance for the Control of Scabies (IACS) is a recently formed group from across the globe to advance the agenda of scabies control (15). The purpose of this study is to identify the risk factors for the occurrence of the outbreak and provide appropriate control & prevention measures of the disease.

Materials and Methods

The outbreak investigation was conducted in Gonchere kebeles of Wadala district, North wollo zone, Amhara regional. The district is the district town which is located 127kms far from Woldiya town and 252km far from the regional town Bahir Dar. The district shares with the Delanta district to East, Mekit district to the West, Gazo district to the North and Dawnt district to the South. An unmatched case-control study s was conducted in district February 10-25, 2017. 120 samples (40 cases and 80 controls) were selected simple random sample and interviewed with structured questionnaire and all cases of line list was collected. Statistical analysis was made using Microsoft Excel, Epi info and SPSS software. Then, Odds Ratio, 95% CI and P-value used to measure the significance of association in bivariate and multivariate analysis. Case definition of the case is any person with generalizing itching which often becomes worse at night, and abnormal skin lesions which are papules, pustules, nodules or urticarial.

Results

Descriptive Epidemiology

Out of 29 kebeles of Wadela district, 27(93%) kebeles were affected by outbreak. We identified 6760 cases of scabies with no death in the district. Majority of 543 (AR 23%) scabies cases were occurred from Gashena town kebele and followed by Gashena rural kebele 408 scabies cases (AR 14%) and Dele/Dega kebele 432 scabies cases (AR 11%) among the affected kebeles in the district. Of the cases 3772 (56 %) were males while the rest 2988 (44 %) were females. The

younger age group 6-14 years was more affected by the disease with an age specific attack rate (ASAR) of 6% followed by age group >= 15 years of 5% and the children age groups 2-5 years of 4%. Case control study was conducted, there were 40 scabies cases (20 males and 20 females) with mean age of cases was 13 (range, 5-45 years), the SD was ± 8.47 years and 80 controls (22 males and 58 females) with mean of age of 41.3(Range, 10-81 years), the SD was ±17.13 years.

Table 27: Age specific attack rate, Wadela district, North Wollo zone, Amhara, Ethiopian 2017

Age Group (year)	Number of cases	Total No of population	Age specific Attack rate (%)
< 2	164	7056	2%
2-5	455	11982	4%
6-14	2362	41209	6%
>= 15	3779	80879	5%
Total	6760	141126	5%

Table 28: Distribution of Scabies cases by sex in Wadela district, N/Wollo zone, Ethiopia, 2017

Sex	Frequency	Population	Rate
Male	3772 (56%)	71269	5.3%
Female	2988 (44%)	69857	4.3%
Total	6760	141126	4.8%

The first date of onset of itching was on January 21/2016 but the outbreak was reported in January 2017 in weekly report. The outbreak investigation was started February 10/2017 and intervention was under taken.

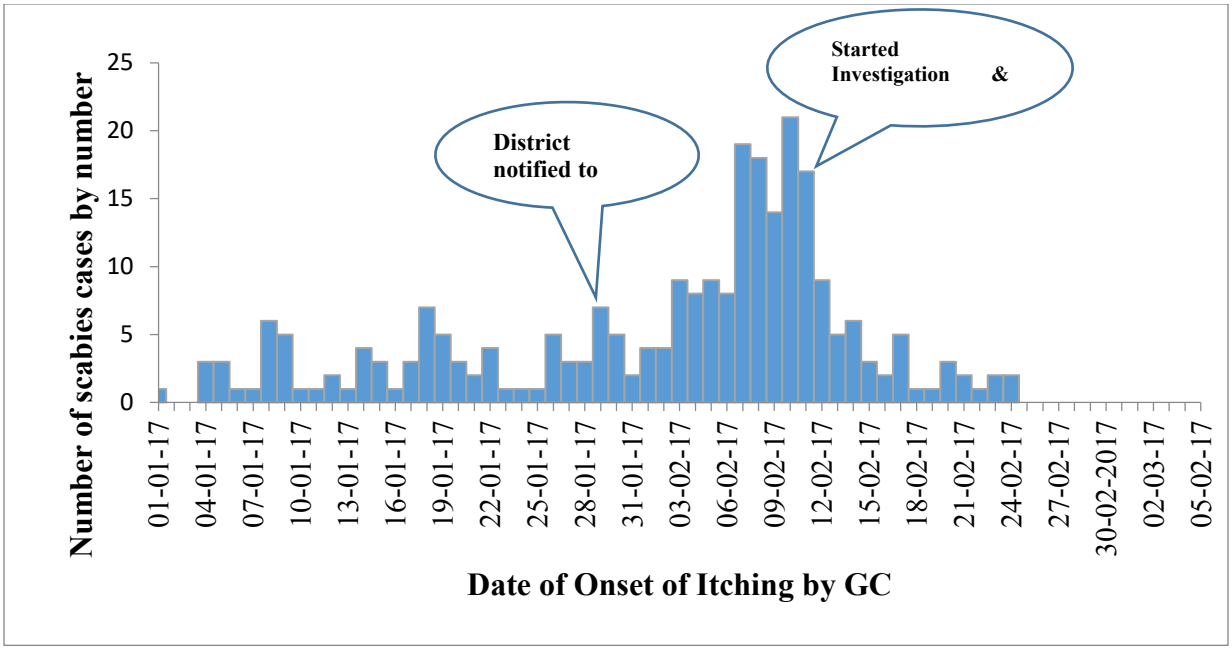

Figure 31: Epi curve of scabies disease outbreak in Ganchere kebele, Wadela district, N/wollo zone, Amhara, 2017

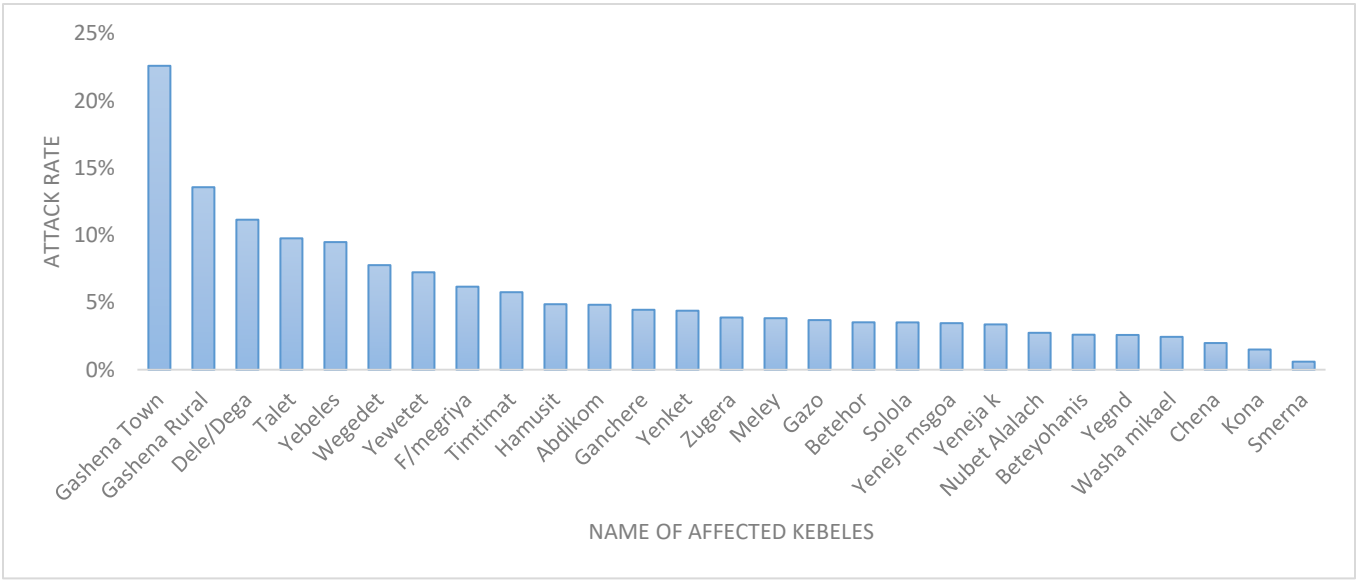

Figure 32: Rate of Scabies cases by kebeles in Wadela woreda, N/wollo zone, Ethiopia, 2017

All 40 (100%) scabies cases first experienced sign and symptoms were manifested with itching and 100% intensity of itching is high at night. The body part mainly affected during the outbreak investigation were finger webs 20 (50 %), Ulnar border of the hand 9 (22.5 %), inner aspects of thighs 7 (17.5 %), face palm and sole 3 (7.5 %) and Inter- Gluteal 1 (2.5 %). When we observed

scabies infection skin examination form 40(100%) were seen scabies lesion and from these eight cases (20%) developed with crusted/Norwegian scabies.

Marital status of the respondents (cases and controls) were 64(53.3%) married, 49(40.8%) single and the remaining were divorced and widowed. All respondents were follower of orthodox religion. Occupational status of the respondents 17(33.3%) were 81 (67.5%) farmer and 18(15%) students. Education level of the respondents were 100(83.3%) not educated, 14(11.7%) elementary students and 6(5%) reading and writing.

Table 29: Distribution of respondents according to their marital status, Wadela woreda, 2017

Marital status	Frequency		Cumulative Percent
	Number	%	
Single	**49**	**40.8**	**40.8**
Married	**64**	**53.3**	**94.2**
Divorced	**4**	**3.3**	**97.5**
Widowed	**3**	**2.5**	**100**
Total	**120**	**100**	

Table 30: Distribution of respondents according to their occupation, Wadela woreda, 2017

Type of occupation status	Frequency		Cumulative frequency
	Number	%	
Farmer	81	67.5	67.5
Student	18	15	82.5
Housewife	13	10.8	93.3
Merchant	1	0.8	94.2
Other/Kids	7	5.8	100
Total	120	100	

Analytic epidemiology

We selected 40 scabies cases with 80 controls. The mean age of the cases and controls was 31.8, range was 5-81 years old and SD $\pm$ 19.95. The statically significant variables in bivariate analysis are sleeping with contracted scabies disease COR 26.7(CI 9.63-74.14),P =0.001 , wearied clothes

of someone who was diseased in the previous six weeks COR 3.4 (CI 1.32-8.6, P=0.011 , sleeping with other COR 6 (CI 1.95-18.49), P =0.002 , more than a week take shower COR 3.8 (CI 1.33-10.7), p =0.013, without soap to take shower COR 7.5(CI 1.89-29.37), P = 0.004 , more than a week wash clothes COR 4.1(CI 1.61-10.25), p=0.003 , more than a week change clothes COR 5.7 (CI 3.5- 20), P =0.001 , have someone else with scabies disease in the previous 6 weeks COR 3.4 (CI 1.32-8.6),P=0.011 were potential risk factors of an outbreak of scabies diseases but age COR 0.3(CI 0.1-0.85),P=0.02, sex COR 0.4(CI 0.17-0.84),P=0.01, weekly taking shower COR 0.2(CI 0.07-0.64),P=0.006, weekly washing clothes COR 0.2(CI 0.08-0.54),P=0.001 ,change clothes every week COR 0.2(CI 0.12-0.54),P=0.001 , sleeping alone COR 0.2(CI 0.05-0.51),P= 0.002 , Use detergent to take shower COR 0.2(0.07-0.74),P = 0.01 were preventive factors.

Table 31: Bivariate analysis of risk and preventive factor for Scabies cases outbreak, Wadela district, 2017

Variables		Case (N=40)	Control (N=80)	COR(95% CI),p-value
Without soap take shower	Yes	9(75%)	3(25%)	7.45(1.89-29.37), P = 0.004
	No	31(28.7%)	77(71.3%)	
Sleeping with other	Yes	36(42.9%)	48(57.1%)	6(1.95-18.49), P =0.002
	No	4(11.1%)	32(88.9%)	
More than a week take shower	Yes	35(40.2%)	52(59.8%)	3.77(1.33-10.7), p =0.013
	No	5(15.2%)	28(84.8%)	
More than a week wash clothes	Yes	33(43.4%)	43(56.6%)	4.06(1.61-10.25), p=0.003
	No	7(15.9%)	37(84.1%)	
More than a week change clothes	Yes	25(58.1%)	18(41.9%)	5.74 (3.5- 20), P =0.001
	No	15(19.5%)	62(80.5%)	
Have someone with the diseases in the previous six weeks	Yes	18(51.4%)	17(48.6%)	3.37(1.32-8.6),P=0.011
	No	22(25.9%)	63(74.1%)	
Wearied clothes of someone else with the diseases in the previous six weeks	Yes	13(56.5%)	10(43.5%)	3.37(1.32-8.6, P=0.011
	No	27(27.8%)	70(72.2%)	
	Yes	33(73.3%)	12(26.7%)	26.71(9.63-74.14),P =0.001

Sleeping with contracted scabies disease	No	7(9.3%)	68(90.7%)	
Use soap take shower	Yes	31(29.2%)	75(70.8%)	0.23(0.07-0.74),P = 0.01
	No	9(64.3%)	5(35.7%)	
Sleeping alone	Yes	4(11.1%)	32(88.9%)	0.17(0.05-0.51),P= 0.002
	No	36(42%)	48(58%)	
Weekly take shower	Yes	4(12.5%)	28(87.5%)	0.21(0.07-0.64),P=0.006
	No	36(41%)	52(59%)	
Weekly wash clothes	Yes	6(14%)	37(86%)	0.21(0.08-0.54),P=0.001
	No	34(44.2%)	43(55.8%)	
Weekly change clothes	Yes	15(20.8%)	57(79.2%)	0.24(0.12-0.54),P=0.001
	No	25(52%)	23(48%)	
Knowledge of mode of transmission on scabies disease	Yes	22(57.9%)	16(42.1%)	4.9(2.1-11.2),P=0.001
	No	18(22%)	64(78%)	
Number of family	<4	5(16%)	26(84%)	0.3(0.1-0.85),P=0.02
	≥4	35(39.3%)	54(60.7%)	
Sex	Female	20(47.6%)	22(52.4%)	0.38(0.17-0.84),P=0.01
	male	20(25.6%)	58(74.4%)	
Age	<15	20(46.5%)	23(53.5%)	0.3(0.1-0.85),P=0.02
	≤15	20(26%)	57(74%)	

Potential risk factors that remained statistically significantly associated with the disease in multivariate logistic regression analysis were sleeping with contracted scabies case AOR 25.3(CI 8.7-73.4), P =0.0001, without soap take shower AOR 8.3(CI 1.7-40.7), P = 0.009, sleeping with other AOR 9.6(CI 2.3-40.12), P =0.002, more than a week wash clothes AOR 3.8(CI 1.3-11.2), p=0.02 and more than a week change clothes AOR 6.3(CI 2.3-17.3), P =0.0001. On the other hand, protective factors that remained statistically significantly associated with the diseases on multivariate logistic regression analysis were age AOR 0.4(CI 0.15-0.8), p=0.01, use soap to take shower AOR 0.2(CI 0.03-0.74), P = 0.02, sleeping alone AOR 0.1(CI 0.02-0.4), P= 0.001, weekly wash clothes AOR 0.2(CI 0.06-0.6),P=0.004 and weekly change clothes AOR 0.2(CI 0.07-0.6),P=0.002.

Table 32: Multivariate analysis of risk and preventive factors of scabies cases outbreak, Wadela district, N/Wollo Zone, 2017

Variables		Case (N=40)	Control (N=80)	AOR(95% CI),p-value
Without soap take shower	Yes	9(75%)	3(25%)	8.3(1.7-40.7), P = 0.009
	No	31(28.7%)	77(71.3%)	
Sleeping with other	Yes	36(42.9%)	48(57.1%)	9.6(2.3-40.12), P =0.002
	No	4(11.1%)	32(88.9%)	
More than a week wash clothes	Yes	33(43.4%)	43(56.6%)	3.8(1.3-11.2), p=0.02
	No	7(15.9%)	37(84.1%)	
More than a week change clothes	Yes	25(58.1%)	18(41.9%)	6.3(2.3-17.3), P =0.0001
	No	15(19.5%)	62(80.5%)	
Sleeping with contracted scabies case	Yes	33(73.3%)	12(26.7%)	25.3(8.7-73.4),P =0.0001
	No	7(9.3%)	68(90.7%)	
Use soap take shower	Yes	31(29.2%)	75(70.8%)	0.16(0.03-0.74),P = 0.02
	No	9(64.3%)	5(35.7%)	
Sleeping alone	Yes	4(11.1%)	32(88.9%)	0.09(0.02-0.4),P= 0.001
	No	36(42%)	48(58%)	
Weekly wash clothes	Yes	6(14%)	37(86%)	0.2(0.06-0.6),P=0.004
	No	34(44.2%)	43(55.8%)	
Weekly change clothes	Yes	15(20.8%)	57(79.2%)	0.2(0.07-0.6),P=0.002
	No	25(52%)	23(48%)	
Sex	Female	20(47.6%)	22(52.4%)	2.6(1.2-5.9),p=0.03
	male	20(25.6%)	58(74.4%)	
Age	<15	20(46.5%)	23(53.5%)	0.35(0.15-0.8),p=0.01
	≤15	20(26%)	57(74%)	

Intervention under taken

Treatment was given for adult 71% Ivermectine, 24% sulfur and 4% BBL in the campaign. We were taken awareness creation on all household contacts should be treated at the same time even if asymptomatic and reapply the topical scabicide to the hands if they are washed during the treatment period.

Discussion

Scabies is endemic in many tropical and subtropical areas, such as Africa, Egypt, Central and South America, northern and central Australia, the Caribbean Islands, India, and Southeast Asia (13) Different study showed that the primary contributing factors in contracting scabies seem to be poor hygiene, poverty and overcrowded living conditions(17)

A community-based study from Brazil showed prevalence of 9.3% with 15.5%, of their patients <15 years old (3). and in rural India 13%(18). A hospital based observational study in Tando Muhammad Khan showed that 50% of their patients were children under the age of 14 years was 6%(19) In Egyptian children, the prevalence was estimated to be 5%(15) As compared to our study, where the patients under the age 15 years were 5%. All the above results and comparisons that scabies is most common in children as compared to adults that might be due to low immunity level or direct physical contact with their families.

In a cross sectional study was conducted in Bangladesh in which female frequency was less than males (16). As compared to our study, about 56% of patients affected from scabies were males as compared to females who were 44%. The slight difference to females might be due to the fact that most of the males were cowherd and busy working throughout the day in our socioeconomic setting, and not giving due importance to the illness.

Major symptoms which identified in this outbreak were itching and worse at night. Generally Itching is the main symptom of scabies. This is often severe and tends to be in one place at first (often the hands), and then spreads to other areas. Frequency of patients of scabies was approximately 74% in houses where the people living were six or more as compared to 26% in houses where people living per household were five or less (20) .

Family size was associated with the occurrence of scabies in our study, 87.5% cases in houses where the people living were four or more as compared to 12.5% in houses where people living per household were less four. This finding might be, crowded living conditions, in particular

overcrowding for sleeping space, and sleeping habits have been important contributory risk factors for scabies.

The potential risk factors included in our study were those pertaining to personal hygiene practices, living conditions and knowledge of mode of transmission, prevention and control scabies disease. Low level of education was found in our study to be one of the risk factors contributing towards development of scabies. Less-educated individuals were more prone to having scabies. The reason is probably that less-educated people are less conscious of the importance of personal hygiene and the role of poor hygiene in the spread of communicable diseases.

Conclusion

Scabies is a under reported health problem in our community. In this study, we found poor hygienic practices, overcrowding family member, sharing of clothing materials, sleeping with contracted scabies associated with higher frequency of scabies disease. Therefore, it seems that awareness creation about the signs, transmission, prevention and control methods of this disease to high risk groups help greatly to reduce the prevalence of scabies and prevent probably future epidemic. Increasing knowledge about scabies diseases and having good hygiene are the proper methods for controlling scabies disease outbreak in the community.

Recommendation

- Active surveillance should be improve to early detect the cases and to give prompt response in the community.
- Provision of education on scabies shall be given in the community to promote the awareness of the community on the modes of transmission scabies and prevention measures.
- Prompt treatment should be given for the cases and contact to stop the spread of disease outbreak and complicated scabies.

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Chapter VI- Abstracts of Scientific Conferences

6.1 Outbreak Investigation of Scabies Disease in Wadela District, North Wollo zone, Amhara, Ethiopia, 2017: Case-control Study

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Background: Scabies is a neglected parasitic disease that is a major public health problem worldwide and endemic in many tropical and subtropical areas. Approximately 300 million cases are reported worldwide each year. Scabies affects people of all countries, particularly, children in developing countries are most susceptible, with an average prevalence of 5–10%.

Methods: We applied the case definition, any person with generalizing itching which often becomes worse at night, and abnormal skin lesions which are papules, pustules or nodules. We conducted 1:2 unmatched case-control study from February 10-25/2017. Data was collected using structured questionnaire. Analysis was made using Epi Info and SPSS software. Then, Odds Ratio, 95% CI and P-value used to measure the significance of association in bivariate and multivariate analysis.

Results: Of 6760 reported cases, 3772 (56 %) of them were males. 543 (AR 23%) scabies cases were occurred from Gashena town kebele and the younger age group 6-14 years was more affected by the disease with an age specific attack rate (ASAR) of 6%. The overall attack rate (AR) was 5 % in the district. Sleeping with contracted scabies case(AOR: 25.3,95% CI: 8.7-73.4 ,P: 0.0001), without soap take shower(AOR: 8.3, 95% CI: 1.7-40.7 ,P: 0.009), sleeping with other(AOR: 9.6, 95% CI: 2.3-40.1, P: 0.002), more than a week wash clothes(AOR: 3.8, 95% CI: 1.3-11.2, P: 0.02), more than a week change clothes(AOR: 6.3, 95% CI: 2.3-17.3, P: 0.0001) were significantly associated with scabies disease.

Conclusion: we found poor hygienic practices, overcrowding family member, sleeping with contracted scabies associated with higher frequency of scabies disease. Therefore, it seems that awareness creation about the signs, transmission, prevention and control methods of this disease to high risk groups help greatly to reduce the prevalence of scabies and prevent outbreak.

Key words: Scabies, case-control, Wadela, Ethiopia, 2017

6.2 Sever Acute Malnutrition Relationship to Crop Production and Climate Variability in Under 5 years Children, Waghimira, Ethiopia, 2012-2015: Cross Sectional Study

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Background: Severe acute malnutrition remains a major killer of children under five years of age. Globally, every year, severe acute malnutrition (SAM) affects nearly 20 million children under five, 3.5 million children die of malnutrition-related causes. An El-Nino effect which affects many countries globally including Ethiopia which had manifested with shortage of rainfall and increasing of temperature. The purpose of this assessment was to characterize the pattern and magnitude of sever acute malnutrition interrelationship to annual crop production and climate variabilities.

Methods: We applied the case definition, Children aged from 6 to 53 months with MUAC less than 11cm and/or children with nutritional bilateral oedema. We conducted descriptive cross sectional study from 2012-2015. Data was collected four years of sever acute malnutrition, crop production and climate variability from concerned sectors.

Results: Of 17664 reported cases, 98.2% of them were MUAC less than 11 cm. The zonal prevalence of SAM was 65.5/1000 aged from 6-53 months. The highest of SAM case was reported 5023 (28.4%), rate 73/1000 per risk children in 2014. The correlation coefficient of sever acute malnutrition cases and crop production was negative 0.3 and the correlation coefficient of rain fall and crop production was 0.6.

Conclusion: The zone has highly prevalent of sever acute malnutrition cases aged 6-53 months' children. Sever acute malnutrition cases, crop production and climate variability have a reasonable relationships between them. Sever acute malnutrition cases and crop production has negative relationship because of its correlation coefficient was negative value and crop production and climate variability have positive relationships because of its correlation coefficient was positive value.

Key words: Sever acute malnutrition, Crop production, Climate variability, Ethiopia, 2012-2015

Chapter VII- Narrative Summary of Disaster Situation Visited

Belg Assessment Report on Non-food, N/wollo & N/ Shewa, Amhara, 2016

Summary

Health emergency need assessment is essential to predict the magnitude of the emergency threats and accordingly to make the necessary plans and preparations to prevent unnecessary human damage, morbidities and deaths. Ethiopia has been conducting human health and nutrition emergency needs assessment twice a year following Meher and Belg seasons in coordinated with food security assessment leaded by Disaster Risk Management and Food Security Sector. The Ethiopian Ministry of Agriculture and the regional DPPBs in collaboration with Ministry of Health, Ministry of Energy and Water resources, respective regional bureaus and different partners has conducted belg season need assessment of 2016.

A total of 6 districts were assessed from 2 zones (N/Wollo and N/Shewa) for health and nutrition emergencies. Belg season assessment was conducted from June 4-19 /2016 in the zone and selected districts. The overall objective of the assessment is to contribute in ensuring appropriate and effective humanitarian planning and responses, which will lead to reducing morbidity, mortality and malnutrition in the most vulnerable areas of Amhara Region. A cross-sectional study design was used to assess and identify human health and nutrition emergency needs in the next six upcoming months. The assessment team was composed of more than 23 experts from federal, regional state and different with working together partners. Structured questioners were used for data collection. Two different questioners were used to collect health and nutrition related data at district and zonal levels. In addition to the structured checklists, observations and discussions with concerned experts of the woreda health office and health facilities were made.

The total population in these visited districts is 847767 of which 433724 are males, 414043 females and 114154 constitute under five years old children. Wadila (17%) followed by Gidan (16.8%) has the highest population from the total assessed district. Kewet (10%) is the least in population size. multi-sectorial epidemic prevention and control committee at the two zones and seven districts assessed during the belg assessment were existed but they were not conduct regular meeting. there was an outbreak of Influenza like illness in North wollo of 801 cases, scabies in N/Shewa of 34 cases & N/Wollo 17,985 cases and 22 number cases of Measles from N/Wollo zone in the last three months. According to 2008 EFY (2015/2016) report, diarrhea, Pneumonia, AFI, Helminthiasis and AURI were the top five leading cause of morbidity in less

than 5 year children in the assessed woredas. The all visited zones and districts have no sufficient drugs and medical supplies to treat diseases of major public importance such as malaria, measles, meningitis and AWD. All health posts are available in the assessed woredas and all are giving OTP services. In addition, of 38 cluster health centers, 27(71%) are established SC and all are currently reporting**.** GAM of children(6-59months) in Menz Gera of N/Shewa zone , Lasta and Gidan of N/Wollo zone was 10.6%(April 2008), 14.6%(May 2008) and 10.7%(May 2008) respectively. Improvement of GAM of children in M/Gera was significant (26.7% in October 2008 & 10.6% in April 2008). GAM of Children in Gidan was increased from 3.6% in October 2008 to 10.7% in May 2008 EC. On average in the last eight months GAM of Gidan Children increased by 10.35%. Other, GAM of Lasta's children has shown no improvement.

In general there are no active epidemic prevention and control committee at both zonal and district level. Currently there is no any ongoing outbreak reported from all visited zones. Both zonal and the district level there is shortage of drug and medical supplies stock.

Multi-sectoral epidemic prevention and control committee should be strengthened at both zonal and district levels. The committee should be meeting regularly and have a minute for each separate meeting. And also the committees should have public health emergency preparedness and response plan. Drugs and medical supplies for emergency response should be stockpiled at district level.

Introduction

Ethiopia has been conducting human health and nutrition emergency needs assessment twice a year following Meher and Belg seasons in coordinated with food security assessment leaded by Disaster Risk Management and Food Security Sector. The Ethiopian Ministry of Agriculture and the regional DPPBs in collaboration with Ministry of Health, Ministry of Energy and Water resources, respective regional bureaus and different partners has conducted belg season need assessment of 2016. On the belg assessment both government and nongovernmental organizations (Ministry of Agriculture, Disaster Risk Management and Food Security Sector, Ministry of Health, Ministry of Water and Energy, National Metrology Agency and respective regional bureaus, WHO, UNICEF, FAO,WFP,OCHA, Goal, Concern, SCI, Plan International, IOCC ,IFH and IOM) had been participated. During the assessment possible human health and nutrition risks were expected to be identified and numbers of beneficiaries were estimated.

Finally using the results of the assessment humanitarian requirements document (HRD) developed and distributed to all partners to fill the gaps identified to avert and minimize public health consequences. Hence, health emergency need assessment is essential to predict the magnitude of the emergency threats and accordingly to make the necessary plans and preparations to prevent unnecessary human damage, morbidities and deaths.

Amhara region is one of the nine administrative regions in the country. It is the second populated with the total population of 20,679,999 (CSA, 2015). The region is shared the boundary with four national regions (Oromia, Tigray, Afar & Benshangul Gumze) and one international country Sudan and .In the region there are 9 zones and three administrative cities, 167 woredas zones and about 3345 kebeles, from which 318 are urban kebeles.

In the region, more than 10 million populations are affected by the El Niño effect and the region has identified priority districts (44 priority one, 27 priority two and 7 priority three). In the year 2015/2016, El Niño driven such as scabies, H1N1, measles and pertussis outbreaks as well as malnutrition and water shortage are some of the prevailing public health emergencies reported in the region. A total of 6 districts were assessed from 2 zones (N/Wollo and N/Shewa) for health and nutrition emergencies. Belg season assessment was conducted from June 4-19 /2016 in the zone and selected districts.

Objective

General objective

The overall objective of the assessment is to contribute in ensuring appropriate and effective humanitarian planning and responses, which will lead to reducing morbidity, mortality and malnutrition in the most vulnerable areas of Amhara Region.

Specific objectives

- To assess the type, magnitude, and likelihood occurrence of different public health emergencies in the most vulnerable (selected) woredas
- To assess the existing capacity of the health system in managing public health emergencies
- Based on the findings, to develop emergency preparedness plans for the region

Methods and Materials

Study design: A cross-sectional study design was used to assess and identify human health and nutrition emergency needs in the next six upcoming months.

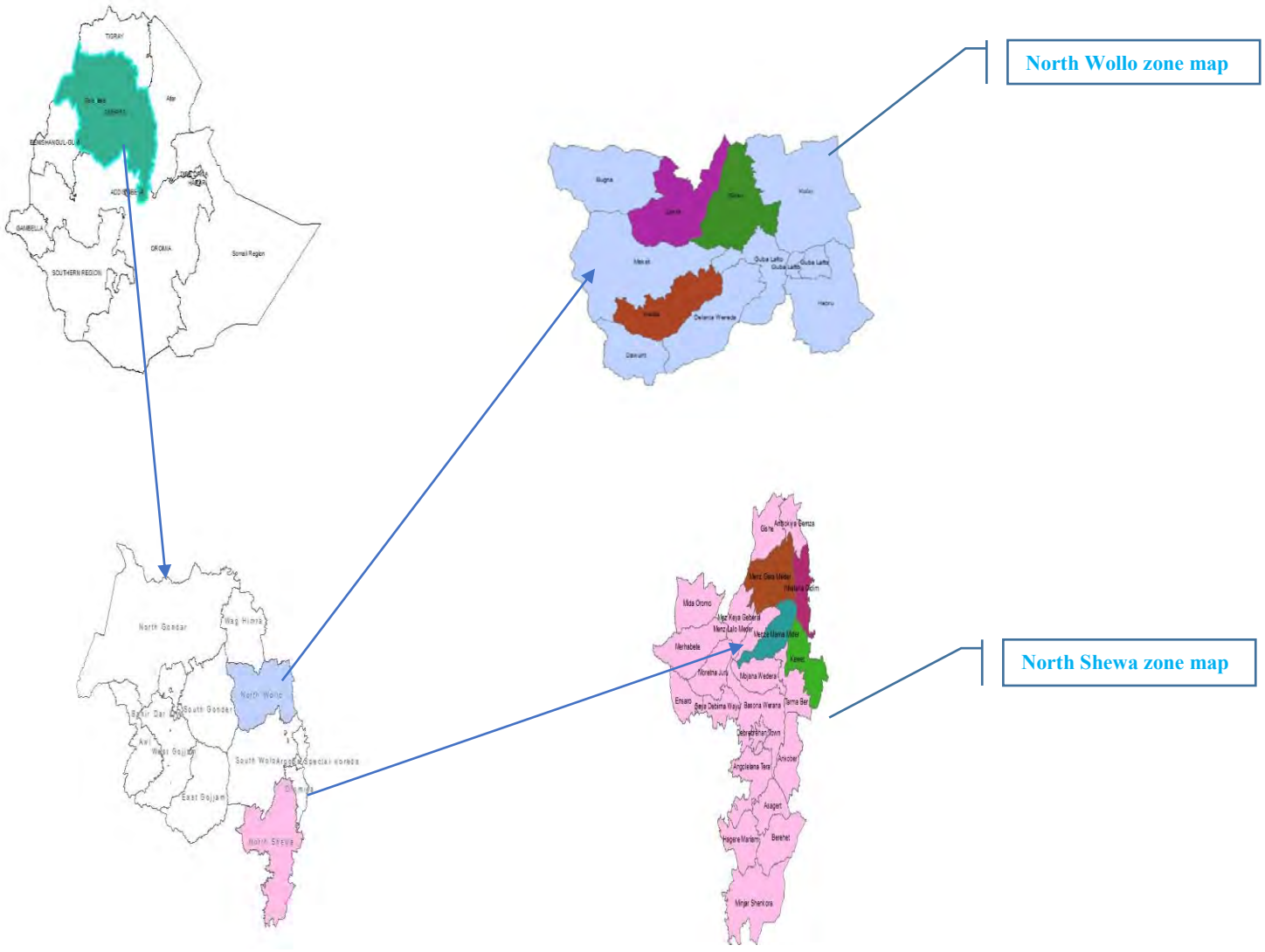
Study Area: The assessment was conducted in North Shewa, and North wollo in Amhara Region. From two zones which of seven districts were selected and visited during the assessment. The zones and districts were selected based on their capacity of belg growing production by regional DPPB.

Study period: this multi sectorial belg assessment was conducted from June 4 to 19, 2016.

Assessment Team: The assessment team was composed of more than 23 experts from federal, regional state and different with working together partners. The half a day training was given for all assessment team members at regional DPPB before deployed to zones on assessment tools and on data collection techniques. The team was classified into two sub group as food and noon food section based on their working organization and Collect data from respective sectors.

Assessment Tools: Structured questioners were used for data collection. Two different questioners were used to collect health and nutrition related data at district and zonal levels. In addition to the structured checklists, observations and discussions with concerned experts of the woreda health office and health facilities were made. The questioners addresses status of epidemic prevention and control multi sectoral coordination committee at all levels and go through asking ongoing epidemic situation and check availability of emergency drug at zonal and district levels .

Source of Data: Both primary and secondary data were collected from zonal health departments, district health offices and health facilities. Head of zonal health departments and district health offices, logistic officer, public health emergency management officers, maternal and child health officers were interviewed.



Maps 8: Map of belg assessment conducted districts in N/Wollo and N/Shewa zones, Amhara, 2015/16.

Results

A Health section

1, Zonal level

Socio-demographic profile: In north Shewa zone has 2151896 total populations of which 1106401 are males and 1045495 are females. The zone has 27 total districts of which 22 rural districts and five urban administrative districts and 389 rural and 54 urban kebeles administrative. 52%, 29% and 19% topography of the zonal geographic area are high land, temperate and lowland respectively. In the zone there are 6

hospitals, 92 health centers, 389 health posts providing both primary and secondary health service for the zonal populations.

Similarly, North wollo there are 1643251 total populations of which 808479 are males and 834772 are females. The zone has 12 total districts of which 9 rural districts and 3 urban administrative districts and 260 rural and 20 urban kebeles administrative. In the zone there are 3 hospitals, 65 health centers, and 273 health posts providing both primary and secondary health service for the zonal populations.

Coordination: multi-sectorial epidemic prevention and control committee at the two zones assessed during the belg assessment were existed. The committee consists of all expected governmental and non-governmental sectors and leaded by zonal administrator's having head of health department as secretary which meeting conducted weekly in N/Shewa but monthly in N/Wollo zone.

Outbreaks: In the assessed zones there was an outbreak of Influenza like illness in North wollo of 801 cases, scabies in N/Shewa of 34 cases & N/Wollo 17,985 cases and 22 number cases of Measles from N/Wollo zone in the last three months.

Ongoing Outbreak: There is no any ongoing epidemic in all districts of assessed zones of Amhara regional states. As of the discussion with Kewet health office the weekly malaria report shows that case build up but the cases increasing with compared the previous week in the same year but it did not fulfill outbreak criteria based on threshold .

Anticipated Epidemics: based on the assessment findings, AWD, Measles, Malaria, malnutrition and Dysentery were anticipated epidemics in the coming months.

Public health Emergency Management: At the all assessed zonal level there was available public health emergency preparedness and response plan but not budgeted. There is no any budget allocated to prevent and control in case any epidemic occurred. If any epidemic happens the zonal health departments and zonal epidemic prevention and control committees mobilize any available resources. At least one trained about public health emergency management staff is working in zonal health departments.

Stock: The all visited zones have no sufficient drugs and medical supplies to treat diseases of major public importance such as malaria, measles, meningitis and AWD. North wollo zone drug stock information's have not available because of a store man not present at visited time.

2. District Level

Socio-demographic:

During belg health and nutrition emergency needs assessment three district was visited from each zone. Menzi Gera, Menzi Mama, Efrata gidim and Kewet districts of North Shewa zone, Gidan, Lasta and Wadila district of North wollo zone were assessed during the assessment. The districts were selected by respective zonal DPPBs based on belg growing capacity and natural disasters.

The total population in these districts is 847767 of which 433724 are males, 414043 females and 114154 constitute under five years old children. Wadila (17%) followed by Gidan (16.8%) has the highest population from the total assessed district. Kewet (10%) is the least in population size (See table for name of districts and zones).

Table 33: population compositions of districts visited during Belg assessment in Amhara

Ser. No	District	Total population	Male	Female	Under five
1	AM-N Wello-Gidan	145968	72838	73130	19764
2	AM-N Wello -Lasta	117343	58906	58437	15888
3	AM-N Wello -Wadila	148055	73287	74768	20047
4	AM-N Shewa-Menzi gera	117515	58170	59345	15864
5	AM-N Shewa-Menzi Mama	98422	58069	40353	13326
6	AM-N Shewa-efrata gidim	131462	65074	66388	17800
7	AM-N Shewa-Kewet	89002	47380	41622	11465
	Total	847767	433724	414043	114154

Coordination: There was an established multi sectorial PHEM coordination forum in Menzi mama, Menzi Gera and Efrat gidim districts but they were not conduct regular meeting. However, Kewet, Lasta, Wadila and Gidan have no PHEM coordination forum. The committee have been leading by respective district administrator and having head of district health office as secretary.

Public health Emergency Management: At the all visited weredas there was available public

health emergency preparedness and response plan and it includes reproductive health but not budgeted except Efratagidim in North Shewa and Gidan in North wollo.

Morbidity and Mortality: According to 2008 EFY (2015/2016) report, diarrhea, Pneumonia, AFI, Helminthiasis and AURI were the top five leading cause of morbidity in less than 5 children. In above five years, Acute Febrile Illness (AFI), Pneumonia, Acute Upper Respiratory Infection (ARI), Dyspepsia and Diarrhea (non- bloody) reported the top five cause of illness in the assessed woredas. In the all visited weredas have not available data of mortality during the assessment.

Table 34: Lists of top five causes of morbidity in the year 2015/16 for under five and above five age visited districts in North wollo and North Shewa zone, Amhara region.

Zone	Wereda	Top five Morbidity in < 5 years	Top five Morbidity in > 5 years
North Shewa	Menzi Gera	Pneumonia Diarrhea(non -blood Diarrhea (with bloody Helminthiasis Other unspecified diseases of eye	Acute febrile illnesses Dyspepsia Pneumonia Diarrhea with bloody Diarrhea (non –blood
	Menz mama	Pneumonia Diarrhea(non- blood AFI Dysentery Diarrhea with bloody	AFI pneumonia URI Diarrhea non bloody Dyspepsia
	Kewet	Diarrhea no bloody Pneumonia AFI URI helminthiasis	AFII Pneumonia helminthiasis URI Dyspepsia

	Efrata gidim.	Pneumonianeumonia diarrhea ARTI AFI helminthiasis	AFI pneumonia ARTI Diarrhea non bloody Helminthiasis
North wollo	Lasta	Diarrhea Pneumonia AURI Infection of skin . Other unspecified diseases of eye	AUR Dyspepsia Disease of musculoskeletal AFI Pneumonia
	Gidan	Not available	Not available
	Wadila	Not available	Not available

Diseases trend: In the last months there are no cases and deaths of AWD and meningitis in the all visited districts. The malaria cases trend from October to May, 2015/16 shows that decreasing trend during the assessment time. And also two cases of measles were reported in December and February, 2015/16 in wadila District of North wollo Zone.

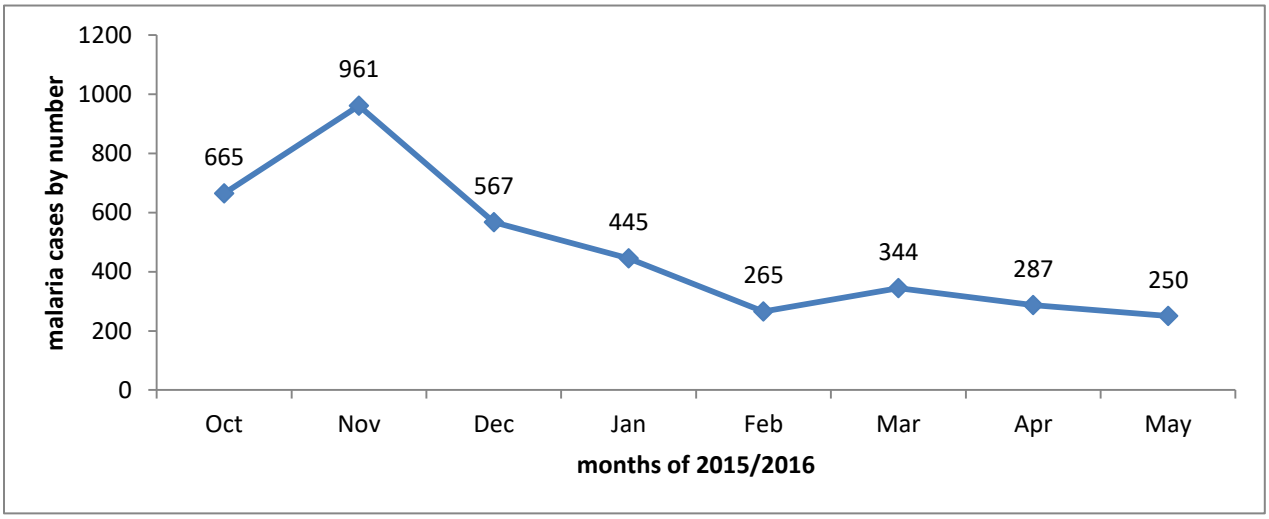


Figure 33: Trend of malaria cases in assessed district from October to May, 2015/16

From the total of 3784 malaria cases reported majority of the cases, 1487 (39 %) are from Lasta district, followed was by 1346 (36%) from Efratagidim district. Menz mama district has not reported malaria cases in the past 8 months. The total number of malaria cases by district in the past 8 months

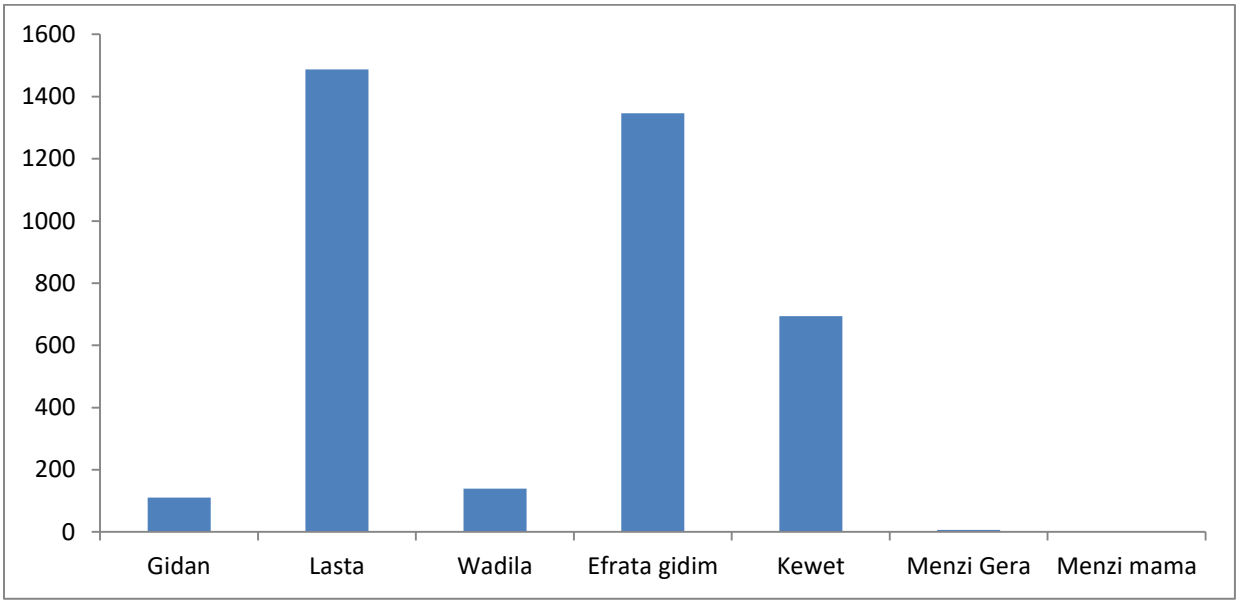


Figure 34: Total Malaria cases by visited district, Amhara, Ethiopia, October – May 2015/16

Outbreaks situation

Scabies: A total of 4527 cases of scabies were reported from three the assessed districts in two zones. More cases have been reported from Gidan (2316 case) in April to May2016, Lasta (2086 cases) in March to May 2016 and Kewet (125 case) in April to May2016.

H1N1: a total of 237 cases of suspected H1N1 were reported from the two the assessed districts. More cases have been reported from Lasta district (190 cases) in 2016 and from Gidan district (47 cases) in 2016.

Typhoid fever: a total of 29 cases of typhoid fever were reported from Gidan district (29 cases) in 2016.

Ongoing Outbreak: There is no any ongoing epidemic all districts in assessed zones of Amhara regional states during the assessment. But in Kewet district the weekly malaria report shows that increments with compare of the previous weeks in the same year.

Disease prevention and control: It was found that of the total assessed seven districts, two (28.5%) districts have measles coverage less than 80%, namely Menzi Gera (55%) and Efrata gidim (75%) from North shewa zone. Menzi Gera districts reported LLINs coverage less than

80%, LLINs had not recommended to distribute because of this district was malaria non endemic area. In the last six months, Vit A supplementation and deworming were given to children 6-59 months and children 2-5 years respectively in all the assessed woredas in the two zones.

Water supply and latrine coverage: all of visited districts are providing improved water sources for more than 50% of the population and Provision treated water. With regard to latrine coverage all assessed district have more than 50%.

Risk analysis

Malaria □ in all the assessed districts in two zones have 62 malarious kebeles and 280,876 peoples are at risk of malaria. It provides breeding sites, interrupting rivers and unprotected irrigations. There was IRS operation in most of the assessed districts in North Shewa and North Wollo zones. It was also found that malaria prevention and control activities are almost depleted in all visited districts.

Watery Diarrhea (AWD) □ there was no AWD epidemic in the last three years in all the assessed woredas. Most are at risk of outbreak due to low safe water coverage and latrine utilization as well as reported diarrhea among the leading cause of morbidity in most woredas.

Measles: The assessment also identified that there was no ongoing measles outbreak in all the assessed woredas. Supplementary immunization activities (SIAs) were conducted in all assessed woredas in 2008. Of the total assessed districts, three (42.9%) reported measles coverage greater than 85% for less than one year in the year 2008.

Meningitis: There was no meningitis outbreak in the visited districts in the last three years and no vaccination being conducted in the past three years.

Section B: Nutrition

SAM Management

Nutrition assessment result in the region revealed, there are 3444 TFP sites (3154 OTPs & 290 SCs) which reported 37774 total SAM cases from Oct-Apr, 2016. Among the total 883 health centers and hospitals, currently 290(32.8%) health facilities have SC and 3154 (93.9%)number of OTPs sites was provided from Oct to May 2016.As to admission and performance of the therapeutic feeding program, SAM admission was increased in 2008 EC comparing to 2015. A total of 37774 SAM cases were admitted from Oct to April 2016.

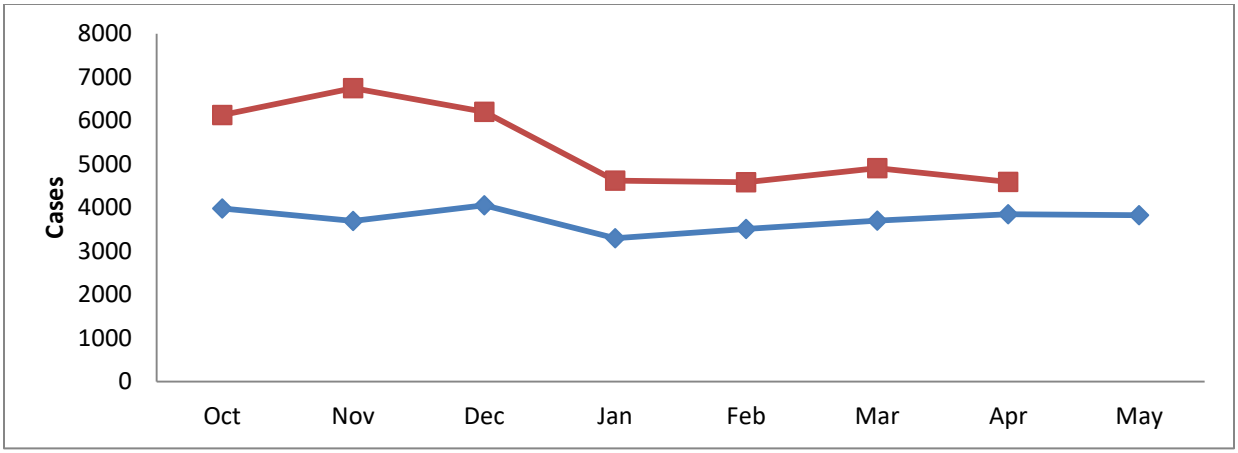


Figure 35: SAM admission trend of Amhara region in 2015 and 2016.

Among the total 229 health centers and hospitals, currently 88(38.4%) health facilities have SC and Number of OTPs sites were in the assessed zones from Oct to May 2016. As to admission and performance of the therapeutic feeding program, SAM admission was increased in 2016 comparing to 2015. A total of 228 SAM cases were admitted from Oct to April 2016. It was seen that cured rate was greatly improved starting Feb 2016 and only one child defaulted in April 2016, of the total 8 defaulted children in the last seven months, Oct. to April 2016. Total 4 children were died in the last seven months. No death report since Feb.2016. However, complete data on SAM admission and performance of the therapeutic feeding program could not be accessed from N/Wollo zone.

Table 35 : Admission and performance of therapeutic feeding programme for SAM management in Amhara region 2016

Month	Total SAM cases		% of SAM children cured	% of children defaulted	% of SAM children died	% of SAM children non-respondent
	2007E.C.	2008 E.C.				
Oct	3983	6127	96.7	3.3	0.2	1.7
Nov	3695	6749	91.5	2.7	0.1	1.0
Dec	4052	6199	92.0	2.5	0.1	1.3
Jan	3297	4620	93.3	2.4	0.2	1.4
Feb	3509	4583	92.3	2.6	0.1	1.5
Mar	3697	4904	91.7	2.3	0.1	1.4
Apr	3848	4592	92.2	1.7	0.0	1.6

Of seven assessed woredas in N/Shewa (4), N/Wollo (3), there were five priority one but the rest were priority two .A total of 153 health posts are available in the assessed woredas and all are giving OTP services. In addition, of 38 cluster health centers, 27(71%) are established SC and all are currently reporting. In most assessed woredas, the reporting rates of health facilities are 100 %, especially OTPs. However, all HCs that are found in the assessed woreda are not fully having SC services. As a result, SC coverage varied from 29% to 100% when it compared to other woredas.

Table 36: Facilities with SAM management in the assessed wereda in North Shewa and North wollo 2016

Woredas	No of HPs	No of HC	OTP	SC	% OTP	% SC
M/Gera	**20**	**5**	**20**	**5**	**100**	**100**
M/Mama	19	4	19	2	100	50
Kewet	20	3	20	2	100	75
Eferta G	20	7	20	5	100	71
Gidan	22	6	22	5	100	83
Lasta	24	6	24	6	100	100
Wadila	28	7	28	2	100	29

SAM admission and performance of the therapeutic feeding

The admission trend through October 2015 to April 2016 for all assessed Woredas and zones showed decreasing. This improvement was achieved due to the intervention of SFP at Woreda level Concerning the TFU performance, the outcome of most therapeutic feeding program is very good because the death and defaulter rates are below the sphere minimum and is zero. SAM admission was showed that there was high SAM admission in Gidan comparing to other assessed woredas and Lasta and Wadila woredas reported increased SAM admission in May 2016.

Therapeutic supplies

Therapeutic supplies like RUTF, F100, F75 and 2ndline drugs are available in the region. In Oromia zone, there were therapeutic supplies such as RUTF, F100, F75 and 2nd line antibiotics available but in South Wollo zone only RUTF was available. N/Shewa reported shortage of F100 & F75 and N/Wollo have no 2nd line drugs. In most assessed Woredas, there is no shortage of therapeutic food supply but Gidan woreda in N/Wollo has no therapeutic supplies such as RUTF,

F100, F75 and 2nd line drugs. However, lack of 2nd line drugs reported from Menz Mama and Efrata Gidim woredas in N/Shewa.

GAM Status

GAM of children(6-59months) in Menz Gera of N/Shewa zone , Lasta and Gidan of N/Wollo zone was 10.6%(April 2008), 14.6%(May 2008) and 10.7%(May 2008) respectively. Improvement of GAM of children in M/Gera was significant (26.7% in October 2008 & 10.6% in April 2008). GAM of Children in Gidan was increased from 3.6% in October 2008 to 10.7% in May 2008 EC. On average in the last eight months GAM of Gidan Children increased by 10.35%. Other, GAM of Lasta's children has shown no improvement.

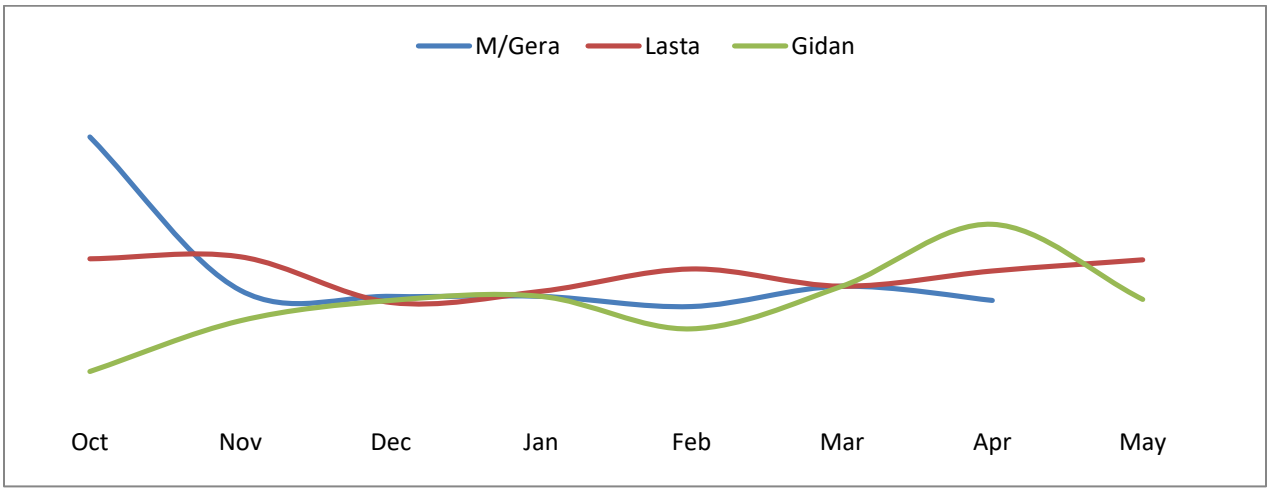


Figure 36: GAM trend of children, N/Shewa & N/wollo, 2016

Emergency Recovery

Recovery is essential in health sector to rebuild, restore and rehabilitate the community and the health delivery activities following health and nutrition emergencies. In fact, recovery is complex and more than replacement of what has been destroyed. Though, our belg assessment findings did not indicate damages of health facilities due to natural disaster like flood, landslide and the likes, it is equally important to strengthen the capacity of health sectors and communities to manage risks of future health emergencies. Therefore, based on the outbreaks reported in the last three months and nutrition emergencies, the required support is proposed with other anticipated emergencies.

Table 37:

Table 38: support required for emergency preparedness and response in the Amhara region, 2016

Zones	Woredas	Type of risks	Beneficiaries	Required finance
All zones	57	AWD & other water borne diseases	2,450,000	12,960,000
All zones	59	Measles	1,342,125	2,400,000
All zones	76	Scabies	1,548,629	7,500,000
All zones	137	Malaria	3,480,000	25,750,000
All zones	89	Malnutrition	3,500,000	30,971,900
Total				**79,581,900**

Table 39:support required for emergency recovery in the Amhara region, 2016

Zones	Woredas	Type of activities	Beneficiaries	Required finance
All zones	H1N1&Scabies affected woredas	Training for health workers	400	1,044,000
All zones	H1N1&Scabies affected woredas	Social mobilization		2,500,000
8 zones	78	Complete the required items of SC Kits	790	1,580,000
8 zones	79	Rehabilitating water sources of HCs	460	2,530,000
Total				**7,654,000**

Gaps/Challenges

- Lack of budget/fund for EPRP at zonal, and shortage in most assessed woredas.
- Critical shortage of water treatment chemicals in most of the assessed woredas
- In availability of emergency medicines and supplies in some assessed zones and woredas
- High risk of malnutrition emergency in the coming months if the current situation continues.
- Refusal of monthly screening by some community members due to expecting support irrespective of the screening result (Gidan).
- TSF distribution is carried out every three month which affected monthly screening coverage (Gidan).
- No nutrition supplies for SCs (Wadila).
- Weak referral linkage b/n OTP, SC & TSFP(Wadila)

Recommendation

- Strengthen disease surveillance and awareness of the community to inform any rumor of events
- Strengthen scabies and other public health diseases management by providing the necessary supplies and building the capacity of health workers.
- EPRP prepared at all level should be supported by emergency budget
- Fund allocation for emergency preparedness should be considered at all level
- Trainings for PHEM staffs in epidemic preparedness planning and risk analysis
- The need to reposition of emergency drugs and supplies including water treatment chemicals at all level
- The data quality should improve and used for action
- Ensure consistency of TSFP support in the assessed woredas
- Provide enough SC/ 2nd line antibiotic drugs to Woredas in shortage.

Chapter VIII- Protocol /Proposal for Epidemiologic Research Project

Malaria prevalence and associated risk factors in Gerbimudiwacho kebele, Jile timuga district, Oromia zone, Ethiopia, 2017

Addis Ababa University

Faculty of Medicine School

Of

Public Health Master of

Public Health Research Project

This Proposal Submitted to the School of Public Health Addis Ababa University in Partial Fulfillment of the Requirements for the Degree of Masters in Field Epidemiology.

Name of investigator	Abebe Gelaw Tegegne (BSc)
Name of advisors	Dr. Naod Firdos (Dr, Phd)
Full title of the research project	Malaria prevalence and associated risk factors in Jile timuga district, Oromia zone, Amhara, Ethiopia, 2017
Duration of the project	Three months
Study area	Jile timuga district, Oromia zone
Total cost of the project	69,100 ETB
Address of the investigator	Phone 0921029994 Email- abebegelaw80@gmail.com

Summary

Background: Malaria is a life-threatening disease caused by plasmodium parasites. It is widespread in Ethiopia, with nearly 55 million out of the 83 million people being at risk of infection. Today, approximately Over 40% of the world's population live in malaria-endemic areas, an estimated 300 to 500 million cases and 1.5 to 2.7 million deaths occur each year. In malaria endemic areas during the major transmission period it attacks greatly, hence the occurrence of malaria epidemics has been more frequent and wide-spread in recent years. Therefore, this study is help to describe the prevalence of malaria and to identify the associated risk factors of malaria in Jile timuga district, Oromia zone, Amhara, 2017.

Methods: we will be conducted a community based cross-sectional study from May to August 2017.

Sampling technique and procedure: From the total 20 malarious kebeles in the district, one kebele as such Gerbi kebele has selected based on the highest contribution of malaria morbidity in the district as well as the zones on the surveillance report. Systematic random sampling method will be employed to select households to be included in the study. Malaria parasite testing will be performed on consenting residents.

Data collection: A structured questionnaire will use to collect data. The data will collect by data collector and supervise by supervisor. Training will be given for data collectors before data collection began. Pretest will be conducted in non-study area has similar character to identify and correct the potential problems during data collection and interview.

Data analysis: After data collection is completed questionnaire will be revised for completeness and consistency of data .Then data will be entered into Epi Info 7 and analysis will be done using SPSS. We will perform descriptive and advanced statistical analysis.

Dissemination of the result : The Findings of this study will be disseminated to Jile timuga district, Oromia zone, Amhara national Regional State Health Bureau, Addis Ababa University School of Public Health, and other concerned bodies work on malaria prevention and control. In addition any attempt will also be present scientific meeting and conferences and to publish on research journals.

Work plan: The project implementation will take place from May to July. The total budget required to implement this project is 69,100 ETB

Introduction

Malaria is a life-threatening disease caused by plasmodium parasites. The parasites are spread to through the bite of infected anopheles mosquitoes, so called "malaria vectors"(1).

Plasmodia species are the parasites responsible for malaria. Only 4 of the over 100 species of plasmodia are infectious to humans. The majority of cases and almost all deaths are caused by *Plasmodium falciparum*. *Plasmodium vivax, Plasmodium ovale* and *Plasmodium malariae* cause less severe disease. Over 90% of all malaria cases occur in Africa, and most are caused by *P. falciparum*. This species also predominates in Haiti and the Dominican Republic. In Mexico, Central and South America, the Mediterranean, Asia and Oceania, both *P. falciparum* and *P. vivax* are endemic. Disease caused by *P. ovale* and *P. malariae* is relatively rare (2).

All four human malaria parasites exist in Ethiopia. However, the two epidemiologically important species are *P. falciparum* and *P. vivax.* They account for 60% and 39% of reported cases of malaria in the country respectively. *P. malariae* comprises about 1% of reported cases and *P. ovale is* rarely seen (3).

The life cycle of the malaria parasite, spanning its mosquito and human hosts. The parasite is transmitted by night-biting *Anopheles* mosquitoes. Warm climates with high humidity and abundant rain create favorable conditions for mosquitoes by increasing breeding areas and prolonging survival, thereby facilitating transmission (4).

The most common symptoms of the disease are fever, headache, chills, muscle and joint pain, nausea, and general malaise. Untreated malaria can result in anemia, kidney failure, coma, and death (5).

In addition to children, pregnant women (particularly prim gravidae) and nonimmune people (e.g., travelers, foreign workers) are at highest risk of severe disease. However, all age groups may be at risk of severe disease during malaria epidemics, which occur either when changes in the physical environment (caused by climatic variation, agricultural projects or mining, for example) increase the capacity of mosquitoes to transmit the disease or when population displacements (natural disasters, war) expose nonimmune populations to infection (6)

The prevalence of the disease continues to increase in many parts of the world. An estimated two billion people (more than 40% of the world population) live in areas with malaria risk. The global annual incidence ranges between three to five hundred million clinical cases, with a death toll of

between two to three million(7). Malaria accounts for 10% of Africa's disease burden, causing the greatest suffering and impoverishment among poor people, with pregnant women and children under five years of age, being the most vulnerable. Approximately one million deaths among children under five years are attributable to malaria, with sub-Saharan Africa having more than 90% of the total malaria incidence and mortality. The economic loss due to malaria in Africa is in excess of two billion US dollars per year. This situation calls for a global concerted effort towards management and control of the disease (7).

The national malaria prevention and control strategy includes indoor residual spraying (IRS), environmental control use of long-lasting insecticide-treated nets (LLINs), and effective case management (8).

Literature review

Malaria is widespread in Ethiopia, with nearly 55 million out of the 83 million people being at risk of infection. In most areas of the country, malaria transmission is seasonal, from September through November, shortly after the main rainy season, and from April to May, after brief rains in March and April. However, malaria transmission is very low or nonexistent during the long dry season in most parts of the country (9).

The characteristic feature in the highlands is highly seasonal and unstable malaria with frequent waves of epidemics. These result in high morbidity and mortality during the planting season when the rains start and during the harvesting season when the rains cease (10).

P. falciparum causes the most frequent and fatal malaria in Ethiopia often resulting in severe and complicated malaria. The case fatality rate is about 10% in hospitalized adults and up to 33% in children less than 12 years old *P. Vivax* is also a widely distributed malaria species. This parasite is not a major cause of mortality but it is an important cause of morbidity due to its relapsing characteristic (11).

It is a leading cause of death and disease in many developing countries, where young children and pregnant women are the groups most affected, 3.2 billion people (half the world's population) live in areas at risk of malaria transmission in 106 countries and territories in 2012, malaria caused an estimated 207 million clinical episodes, and 627,000 deaths. An estimated 91% of deaths in 2010 were in the African Region (12).

The disease causes an estimated number of 219 million cases and 660,000 deaths annually in world wide. Of this, 85% of cases and 90% of deaths were from Africa. In this region 85% of

malaria deaths occur in children under five years of age. In addition, on every 30 seconds a child dies because of malaria (13).

Today, approximately Over 40% of the world's population live in malaria-endemic areas, an estimated 300 to 500 million cases and 1.5 to 2.7 million deaths occur each year. Ninety percent of deaths occur in sub-Saharan Africa, the majority involving children less than 5 years of age. Africa, the majority involving children less than 5 years of age (14). Malaria disproportionately affects the poor, in whom higher morbidity and mortality can be largely attributed to lack of access to effective treatment; 60% of malaria deaths worldwide occur in the poorest 20% of the population (15) .

In Africa, 30% of outpatient consultations, 20-50% of hospital admissions, and 20% of under-5 mortality are due to malaria (16). In Ethiopia, an estimate of 52 million peoples, 68% lives in malaria endemic areas, primarily at altitudes above 2'000 meters (17).

Statement of the problem

Africa is the most affected by malaria due to a combination of factors: A very efficient mosquito (Anopheles Gambia complex) is responsible for high transmission. The predominant parasite species is Plasmodium falciparum, which is the species that is most likely to cause severe malaria and death. Local weather conditions often allow transmission to occur year round. Scarce resources and socio-economic instability have hindered efficient malaria control activities.

Malaria is a significant problem to social and economic development in Ethiopia. In malaria endemic areas during the major transmission period it attacks greatly. (During planting and harvesting seasons,) reducing productive capacity at a time when there is the greatest need for agricultural work. Malaria is public health priority problem in Amhara Region. Oromia zone is one of malaria endemic Zone of the Region with malaria hotspot districts.

The occurrence of malaria epidemics has been more frequent and wide-spread in recent years. Although rainfall-associated breeding of the major vector *Anopheles arabinoses* is the main cause of seasonal malaria epidemics in Ethiopia, abnormal climatic changes have often given rise to major epidemics in the past. In Jile timuga district, Malaria is prevalent throughout the year and all 20 kebeles are malarious. In the last year 20526 febrile cases were tested among that 3900 cases were showed positive of malaria. From total positive, 3795 (97%) cases of P.falciparm and 1889 (3%) cases of P. vivax of species. From total positives 685 (18%) cases were under five and 3215 (82%) cases adult. in the district Slide positivity rate was 19% and API 45.9 per 1000 at risk population.

Objectives

General objective

- To describe the prevalence of malaria and associated risk factors in Jile timuga district, Oromia zone, Amhara,2017

Specific objective

- To determine the prevalence of malaria in Jile timuga district 2017
- To identify the associated risk factors for the occurrence of malaria

Methods and materials

Study area: We will conduct the study in Jile timuga district, Oromia zone, Amhara region. Located 605 km far from Bahirdar and 265KM far from North West of Addis Ababa. The district has 2 urban and 19 rural Kebeles and according to the 2015/16 population estimate for the district was 84983 of which females constituted 51% (43341) with 10.8% (9152) of the district population living in urban. Jile timuga wereda shares boarders with on the North with Artum fursi district, on the south with Kewet district, on the East with Afar region and on the west with Efratagidim. The total catchment area of the wereda is 59,116 Km2. It has altitude range 1300-2000 meters above sea level. It has two Climatic zones, which is 95% Kola and the rest 5% is Weyina dega. It has on average 27 oC annual temperatures, maximum of 30 oC and minimum 24 oC. In addition it has Annual rain fall on average 1500 mm and ranges 1800 - 1200 mm. Topography in this woreda shows that 40% is flat, 31% valleys, 22% mountainous, 7% hills. Jile timuga wereda is divided into 4 clusters, and has 19 rural and 2 urban kebeles. The health service coverage of the district is 100% which based an estimate of five health post and one health center as giving service for 25000 people. There are 20 health posts, 4 health centers and no hospital in Jile timuga district.

Study design: A community based cross-sectional study will be conducted.

Study period: We will conduct the study in Jile timuga district from May to august 2017

Source population: All residents live at risk of malaria in district at time of the study period.

Study population: All residents' lives in Gerbi kebele of jile timuga districts

Sampling technique and procedure: From the total 20 malarious kebeles in the district, one kebele as such Gerbi kebele has selected based on the highest contribution of malaria morbidity in the district as well as the zones on the surveillance report. Therefore, systematic random sampling method will be employed to select households to be included in the study. Malaria

parasite testing will be performed on consenting residents. A blood sample will collected by taking finger-prick blood from participants for malaria RDT.

Study subjects: individuals selected to be included under the study

Sample size determination:

The study sample size will be calculated using a formula a single population proportion. It is calculating considering:-

$$n = \frac{z2\ 1-\alpha/2 \times p\ (1-p)}{d2}$$

$$n = \frac{(1.96)2(0.34)\ (0.7)}{(0.05)2}$$

$$=366$$

n = Number of sample size

Z = standardized normal distribution value at the 95% CI, which is 1.96

P = 34%(12)

w = the margin of error, taken as 5%. Assuming 10% non-response rate the final sample size will be 403.

Data collection

A structured questionnaire will use to collect data. The data will collect by data collector and supervise by supervisor. Training will be given for data collectors before data collection began. Pretest will be conducted in non-study area has similar character to identify and correct the potential problems during data collection and interview.

Data analysis: After data collection is completed questionnaire will be revised for completeness and consistency of data .Then data will be entered into Epi Info 7 and analysis will be done using SPSS. We will perform descriptive and advanced statistical analysis.

Ethical consideration

This study will be conducted after the ethical clearance given by the research and ethics committee of Addis Ababa University, school of public health and Amhara regional health bureau ethical review board. Informed consent will be also obtained from the health facility and study participants and the confidentiality of the information collected from them will be maintained.

Variables

Dependent variables

The outcome interest is malaria RDT result

Independent Variables

The independent covariates comprised the baseline socio-economic, demographic, and geographic variables that included gender, age, family size, education level, occupation, sleeping habit, altitude, radio and television, total number of rooms, main material of the room's wall, main material of the room's roof, indoor residual anti-malarial spraying in the past 12 months, use of mosquito nets, total number of nets and knowledge of malaria prevention and control

Dissemination of the result

The Findings of this study will be disseminated to Jile timuga district, Oromia zone, Amhara national Regional State Health Bureau, Addis Ababa University School of Public Health, and other concerned bodies work on malaria prevention and control. In addition any attempt will also be present scientific meeting and conferences and to publish on research journals

Work plan

Table 40: Work plan Project implementation time for Epi project

Sr. No	tasks	Responsible body	Time frame											
			May				June				July			
1	Title selection	Investigator												
2	Proposal writing	Investigator												
3	Submission to concerning bodies	Investigator												
4	Budget rise	AAU,ARHB												
5	pretest	Investigator, data collectors												
6	Data collection	Investigator, data collectors												
7	Data analysis	Investigator												
8	Writing first draft narration	Investigator												
9	Submission of first draft narration	Investigator												

10	Writing final narration	Investigator												
11	Submission of research	Investigator												

Budget

Table 41: Budget breakdown for Epi project.

Titles	Number of personnel (P)	Rate by Birr (R)	Date of duration (D)	Required birr =P*R*D
Two nurses	2	290	20	2*290*20=11,600
Two lab technologists	2	290	20	2*290*20=11,600
Supervisor	1	290	20	1*290*20=5800
Principal investigator	1	290	60	1*290*60=17400
Driver	2	290	20	2*290*20=11,600
Pen lexi	20	5		5x20=100
A4 size papers	2	250		2*250=500
Printing and binding cost	5	100		5x100=500
Vehicle	2			10000
RDT, anti-malaria drugs, safety box, gauze,				
Total birr required				69,100 birr

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Annexes

Annex 1: Scabies cases outbreak investigation questionnaire

Case status: Case _____Control_____

Patient Name_____ Code____ date of Data collection_____

Zone ---------- Woreda_____ kebele_____ Gote_____

I. Socio-demographic Characteristics

S. No	Questions	Alternatives
1.1	Sex	1.Male 2.Female
1.2	Age	years___ Months_____
1.3	Resident	1. Urban 2. Rural

1.4	Religion	1 orthodox 2. Muslim 3. Protestant 4. Others
1.5	Occupation	1.farmer 2.civil servant 3.student 3.house wife 4.merchant 5.other
1.6	Educational status	
1.7	Marital status	1. Single 2.married 3.divorced 4. Widowed
1.8	Family size	_____
1.9	Is there any sick person with scabies in family?	1. Yes 2. No
1.10	If yes, number of sick person	_____

II. Clinical History of Diseases:

2.1	Do you have any itching or rash in your body?		1.Yes 2.No
2.2	Which sign and symptom did you experience first?		1. Itching 2. Rash
2.3	Date of onset of		1. Itching---------- (dd/mm/yy) 2.Rash ---------- (dd/mm/yy)
2.4	During at what time the itching intense?		1.At day 2.At night
2.5	Can you see scabies lesion on infected person?		1.Yes 2.No
2.6	If yes, how many is there?		1. Mild (5 or less) 2.moderate (6-10) 3. Severe (11-49) 4. very severe(50 and more)
2.7	Which body part is mostly affected?	1.finger webs 2.ulnar border of the hand 3.elbow 4.wrist 5.anterior axillaries line	6.umbilicus 7. inter gluteal area 8.genital (male) 9.inner aspects of thighs 10.face palm and sole(children)
2.8	What type of skin lesion?		1. Nodular 2. pustules
`2.9	Is there filled sores or crusted sores over the scabies lesion?		1. Yes 2. No

2.10	Did you take treatment?	1.Yes 2.No
2.11	If yes, what type?	1. Ivermectine 2. BBL 3.Sulphur 4.premethrine

III. Risk factors

3.1	Did you have been infected Previously?	1.Yes2.No 3.Unknow
3.2	With whom do you sleep?	1.Alone2.wife/husband 3.brother/sister 4.friend
3.3	Has the person whom you are sleeping with contracted scabies	1.Yes 2. No
3.4	How often you take shower?	1,2-3 days 2,weakly 3,more than a weak
3.5	What do you use detergent to take shower?	1.Water only 2.water with soap other
3.6	Do you wash your clothes?	1.Yes 2.No
3.7	If yes, when do you wash your clothes?	1. Weakly 2. more than a weak
3.8	Have you put on clothes of someone who was diseased in the previous 6 weeks?	1, Yes 2,No
3.9	When do you change your clothes that you wear now?	1.everyday 2.weakly 3.more than a weak
3.10	Is there any shortage of water to wash your body and clothes?	1.Yes 2.No
2.11	What is the source of water for your drinking?	1.Pipe2.well3.spring 4.river

IV. Knowledge of patient on influenza like illness

1	Do you hear about scabies?	1.Yes 2.No
2	From whom did you heard	1.Friends 2.Family member 3 HEW 4 Teacher 5. Health workers
3	Do you know the causes of scabies?	1.Yes 2.No
4	If Yes? What it is?	

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5	What are the Signs and symptoms of scabies?	1. Itching 2, skin lesion 3, Don't know 4.
6	How do you think this disease transmit from person to persons?	1,.Contact with infected patient 2, sleeping with infected person 3. Don't know 4.Other(specify)----------

Annex 2: Influenza like illness outbreak investigation Questionnaire

Case status Case _____Control_____

Patient Name_____ Code____ date of Data collection_____

Woreda_____ kebele_____ Gote_____

I. Socio-demographic Characteristics

S. No	Questions	Alternatives
1.1	Sex	1.Male 2.Female
1.2	**Age**	
1.3	**If female, is she currently pregnant?**	**1.Yes 2. No 3.Do not know**
1.4	**Occupation**	
1.5	**Educational level**	
1.6	**Marital status**	
1.7	**Family size**	**----------**
1.8	**Is there any sick person with fever, cough , headache , running nose/vomiting(Illness) family**	**1. Yes 2. No**
1.9	**If yes, number of sick person**	**----------**
1.10	**Specimen taken**	**Yes No**

II. Clinical History of Diseases:

2.1	**Date of illness on set**	**----------(dd/mm/yy)**
2.2	**Date seen at health facility**	
2.3	**Date of Admission if Inpatient**	**----------(dd/mm/yy)**

2.4	**What was the symptom?**	**Cough** **Fever** **Sore throat** **Shortness of breath** **Difficulty in breathing** **Vomiting** **Diarrhea**	**Sneezing** **Chest pain** **Joint pain** **chills** **Headache** **.Other (Specify**
2.5	**Did you take treatment?**		**1.Yes 2.No**
2.6	**Outcome**		**1.cure 2. Improved 3.died 4.Referred 5.on treatment**

III. Risk factors

3.1	**Did you ever Previously vaccinated against Flu?**	**1.Yes 2.No 3.Unknow**
3.2	**If yes, last vaccination year**	**_____**
3.3	**Did you have any travel history 7 Days to areas with active influenza like illness cases before onset of symptoms?**	**1.Yes 2. No**
3.4	**If Yes where**	**_____**
3.5	**Do you have any contact history with Someone else with suspected or confirmed Flu patient(s)?**	**1.yes 2.No**
3.6	**If yes with whom**	
3.7	**Do you have any contact history with sick or dead animals (wild or domestic):**	**1.Chickens 2.Wildbirds3.Swine**
3.8	**was there death of birds/chicken in the kebeles**	**Yes No**
3.9	**Is your house well ventilated?**	**1.Yes 2.No 3. other**
2.11	**Number of windows**	**----------**
2.12	**How many times do open windows per week**	

Knowledge of patient on influenza like illness

1	**Do you hear about influenza like illness?**	**1.Yes 2.No**

2	**From whom did you heard**	**1.Friends 2.Family member 3 HEW 4 Teacher 5. Health workers**
3	**Do you know the causes influenza like illness?**	**1.Yes 2.No**
4	**If Yes? What it is?**	**1. Virus 2.bacteria 3.contaminate food 4.from God 5. related to weather condition 6.Don't know**
5	**What are the Signs and symptoms of influenza like illness?**	**1 .cough 2.Fever 3.Headache 3. Nasal discharge 4.fatigue 5. Chills 6. Chest pain e) 7. Vomiting 8.diarrhea 9. Loss of appetite 10.Don't know**
6	**How do you think this disease transmit from person to persons (none proving)?**	**1. sneezing/coughing 2.Contact with patient 3.wind 4. Don't know**
7	**What are the prevention methods of ILI?**	**1.limit your contact with others** **2. hands washing** **3. Cover mouth and nose during coughing and sneezing?** **4. Don't touch any dead poultry** **5. Hot fluid drinking** **6. Don't know**

Annex 3: Surveillance system evaluation questionnaire

Region_____Respondent_____Zone_____District_____HCs_____HPS_____

Date _____Tele._____

General

Total pop._____ Male ____ Female _____ < 5yrs _____ Rural pop.____ urban pop. _____

Total Kebeles _____ Urban _____ Rural _____

Hosps. _____ # H.Cs _____ # HPs _____ # private clinics ____# NGOs H.F._____

Total # of malarious Woreda _____Total # of malarious kebeles___ ___

Total pop at risk for malaria----------

Availability of a National Surveillance Manual

1. Is there a national PHEM manual/ guideline for surveillance? Yes / No
2. ***If yes***, describe (last update, diseases included, case definitions, surveillance and control, integrated or different for each disease):_____
3. What are the objectives of surveillance? _____
4. What are the strengths of your surveillance system? _____
5. What are the weaknesses of your surveillance system? _____

III, ***Case Detection and Registration***

6. Do you have standard case definitions for the Country's priority diseases like AFP (polio), malaria, and measles? Yes / No / Unknown / Not applicable
7. If the answer is yes for Q #6, observe the presence of the standard case definition for each priority disease. Yes No Unknown Not applicable

I. *Data reporting::*

Presence of recommended reporting forms in the zone at all times over the last year (2008EC)

8. Are the Federal/ Regional health bureau responsible for providing surveillance forms to the health facilities? Yes No Unknown Not applicable
9. ***If yes***, have you lacked appropriate surveillance forms at any time during the last year? Yes No Unknown Not applicable
10. What are the reporting entities for the surveillance system?
    a. Public health facilities
    b. NGO health facilities
    c. Military health facilities
    d. Private health facilities
    e. Others_____
11. Was there any report of the immediately reportable diseases in the past year? Yes/ No
    What was the disease_____?
12. If yes, for Q 11, with in what time is the report received after detection of the diseases?
    a. Less than 1 hour
    b. 2-24 hour

c. 1- 2 days

d. 3- 7 days

e. After 1 week

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

G) Yearly

H) Others_____

14. When are you expected to send weekly report to the Regional PHEM unit? Every

☐ Monday

☐ Tuesday

☐ Wednesday

☐ Thursday

☐ Friday

☐ Saturday

☐ Sunday

☐ I don't know

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

☐ Monday

☐ Tuesday

☐ Wednesday

☐ Thursday

☐ Friday

☐ Saturday

☐ Sunday

16. ☐ I don't know How is the Zone communicating the woredas/health facility PHEM officers in case of immediately reportable diseases?

☐By e-mail

☐ By phone

☐By fax

☐ Regular weekly report

☐ Others----------

17. Did you send summary or short report to the administrative /program leaders or other responsible organs on planning, prevention and control activities addressing important issues at community level that have arisen through the surveillance system? Yes/No
18. If answer for Q 22 is yes to whom did you send? _____
19. If you faced any problems on communicating and reporting, list them_____
20. How do you manage the problem you faced? _____

II. Data analysis

1. Have you trained on surveillance system? Yes/ No
2. If answer for Q1 is yes a) when_____ b) Topic_____ c) For how long_____
3. Did you give any onsite training / orientation about surveillance system for the woredas or health facility PHEM focal persons? Yes/No (if yes observe any documents)
4. How many woredas have permanently assigned surveillance officer or focal person? ___
5. How many of them trained on surveillance and epidemic management? _____
6. If Q #4 is no, how surveillance activates were done at woreda level? _____
7. Was data compiled and registered? Yes/ No (if yes observe documents)
8. Did you have computer on your department (PHEM unit)? Yes/ No
9. What is the data entry and compilation instrument?
10. Did you have computer skill on A) Ms. word B)MS. excel C)MS. power point D) Epinfo
11. Did you analyze data of the surveillance system (cased based, routine, outbreak ?Yes/ No
12. If answer for Q 11 is yes, observe whether or not data is analyzed by time, place and person
13. If you analyze surveillance data how frequently? A) weekly B) every two week C) Monthly D)quarterly E) every 6 month F) annually G) No regular time
14. Did you perform trend analysis for priority diseases? Yes/ No
15. If yes for Q #10, observe and list the diseases which has line graph _____

16. Did you have denominators for data analysis? A) T. population B) male C) female D) U5 E) pop. By woreda E) hard to reach area pop.
17. Did you notify the results of your analysis to the higher level PHEM? Yes/ No
18. Did you notify the results of your analysis to the lower level PHEM? Yes/ No
19. If answer for Q #18 is No, what is the reason?

☐ Lack of knowledge

☐Shortage of time

☐Less attention to data analysis

☐ Shortage of materials

☐Analysis is not familiar

☐ Negligence

☐ Other-------

III. <u>Outbreak Investigation</u>

1. How many outbreaks were occurred in 2008 EFY? _____
2. How many of them were investigated _____list the diseases _____
3. Did you have outbreak investigation check list? Yes/No
4. If the answer no for Q #3, how did you know possible factors for cause of the outbreak? __
5. Where was laboratory confirmation of cases done☐Regional laboratory ☐Hospital☐Health center ☐Contracted private laboratory ☐Other----------Who was responsible to investigate an outbreak? ☐ rapid response team ☐ HEW ☐ staffs of woredas health office ☐ experts organized randomly ☐ health facility staffs ☐ other_____
6. Fill the table below for question #2

S.N^{O}	Name of outbreak	Place(Kebele /woreda	N^{O} of cases			N^{O} of deaths			Start date of the outbreak	Investigation date	Remark
			M	F	U5	M	F	U5			
1											

7. Had you faced any challenge in outbreak investigation in 2008 EFY? Yes/No
8. If answer for Q 8 is yes, a) list the challenges_____

b) List the alternatives that you take to tackle the challenges._____

IV. Epidemic preparedness(relevant for epidemic prone diseases)

1. Did you have plan for epidemic response and preparedness? Yes/No (if yes observe)
2. Was there an emergency stock of drugs and supplies at all times in the past 1 year (2008)? Yes/ No (if yes observe any document for evidence)
3. If answer for Q2 is No, how did you control epidemics? ----------
4. Had you experienced shortage of drugs, vaccines and supplies in 2008 EFY? Yes/No
5. Was an epidemic management committee established at zonal level? Yes/No
6. Did the epidemic management committee have regularly scheduled meeting time? Yes/No(if yes observe minute book)
7. How many woredas are established epidemic management committee and meet regularly?
8. Was Rapid response team established at zonal level? Yes/No
9. Did the Rapid response team have regularly scheduled meeting time during epidemics? Yes/No (observe minute book or other document)
10. How many woredas have established Rapid Response Team? _____
11. Did you have case management protocol for epidemic prone diseases? Yes/No/Not applicable (check)
12. Do have multi sectorial emergency preparedness and response task force committee? Yes/ No/ Not applicable
13. In what frequency did the task force meet during outbreaks? _____
14. Were partners working together with your office on emergencies ?Yes/No
15. If answer for Q 14 is yes, what type of supports did they give to your office? _____
16. Was there a budget for epidemic response in the last year (2008)? Yes/No
17. Had you a car assigned for emergencies (PHEM)?Yes /No/Not functional
18. If answer for Q 17 is NO, how did you address emergencies? _____
19. Had you faced any Challenges on epidemic response and preparedness in 2008 EFY ?Yes/No
20. If answer for Q 19 is yes,

a) List the challenges _____

b) What measures did you take to tackle the challenges?_____

V. Response to epidemics

1) Did the zonal health office respond for epidemics within 48 hours of notification of most recently reported outbreaks? Yes /No (observe any documents)

2) Are epidemic management committees evaluating their epidemic preparedness and response activities during the past year (2008)? Yes/No (check written document)

VI. Supervision and Feedback

1. Did you have supervision plan in 2008 EFY? Yes/No(check documents)
2. If answer for Q1 is No, how did you supervise? _____
3. If Q #1 is yes, did you supervise the woredas and health facilities? Yes/No
4. If Q #3 is No, what is the reason? _____
5. If Q #3 is yes, how many times did you supervise each woredas and health facilities in 2008 EFY? Woreda----------. Health facility----------
6. Had you received supervision from regional PHEM or FMOH in the last 2008EFY? Yes/No
7. If Q #6 is yes, how many times in 2008 EFY? ----------
8. Did you have regular supervision checklist? Yes/No
9. If Q #8 is No, how did you supervise the woredas and health facilities? _____
10. Did you send feedback of your supervision findings to the woredas and health facilities which commenting/indicating their strong and weak sides? Yes /No(check)
11. If Q #10 is No, why? _____
12. If answer for Q #10 is yes, for how many woredas and health facilities and sessions did you send a feedback in 2008 EFY? Woreda_____ health facilities_____
13. Had you received feedback from higher level supervisors in the last 2008EFY? Yes/No
14. If Q #13 is yes, how many feedbacks did you received in last 2008 EFY? _____
15. Did you conduct active case search for health facilities in last 2008EFY? Yes/No, if yes, how many times and for how many woredas and health facilities? _____ did woreda PHEM officers also conducted? Yes/ No (observe the document)
16. What did you get from active case search _____
17. Had you faced any challenge on supervision and feedback in the last year? Yes / No
18. If answer for Q #15 is yes, a) list the challenges._____

b) List the measures that you take to tackle the challenges _____

IX. Resources

Percent of sites that have:

26. Data management

Computer_____Printer_____Photocopier_____Data manager _____Statistical package_____

27. Communications

Telephone service Fax Radio call Satellite phone

Budget line _____

28. Logistics _____

VII. Surveillance

29. Do you have a computerized surveillance network at this level? Yes/No/Not applicable

Budget for surveillance

30. Is there a budget line for surveillance in the zonal Health office budget? Yes/No Not applicable
31. ***If yes***, what is the proportion: %
32. How could surveillance be improved? _____

Questionnaire for Attributes and level of Usefulness:

1. Total population under surveillance_____ 2016/2008
2. What is the incidence / Prevalence of 2016/2008 ----------in your area/region
    - Malaria_____ laboratory done _____cases P.F _____P.V____ Deaths

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

Does the surveillance system help?

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

Observe (confirmation):

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

I. Describe Each System Attributes:

Simplicity:

1. Is the case definition of the priority diseases (malaria, SAM) easy for case detection by all level health professionals? Yes/ No
2. The surveillance system allows all levels of professionals to fill data? Yes/No

3. Does the surveillance system help to record and report data on time? Yes/ No
4. Does the surveillance system (Reporting format) have necessary information for investigation? Yes/No
5. How long it takes to fill the format? a, <5 minute b, 10-15 minutes c, >15 minutes
6. How long does it take to have laboratory confirmation of malaria and others?

Flexibility:

1. Can the current reporting formats be used for other newly occurring health event (disease) without much difficulty? Yes/ No
2. Do you think that any change in the existing procedure of case detection and reporting formats will be difficult to implement? Yes /No
3. Is the system easy to add new variables? Yes /No
4. Is the surveillance system easy to integrate with other systems? Yes /No
5. Is the surveillance system easy to add new disease on report? Yes /No
6. Is the system easy to add new information technology? Yes /No

Acceptability:

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

2) If yes, how many are active participants (of the expected including all private clinics)? _

3) If No for Q #1, what is the reason for their poor participation in the surveillance activity?

A. Lack of understanding of the relevance of the data to be collected

B. No feedback / or recognition given by the higher bodies for their contribution;

I.e. no dissemination of the analysis data back to reporting facilities

C. Reporting formats are difficult to understand

D. Report formats are time consuming

E. Other:_____

4) Were all participants using the standard case definition to identify cases? Yes/ No

If yes, what is your evidence _____

5) Were all the reporting agents send their report using the current and appropriate surveillance reporting format? Yes/ No (if yes observe the documents)

6) Were all the health professionals aware about the surveillance system? Yes/No (if yes how they aware)

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

1. Are the reporting site / data collectors trained/ supervised regularly? Yes/No
2. **Observe:** Review the last months report of these diseases
    a) Average number of ***unknown or blank responses*** to variables in each of the reported forms _____
    b) Percent of reports which are complete(that is with no blank or unknown responses) from the total reports ___
3. Are all woredas reporting (including late report)?☐ Yes ☐ No
4. Percent of woredas that send report of each week the last 2008 EFY. ----------
5. Are all hospitals reporting? ☐ Yes ☐ No
6. Percent of hospitals that send report of each week the last 2008 EFY. ----------
7. Total weekly reports received from woredas/Hospitals (including late reports, in last 2008 EC)

WHO epid. wk	N^{O} of woredas expected to report	N^{O} of woredas that report (including late report)	N^{O} of Hospitals expected to report	N^{O} of hospitals that report (including late reports)	WHO epid. wk	N^{O} of woredas expected to report	N^{O} of woredas that report (including late report)	N^{O} of Hospitals expected to report	N^{O} of hospitals that report (including late reports

Representativeness:

8. What is the health service coverage of the district/ zone? _____%
9. What is the health service utilization of wereda/ zone? _____%
10. Do you think, the populations under surveillance have good health seeking behavior for these diseases? Yes / No
11. Was the surveillance system enabled to follow the health and health related events in the whole community? Yes /No
12. If answer for Q 11 is no, who do you think is well benefited by the surveillance system? ☐ The urban ☐the rural ☐both

13. If yes for Q 12, do you think that rural and urban communities are equally benefited in surveillance system? Yes/ No , if no why _____
14. Are all the Socio demographic variables included in the surveillance reporting format? Yes/No
15. If the answer for Q 14 is No, which a) Sex---------- b) age group---------- C) ethnic group----- d) religion---------- is less represented?

Stability:

1. Was any new restructuring affected the procedures and activities of the surveillance of these diseases? Yes/ No
2. Was there lack of resources that interrupt the surveillance system? Yes / No if yes what was it and how do you solve it_____
3. Was there any time /condition in which the surveillance is not fully operating? Yes/ No
4. If the answer yes for Q #3 When/what is the condition that talks the system not to function properly? ----------
5. Is there a surveillance officer or focal person (PHEM unit)? Yes/No Number _____

Timeliness:

1. Are all woredas /health facilities reporting on time? ☐ Yes ☐ No
2. Percent of woredas that report on time. ----------
3. Are all Hospitals reporting on time? ☐ Yes ☐ No
4. Percent of hospitals that report on time. ----------

WHO epid wk	N^{O} of woredas expected to report	N^{O} of woredas that report on time	N^{O} of Hospitals expected to report	N^{O} of Hospitals that report on time	WHO epid wk	N^{O} of woredas expected to report	N^{O} of woredas that report on time	N^{O} of Hospitals expected to report	N^{O} of Hospitals that report on time

Annex 4: Health profile assessment for data collection tools of Jiletimuga wereda check.

Region_____Zone_____Woreda_____Respondant_____Interview----------

1. Historical back ground of the area (if available)
   - Woreda Name_____
   - How & why the name given_____
   - How and when the woreda was formed/founded?_____
   - Any other historical aspect_____
2. Geography and Climate (including map, altitudes, agro ecological zones etc.)
   - Woreda map_____
   - Location(distance) _____Direction _____
   - Altitude _____
   - Surface Area _____(_____% from the zone)
   - Town _____rural _____(land)
   - Geographical coordinate
     - ✓ Latitude _____
     - ✓ Longitude _____
     - ✓ Annual rain fall(average)_____
     - ✓ Annual temp(average)_____
     - ✓ Climatic zones_____(%) _____(%) _____(%)
   - Woreda boundaries
     - North _____South_____
     - East _____West_____
3. Political and Administrative Organization
   - Total no. of kebeles:
     - Rural _____
     - Urban_____
4. Population and Population structures
   A. Demographic data
      - Total Population _____ Male _____Female_____ sex ratio_____
      - Urban Total _____ Male _____Female_____

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- Rural Total _____ Male_____ Female_____
- Population under 1yrs_____
- Population under five yrs.'_____
- Population < 15 years_____
- Population >64 years_____
- Women 15_49 years of age_____
- Total population by kebele(each kebele pop)_____
- Population enumerated by woreda/H.E.Ws_____

(Population pyramid)

Population data by age and sex								
Male	<1	1-5	6-14	15-24	25-34	35-49	50-64	>65
Female	<1	1-5	6-14	15-24	25-34	35-49	50-64	>65

B. Ethnic/language

_____(%) _____(%)_____(%)

C. Religion

- Orthodox _____ (_____ %), Muslim _____ (_____ %),
- Protestant_____(_____%), Other _____ (_____ %)

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

- Main income sources
  - ✓ Agriculture
    - Cultivated area_____
    - Grazing area_____
    - Cropping seasons_____
    - Land density_____
  - ✓ Livestock
  - ✓ Truism
  - ✓ Trade
  - ✓ Other business

- House hold income source
  - ✓ Agriculture_____ (No.)
  - ✓ Government Employer_____(No.)
  - ✓ Private Employer_____(No.)
  - ✓ Daily Laborer_____(No.)
  - ✓ Different business_____ (No.)
  - ✓ Jobless _____ (No.)
- Average Income_____

6. Education and school Health

- Number of educational institution
  - ✓ K.G._____
  - ✓ Primarily School_____
  - ✓ Secondary_____
  - ✓ Preparatory_____
  - ✓ College/ University_____
  - ✓ TVET_____
- Total School Age Children (target) _____
  - ✓ Total Enrolment _____Male _____Female_____
  - ✓ School dropout in year 2005 _____
  - ✓ If there is school dropout why _____
- Educational status of the community
  - ✓ Total Educated people_____
    - Male _____
    - Female _____
    - level of education

      Illiterate _____

      Read and write _____

      12 completed_____

      Diploma _____

      Degree & above _____
- School health activities:

- Number of schools with water supply_____
- Toilets:
  - Schools with functional latrines (male & female)_____

Schools with HIV/other Health clubs_____

7. Facilities

A. Transport

- Accessibility (main roads)_____ _____
- Type of road _____
- How many kebeles have access to transportation _____
- Flow of transportation per day_____

B. Telecommunication

- How many people have access to fixed telephone?_____
- How many people have access to mobile phone? (coverage)_____
- How many kebeles have access to fixed telephone?_____
- How many kebeles have access to mobile phone? (coverage)_____

C. Post Office_____

D. Bank_____

E. Power supply

- How many house hold get power supply_____?

F. Water

- Total safe water coverage _____ (___%)
- Safe water supply coverage by kebele _____
- Main source of water supply _____
- Kebeles getting safe water____ (__ %)
- Population getting safe water_____ (__ %)
- Daily water consumption per day per person_____

8. Disaster situation in the woreda

- Was there any disaster (natural or manmade) in the woreda in the last one year?_____

- Any recent disease outbreak/other public health emergency_____
- If yes cases_____ and deaths_____

9. Social situation:

Number of libraries_____

Number of NGO working on public health_____

Number of youth clubs_____

10. Health service institutions and infrastructure

S.NO	Type of health institution		No of institutions
1	Number of Health Centers	with sustainable/ 24 hour /electric power	
		without sustainable/ 24 hour /electric power	
		with telephone service (cable based/mobile)	
		without telephone service (cable based/mobile)	
		with piped water supply	
		Without piped water supply	
2	Number of Health centers		
3	Number of Health post		
4	Number of private clinics	Lower	
		Medium	
		Higher	
5	Number of Drug vendors		
6	Number of Drug stores		
9	Number of Pharmacies		
10	Number of Diagnostic laboratories		
11	Hospital to population ratio		
12	Health center to population ratio		
13	Health posts to population ratio		
14	Physical health service coverage		

Health budget allocation:

- Government
  - ✓ Total budget allocated for the district _____
  - ✓ Total budget allocated for health _____(____%)
  - ✓ Total budget allocated for emergency_____
- Funds from NGO
  - ✓ Total _____ (purpose/programs)_____

Community Health Services;

- Status of services provided by community health workers namely
  - ✓ No. of TBAs/TTBA_____ and their responsibility __
  - ✓ No. of HDA_____ and their responsibility _____
  - ✓ Responsibility of HEWs _____
  - ✓ Others_____

9. Top 10 diseases of morbidity and mortality:-

Morbidity cases in adult OPD			Pediatrics/ <5 year		
Rank	Diseases	%	Rank	Disease	%
1			1		
2			2		
.			.		
.			.		
10			10		

12,Top ten of admissions

ılt			Pediatrics/ <5 year	
rbidity		rtality	rbidity	rtality
1				
2				
3				
4				
5				
6				

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7				
8				
9				
10				

13. Child Health

A. Health centers providing IMNCI service_____

C. Live births weighing < 2500gm_____

B . Moderate malnutrition in < 3yrs_____

D. Severe malnutrition in < 3yrs_____

14. Health staff to population ratio:

Physicians (GP+ specialist)_____

Health officers_____

All Nurses_____ Mid-wife Nurses_____

Medical lab_____ Pharmacy_____, Env'tal _____Health education_____

Health extension workers_____

Other_____

Expected No of health staff based on BPR and the gap----------

Cause of the gap ----------

No of Health posts full filled HEW ----------

No of health posts access with telephone ----------

15. Vital statistics and health indicators

S. No	Indicator	Rural	Urban	Total
1	Total population			
2	Male			
3	Female			
4	Under 1 years old			
5	Under 5 years old			
6	Under 15 years old			
7	Productive age female (15-49 years)			
8	Pregnant women			

9	Live births			
10	Total fertility rate			
11	Crude birth rate			
12	Crude death rate			
13	maternal mortality rate			
14	Child mortality			
15	Under 5 mortality rate			
16	Infant mortality rate			
17	Dependency ratio			
18	Average household size			

16. Immunization

Description	Number (%)	Remark
BCG coverage		
Measles vaccine		
OPV		
Penta1		
Penta2		
Penta3		
PCV		

1. Penta3 coverage _____
2. Measles coverage _____
3. Full Immunization Coverage_____
4. Measles dropout rate_____

S.No	Type of service	Coverage (%)
1	Antenatal care (ANC) Coverage at least 1 visit (%) Antenatal care (ANC) Coverage at least 4 visit (%)	
2	Contraceptive acceptance rate (CAR (%))	
3	Contraceptive prevalence rate (CPR (%))	

4	Post-natal care (PNC) Coverage	
5	Proportion of delivery attended by skilled personnel	
6	TT2+ pregnant	
7	TT2+ non pregnant	

5. Penta3 dropout rate _____

6. PAB_____

17, maternal health coverage

18. Environmental Health & sanitation.

- ✓ Latrine coverage_____ & utilization rate_____
- ✓ Solid waste management_____
- ✓ Liquid waste management _____
- ✓ others_____

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

19. Endemic disease

A) Tuberculosis and Leprosy

S. No	Cases		Number		
			male	female	total
13.	Prevalence of TB				
14.	Pulmonary TB	smear positive			
		Smear negative			
15.	TB case detection rate				
16.	TB treatment success rate				
17.	TB treatment cure rate				
18.	Defaulters				
19.	Death				
20.	Total TB patients screened for HIV				
21.	HIV prevalence rate among TB cases				
22.	No of Leprosy cases				

B) MALARIA

		Adult	Under 5	Preg.		

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S. No	Malaria cases		M	F	M	F		Total		M + F
								M	F	
1	Confirmed malaria cases	Pf								
		Pv								
		Mixed								
2	Admission cases due to malaria									
3	IRs coverage	Urban								
		Rural								
		Total								
4	Coverage of LLITN (1 LLITN/1.8 person)	Urban								
		Rural								
		Total								
5	LLITN utilization coverage	Urban								
		Rural								
		Total								

- Number of Malarious areas /kebeles
- Coverage of Insecticide chemical spray

C) HIV/AIDS

Total people screened for HIV Male ---------- Female ----------

HIV prevalence_____

HIV Incidence_____

VCT_____

PMTCT_____

PITC_____

Mothers who received NVP from those tested positive_____

Persons Ever Enrolled in HIV Care_____

Persons Ever Started on ART_____

Persons Currently on ART _____

14. What are the main zoonotic diseases in the district?

20. Disaster situation in the wereda

- ✓ Was there any disaster (natural or manmade) in the wereda in the last one year? YES(specify)_____ No_____
- ✓ Any recent disease outbreak/other public health emergency?
  Yes (specify) _____
  No_____
- ✓ If yes cases_____ and deaths_____

21. Nutrition and foods

Nutrition (malnutrition related OTPs, SC, TSF, CBN and PSNP activities)/HO & Early warning

- ✓ Total OTP sites_____, total admissions to OTP/yr_____
- ✓ Total SC sites,_____, Newly opened/yr_____, total admissions to SC/yr_____
- ✓ Is there TSF (targeted supplementary feeding) program in the woreda_____
- ✓ CBN program_____ PSNP _____other_____
- ✓ General food security condition_____

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

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

24. Conclusions made about the health status of the Woreda based on the findings

25. Action plan and recommendations- on how to address the problems identified clearly depicting responsibilities, required resource and timeline

Annex 5: Rapid Belg Assessment Health sector Questionnaire

Interviewer name_____		Institution:_____	
Interview Date: (dd) ____/(mm)_____/2016		Region:_____Zone:_____	
Main contact at this location:	Name:_____	Position:_____	Tel:_____
1. COORDINATION			
A. Is there a functional multi-sectoral coordination forum for the health sector?		Yes□	No□
B. Are all relevant government, NGOs and UN agencies represented?		Yes□	No□
C. Frequency of regular meeting? (Weekly, Every 2 weeks, monthly…..)_____			
2. Outbreak?			

Was there any outbreak in the last 3 months? If yes, specify the type of disease	Yes□	No□
Type of outbreak _____Number of cases _____Deaths _____(specify the time period)_____		
Type of outbreak _____Number of cases _____Deaths _____(specify the time period)_____		
Type of outbreak _____Number of cases _____Deaths _____(specify the time period)_____		
Type of outbreak _____Number of cases _____Deaths _____(specify the time period)_____		
Type of outbreak _____Number of cases _____Deaths _____(specify the time period)_____		
Is there any ongoing outbreak of any disease? YES_____ NO_____		
If yes, specify the type of disease Type of outbreak _____Number of cases _____Deaths _____(specify the time period)_____ Type of outbreak _____Number of cases _____Deaths _____(specify the time period)_____ Type of outbreak _____Number of cases _____Deaths _____(specify the time period)_____ Type of outbreak _____Number of cases _____Deaths _____(specify the time period)_____		
3. Mention anticipated epidemics_____,_____,_____ If yes please indicate Zone/Woreda at risk and risk population per anticipated risk: *(Use the back side)*		
4. Public Health emergency Management		
A. Is there a Public Health and Nutrition Emergency Preparedness and Response plan?	Yes□	No□
If yes, is the plan budgeted/ funded?	Yes□	No□
B. Is there a trained staff on PHEM basic level (Regional/Zonal/Woreda/HFs)	Yes□	No□
If yes specify number of trained personnel per level: **Region:** Female _____ Male_____ **Zone:** Female _____ Male_____ **Woreda**: Female _____Male_____		
C. Is there a Regional/zonal trained Rapid Response team (RRT)?	Yes□	No□
D. Is there a trained staff on Emergency nutrition management at all level? yes --- No ---- If yes specify the no. : Total___ Male : ____Female :-___		

E.	Drugs and medical supplies		Total requirement	Available	Gap
	i. Meningitis vaccine				
	ii. Drugs:	Coartem			
		Artesunate (rectal)			
		Artesunate (Inj)			
		Artemether IM			
		Quinine (PO)			
		Quinine (IV)			
		Chloroquine			
		Ceftriaxione			
		Oily CAF			

		Doxcycline			
		Ringer lactate			
		ORS			
		Vit A.			
	iii.Nutrition: Therapeutic supplies and antibiotics	F100			
		F75			
		RUTF			
		Resomal			
		Routine antibiotics at SC/OTP (the list can be annexed)			
	iv.Lab supplies	RDT (Malaria)			
		Pastorex (Meningitis)			
		LP set			
		TI bottle			
	CTC Kit (AWD)				
	Medical Supplies	Gloves,			
		Syringe			
		PPE			
	Drugs and supplies for Emergency RH	Individual Clean Delivery Kits			

Section IV: Nutrition – SAM & MAM Management in the Region /Zone October 2015 to March 2016

SAM Management

4.1 Facilities with SAM management in the Region /Zone

Month	Total Number of Health centers/ hospitals	Total Number of Health posts	Number of SC.	% of health centers/ hospitals with a SC.	Number of OTP.	% of health posts with an OTP	Total Number of OTP/SC reported	% of OTP/SC who have reported
Oct								
Nov								
Dec								
Jan								
Feb								
Mar								

4.2 Admission and performance of the therapeutic feeding programme for SAM management

Month	Total SAM Cases		% of SAM children cured	% of SAM children defaulted	% of SAM children died	% of SAM children non-respondent	% of SAM children other
	2007 E.C.	2008 E.C.					
Oct							
Nov							
Dec							
Jan							
Feb							
March							

4.3. Availability of therapeutic supplies

	Yes	**No**	**If Yes, How much is available**
Is there sufficient supplies for 3 months of :			
RUTF			
F100			
F75			
2nd line drugs			

MAM Management

4.6. TSFP programme in the Region /Zone

	Yes	**No**	**If Yes, How much is available**
Is this a priority 1 woreda?			
Was there a TSFP distribution last month?			
Is there sufficient TSFP supplies for the next 1 month (RUSF, CSB+/oil or CSB++)?			
Is there woreda level storage of TSFP supplies for at least 2 months of supplies?			
Are children discharged from OTP referred to TSFP			
Is this a pilot (2nd generation) TSFP woreda?			
Has the Woreda been supported by an NGO in the last 3 months?			

4.7 MAM admission

Month	Priority 1 woreda Y/N		Total MAM Cases		Total Number of Food Distribution point in the woreda
	2007 E.C.	2008 E.C.	2007 E.C.	2008 E.C.	
Oct					
Nov					
Dec					
Jan					
Feb					
March					

Screening

4.8. When was the last screening conducted in the Region /Zone? _____

4.9. What screening modality is used in the Region /Zone? EOS _____, CHD ____, Routine____, vitamin A and de-worming coverage from Oct 2015– March, 2016

Vitamin A _____ De-worming _____

4.10. Screening performance for children in the Region /Zone

Month	Target Children 6-59 months	# of screened children	Screening Coverage (%)	# of Children with no odema and MUAC <11 cm			# of children with no oedema and MUAC 11 to 11.9CM	% Proxy GAM for children	% Proxy SAM for children
				#SAM			#MAM		
				MUAC <11 cm	odema	Total			
Oct									
Nov									
Dec									
Jan									
Feb									
March									

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4.11. Screening performance for Pregnant and lactating Women (PLW) in the Region /Zone

Month	Target PLW	# of screened PLW	Screening Coverage (%)	# of PLW MUAC below 23.0 cm*	**% Proxy GAM for PLW**
Oct					
Nov					
Dec					
Jan					
Feb					
March					

* Below 21.0 cm in Tigray

4.12 Any other observations you made or any risks of emergency nutrition?

_____

4.13 What were the major challenges in your emergency nutrition response experience?

_____

Flood

- Was there flood disaster in the last 6 months in the **Region /Zone**? Yes□ No□
- If yes, How many weredas affected _____, population affected_____
- Human Death due to flooding_____ yes or no
- If yes how many in number_____
- Are there displaced people due to flooding? Yes or No
- If Yes , how many_____
- was there outbreak in the flood affected area Yes□ No□

If yes , Type of outbreak _____Number of cases _____Deaths _____(specify the time period)_____
Type of outbreak _____Number of cases _____Deaths _____(specify the time period)_____
Type of outbreak _____Number of cases _____Deaths _____(specify the time period)_____
Type of outbreak _____Number of cases _____Deaths _____(specify the time period)_____
Type of outbreak _____Number of cases _____Deaths _____(specify the time period)_____

Any comment

Summary: Requirements/Needs/ 2016

Region/Zone	Type of Health and nutrition Emergency	Total estimated Beneficiaries[1]	Required finance

Region	Zone	Woreda at Risk	Type of Risk	At risk Population

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