

## Assessment of Indigenous Knowledge, Attitude and Practice of Community on Anthrax in Selected Districts of West Wollega Zone, Western Ethiopia

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### Abstract

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*Anthrax is zoonotic disease of public health importance. The disease negatively impacts the livestock production and causes worldwide concern because of its potential use as a biological weapon. A cross-sectional study was conducted from December, 2017 to June, 2018 in selected districts of west Wollega zone to assess knowledge, attitude and practice (KAP) of community on anthrax. The study was conducted through face to face interview by structured and pre-test questionnaires. The KAP variables were scored and pooled together. The mean score was computed to determine the overall knowledge, attitude and practice of the respondents; respondents who score greater than or equal to mean value are grouped as good Knowledge, attitude and practice, while that less than the mean value was poor for each. In this study, a total of 200 individuals were interviewed from two districts. Majority of participants stated that they had heard the disease called anthrax. More of respondents indicated they know about the transmission of disease from animal to human. The respondents were showed that, the disease can be occurred throughout of the year; the disease was affecting all breed (local, cross and pure exotic); many species (bovine, equine and small ruminants); both sex and all age of the animals. There were statically significant association was observed between knowledge and attitude score; and sex of participants at ( $P=0.00$ ). The practice score was statically significant associated ( $P<0.05$ ) with sex, age, and occupation of the study participants. The findings indicated that, majority of the respondent had good knowledge; good attitude and good practice with 67.2%, 78.6% and 71.6% a respondent respectively. The KAP score of current finding conclude that respondents had good knowledge, attitude and practice. Therefore, based on the conclusion, still awareness creation on all aspect in one- health concept is strongly recommended.*

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### INTRODUCTION

Anthrax is a neglected zoonotic disease of public health importance. The disease negatively impacts the livestock industry and causes worldwide concern because of its potential use as a biological weapon (Siamudaala *et al.*, 2006). Anthrax does not only affect human health but also perpetuates

poverty and causes emotional stress, especially among the poor populations whose livelihoods depend on pastoral farming (Molyneux *et al.*, 2011). This is because quarantine measures necessitated by disease outbreaks result in restricted livestock trade between areas, and hindrance of exchange of

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animals for drought power. Due to destruction of infected animals, household food security is affected and farmers experience financial losses (Siamudaala *et al.*, 2006).

Anthrax is a zoonotic disease that affects mainly large domesticated animals. Man acquires the disease accidentally through contact with infected animals or their products, often by the cutaneous route and only rarely by the respiratory or gastrointestinal routes (Freidlander, 2000).

*Bacillus anthracis*, a gram-positive, rod-shaped bacterium, is the causative agent of anthrax. Although, the disease was known to man since ancient Egyptians and may have been responsible for two of the plagues that afflicted Egypt around 3500 years ago (Shafazand 1999), the causative organism was not known until Robert Koch in 1877 was able to grow it in vitro. Also, by inoculating pure cultures of the organism in healthy animals and inducing the disease in them, Koch established the famous postulates that must be fulfilled before an agent can be identified as the cause of a specific infection (Zydowics, 1998). Furthermore, in 1881 Pasteur employed the first successful bacterial vaccine in animals by using a live heat attenuated culture of *B. anthracis* (Mock, and Fouet, 2001).

*Bacillus anthrax* spores are still at the top of the list of organisms used in these programs and also the favorite agent used by terrorist organizations and individuals to cause panic and fear in civilian populations (CDC, 2001). Anthrax is globally distributed disease, reported from all continents that are populated heavily with animals and humans. Animal anthrax outbreaks have been recorded in nearly 200 countries by the world anthrax data site, a world health organization collaborating center for remote

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sensing and geographic information systems for Public Health in 1996-1997 (Hugh Jones, 2001).

Anthrax is a worldwide zoonosis to which most animals, especially grazing herbivores, are susceptible. In natural conditions, human infections (predominantly cutaneous) usually result from contact with infected animals or contaminated animal products, such as hides or wool. Cases of inhalation anthrax (wool sorters' disease) have occurred in enclosed factory spaces where large scale processing of hides and wool took place. The ability of the anthrax spore to produce disease by the respiratory route is not high (Lincoln *et al*, 1967). Inhaled spores of > 5 µm pose no threat because they are cleared from the lung by the mucociliary escalator system. Humans are generally regarded as being moderately resistant to anthrax. Using air sampling techniques, Dahlgren and co-workers estimated that in one woollen mill, workers were inhaling between 600 and 1300 spores during an eight hour shift with no ill effects (Dahlgren *et al*, 1960)).

Control of anthrax among humans depends on the integration of veterinary and human health surveillance and control programmes. The primary objectives of any anthrax surveillance system are to prevent or reduce livestock losses and to prevent human disease.

Similarly, according to the information obtained from different source, there was not enough vaccination of livestock against anthrax, while several cases of anthrax were thought to visit the clinics (personnel communication). These all indicate the presence of significant health risk of anthrax in the areas. Information on knowledge, attitudes and practices (KAP) of the community and associated risk factors in a given community is crucial to plan and

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implement appropriate control measures. Though, anthrax was reported to be endemic in the Gulliso and Ayira districts, there is no study conducted on associated risks and community's knowledge, attitudes and practices towards the anthrax in West Wollega zone. Therefore, the objective of this work is:

- To assesses indigenous knowledge on the Anthrax with respect to their knowledge, attitude and practice

## **MATERIALS AND METHODS**

### **Study Area**

The study was conducted in Gulliso and Ayira districts of West Wollega Zone. The areas were far around 40-50km from the main town of west Wollega zone Ghimbi. Ghimbi was located between  $9^{\circ}10^{\circ}$ -  $9^{\circ}17^{\circ}$  North latitude and  $35^{\circ}44^{\circ}$ -  $36^{\circ}09^{\circ}$  East longitudes. The mean minimum and maximum annual temperature ranges between  $10^{\circ}\text{C}$  and  $30^{\circ}\text{C}$ . The mean annual rainfall is 1400-1800ml. It lies at altitudinal range of 1200m-2222m above sea level. The climatic condition alternates with long Summer May to August and short rainy seasons from March to April. The winter dry seasons (November to February) with mean annual rain fall of 1200mm (Mekuria & Gadissa, 2011).

### **Study population**

The study population was animals' owners who were randomly selected from per-urban and rural areas of Gulliso and Ayira districts of west Wollega zone.

### **Study design**

A cross-sectional study was conducted from December 2017 to June 2018 for assessment of community's indigenous knowledge, attitude and practices on Anthrax. Semi-structured questionnaire was prepared for the collection of the knowledge, attitude and practice (KAP) of the community on anthrax.

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### **Sample Size Determination**

For household questionnaire survey, the sample size was determined by using the formula recommended by Ashram (2007) for formal survey.  $N = 0.25/SE^2$ , SE= standard error= 0.05. Thus,  $N = 0.25/0.0025 = 100$  households. So that, the total sample collected from one district was 100 and from next district also 100 as results 200 participants were interviewed in this study.

### **Data collection methods**

To gather relevant information for the assessment of animal's owners indigenous knowledge on the anthrax cases in human and cattle in study area; face to face interview was made by using questionnaire specifically developed for these purpose. Demographic details (age, sex, residential, educational status, and occupation) of the respondent were covered by the questionnaire. The respondent was also asked questions which explore their knowledge concerning the disease, its means of transmission to humans and animals, and treatment, their attitudes on the public health risk of the Anthrax and its management, their practices in trying to prevent for prevention and control of the disease.

### **Data Management and Analysis**

The collected data was entered in to Microsoft excel and analyzed using SPSS version 25.0 statistical software package. Descriptive and inferential statistics was used to summarize and conclude on the findings. Association of the dependent and independent variables of the findings was analyzed by Statistical tools like logistic regression. The mean score was computed to determine the overall knowledge, attitude and practice of the respondents; respondents who score greater

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than or equal to mean value are grouped as good Knowledge, attitude and practice, while that less than the mean value was poor for each.

### Inclusion and Exclusion criteria

Randomly selected individuals mainly owners of animals, was included in the questioner survey. Persons who have no animals; and children less than 18 years, who cannot well express their ideas was excluded.

### Ethical consideration

The study was ethically reviewed and approved by Wollega University's Research

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and Publication Office. The study participants were interviewed in one to one approach. The sampling unit was coded and the information was kept confidential. If needed, oral informed consent was obtained from each study participant.

### RESULTS

Frequency of respondent towards anthrax in selected district of West Wollega Zone

In the current study, majority of the respondents were interviewed from Gulliso district. Of all participants more were male. Majority of respondent were at least attended primary school (Table1).

**Table 1:** Socio-demography data of participants on anthrax, West Wollega, 2018

Variables	Numbers of respondents	Percent (%)
Districts		
Gulliso	106	52.7
Ayira	95	47.3
Residence		
Per-urban	109	54.2
Rural	92	45.8
Age of respondents		
18-30	53	26.4
31-45	83	41.3
46-60	58	28.9
>60	7	3.5
Sex		
Male	136	67.7
Female	65	32.3
Educational status		
Illiterate	60	29.9
1-8grade	63	31.3
9-12grade	24	11.9
Diploma and above	54	26.9
Occupation		
Employee	43	21.4
Farmers	86	42.8
Other	72	35.8

### Data collection procedures

Data was collected using standard and structured self-administered questionnaire (ILO/ICN/WHO/PSI,2003). This tool was reviewed and adapted to the local context. The stated objectives and expected results were strictly taken into account while reviewing and adopting the data collection

tool. Experienced male and female data collectors were selected and trained for two consecutive days. Pre-testing was done to see the functionality of the developed questionnaires and reviewed as per the feedbacks or findings.

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### **Data analysis**

Data was entered, cleaned and processed using EPI-INFO version 3.3.1 statistical packages and exported to SPSS version 21. 95% confidence interval was calculated to assess the association between the study variables. Binary logistic regression was performed to see the effect of each explanatory variable towards dependent variable. Those variables having *P*-value of 0.29 or less at bi-variable analysis was included for multi-variable analysis. In the final model *P*-value of 0.05 or less were used as cut off points to declare the significant association between the study variables. Proportions, tables and graphs were used for a description of the data as appropriate. All the assumptions like normality of continuous variables and multi-collinearity between independent variables were checked to be satisfied with the appropriate methods.

### **Data quality assurance**

To ensure data quality, supervisors and data collectors were trained on the data collection tool and supervisors were assigned to the field to properly coach and mentor data collectors. Pre-testing of the developed tool was done to see the feasibility of the developed quantitative data collection tool or questionnaire. Participants were briefly explained about the objective of the study and questions one by one. Data entry and cleaning was done properly by the investigators.

### **Ethical consideration**

Letter to conduct the assessment was collected from Adama Hospital Medical College and was distributed to the concerned organizations. These organizations informed the selected study Hospitals to practically conduct the study. Regarding the study

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participants, consent form was prepared and participants were informed to make the decision to participate in the study. Those who were willing to participate signed the consent form before proceeding to answer the questionnaires. They were informed that they had the right to discontinue or refuse to participate in the study and confidentiality of the information was assured and privacy was maintained.

### **Operational definitions**

**Workplace Violence:** Incidents where staff are abused, threatened or assaulted in circumstances related to their work, including commuting to and from work, involving an explicit or implicit challenge to their safety, well-being or health (*ILO/ICN/WHO/PSI, 2003*).

**Physical Violence:** The use of physical force against another person or group that results in, physical, sexual or psychological harm. These include beating, kicking, slapping, stabbing, shooting, pushing, biting, and pinching, among others (*ILO/ICN/WHO/PSI,2003*).

**Psychological Violence (Emotional abuse):** Intentional use of power, including the threat of physical force, which can result in harm to mental, spiritual or moral. Includes verbal abuse, bullying/mobbing, harassment, and threats (*ILO/ICN/WHO/PSI,2003*).

### **RESULTS**

A total of 261 health professionals was planned to participate in the study, out of which 258 study subjects were enrolled making a response rate of 98.9%. The questionnaire for three respondents was

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incomplete or partially filled and excluded from the analysis.

### Socio-Demographic Characteristics

From the study participants, half (49.2%) were from the specialized hospital and more than half (55.8%) were female. The majority were

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in the age range of 26-35 years with the median ( $\pm$  IQR) of 28 ( $\pm 6$ ) years. Of all respondents, 55.0% were nurses of all categories. About one in three, 61.6% and 63.6% were married and had five more years of experiences at the time of data collection (Table 2).

Table 2: Socio-demographic Characteristics of the respondents, East Shoa Zone of Oromia Region, March to August, 2018

Variables	Frequency	Percent
<b>Status of Health Institution</b>		
Specialized	127	49.2
General	68	26.4
Primary	63	24.4
<b>Sex of the respondent</b>		
Male	114	44.2
Female	144	55.8
<b>Age Category</b>		
<25 yrs	33	12.8
26-35 yrs.	144	55.6
> 36 yrs.	35	13.6
<b>Median (<math>\pm</math> IQR)age 28 (<math>\pm 6</math>)years</b>		
<b>Profession Category</b>		
Physicians	42	16.3
Nurses	142	55.0
Others	74	28.7
<b>Marital Status</b>		
Single	87	33.7
Married	159	61.6
Others	12	4.7
<b>Work Experience</b>		
<5 years	94	36.4
>5 years	164	63.6

As the highest numbers were heard the disease called anthrax, the survey concluded that anthrax was commonly occurred in the areas, even if, most of them don't know the causes of the disease. Regarding the source information, the smallest numbers of the respondents were got information from mass media. The respondents were indicated that, the disease can be occurred throughout of the

year. The participants of current study showed that the disease was affecting all breed (local, cross and pure exotic); most species (bovine, equine and small ruminants); both sex and all age of the animals. The participants of this survey highlighted that the preferred treatment animals infected with anthrax was killing and burning of dead animals (Table 3).

**Table 3:** Knowledge of Respondents towards to Anthrax, West Wollega, 2018

Knowledge Variables	No. respondents	% of respondents
Did you hear of anthrax?		
Yes	158	78.6
No	43	21.4
From where you heard?		
Family	97	48.3
Health professional	57	28.4
Mass media	4	2.0
What are the clinical sign of anthrax		
Blood oozing out	14	7.0
Sudden death	21	10.4
Fever, shivering, bloat and dystantrity	9	4.5
I don't know	114	56.7
What are the causes of anthrax?		
Germ	73	36.3
Others	10	5.0
I don't known	75	37.3
Which species of animals are more affected?		
Bovine	98	48.8
Shoats	52	25.9
Equine	8	4.0
Which breed of animals more affected?		
Local	87	43.3
Cross	46	22.9
Pure exotic	25	12.4
Which age groups are more affected?		
Young	119	59.2
Adult	39	19.4
Sex		
Male	108	53.7
Female	50	24.9
Season		
Summer	70	34.8
Autumn	63	31.3
Winter	19	9.5
Spring	6	3.0
Anthrax transmit from animals to humans		
Yes	117	58.2
No	41	20.4
Which treatment is preferred for anthrax?		
Drugs (antibiotics)	40	19.9
Burning	9	4.5
Burning	109	54.2
Anthrax is fatal disease in animals and humans?		
Yes	120	59.7
No	39	19.4

Majority of the respondents of this survey agreed that as anthrax is health risk, as an exposed individuals to anthrax should Seek medical intervention promptly; anthrax is

preventable by vaccination; traditional healer can cure anthrax; anthrax is zoonotic disease; as transmitted to humans by eating carcass with case of anthrax, unprotect handling and feed offer to animals (Table 4).

**Table 4:** Attitude of participants and their frequency distribution, west Wollega 2018

Attitude Variables	Number of respondents	Percent of respondents
Do think anthrax is health risk to you?		
Agree	126	62.7
Disagree	32	15.9
An exposed to anthrax should Seek medical intervention promptly.		
Agree	122	60.7
Disagree	36	17.9
Anthrax is preventable by vaccination.		
Agree	127	63.2
Disagree	31	15.4
Traditional healer can cure anthrax.		
Agree	107	53.2
Disagree	51	25.4
Anthrax is Zoonotic disease		
Agree	121	60.2
Disagree	37	18.4
Dead animals act as of Source anthrax.		
Agree	114	56.7
Disagree	44	21.9
Can it be transmitted to humans by eating carcass with case of anthrax?		
Agree	125	62.2
Disagree	33	16.4
Unprotect Handling and feed offer can transmit anthrax to humans?		
Agree	133	66.2
Disagree	25	12.4

The respondents had good practice on handling dead animals from anthrax by made burning and burring; take to

veterinary clinics, isolation, burning and burring as immediate measurements of diseased animals (Table 5).



**Table 5:** Practice variables on anthrax in selected districts of West Wollega zone, 2018

Practice variables	Number of respondents	Percent of respondents
If your animals are diseased from anthrax		
Take to clinic	148	73.6
Others	10	5.0
Measure should taken		
Veterinary clinics	37	18.4
Isolation	26	12.9
Slaughter	4	2.0
Others (pray tradit. Healer, Handling dead Animals)	91	45.3
Slaughter	35	17.3
Burning	88	43.8
Burring	35	17.3
Immediate measure for Diseased animals		
Burning	8	4.0
Isolation	14	7.0
Take to clinic	43	21.4
Others (pray .....)	93	46.3
Vaccination		
Yes	101	50.2
No	57	28.4

### KAP score and their associated risk factors

The mean score of knowledge, attitude and practice is 18.1, 7.73 and 9.02 with standard deviation of 8.77, 4.51 and 4.87

respectively. The knowledge, attitude and practice (KAP) score of current finding concluded that the participants had good knowledge (67.2%), attitude (78.6%) and practice (71.6%) as majority of them score greater than mean values (Table 6).

**Table 6:** KAP scores of respondents on anthrax in selected districts of west Wollega, 2018

Variables	Numbers	Percent (%)
Knowledge score		
Poor (Less than mean)	66	32.8
Good (Greater than mean)	135	67.2
Attitude score		
Poor Less (than mean)	41	20.4
Good (Greater than mean)	158	78.6
Practice score		
Poor (Less than mean)	57	28.4
Good (Greater than mean)	144	71.6

The statically association between knowledge score and independent variables was made as a result statically significant variation at (P=0.006; odd ratio= 2.9) was observed between sex and knowledge score. The higher score was

recorded in participant had good knowledge as compared with those had poor knowledge. However, there was no statically association was observed between knowledge score and other independent variables (Table 7).

**Table 7:** Association between Knowledge score and independent variables, 2018

Variables	Poor Knowledge <mean n (%)	Good knowledge mean) n (%)	P- Value	Odd ratio	Lower	Upper
Districts						
Gulliso	39(19.5)	67(33.3)	0.20	0.68	0.37	1.24
Ayira	27(13.4)	68(34.8)				
Place						
Per-rban	41(20.4)	68(33.8)	0.08	0.48	0.22	1.09
Rural	25(12.4)	67(33.3)				
Sex						
Male	37(18.4)	99(49.3)	0.006	2.90	1.35	6.24
Female	29(14.4)	36(17.9)				
Age						
18-30	27(13.4)	26(12.9)	0.57	0.49	0.04	5.61
31-45	26(12.9)	57(28.4)	0.91	0.87	0.08	9.10
46-60	12(6.0)	46(22.9)	0.98	1.03	0.09	11.30
>60	1(0.5)	6(3.0)				
Education						
Illiterate	10(5.0)	50(24.9)	0.32	1.76	0.57	5.39
1-8grade	29(14.4)	34(16.9)	0.11	0.47	0.19	1.18
9-12grade	7(3.5)	17(8.5)	0.74	1.23	0.36	4.17
Diploma and above	20(10.0)	34(16.9)				
Occupation						
Employee	18(9.0)	25(12.4)	0.94	0.96	0.39	2.39
Farmers	19(9.5)	67(33.3)	0.33	1.55	0.64	3.76
Other	29(14.4)	43(21.4)				

Majority of the respondent had good attitude as compared to poor attitude. There was statically association was observed between sex, among age category with independent

variables. But, attitude score and other an independent variables were no statically significance association(Table 8).

**Table 8:** Association between Attitude Score and Independents Variables, 2018

Variables	Poor attitude (<mean)	Good attitude (>mean)	P-Value	Odd ratio	95% CI	
					Lower	Upper
Districts						
Gulliso	26(12.9)	80(39.8)	0.25	0.67	0.33	1.33
Ayira	17(8.5)	78(38.8)				
Place						
Per-urban	25(12.4)	84(41.8)	0.12	0.46	0.18	1.22
Rural	18(9.0)	74(36.8)				
Sex						
Male	20(10.0)	116(57.7)	0.006	3.72	1.46	9.48
Female	23(11.4)	42(20.9)				
Education						
Illiterate	8(4.0)	52(25.9)	0.18	0.37	0.09	1.54
1-8grade	25(12.4)	38(18.9)	0.00	0.08	0.03	0.29
9-12grade	4(2.0)	20(10.0)	0.32	0.45	0.09	2.14
Diploma and above	6(3.0)	48(23.9)				
Occupation						
Employee	10(5.0)	33(16.4)	0.68	1.26	0.40	3.98
Farmers	13(6.5)	73(36.3)	0.15	2.08	0.75	5.77
Other	20(10.0)	52(25.9)				

In current finding, the practice score was statically significant associated ( $P < 0.05$ ) with

sex, age, and occupation of the study participants. The practice score was higher in

participant who had good practices than poor practice. However, there was no statically

significant variation was observed on other independent variables (Table 9).

**Table 9: Association between Practice Score and Independent Variables, 2018**

Variables	Poor practice (<mean)	Good practice (>mean)	P-value	Odd ratio	95% CI Lower	Upper
Districts						
Gulliso	33(16.4)	73(36.4)	0.35	0.75	0.40	1.39
Ayira	24(11.9)	41(21.9)				
Place						
Per-urban	31(15.4)	71(35.3)	0.07	0.43	0.18	1.06
Rural	26(12.9)	66(32.8)				
Sex						
Male	29(14.4)	107(53.2)	0.001	3.94	1.69	9.16
Female	28(13.9)	37(18.4)				
Education						
Illiterate	10(5.0)	50(24.9)	0.47	0.63	0.18	2.22
1-8grade	31(15.4)	32(15.9)	0.00	0.12	0.04	0.37
9-12grade	6(3.0)	18(9.0)	0.22	0.43	0.11	1.66
Diploma and above	10(5.0)	44(21.9)				
Occupation						
Employee	11(5.5)	32(15.9)	0.10	2.45	0.83	7.22
Farmers	17(8.5)	69(34.3)	0.04	2.63	1.03	6.74
Other	29(14.4)	43 ((21.4)				

## DISCUSSIONS

This current study indicated that, most of the respondents (78.6%) were heard anthrax. The names by which anthrax disease is addressed suggest that respondents understood the common signs of disease and transmission route. In the areas, anthrax is called "Abba Sanga". According to the respondents, the disease is called as such because typical affect ox and kill male animals. Additionally, finding also found that most respondents (76.7%) have not got any form of information from mass media. This means that the majority of respondents are more likely to have poor access to media to share information and messages transmission ways. This study showed that most respondents accessed information from their family and friends rather than media. This

situation is likely to interfere with public health messages as community members share misunderstand and tradition surrounding the disease. This is in line with the report of Doreen *et al.*, (2017), who summarized there finding in the same manner. This finding also identified that 21.6% of the respondents were never heard nor know the disease called anthrax. This indicated those major gaps were existing among the community living in the same areas on awareness about this fatal disease.

The survey results indicated participants had good awareness about anthrax. Both male and female respondents also showed an understanding of the susceptibility of animals and humans to anthrax, the signs and symptoms of anthrax in dead animals, seasonal outbreak periods, common

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transmission routes and the importance of vaccination as a preventive measure. Veterinary services and public health authorities should cooperate to integrate disease surveillance data. This shared data will give a more complete picture of disease presence, and may identify regions where no animal cases are reported but where there are human anthrax cases, indicating the presence of disease in animals. Anthrax can be prevented in livestock species through vaccination, which is the principal tool used for controlling anthrax in livestock (OIE, 2007).

On questioner survey about anthrax, 36.3% of the respondents knew the causative agent of the disease as germs. Majority of them knew that anthrax occurs in cattle, shoats and equine. This was agreement with the previous Shadomy *et al*, (2016)) who reported that anthrax mainly occurs in herbivores (cattle, sheep, camels, horses, etc.), however practically all animals are susceptible to some degree. The disease in herbivores tends to be severe, with a high mortality rate. Among birds only ostriches are known to be susceptible to anthrax. When questioned on clinical signs that suggest anthrax in animals, they mentioned the presence of blood oozing from natural orifice, sudden deaths, and fever, shivering, bloat and dystantrity as signs indicative of anthrax (Table 2).

From the total interviewed participant's majority (58.2%) of them aware as anthrax disease transmit from animals to human being by different means of transmission such as skinning, handling and eating infected carcasses were mentioned as important. They also mentioned as anthrax was the fatal disease for humans and animals unless they were treated with antibiotics immediately. In view of different authors; generally poor

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knowledge about anthrax in a community and its health care providers may play a major role in the increase of morbidity and mortality rates during outbreaks and epidemics. Also the use of folk and herbal medicine can result in the increase of patients presenting with severe symptoms compared with those seeking antibiotic treatment (Seboxa & Goldhagen, 1989). Public education campaign involving both veterinary and local health personnel on the actual cause and prevention of *anthrax* could reduce outbreaks of the disease in people (Opare, *et al.*, 2000).

The survey summarized that, high levels of knowledge were found to be consistent with the attitudes and practice of respondents in this study; this means that the respondent who had good knowledge also had good believe and acceptable practice.

They also believed that as anthrax is health risk, as an exposed individuals to anthrax should Seek medical intervention immediately; anthrax is preventable by vaccination; traditional healer can cure anthrax; anthrax is zoonotic disease; as it's transmitted to humans by eating carcass with case of anthrax, unprotect handling and feed offer to animals. This agreement with the previous ideology on anthrax they said that there is strong evidence that the vaccine is safe and effective against inhalation anthrax (FAO, 2026). Contrary to this finding, the study done by Gombe *et al* in Zimbabwe revealed that respondents disagreed with statements that overcooking infected meat kills anthrax bacteria (Nkomo, *et al*, 2010).

This study indicated that, majority of the respondents from Gulliso district had good knowledge, than Ayira district. The male respondents had good (49.3%) knowledge than female (17.9%) respondents who were settled in per-urban areas of the districts. The

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adult age of the participants had good knowledge than adolescent age of interviewed community. This may be related to age, as age increase the possibility of exposed to different clinical diseases that help to learn from what have seen and what we have handled even though no health education was practiced in the areas.

Anthrax control measures must employ an understanding of the entrenched local knowledge, cultural factors and behaviors influencing transmission. A sensitive control strategy will provide effective communication that will help establish a bond of trust between responsible authorities and those who are potentially affected (Blanchard *et al.*, 2005). This may contribute to improved compliance to control measures and application of empirical evidence based on both technical and locally acceptable interventions.

The participants had acceptable practice on handling dead animals from anthrax by made take to veterinary clinics, isolation, burning and burring as immediate measurements of diseased and dead animals. This is agreement with the ideas; interruption of anthrax vaccination programmes in endemic areas is a risk factor for both animals and humans. Appropriate and safe disposal of dead animals, bedding and other contaminated materials, and subsequent disinfection and decontamination of all possible surfaces that can harbor anthrax spores are key steps in limiting the spread of anthrax and contamination of the environment. The ideal method of disposal of an anthrax carcass is incineration (Stoltenow, 2015; WHO, 2008).

The knowledge, attitude and practice (KAP) score of current finding concluded that the participants had good knowledge (67.2%), attitude (78.6%) and practice (71.6%) as

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majority of them score greater than mean values. This good awareness of the participants about anthrax might be due to the presence of the disease in the areas for long period of time which lead to the access of visiting diseased and dead animals from anthrax.

## **CONCLUSION AND RECOMMENDATIONS**

In current finding, the overall knowledge of the majority of the respondents were good regarding the modes of anthrax transmission, clinical signs of anthrax, prevention and control methods. However, some of the respondents were never heard the disease called anthrax, the respondents were believed the disease health risk to communities. They also believed that as anthrax is preventable by vaccination; traditional healer can cure anthrax; as it's transmitted to humans by eating carcass with case of anthrax, unprotect handling and feed offer to animals. The participants had acceptable practice on handling dead animals from anthrax by made, isolation, burning and burring as immediate measurements of diseased and dead animals. The KAP score majority of the participants in current finding conclude that good knowledge, good attitude and acceptable practice were observed in on interviewed respondents. Therefore, the Federal Ministry of Health; and livestock and fishery should work in cooperation to combat anthrax in both animals and humans. Awareness creation still need be given to raise knowledge, attitude and practices of the communities. Concerning body should provide accurate information which is advance awareness of the communities. Recommendations for anthrax control have largely depended on surveillance and management of biological agents, including

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medical treatment, and decontamination infected areas. In addition, continued education on existing guidelines for the slaughter, disposal, and quarantine of domestic animals suspected to have anthrax and for those that have been exposed to anthrax and dead would be beneficial to burning and burring.

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