

**SERO-PREVALANCE OF BRUCELOSIS AMONG PATIENTS ATTENDING
MEDICAL CARE SERVICES AT SHUUKU HEALTH CENTER
FOUR IN SHEEMA DISTRICT.**

**BY
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**A RESEARCH REPORT SUBMITTETTED TO THE SCHOOL OF ALLIED HEALTH
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DECLARATION

I KANYIJE ABERT declare that the work presented in this booklet for the award of diploma in clinical medicine and community health is my original copy and has never been presented either wholly or in part for the award of any academic qualification, where other peoples' work has been quoted reference has been indicated.

.....

SIGNATURE

.....

DATE

SUPERVISOR'S APPROVAL

I hereby accept the research report of the above named person under my supervision. And i approve it for the school of allied health sciences of Kampala International University-western campus.

SIGN.....DATE.....

MR TUTAMWEBWA THOMAS

DEDICATION

This document is dedicated to my beloved mother MRS Kobusingye Gorrette my sisters and brothers and friends who contributed whatever they had in any way towards the accomplishment of my course, May the almighty God bless them abundantly.

ACKNOWLEDGMENT

Glory be to God for such abundance of grace and faithfulness in all my academic achievements. Am grateful to my supervisor MR Tutamwebwa Thomas, my lecturer who tirelessly guided me through the production of this booklet. My gratitude also goes to the staff at Shuuku health center four for the conducive atmosphere granted on to me throughout my data collection process.

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DEFINITION OF TERMS

Agglutination: Is the binding of antigen-antibodies which result in formation of a visible clumping

Antibody: Substance produced by B-Lymphocytes in response to unique antibody

Antigen: Are foreign substances usually proteins nature that stimulates production of antibodies

Confirmatory tests: Tests that have high specificity and sensitivity

- **Flash method:** Heating at 72 degrees centigrade for 15 seconds.
- **Holder's method:** Sterilization of milk and its products at 63 degrees centigrade for 30 minutes.

Pasteurization: Sterilization of dairy products which involves the following methods;-

Ultrahigh temperature [UHT]: Heat at 140 degrees centigrade for 15 seconds.

Virulence: Is the relative power and degree of pathogenicity possessed by organisms

Zoonotic diseases: are diseases that are transmitted from animals to humans.

ABBREVIATIONS

BAT:Brucella agglutination test.

CFT:Complement fixation test.

ELISA: Enzyme linked immunesobent assay

MAT: Monoclonal antibody test.

MOH: Ministry of health.

PCR: Polymerase chain reaction.

RBPT: Rose Bengal plate test.

SAT: Serum agglutination test.

SOPS: Standard operation procedures.

SSA:Sub Saharan Africa.

WHO: World health organization.

A LIST OF TABLES AND GRAPHS

Table 1;summary of the participant's social-demographic characteristics and brucellosis sero-prevalance percentages

.Table 2; showingsummary of the results according to sex and their positive and negative percentages.

Graph 3; summary of the people's knowledge about the risk factors for the transmission of brucellosis.

Graph 4; Summary of the results showing the peoples knowledge about the cause and the symptoms of brucellosis. .

ABSTRACT

Back ground

Brucellosis is the most infectious zoonotic infection worldwide and it is a global health problem in humans. Globally, over 500,000 new infections are reported annually and about 14% in Uganda.

Objective

To determine the prevalence of brucellosis among patients attending medical care services at Shuuku health center four in Sheema district.

Sample size determination

The sample size was determined by using Fisher's formula

$N = Z^2 pq / d^2$ where, N=sample size.

Z=the standard deviation and the standard degree of accuracy(95% and the standard deviation of 1.96.

P=the presumed sero-prevalence of 14.2%, q=1-p

d=the degree or the amount of errors (5%=0.05)

Method

An open and closed ended questionnaire was developed and used during data collection. The questionnaire included sociodemographic data (age, sex, marital status, religion, education level and occupation) and the people's awareness about brucellosis.

About 2 milliliters of blood samples were collected from each patient who was chosen basing on the inclusion criteria. Blood sample was clearly labeled with a specific number. The samples were then screened using Brucellosis agglutination test.

Results

The findings of the study revealed that 15%, n=28 participants were positive of brucellosis and 85% n=158 participants were negative, 81 males were recruited representing 43.5% and 18 were positive (22.2%) and 105 were females representing 56.5% and 10 were positive 9.5%.

CHAPTER ONE

INTRODUCTION

1.1 BACKGROUND OF THE STUDY.

Brucellosis is one of the most common zoonotic infections globally (Ariza *et al*, 2007), transmitted to humans through consumption of unpasteurized milk or through direct contact with infected animals, placenta or aborted fetuses (Kansiime *et al* 2014). It is caused by gram negative bacilli bacteria of the genus *Brucella*, which comprises of eight species ranked according to their pathogenicity and host preferences. Six of the eight species can be isolated from terrestrial mammals, *B.abortus*, *B.melitensis*, *B.suis*, *B.canis*, *B.Ovid* and *B.neotomae*(Abdu R B *et al*,2013,)

Globally over 500,000 new infections are recorded annually, making brucellosis one of the main global health problem in humans particularly in Mediterranean, middle east, central Asia, united states that borders with Mexico(WHO,2003).

The disease is endemic in sub Saharan Africa (SSA),with significant effects on economic and social conditions of people in this region (FAO,2009).

The epidemiology of brucellosis in SSA is complex and the prevalence varies across geographic regions and livestock systems (Man gen M j *etal* 2002)

Generally in SSA the prevalence ranges from 10.2 to 25.7% though most reports indicate major endemicity in North African countries including Egypt with the incidence highest among the pastoral production (Ongor H *etal* 2006)

In Uganda, human brucellosis has been reported to be prevalent in both rural and urban area (Makita K *et al*,2008),with a recent case control study at Mulago National Referral Hospital in Kampala showing that living in a slum area was a risk factor for infection for urban dwellers. A study of brucellosis in cattle in Mbarara district reported a herd prevalence of 55.6% and animal prevalence of 15.8% in the pastoral dairy system (Bernard F *et al*,2005) but higher figures of up to 100% at herd level and 30% of animal level have been reported in central district of Nakasongola.

Generally, brucellosis is highly prevalent with 14% infection in humans and animal sero prevalence of 4-26% in both East, central and western Uganda and sero prevalence of 13.3% in urban settings of Uganda. In western and some parts of central Uganda, like Mbarara, Kampala, kiboga, and others. Brucellosis is prevalent in kiboga with 17.0% out of the 235 people tested. The results show that Brucella was high in males with 20.5% of the 78 tested and elderly above 60 years with 22.2% out of the 18 tested. (Tumwine G *et al*, 2015).

In rural Uganda, poor communities are at risk of the disease because of their poor life style which exposes them to contact with animals, their excreta, and consumption of unpasteurized dairy products. Brucella is disseminated via the lymphatic and blood vessels to the heart, kidneys and other body parts and leads to splenomegaly in response to infection. The infection is then controlled by pasteurization of milk and milk products and inspection of animals for the disease before slaughter; immunization using an attenuated vaccine effectively controls the disease (Scolz HC *et al* 2010).

Humans get infection by ingestion of unpasteurized milk, milk products, raw meat from animals infected with brucellosis. It also affects meat processors, livestock rearers, veterinarians as a result of exposure to infected animals (Monajjemi M *et al* 2001)

In humans, the onset of brucellosis is usually gradual and the symptoms are not specific to the disease therefore making the diagnosis to be challenging because it presents with signs and symptoms which are cordially the same for other diseases. Patients may present with intermittent fever, sweating, chills, depression, weight loss, aches and pains and presents with the following complications: Enlargement of lymph nodes, arthritis, hepatomegaly, endocarditic, neurological symptoms (Layla G *et al* 2003)

It has been noted that little data is available on the prevalence of brucellosis in western Uganda thus the current study is designed and directed to investigate the rate at which the community is affected and provide data.

1.2 Problem statement

The traditional epidemiology of the disease has changed dramatically over the last two decades but the incidence remains high in the Middle East, North African countries like Egypt and SSA.

According to WHO, every 500,000 people are infected in Uganda and in the United States Of America 4-10% of the cases were diagnosed and reported in 2012.

The studies showed that Brucellosis increased with age (Fallatah S.M *et al*, 20005).

The relatively low prevalence of Brucellosis in children below 15 years compared with adults is as a result of close contact with Livestock (Yumuk Z *et al*, 2012).

In Uganda, the majority of the communities are affected by the disease and little has been done to provide awareness about the causative agents of Brucellosis.

The information available is in complicated forms such as text books and journals which are rarely available to local population. This study was therefore intended to unveil the knowledge about the disease through health educating the patients who took part in the study there by reducing the risk of contracting the disease.

However the study was mostly aimed at determining the prevalence of brucellosis among patients who attended Health care services at Shuuku Health center Four.

1.3 Justification of the study.

The study was aimed at providing the general knowledge of Brucellosis to the patients taking part in the study at Shuuku Health Center Four. For example people got knowledge about the causative organism, transmission of the disease, signs and symptoms, prevention and control measures of the disease.

All the patients who tested positive of Brucellosis antigen were treated.

1.4.0. OBJECTIVES.

1.4.1. General objectives.

To determine the prevalence of brucellosis among patients who get medical care services at Shuuku Health center four in Sheema district.

1.4.2 Specific objectives.

- To determine the prevalence rate of brucellosis among patients who visit Shuuku Health center four basing on laboratory serological tests.
- To identify the risk factors for the transmission of brucellosis among people.

- To access the peoples knowledge about the cause and symptoms of Brucellosis

1.5 Research questions

1. What is the prevalence of brucellosis among patients attending Shuuku health four?
2. What are the factors that predispose people/patients to brucellosis?
3. How much does the public know about the causes and symptoms of brucellosis?

1.5.0 Scope of the study

1.5.1 Geographical scope

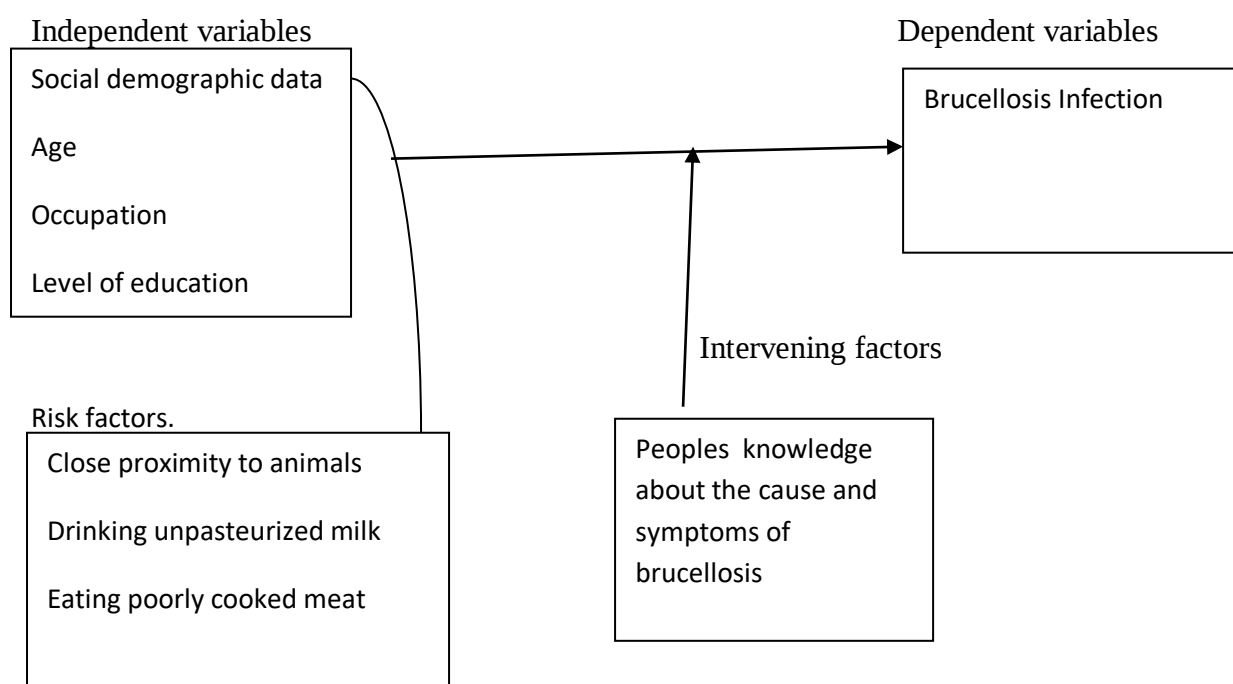
The study was carried out at Shuuku health center four located in Sheema district. Sheema district is located in Western Uganda. It is bordered by Buhweju district to the North, Mbarara district to theeast, Ntugamo district to the south, Mitooma district to the South east and Bushenyi district to the west. Kibingo where the district headquarters are located, lies approximately 33kilometers (21mi),by road, west of Mbarara, the largest city in the Ankole sub region.

The coordinates of the district are 00 32S,30 24E.In 2002, the national population census was 180234,and according to the population census conducted on 27/08/2014the population was at207343 and the population was estimated to be 211100 as on 01/07/2016

1.5.2 Significance of the study

The outcome of this research will help the health care workers to identify the prevalence of brucellosis and the most common affected gender and age group. The study will be a partial fulfillment requirement for the researcher in attaining a diploma in Clinical medicine and community health of Kampala international university western campus.

Conceptual framework



CHAPTER TWO

LITRETURE REVIEW

2.1. Brief history of brucellosis

Historically, the disease was recognized in the Mediterranean region, particularly in goats and sheep, dating back to antiquity. Brucellosis type illnesses were recognized by Hippocrates in his Epidemics writing; the apostle Paul is considered to have been infected following his being shipwrecked on the island of Malta and suffered from a recurrent illness or "thorn in my flesh." Afterwards Britain maintained a military base on this island during the 18th and the 19th centuries. During this period, vivid descriptions of illness in garrisoned troops and physician David Bruce was dispatched to investigate, He isolated the causative organism from four different animals. *Brucella melitensis* was the first member of the genus *Brucella* to be isolated from the liver of British soldiers dying from a febrile disease in Malta. Its source was found linked to the milk of goats. This specie, is the most virulent for man among *Brucella* species and *Brucella abortus* was isolated from cows showing infectious abortion [Lecaraz *Cet al* 2006]

The disease has been referred by various names such as Brucellosis, Undulant fever, Malta fever, Mediterranean fever in humans. It is also called infectious abortion, Bang's disease in animals (Dean AS *etal* 2012).

However, the clear history of brucellosis is not well documented.

2.2. Distribution of the disease.

Because brucellosis is a debilitating zoonotic disease, with over 500,000 new cases annually, brucellosis is the most common zoonotic infection worldwide and remains a global health problem in humans particularly in the Mediterranean region, Middle East central Asia United States with osteo-articular complications in humans and the most common localized manifestation of brucellosis occurring up to 80% of the cases. Currently little is known about the pathogenesis of osteo-articular complications. Researchers are investigating the immunologic basis for *Brucella* induced osteo- articular pathology (NCBI *etal* 2015)

A prevalence ranging from 10.2-25.7% is reported across sub-Saharan Africa which indicate major endemicity issues in North African countries including Egypt and incident is highest among pastoral communities. It is the cause of the highest fever in Cairo and it is common in western parts of Uganda for example Mbarara, (Alp EF *etal* 2008).

There is relatively low prevalence of brucellosis in children compared to adults because adults are so close to animals compared to children and there is no significant difference in prevalence of the disease in sexes. All are susceptible to infection because all have close contact with animals (Celebi *Getal*, 2007). Access to information on brucellosis is a human right as well as a public health measure so that people can protect themselves and improve on their health care.

2.3. General characteristics of brucellosis

The disease brucella consists of small, non-motile, non-spore forming gram negative aerobic coccobacilli and each has specific biotypes that differ from one another on the basis of biochemical activity. Many species require supplemented carbon-dioxide for their growth especially on the first isolation (kokoglu OF *etal* 2006)

Brucella species and their hosts.

Number	Brucella species	Host
1	Brucellaabortus	Cattle
2	Brucellasuis	Pigs
3	Brucella melitensis	Goats/sheep
4	Brucellacanis	Dogs
5	All the above	Man

2.4. Resistance and survival of brucellosis

Brucella organisms are destroyed by exposure to high temperature at 60 degrees celcius for 10 minutes. Exposure to phenol for at least 15 minutes or exposure to low temperature such as 0 degrees celcius for a month kills the organism.(Mantur BG *etal* 2006)

2.5. Transmission of brucellosis in humans.

Brucellosis is zoonotic bacterial diseases which is transmitted from animals to humans and occurin the following ways;

Animal care takers, animal health professionals, and veterinarians are prone to brucellosis (Gerberding JL *etal* 2008).

Man acquires brucellosis either directly or indirectly from infected animals, the most common way to be infected is by eating or drinking contaminated milk products.(Fallatah S*Metal* 2005).

Brucella organisms can also enter the body through skin wounds which is a problem mainly to persons working in slaughter rooms or meat packing plants. Brucellosis is rarely got by eating well cooked meat as cooking destroys the organisms except if not cooked well.

Some vaccines used in livestock most notably B.abortus strain 19, also cause the disease in humans if accidentally injected. (Wikipedia)

2.8. Signs and symptoms of brucellosis.

- The disease is a cute or sub-acute ranging from self - limiting to complications. Persons of all ages are affected but common with working stages of life.
- Patients will have abnormalities linked to reticulo-endothelial system characterized by intermittent fever of 40 degrees Celsius, chills, malaise, fatigue, profuse sweating especially at night, joint pain and swelling, anorexia, weakness, orchitis, arthritis, weight loss, hepatomegaly, mental disorders, depression depending on the organ affected.
- Pain of the gluteal and lower limb are frequent clinical features. (Young, 2009)
- However much the symptoms are like those associated with many other febrile diseases, more emphasis should be put on the presence of muscular pain and sweating. In the first stages of the disease, septicemia occurs and leads to the classic triad of undulant fevers, sweating (often with characteristic smell liked to wet hay) and migratory arthralgia and myalgia (joint and muscle pain) (Wikipedia)

2.9. Prevention and control of brucellosis

- Strict adherence to hygienic measures and practices in the farms
- Avoid consumption of raw milk.
- Strengthening of the surveillance of brucellosis in the population at risk.
- Adoption of the policy of disposal of infected animals.
- Health education of the community to create awareness to the public.
- Proper cooking of meat and milk.
- Early diagnosis and treatment of the disease.
- Vaccination of animals (Dean AS *etal* 2012)

2.11. Treatment of brucellosis

The goal of the medical therapy in brucellosis is to control symptoms as quickly as possible in order to prevent complications and relapses.

Multi drug antimicrobial regimens are the mainstay of the therapy because of high relapse rates reported with monotherapeutic approaches.

Drugs that display clinical activity with low relapse rates include the following;

Doxycycline, Gentamycin, Streptomycin, Rifampicin or Trimethoprim-sulfamethaxazole (TMP-SMZ)

For acute brucellosis in adults and children above 8 years, the WHO guidelines recommend the following;

1: Doxycycline 100mg po bid 6/52 plus Rifampicin 600-900mg/day po 6/52

2: Doxycycline 100mg po bid 6/52 plus Streptomycin 1g/day IM for 2-3 weeks. This regimen is believed to be more effective mainly in preventing relapse. Gentamycin can be used as a substitute for streptomycin and has shown equal efficiency.

IN CHILDREN BELOW 8 YEARS;

Rifampicin plus TMP-SMZ for 6 weeks is the therapy of choice. The relapse rate appears to be 5% or lower.

IN PREGNANT WOMEN;

TMP-SMZ either as mono therapy or as part of combination with Rifampicin or streptomycin.

Rifampicin plus TMP-SMZ the most common recommendation.

In patients with spondylitis and sacroiliitis:

Doxycycline plus Rifampicin combined with aminoglycoside (Gentamycin) on the initial 2-3 weeks, followed by 6 weeks of Rifampicin and Doxycycline is usually recommended.

For chronic brucellosis the treatment is with triple therapy that is the combination of rifampicin, Doxycycline and streptomycin (Medscape, 2017).

2.12. Description of the method used in this study.

Brucellosis agglutination test [BAT] or SAT

This test total antibodies to the two encountered brucella species that is to say brucellaabortus and brucella melitensis. It is entirely used in the diagnostic laboratories.

Purpose of the test

To aid in the diagnosis of brucellosis and monitoring of treatment.

Principle of test

When a smooth suspension of attenuated antigen is mixed with patient's serum, brucella Agglutination shows a positive result indicating the presence of brucella in patients sample and no agglutination is a negative test indicating absence of brucella antibodies.

Specimen required

Fresh Serum

Materials and reagents

Antigen suspension of brucellaabortus and melitensis

Polyspecific positive sera

Centrifuge

Agglutination card or slides

Pipettes

Method

Qualitative method [rapid slide agglutination]

This is a useful rapid screening test to detect reacting serum that requires titration

Arrange all the materials to be used

Centrifuge the sample to obtain serum

Bring sample and reagent to room temperature

Place a drop of sample to circle labeled test, negative and positive control respectively as shown below;

Negative control	Positive control	Test
O	O	O

Brucella antigen drop was added to the test circle

Mixed well and spread over the ring

Rotated for 2-3 minutes and examined macroscopically for agglutination

Interpretation of results

Visible agglutination indicate positive results

No agglutination indicate negative result

CHAPTER THREE:

METHODOLOGY.

3.0 Introduction

This chapter contains the study area, study design sampling procedure, sample size, data collection methods and tools, quality control, data collection methods, ethical consideration, limitations of research.

3.1 Study design

The study is prospective cross-sectional laboratory based where people/patients who visited the hospital for medical services were tested. The tools of data collection include questionnaires prepared in both open and closed ended questions and in simple English to understand and interpret.

3.2 Study area

The study was conducted at Shuuku Health center four in Shuuku Sub County Sheema south Sheema district. The sub county has the second largest number of herds of cattle in the district and the community in this area derives their economy by selling cattle products mostly milk.

Sheema district is located in western Uganda, boarded by Buhweju district to the North Mbarara district to the East, Ntugamo district to south, Mitooma district to the South east and Bushenyi district to the West.

Kibingo where the district headquarters are located lies approximately 33km (21mi) by road west of Mbarara, the largest city in the Ankole sub region located in western Uganda. The district coordinates are 00 32S, 30 24E. In 2002, the national population census was 180234 and according to the population census conducted on 27/08/2014, the population was at 207343 and the population was estimated to be 211,100 as on 01/07/2016.

3.3 Study population

The study population was all patients who visited Shuuku health center four for medical checkup and treatment and presented with signs and symptoms of brucellosis. Cattle rearing communities from parishes with in Shuuku Sub County was the target group for the study

3.4 Sampling techniques

The study employed accessibility systemic random sampling techniques. This refers to the situation where patients who visit the hospital for treatment with the signs and symptoms are considered for the test/study. The method gave a chance to those who had signs and symptoms and people at a risk of getting the disease for the example cattle keepers, milk and meat eaters (these were identified according to the questionnaire assessing whether one eats animal products such as milk and meat). This ensured that the people who tested were a good representative of the study population

3.5 The sample size determination

The sample size was determined by use of Fisher's formula which states that;

$$n = z^2 pq / d^2$$

Where:

n was derived sample size

z was standard deviation and the desired degree of accuracy [usually the degree of accuracy accepted is 95% which gives a standard deviation of 1.96

p was expected population sero-prevalence, [obtained from previous studies carried out in similar populations] of 14.2%.

$$q = 1 - p$$

d = the degree or amount of error the researcher is ready to accept. [5% = 0.05]

$$n = z^2 pq / d^2$$

$$n = (1.96)^2 \times 0.142 \times 0.86 / (0.05)^2$$

$$n = 3.93 \times 0.142 \times 0.86 / 0.0025$$

$$n = 0.473172 / 0.0025$$

$$n = 186$$

Therefore: Sample size = 186

3.5.1 Inclusion criteria.

All patients who sought treatment and presented with signs and symptoms of the disease and consented for the test were included in the study.

3.5.2 Exclusion criteria

Patients who did not present with signs or symptoms of the disease were excluded.

And those patients who did not consent for the test were also be excluded.

3.6 Data collection and tools

Data was collected by the use of a questionnaire prepared in simple English that is easy to understand and interpret made of closed and open ended questions. Laboratory reagents used in Brucellosis serology testing such as brucella antigen, gloves and syringes shall be used in the laboratory for testing.

3.7 Data analysis and data presentation

Data analysis was done using statistical packages such as SPSS. The results of this study were presented in table form, graphs and Pie-charts

3.8 Data quality control, validity and reliability.

Data reliability control was assured done by use of positive and negative controls for any test that was conducted.

Data collection process was supervised daily and checking for completeness of data was done by the end of the day so that the incomplete work can be compiled before leaving the station.

3.9 Ethical considerations

Permission to carry this research was obtained from Shuuku health center four.

This research topic was approved by the ethical committee of the university

The patients were given the right to decide/consent for the test and study

Patients had the right to withdraw at any time of the interview without any penalty.

The patients had freedom to ask questions.

Patients were assured of confidentiality (codes were be used instead of names)

3.10 Study limitations

Tight schedule since the research had to be done with lectures also going on leading to little time. This can be solved by proper time table.

The economic problem was the major obstacle throughout my research process as every item used during the process had to be self-catered for.

CHAPTER FOUR: RESULTS

4.0 Introduction

The data obtained from this study was analyzed and presented in form of tables. 186 participants were recruited in the study and the results of the study are as shown below.

4.1 social demographic characteristics

Table 1 Summary of the participants social-demographic characteristics and brucellosis sero-prevalance among the participants..

A total of 186 human participants were involved in the study. Most of the participants were females 56.5%(n=105) males were 43.5%(n=81). The participants grouped into different age groups that is 18-24 (9.1%,n=17) 25-31 (10.8%,n=20) 32-38 (30.1%,n=56) 39-45 (37.1%,n=69) 46+ (12.9%,n=24). participants occupation peasants (84.9%,n=158), teachers (2.2%,n=4), civil servants (7.2%,n=9), businessmen (21.4%,n=15) level of education none (5.4%,n=10), primary (61.3%,n=114) secondary (20.4%,n=38) tertiary institutions (12.9%,n=24).

characteristic	Number of participants	Positive participants	% of positive participants
SEX			
Male	81	18	64.3
Female	105	10	35.7
AGE			
18-24	17	02	7
25-31	20	04	14.3
32-38	56	05	17.8
39-45	69	10	35.7
46+	24	7	25
OCCUPATION			
Peasant	158	20	71.4
Teachers	04	00	00
Civil servants	09	02	7.2

Businessman	15	06	21.4
LEVEL OF EDUCATION			
None	10	02	7.1
Primary	114	15	53.6
Secondary	38	07	25
Tertiary	24	04	14.3

4.3 Results according to sex

Male were 81(43.5%) and 18 were positive (22.2%) and 63 were negative (77.8%).Female were 105(56.5%), 10females were positive (9.5%) and 95 were negative (90.5%)

Table 2: summary of results showing total number of males and females their total positive and total negative percentages.

Sex	Total	Positive	Negative	Percentage positive	Percentage negative
Male	81	18	63	22.2	77.8
Female	105	10	95	9.5	90.5

4.4. People's knowledge about the risk factors for the transmission of brucellosis among people.

Majority of the people were aware that brucellosis is preventable in humans. However only two methods of prevention were mainly mentioned. A high proportion 184, 98.9% reported pasteurization of dairy products and 179, 96% mentioned proper cooking of meat as the methods of prevention of animal to human.

Majority of the participants mentioned drinking unpasteurized milk 98.9%,n=184 and consumption of poorly cooked meat(96%,n=179) as the commonest risk factors of brucellosis infection in human close proximity to animals was also cited by few participants (46.5%,n=25)

Table 3;Summary of the people’s knowledge about the risk factors for the transmission of brucellosis.

VARIABLE	FREQUENCY	PERCENTAGE
Risk factors for transmission		
Eating poorly cooked meat	179	96
Drinking unpasteurized milk	184	98.9
Close proximity to animals	25	46.5

4.5 Results of the people’s knowledge about the cause and symptoms of brucellosis.

Almost all participants (183, 98.3%) had ever heard about brucellosis and all of them believed that it affects both sexes. And (177, 95.2%) believed that close proximity to animals infected with the disease contributes to the presence of the disease in humans. The main routes of infection in humans such as consumption of unpasteurized dairy products were known (95%, n=177) eating of half cooked meat was known by 90% n=167.

Most of the participants knew about some symptoms of brucellosis 45.7%,n= 85,mentioned fever,32.3%, n=60, joint and muscle pains 13.9%, n=26, body weakness, and 8.1%, n=15, talked of shivering.

Table 4; Summary of the results showing people’s knowledge about the cause and symptoms of brucellosis.

Variable	Frequency	Percentage
Ever heard about brucellosis		
Yes	183	98.3
No	3	1.7

Heard from whom		
Mass media	45	24.6
Health centre	15	8.2
Friends	112	61.2
Church leaders	04	2.1
Others	07	3.8
Cause of brucellosis		
Virus	25	13.4
Germes	45	24.2
Bacteria	76	40.8
I don't know	40	21.5
Symptom of brucellosis		
Fever	85	45.7
Joint and muscle pain	60	32.3
Body weakness	26	13.9
Shivering	15	8.1

Associated risk factors for the transmission of brucellosis

In accordance with the number of participants in the study, the researcher identified the following factors to be highly associated with the transmission of the disease; male sex; of 186 participants, 81 were males and 105 were females and 18 males were infected out of 28 participants who tested positive (64.3%). Age; it was observed that brucellosis was more prevalent among those participants above the age of 39 years. Occupation, in my study it was

found that being a peasant was among the risk factors for brucellosis, among 186 participants, 158 were peasants from whom 20 participants were positive. Level of Education; the level of education also influenced the outcome of the study and it was found out that those who were more affected were of lower education level as demonstrated in the table below.

According to sex

sex	Number of participants	Total positive	% of positive participants by sex
Male	81	18	64.3
female	105	10	35.7

According to age

Age	Number of participants	Positive participants	% of positive participants by age
18-24	17	02	7
25-31	20	04	14.3
32-38	56	05	17.8
39-45	69	10	35.7
46+	24	07	25

According to occupation

Occupation	Number of participants	Positive participants	% of positive participants
Peasant	158	20	71.4
Teacher	04	00	00
Civil servants	09	02	7.2
businessmen	15	06	21.4

Level of education

LEVEL OF EDUCATION			
None	10	02	7.1
Primary	114	15	53.6
Secondary	38	07	25
Tertiary	24	04	14.3

CHAPTER FIVE: DISCUSSION, CONCLUSION AND RECOMMENDATIONS.

5.1 DISCUSSION.

This hospital based research highlights the prevalence of brucellosis among patients attending medical care services at Shuuku health center four. The percentage prevalence of brucellosis was 15%. More women participated in the study (105 women) and 10 were positive (9.5%) as compared to men who were 81 and 18 were positive (22.2%). Overall results showed that among 186 participants, 28 were positive for brucellosis giving 15% prevalence. The study results were lower than the results got in the study conducted in kiboga district central Uganda. (Tumwine G *et al*, 2015). But the results of the study correlates with animal brucellosis that has been reported to range from 10.2% to 25.7% in cattle in the region. Thus it is most probable that the animals in the area of study are more infected and serve as a reservoir and source of brucellosis (Tumwine G *et al*, 2015)

The majority of the participants in my study (183, 98.3%) this had ever heard about brucellosis and the main source of information was friends (112, 61.2%) parallel to this finding a study conducted in communities around lake Mburo National park in Uganda (Kansiime *et al*, 2014). This shows a need for multiple communication channels to transmit and improve public knowledge about brucellosis through mass media, schools and other public gatherings for example government should fund for the ministry of health so that health education talks can be conducted in hospitals by medical professionals

In my study a large number of participants knew about signs and symptoms of brucellosis in humans which is crucial for them to seek medical care. This finding is similar to the finding in the study (Kansiime *et al*, 2014) where 84% mentioned of joint pains. Contrary to this finding a study done in Ghana 23 found that only 4.5% knew about at least one symptom of brucellosis in humans. There's a need for increased public health education and behavioral change communication with emphasis on various modes of transmission to humans for the better control of the disease.

In this study, I found three important risk factors for human brucellosis that is eating poorly cooked meat, drinking unpasteurized milk and close proximity to animals. The drinking of unpasteurized milk was the most risk factor identified in this study. Traditionally people in this area are known to consume raw milk and raw milk products. Consumption of unpasteurized milk products was associated with the occurrence of brucellosis in line with various studies that reported similar findings (Mangen MJ *et al*, 2002)

.These risk factors were mostly associated with sex where the males were most at risk for contracting the diseases this is more evident in that males are the ones who are more engaged in looking after cows, milking helping in deliveries, working in abattoirs and other animals related works. Age was also viewed to be a factor associated with brucellosis as the majority of the participants who tested positive for the disease were above 39 years of age. Ones occupation and the level of education also were associated with the prevalence of brucellosis as it was highly prevalent in peasants and those who attained little or no education than other categories who participated in the study that is to say, the teachers, businessmen, civil servants and those who had attained a minimum of O” level as per Ugandan education curriculum.

5.2 CONCLUSION

The prevalence of brucellosis in patients attending medical care services at Shuuku health center was 15% therefore the infection is slightly high in the area of study. Therefore it is an important health problem

According to the interview that was given to the respondents, most people affected were farmers and milk and meat takers who don't have the knowledge about brucellosis, its transmission and prevention measures.

The transmission was found to be associated with consumption of unpasteurized milk, meat which is not well cooked and handling of animals infected with brucellosis. There's a need to initiate screen treat infected humans early, and educate the public about risk factors and appropriate preventive measures of brucellosis.

5.3 RECOMMENDATIONS

Since brucellosis is a global threat, there is need for joint effort by all the countries to fight against the disease, the governmental organizations and non-governmental organizations should come together and fight the disease through creation of awareness, health education of the community on the mode of transmission, prevention and control of the disease. Veterinary and medical departments should work together to prevent and control the spread for example veterinary departments at district levels should educate the farmers about the signs and symptoms of the disease in animals and treat the identified animal.

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APPENDIX 1; CONSENT FORM.

I KANYIJE ABERT a student doing diploma in clinical medicine and community health in my final year is conducting a research on the sero- prevalence of brucellosis among patients who attend medical care at Shuuku health center four in Sheema south Sheema district.

The purpose of this research/ survey is to collect information about the prevalence of brucellosis in western Uganda and I really appreciate your participation in this study and I therefore request all of us to share ideas and experience in this study. I welcome questions and feel free to ask.

Your participation is voluntary and i assure you that your results will be private and confidential and will be used solely for both research purposes and patients benefit and the community as a whole.

Thank you for your assistance, may GOD bless you and keep you healthy.

Participants.....Signature.....Date.....

...

Researcher.....Signature.....Date.....

...

APPENDIX 11: QUESTIONNAIRES

QUESTIONNAIRES ON THE SERO-PREVALENCE OF BRUCELLOSIS AMONG PATIENTS WHO GET MEDICAL SERVICES AT SHUUKU HEALTH CENTER FOUR SHEEMA DISTRICT

Hello, I am **KANYIJE ABERT** a student from kiu doing diploma in clinical medicine and community health in my final year and I am conducting research on the sero-prevalence of brucellosis. The purpose of this research is to find out how the disease has affected the community so as to design measures of preventing and controlling the disease and creating awareness on the causative agent of the disease.

I therefore request for your consent to participate in this study. The results of this study will remain private and confidential.

Your participation is highly welcome, Thank you!!

INSTRUCTIONS

- Put a tick in the space provided for an appropriate answer.
- Fill in the blank space where alternatives are not provided.
- Names of the respondents are not required

A) SOCIAL DEMOGRAPHIC DATA.

1 Age of the respondent.

A.18-24.....[] b. 25-31..... [] c. 32-38.....[]
d 39-45.....[] e. 46+.....[]

2.Marital status of the respondents.

a. Married.....[] b. Single.....[]
c. widow.....[] d. separated.....[]

3 Occupation of the respondent.

a. Peasant/ cattle keeper..... [] b, A teacher..... []

c. A civil servant [] d. A businessman.....[]

e. Others, specify.....

4. Religion of the respondent.

a. A catholic..... [] b. A protestant..... [] c, Muslim.....[]

d. Pentecostal.....[] e .Others. Specify.....

5. Education level

a. Primary..... ☐ b. Secondary..... ☐

c. Tertiary institution..... ☐ d. None..... ☐

6. Does the respondent eat meat or eat any dairy product? If yes which one?

.....

B) LEVEL OF AWARENESS ABOUT BRUCELLOSIS.

7. Have you ever heard of a disease called brucellosis?

a. Yes..... ☐ b. No..... ☐

8. If yes where did you get the information from?

A. mass media..... ☐ b. Health Centre..... ☐ c. friends..... ☐ d.

Church leaders ☐ e. Others, specify.....

9. What causes brucellosis?

a. A virus..... ☐ b. A germ..... ☐ c. Bacteria..... ☐ d. I don't
know..... ☐ e. others, specify.....

10. How is brucellosis transmitted?

a. Sexual intercourse..... ☐ b. Contact with animals and animal products..... ☐

c. I do not know ☐ d. Others specify.....

11. From signs and symptoms, how can you tell that some has brucellosis?

a. A person has fever..... ☐ b. joint and muscle pains ☐ cBody
weakness..... ☐ d. fever.....

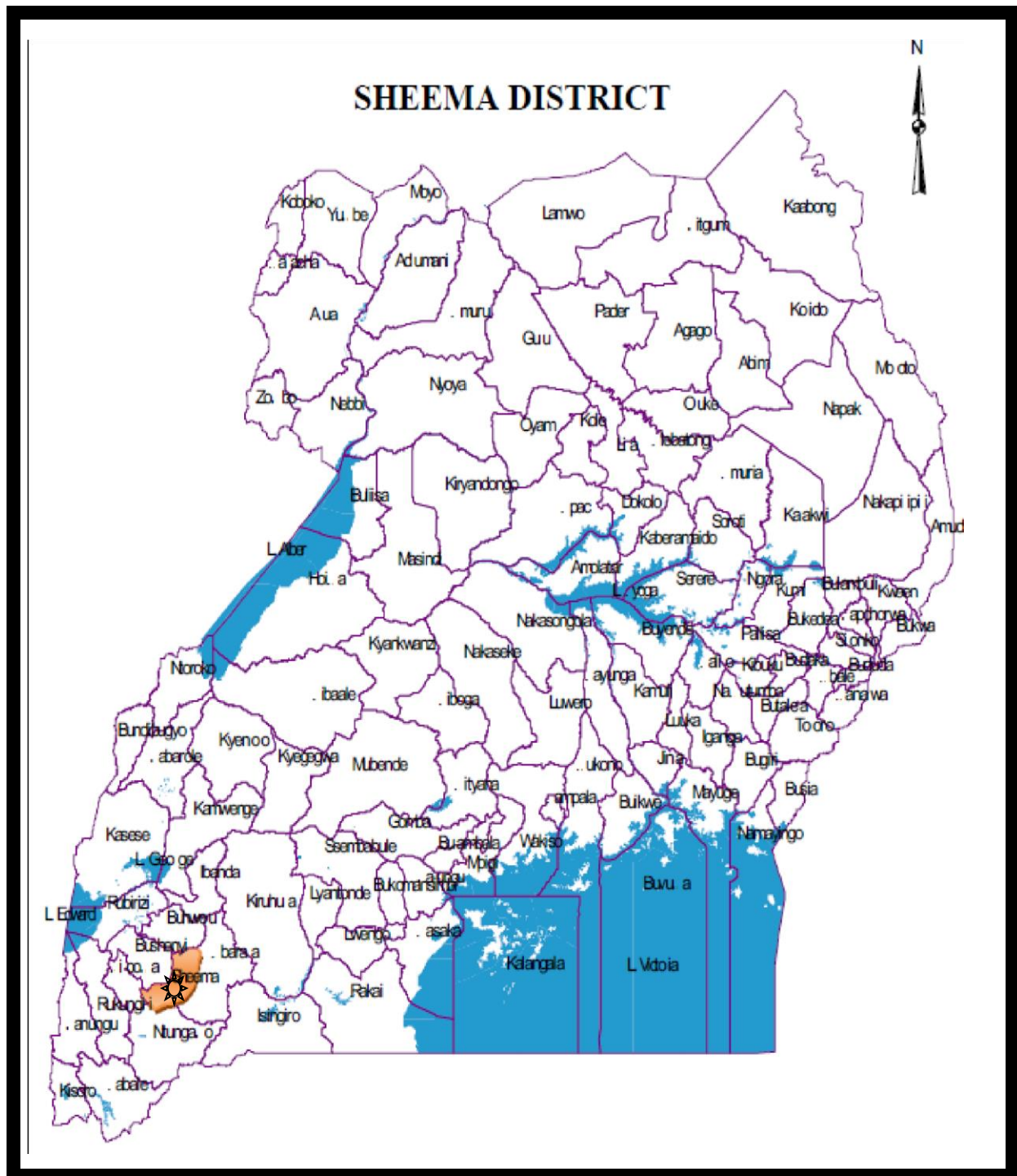
12. What are the risk factors for the transmission of brucellosis to humans?

A Eating poorly cooked meat B. Drinking un pasteurized milk

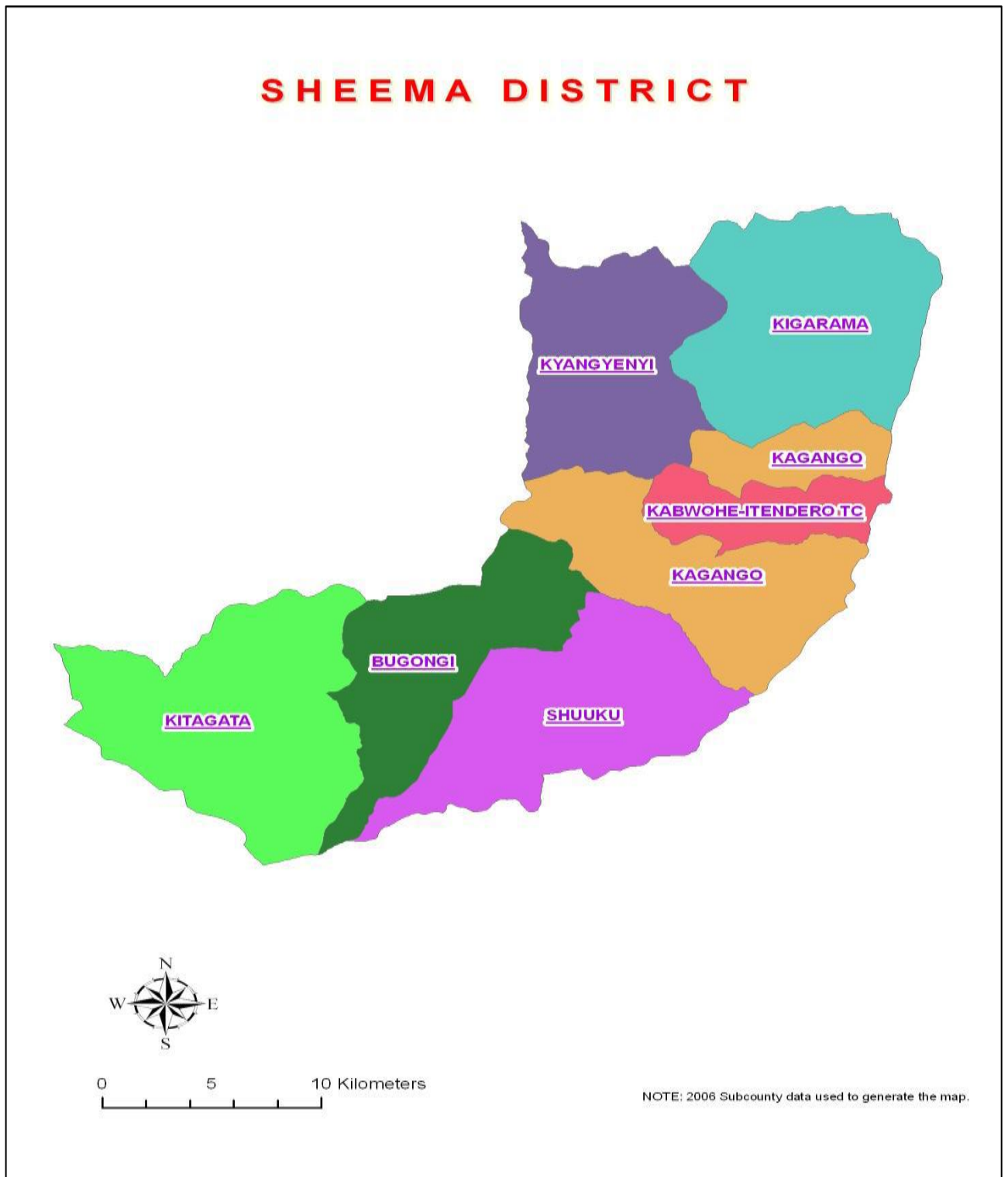
C. close proximity to infected animals

THANKS FOR YOUR TIME AND COOPERATION.

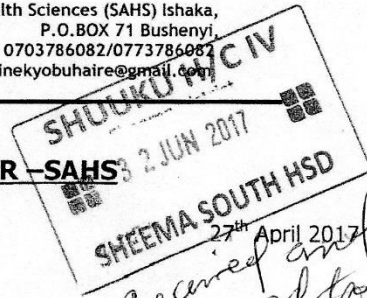
APPENDIX I11: A MAP OF UGANDA SHOWING SHEEMA



Appendix 1V: MAP OF SHEEMA



OFFICE OF THE ADMINISTRATOR - SAHS



The Incharge Shuuku H/CIV

Dear Sir/Madam,

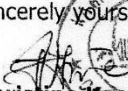
SUBJECT: DATA COLLECTION

Academic research project is an Academic requirement of every student pursuing a 3 year Diploma in Clinical Medicine & Community Health (DCM) of Kampala International University- Western Campus (KIU-WC). DCM program is housed in the School of Allied Health Sciences (SAHS).

The students have so far obtained skills in Proposal writing especially chapter one, Three & Questionnaire design. The student's topic has been approved by SAHS Research Unit and is therefore permitted to go for data collection alongside full proposal & dissertation writing. As you may discover the student is in the process of full proposal development. However, the student MUST present to you his questionnaire and his research specific objectives that he wishes to address. We as academic staff of Allied Health Sciences are extremely grateful for your support in training the young generation of Health Professionals. I therefore humbly request you to receive and allow the student **KANYIJE ABERT** Reg. No. **DCM/0034/143/DU** in your area to carry out his research. His topic is hereby attached. Again we are very grateful for your matchless support and cooperation.

Topic: **SERO-PREVALENCE OF BRUCELLOSIS AMONG PATIENTS ATTENDING MEDICAL CARE SERVICES AT SHUUKU HEALTH CENTRE FOUR IN SHEEMA DISTRICT.**

Sincerely yours,


Christine Kyobuhaira, Administrator- SAHS

CC: Dean SAHS

CC: Associate Dean SAHS

CC: Coordinator, Research Unit- SAHS

CC: H.O.D Dept. Public Health

CC: H.O.D Laboratory Sciences