

**PREVALENCE OF SYPHILIS AMONG COMMERCIAL  
SEX WORKERS IN MBARARA  
MUNICIPALITY**

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INTERNATIONAL  
UNIVERSITY**

**DECLARATION**

I TUKAMWESIGA NABOTH do declare that this research report is my original work and done to the best of my ability and knowledge. This piece of work has never been submitted either wholly or partially to any university or higher institution of learning for an award of any academic qualification.

Signature ..... Date.....

## **APPROVAL**

This research report was done under my supervision. It is ready for submission and examination.

Signature..... Date.....

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## **DEDICATION**

I specially dedicate this piece of work to my beloved wife, Nuwahereza Agatha (Mrs), my beloved children; Godlive S Tukamwesiga, Ahabwe. N. Mischelle and Kihembo N. Christbell for their endless support financially, morally and spiritually throughout my course.

## **ACKNOWLEDGEMENT**

I am grateful to all those who have helped me in production of this research report especially my supervisor Dr SK Mirembe. I do appreciate his technical knowledge and support towards the completion of this work. May the Almighty God reward him abundantly.

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## **LIST OF ABBREVIATIONS/ ACRONYMS**

AIDS	Acquired Immunodeficiency syndrome
CIA	Chemiluminescence Immunoassays
CNS	Central Nervous System
e.g.	For example
EIAs	Enzyme Immunoassays
FT RC	Faculty Research Committee
FTA-ABS	Fluorescent Treponemal Antibody absorption
HIV	Human Immunodeficiency Virus
MARPs	Most At Risk Populations
MHA	Microhaemagglutination Assay
MSM	Men who have Sex with Men
FSW	Female Sex Workers
NNSS	National Notifiable Surveillance system
RCT	Randomized Clinical Trial
RPR	Rapid Plasma Reagin
RST	Reagin Screen Test
SOP	Standard Operating Procedure
STDs	Sexually Transmitted Diseases
TPHA	Treponema Pallidum Heamagglutination Assay
TPPA	Treponema Pallidum Particle Agglutination Assay
TRUST	Toluidine Red Unheated Serum Test

USR	Unheated Serum Reagin
VDRL	Venereal Disease Research laboratory
WHO	World Health Organization

## **OPERATIONAL DEFINITIONS**

Condylomata Lata	Grayish, broad, flat topped papular lesions occurring in moist areas of the body, such as ,anus, vulva and scrotum.
Congenital	A condition that is recognized at birth or is believed to have been present since birth
Epidemiology	The study of the occurrence, distribution and control of infectious and non-Infectious diseases in populations, which is a basic part in public part of public health Medicine
Etiology	The study or science of the causes of disease
Mucous Patches	Shallow, painless ulcerations seen on mucus membranes in some patients in secondary syphilis.
Population	Refers to an entire group of individuals having a common observable characteristic.
Quality control	Set of procedures intended to ensure that a manufactured product or performed service adheres to a defined set of quality criteria or meets the requirements of the client.
Sample	A small part or quantity of a population representing the entire population.
Syphilis	A chronic sexually transmitted disease caused by a bacterium spirochete of species <i>Treponema pallidum</i>

## ABSTRACT

**Background;** Syphilis, a sexually transmitted disease with a chronic progression, is caused by the spirochete, *Treponema pallidum, subspecies pallidum*. There is limited information on prevalence of syphilis among commercial sex workers in Mbarara Municipality. Routine syphilis screening policy among pregnant women and commercial sex workers has not automatically translated into an effective health programme in Uganda.

## Objectives

1. To determine the prevalence of syphilis infection among commercial sex workers in Mbarara municipality, Mbarara district.
2. To establish the social-demographic factors associated with syphilis among commercial sex workers in Mbarara municipality, Mbarara District.

**Methods:** The study was a cross sectional descriptive study that involved the researcher, stake holders such as Leaders of commercial sex workers, Local council leaders and police. A total of 86 respondents were sampled. Data on participants socio-demographic characteristics, knowledge and attitude on condom use was collected using a structured questionnaire, through a face to face oral interview of every respondent, blood samples removed and analyzed using Rapid TPHA and RPR kits, results reported entered and analyzed using Excel, tables and graphs.

**Results and discussion:** Majority (52.3%) of commercial sex workers between 20 to 30 years of age. The overall prevalence of syphilis among commercial sex workers was 10.5%. Syphilis was most prevalent (14.3 %) among those aged between under 20 years of age, followed by 11.1% among those aged 21-30 years of age.

**Conclusion:** There is a high prevalence of Syphilis among CSWs in Mbarara Municipality despite the relatively high level of awareness of the disease and the high rate of primary and secondary school level of education.

## CHAPTER ONE

### INTRODUCTION

#### 1.1 Background

Syphilis, a sexually transmitted disease with a chronic progression, is caused by the spirochete, *Treponema pallidum*, subspecies *pallidum*. *Treponema pallidum* is strictly a human parasite. The disease is transmitted in several ways: direct contact (generally intimate sexual contact) with the active cutaneous lesions of an infected person, a kiss or other contact with an active lesion, across the placenta (congenital syphilis) or during blood transfusions. The likelihood of developing syphilis after unprotected sexual intercourse with a partner with infectious syphilis is estimated to be from 10 to 60% (SEIMC, 2001). Population groups such as MSM or FSW are especially vulnerable to STIs because of a higher number of sexual partners than the general population, resulting in more exposure. In addition, high-risk practices such as unprotected sex or inconsistent condom use that can be associated with a higher probability of infection among these groups have been documented (CDC, 2006).

In China, the rapid economic development, the resulting economic disparities, internal migration and re-establishment of the commercial sex industry have greatly facilitated the spread of syphilis and other sexually transmitted diseases (STDs) (Yang & Xia 2006; Poon *et al.* 2011). After the near eradication of syphilis in the 1970s, the prevalence of syphilis has increased rapidly and nowadays it ranks as the third most prevalent notifiable infectious disease in China, with about 400 000 new reported cases in 2011 (Tucker *et al.* 2012; China, Ministry of Health 2012).

Prevalence of syphilis was 4.0% for girls and 2.8%, for boys (The 2011 Uganda Aids Syphilis Indicator survey-UASIS)

The prevalence of syphilis among adults aged 15-64 years in Uganda is 6.1% of females and 5.8% of males have ever been infected with syphilis. The prevalence of active syphilis infection is nearly similar among men and women aged 15-64 years at 2.2% among women and 2.0% respectively. The prevalence of active syphilis was higher among rural residents at 2.64% compared to 2.07% in urban areas. (Uganda population HIV, Hepatitis, syphilis impact assessment, 2017).

Available studies on the effects of STI prevention interventions highlight the fact that, for the most largely affected community in the STI era, rigorous prevention strategies are urgently needed (Coates et al., 2008; Herbst et al., 2005; Johnson et al., 2008; Johnson et al., 2002).

In western Uganda and Mbarara Municipality in particular, there is no reported study that has been done and reported on the trends of syphilis among commercial sex workers (CSWs). In this study, we shall investigate the prevalence of syphilis infection among CSWs in Mbarara municipality, Mbarara district.

## **1.2 Problem statement**

There are currently 36 million people infected with syphilis worldwide, with 12 million new cases reported every year. Although the widespread availability of penicillin in the 1940s significantly decreased the prevalence of syphilis, infection rates have begun to increase again in many countries in the last two decades, particularly among high-risk groups (Wohrl., 2007). The new rise of syphilis is frequently associated with high-risk sexual practices among men who have sex with men (MSM). This group accounts for 75% of all primary and secondary syphilis cases and prevalence is increasing (CDC, 2014). In addition, the low effectiveness of contraceptives (including condoms) to prevent infections such as syphilis, on one hand, and the indiscriminate use of antibiotics that increases the risk of resistant trends, on the other, could lead to a more complex situation regarding the eradication of this infection even when there is an effective treatment available nowadays.

Female sex workers (FSW) and men who have sex with men (MSM) have been reported as groups with an average number of sexual partners higher than the general population. Because of this, and because their partners are from different groups in the population, FSW and MSM are key for STIs transmission dynamics. Epidemiological studies on Syphilis among MSM are still scarce particularly in developing regions (Caceres et al., 2006).

Mbarara municipality being a regional town for western Uganda, there is an increasing population, business communities, and institutions of learning which have contributed to the growing number of commercial sex workers, yet there are no studies on the prevalence of syphilis in these

populations. Basing on this background, there is need to establish the prevalence of syphilis among the commercial sex workers in Mbarara municipality, Mbarara district.

### **1.3 Justification of the study**

There is limited information on prevalence of syphilis among commercial sex workers in Mbarara Municipality. Routine syphilis screening policy among pregnant women and commercial sex workers has not automatically translated into an effective health programme in Uganda.

There was a need to ascertain prevalence with special focus among commercial sex workers, since syphilis is sexually transmitted and a common infection among the MARPs that don't freely access medical services.

The study aimed at establishing the prevalence of syphilis in MARPs, a population that offers greater risk of STDs in the general population, in turn translating into a health and economic concern for Uganda. Information on the prevalence of syphilis in this population in Uganda is scarce, which further limits resource allocation towards improving the health standards of the people being affected by syphilis especially commercial sex workers in Uganda.

### **1.4 Significance of the Study**

The findings of the study will be of value to the participants by helping them get to know their syphilis sero status and thus seek for proper treatment.

Knowledge of prevalence will offer extent of the burden of syphilis in Mbarara to allow revised resource allocation by the MoH and relevant stakeholders.

### **1.5 General Objective of the Study**

- To determine the prevalence of syphilis among commercial sex workers in Mbarara Municipality, Mbarara District.

#### **1.5.1 Specific Objectives**

1. To establish the social-demographic factors associated with syphilis among commercial sex workers in Mbarara municipality, Mbarara District.

2. To assess the knowledge about transmission of syphilis among commercial sex workers in Mbarara municipality, Mbarara District.



## CHAPTER TWO

### LITERATURE REVIEW

#### 2.0 Overview

#### 2.1 Epidemiology of syphilis

Humans are the only natural hosts for *Treponema pallidum*. Infected persons are most infectious in the early stages of the disease; they become less infectious with time and are unable to spread the disease by sexual contact four years after the infection. Syphilis is most commonly spread by sexual contact and about 30% of those who have sexual contact with an infected person become infected (Peter & Flood, 2007).

Although the rates of primary and secondary syphilis in the United States declined 90 percent from 1990 to 2000, the rates increased annually from 2001 to 2009. In 2013, based on data reported as of April 28, 2014, the rate of reported primary and secondary syphilis in the United States was 5.3 cases per 100,000 population, more than double the lowest-ever rate of 2.1 in 2000. To characterize the recent epidemiology of syphilis in the United States, CDC analyzed data from the National Notifiable Diseases Surveillance System (NNDSS) for cases of primary and secondary syphilis diagnosed during 2005-2013 with a focus on states that reported the sex of sex partners during 2009-2012 to describe reported syphilis among gay, bisexual, and other men who have sex with men (collectively referred to as MSM). During 2005-2013, primary and secondary syphilis rates increased among men of all ages and races/ethnicities across all regions of the United States. Recent years have shown an accelerated increase in the number of cases, with the largest increases occurring among MSM. Among women, rates increased during 2005-2008 and decreased during 2009-2013, with different trends among different racial/ethnic groups. Racial/ethnic disparities in reported syphilis persisted during 2005-2013, likely reflecting social determinants of health, such as socioeconomic status, that might contribute to the burden of syphilis in a community. These findings underscore the need for continued syphilis prevention measures among MSM (Patton *et al.*, 2014).

The largest increase in the number of syphilis cases has occurred among men who have sex with men (MSM). The increasing incidence of syphilis in this population is due in part to rising rates of

risky sexual behaviors, such as anonymous sex, unprotected sex (oral and anal), sex with multiple partners, and/or sex under the influence of drugs, especially methamphetamine which has been associated with risky sexual behavior and sexually transmitted disease transmission among men who have sex with men (MSM) (Taylor *et al.*, 2007).

In China, the rapid economic development, the resulting economic disparities, internal migration and re-establishment of the commercial sex industry have greatly facilitated the spread of syphilis and other sexually transmitted diseases (STDs) (Yang & Xia 2006; Poon *et al.* 2011). After the near eradication of syphilis in the 1970s, the prevalence of syphilis has increased rapidly and nowadays it ranks as the third most prevalent notifiable infectious disease in China, with about 400 000 new reported cases in 2011 (Tucker *et al.* 2012; China, Ministry of Health 2012).

Prevalence of syphilis was 4.0 % for girls and 2.8 %, for boys (The 2011 Uganda Aids Syphilis Indicator survey-UASIS).

This prevalence was slightly higher in males (10.9%) than females (9.6%). The age groups 15-30 and 31-63 years had the highest (73%) and lowest (27%) seroprevalence of syphilis respectively (Sero-prevalence of Syphilis among HIV Positive Individuals Attending Immune suppressed syndrome clinic at IHK, Kampala, Uganda. Gerald Mboowa and Diana Achieng Inda, 2015).

The Prevalence of syphilis among adults aged 15-64 years in Uganda is 6.1% of females and 5.8% of males have ever been infected with syphilis. The prevalence of active syphilis infection is similar among men and women at 2.2% among women and 2.0% among men aged 15-64 years. The prevalence of active syphilis was higher among rural residents at 2.64% compared to 2.07% in urban areas (Uganda population HIV, Hepatitis, syphilis impact assessment, 2017).

The existent studies on the effects of STI prevention interventions highlight the fact that, for the most largely affected community in the STI era, rigorous prevention strategies are urgently needed (Coates *et al.*, 2008; Herbst *et al.*, 2005; Johnson *et al.*, 2008; Johnson *et al.*, 2002).

## 2.2 Pathogenesis of syphilis

Syphilis, a sexually transmitted disease with a chronic progression, is caused by the spirochete, *Treponema pallidum* subspecies *pallidum*. *Treponema pallidum* is strictly a human parasite. The disease is transmitted in several ways: direct contact (generally intimate sexual contact) with the active cutaneous lesions of an infected person, a kiss or other contact with an active lesion, across the placenta (congenital syphilis) or during blood transfusions. The likelihood of developing syphilis after unprotected sexual intercourse with a partner with infectious syphilis is estimated to be from 10 to 60%. If untreated, it progresses through 4 stages: primary, secondary, latent, and tertiary (SEIMC, 2001). Early syphilis is defined as the stages of syphilis that typically occur within the first year after acquisition of the infection. These include primary, secondary, and early latent syphilis. Central nervous system associated diseases (neurosyphilis) can also occur within the first year after infection. Latent syphilis is characterized by asymptomatic infection with a normal physical examination in association with a positive serology. Latent syphilis is categorized as "early" or "late" depending upon the established date of infection. Early latent syphilis infers infection within one year. All other cases are referred to as late latent syphilis (CDC, 2014).

## 2.3 Clinical diagnosis of syphilis

Sexually acquired syphilis which has early infectious stage occurring within the first 2 years of infection and a late non infections stage. Early stage; this includes primary syphilis, secondary syphilis and early latent syphilis. Late stage; this induces late latent syphilis, late benign syphilis, cardiovascular syphilis and neurosyphilis (Lukehart, 2012).

Primary syphilis commonly manifests as a single painless nodule at the site of contact that rapidly ulcerates to form a classic chancre; in HIV-infected patients, however, multiple or atypical chancres occur and primary lesions may be absent or missed. Progression to secondary syphilis typically follows 2 to 8 weeks after primary inoculation. Although more rapid progression or severe disease can occur in HIV-infected patients with advanced immunosuppression, the clinical manifestations are similar to those in HIV-uninfected individuals. The manifestations of secondary syphilis involve virtually all organ systems. The most common manifestations macular, maculopapular, papulosquamous, or pustular skin lesions can involve the palms and soles and be accompanied by generalized lymphadenopathy, fever, malaise, anorexia, arthralgias, and

headache. Condyloma lata (moist, flat, papular lesions in warm intertrigenous regions) can occur and may resemble human papillomavirus infection. Lues maligna is a rare manifestation of secondary syphilis, characterized by papulopustular skin lesions that evolve into ulcerative lesions with sharp borders and a dark central crust. Secondary syphilis, especially when associated with symptomatic early neurosyphilis, can resemble acute primary HIV infection. Constitutional symptoms, along with non-focal central nervous system (CNS) symptoms and cerebrospinal fluid (CSF) abnormalities such as lymphocytic pleocytosis with a mildly elevated CSF protein, are common to both secondary syphilis and acute primary HIV infection. Signs and symptoms of secondary syphilis can persist from a few days to several weeks before resolving and evolving to latent or later stages (CDC, 2010).

Latent syphilis lacks overt clinical signs and symptoms, but relapse of manifestations of secondary syphilis can occur, most commonly during the first year after infection. Manifestations of tertiary syphilis generally include cardiovascular syphilis and gummatous syphilis or a slowly progressive disease that can affect any organ system. Neurosyphilis can occur at any stage of syphilis and manifests in varied clinical presentations, such as cranial nerve dysfunction, stroke, meningitis, acute or chronic change in mental status, loss of vibration sense, and auditory or ophthalmic abnormalities. Manifestations of symptomatic neurosyphilis in HIV-infected patients are similar to those in individuals who are not HIV infected. However, clinical manifestations of neurosyphilis, such as concomitant uveitis and meningitis, may be more common in HIV-infected persons (Hook, 2012).

## **2.4 Laboratory Diagnosis**

Direct diagnostic methods include the detection of *T pallidum* by microscopic examination of fluid or smears from lesions, histological examination of tissues or nucleic acid amplification methods such as polymerase chain reaction (PCR). Indirect diagnosis is based on serological tests for the detection of antibodies. Serological tests fall into two categories: nontreponemal tests for screening, and treponemal tests for confirmation. All nontreponemal tests measure both immunoglobulin IgG and IgM antiphospholipid antibodies formed by the host in response to lipoidal material released by damaged host cells early in infection and lipid from the cell surfaces of the treponeme itself. All treponemal tests use *T pallidum* or its components as the antigen. If lesion exudate or tissue is available, direct examination is performed, followed by a nontreponemal serology test.

## **2.4.1 Tests for Direct Detection of *T pallidum***

### **2.4.1.1 Dark-field microscopy**

This method still remains one of the simplest and most reliable for the direct detection of *T pallidum*. Exudates and fluids from lesions are examined as a wet mount using dark-field microscopy. The identification of *T pallidum* is based on the characteristic morphology and motility of the spirochete.

Other direct *T.pallidum* tests include; direct fluorescent antibody tests, Nucleic acid amplification methods like PCR based test methods.

### **2.4.3 Non- treponemal Serological Tests include**

VDRL slide test, the rapid plasma reagin (RPR) card test, the unheated serum reagin (USR) test and the toluidine red unheated serum test (TRUST), approved by CDC (Larsen *et al.*, 1998). Non-treponemal tests are rapid, simple and inexpensive.

Fluorescent treponemal antibody absorption test and fluorescent treponemal antibody absorption double staining tests also exist and include; fluorescent treponemal antibody absorption (FTAABS) *Treponema pallidum* particle agglutination (TP-PA) test, Enzyme immunoassay (EIA).

## **CHAPTER THREE**

### **METHODOLOGY**

#### **3.0 Overview**

##### **3.1 Study site**

The study was carried out in Mbarara municipality, located at the Centre of Mbarara district, western Uganda. Mbarara is about 290 kilometers (180 mi), by road, southwest of Kampala, Uganda's capital and largest city. Mbarara is an important transport hub, lying west of Masaka on the road to Kabale, near Lake Mburo National Park. The coordinates of the Mbarara central business district are 00 36 48S, 30 39 30E (Latitude:-0.6132; Longitude: 30.6582). <https://en.wikipedia.org/wiki/Mbarara>

##### **3.2 Study Population**

Commercial sex workers operating in Mbarara Municipality

##### **3.3 Study design**

The study was a cross sectional descriptive study. That involved the researcher, mobilization, stake holders such as Leaders of commercial sex workers, Local council leaders.

##### **3.4. Selection Criteria**

###### **3.4.1 Inclusion Criteria**

Only Commercial sex workers who consented were included in the study irrespective of social status, religion and tribe.

###### **3.4.2 Exclusion Criteria**

Commercial sex workers who never consented were not included in the study

##### **3.5 Sample size**

The study only considered commercial sex workers (86 Commercial sex workers).

Using a sample size formula by Kish and Leslie (1965) for cross-sectional studies

$$n = \frac{Z^2 P(1 - P)}{D^2}$$

Where      n=  
sample size

P= is the assumed prevalence which is 6%

1-P = the probability of not having syphilis, so 1-P = 94%

Z = 1.96 at standard confidence interval which is 95%

D<sup>2</sup> = 0.05 which is the permissible error term

$$\text{The calculated sample size } N = \frac{1.96^2 (0.06 \times 0.94)}{0.05^2}$$

=86 commercial sex workers

### **3.6 Sampling technique**

The study was a non-probability sampling technique, where by any sex worker who consented during the time of study was taken into account of the study population as a study participant.

### **3.7 Data Collection Methods**

Data was collected using a questionnaire. Questionnaire administration involved a face to face interview between the researcher and the study participant.

Study participants were assigned special Identifiers as opposed to using names. This was known as the participant ID Number.

#### **3.7.2 Data collection Tools**

The following was used during the study; Questionnaire, data entry sheet, pens and markers.

### **3.8 Syphilis Screening**

Test procedures for qualitative RPR and TPHA test kits were used according to manufacturer's instructions /test kit inserts and even their interpretation and reporting of results.

### **3.10 Data Management and Dissemination of findings**

Data was managed both manually by using simple tools like pens, markers, then entered into Excel on a computer and processed data presented in form of texts and figures like pie charts, tables and comparative bar graphs. Study findings in form of a compiled report were presented by the researcher to Kampala international university-western campus.

### **3.11 Quality control**

Quality control of reagents and Strips involved the use of known positive and negative samples, temperature taking of storage boxes, Lot to Lot testing, noting manufacturing and expiry dates of all material used.

Standard Operating Procedures (SOPs) of RPR, TPHA and SOPs on specimen collection were consistently and carefully followed.

Expired reagents and materials were not used; calibrated pipettes were used during specimen analysis.

### **3.12 data analysis**

Data was entered on data entry result sheets, then into Excel which was analyzed in form of graphs, tables and pie chart to generate a report.

### **3.12 Safety**

Normal laboratory safety procedures were followed based on Ugandan Ministry of health and Central public health laboratory safety guidelines.

### **3.13 Ethical considerations**

The study was approved by Kampala International University research and ethics committee. Approval also was sought from Mbarara district health services authorities.



## CHAPTER FOUR

### RESULTS

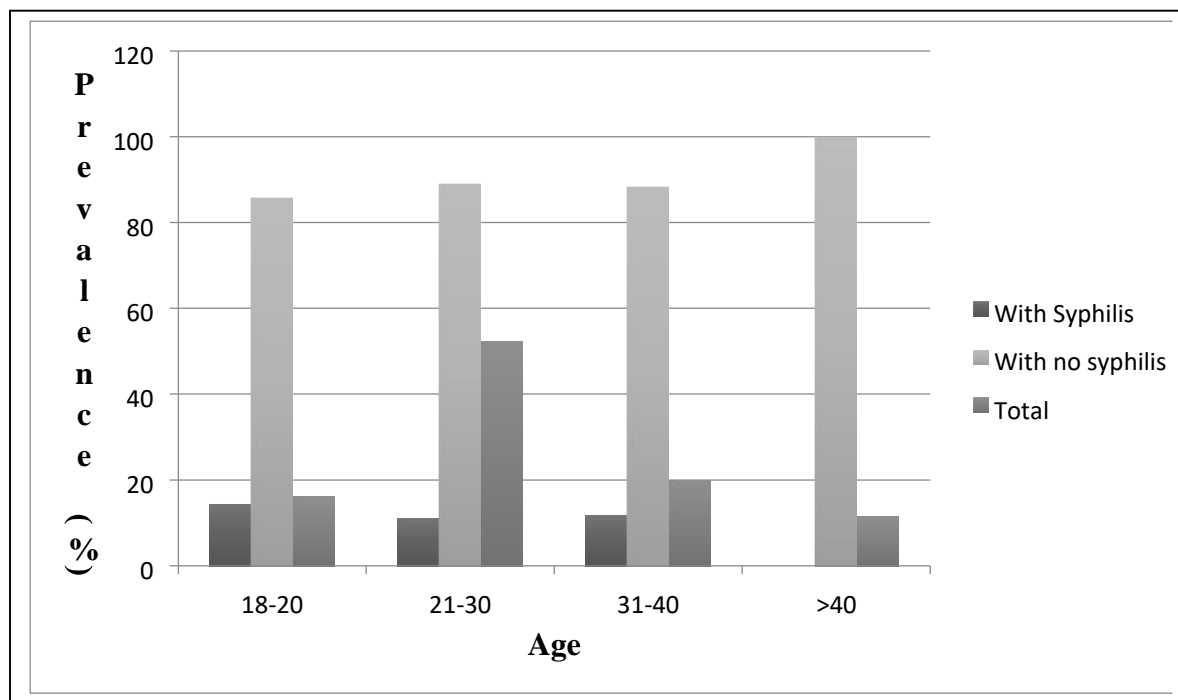
#### 4.1 Prevalence of syphilis among commercial sex workers according to age

The study revealed that majority (52.3%) of commercial sex workers were aged between 21-30 years of age. Furthermore, the study revealed that the total prevalence of syphilis among commercial sex workers was 10.5%. The study further indicated that syphilis was most prevalent (14.3 %) among those aged  $\leq 20$  years of age, followed by 11.1% among those aged 21-30 years of age as shown in **Table 1**.

Table 1: Prevalence of syphilis among commercial sex workers according to age

Parameter	Frequency (%) prevalence of syphilis			
	Variable	Yes	No	Total
Age	$\leq 20$	2(14.3)	12(85.7)	14(16.2)
	21-30	5(11.1)	40(88.9)	45(52.3)
	31-40	1(6.3)	15(93.7)	16(18.6)
	>40	1(9.1)	10(90.9)	11(12.9)
Total		09(10.5)	77(89.5)	86(100)

Fig. 1 Bar chart showing prevalence of syphilis among commercial sex workers according to age



#### 4.2 Social-demographic factors associated with syphilis among commercial sex workers

The study revealed that all (100%) commercial sex workers use condoms however the study further indicated a 10.5% prevalence of syphilis among condom users.

Furthermore, the study indicated majority (46.5%) of sex workers were primary and secondary leavers and 66.7% among the non-educated commercial sex workers.

The study further indicated that syphilis was most prevalent (13%) among the married sex workers followed by single sex workers with 5% prevalence as shown in **Table 2**.

**Table 2:** Social-demographic factors associated with syphilis among commercial sex workers

Frequency (%) social demographic factors				
Parameter	Variable	With syphilis	Without syphilis	Total
Condom use	09(10.5)	77(89.5)	86	
Level of education	None	02(66.7)	01(33.3)	03(3.5)
	Primary	05(12.5)	35(87.5)	40 (46.5)
	Secondary	02(5.0)	37(95.0)	40 (46.5)
	Tertiary	0(0.0)	03(100)	03(3.5)
Marital status	Single	01(5.0)	19(95.0)	20 (23.3)
	Married	08(13.0)	54(87.0)	62 (72.1)
	Divorced	0(0.0)	04(100)	04 (4.7)

**Table 3 Showing the prevalence of syphilis among CSW s according to Religion**

Frequency (%age)			
Religion	With Syphilis	Without Syphilis	Total
Catholic	5(12.2)	36(87.8)	41(47.7)
Protestant	2(5.9)	32(94.1)	34(39.5)
Born again	0(0.0)	3(100)	3(3.5)
Muslim	2(25)	6(75)	8(9.3)
Total	09(10.5)	77(89.5)	86(100)

**Table 4 showing the Duration/period of participants after previous syphilis test**

Duration after previous syphilis test	Number of participants	Those who were syphilis seropositive previously and again tested positive with TPHA and RPR
3months	15	0

<b>6months</b>	12	0
<b>1 year</b>	13	0
<b>&gt;1 year</b>	6	2
<b>Total</b>	46	2

**Table 5 showing the proportion of participant's knowledge about syphilis transmission**

How is syphilis transmitted		Number of respondents (%age )
<b>Unprotected sex with an infected individual</b>		<b>72(83.7)</b>
<b>Use of unsterilized instruments</b>		<b>08(9.3)</b>
<b>Blood transfusion</b>		<b>01(1.2)</b>
<b>No knowledge about transmission</b>		<b>05(5.8)</b>
<b>TOTAL</b>	<b>86(100)</b>	

Table 6 Showing blood sample tests results

Test			Re-testers Non-retesters	Non-samples	Test result testers	Number of testers	Re-testers results	1 <sup>st</sup> time results
<b>RPR</b>	46	40	Positive	49	42	07		
			Negative	37	04	33		
			Invalid		00	00	00	
				Positive	09		02	07
<b>TPHA</b>	46	40	Negative		77		44	33
			Invalid				00	00
				Invalid			00	00

## CHAPTER FIVE

### DISCUSSION

#### 5.1 Prevalence of syphilis among commercial sex workers according to age

In Our study, we found a syphilis prevalence of 10.5% among commercial sex workers, a prevalence far higher than the Ugandan prevalence at 2.2% and 2.0% among women and men aged 15-64 years respectively based on the 2017 Uganda population HIV, Hepatitis, syphilis impact assessment. This could be explained by lack of awareness for syphilis transmission among CSWs as 5.8% of the respondents in our study lacked this information.

Our syphilis prevalence of 10.5% among CSWs in Mbarara municipality compares with that of 10% as seen in *Munafu et al*, 2014. This may suggest the same factors risking CSWs prevailing over the general population. Majorly, syphilis is not considered under infectious diseases in Uganda and its diagnosis and treatment does not target commercial sex workers yet they are at a higher risk of contracting syphilis as opposed to antenatal care for pregnant mothers who have a slightly lower prevalence of 4.0% (The prevalence of syphilis and pregnancy outcome among HIV Infected pregnant women attending antenatal syphilis screening program at IDI, Uganda, 2016), most likely due to early screening, detection and treatment.

Syphilis was most prevalent among  $\leq 20$  years of age (14.3%) followed by 21-30 years of age (11.1%), with the lowest prevalence among 31-40 years (6.3%). This is much higher prevalence compared to the Prevalence of syphilis 4.0% for girls and 2.8%, for boys (The 2011 Uganda Aids Syphilis Indicator survey-UASIS). This is attributed to their young youthful activeness in sexual activities and their risky occupation of CSWs.

The highest prevalence of 14.3% and lowest prevalence of 6.3% for the respective age groups above was slightly lower when compared with the age groups 15-30 and 31-63 years that had the highest (73%) and lowest (27%) seroprevalence of syphilis respectively (Sero-prevalence of Syphilis among HIV Positive Individuals Attending Immune suppressed syndrome clinic at IHK, Kampala, Uganda. Gerald Mboowa and Diana Achieng Inda, 2015).

This is because currently in Uganda co- infection of syphilis with HIV is aggressively tested and treated to reduce on co-morbidities. This has reduced the transmission of syphilis as manifested in this study. However, the young age of under 20 years remains the ultimate culprits of the disease with highest prevalence. They are young adults, sexually active but with no strict adult authoritative judgement when making sexual decisions, therefore end up being taken as victims of circumstance (The prevalence of syphilis and pregnancy outcome among HIV Infected pregnant women attending antenatal syphilis screening program at IDI, Uganda ,2016 ).

Although, they reported high prevalence of syphilis in Uganda of 10% (Munafu *etal.* 2014), this does not show a bigger variation with results of this study (10.5%). Uganda is short of data about syphilis among CSWs, but a new study showed in the capital Kampala, syphilis prevalence among female sex workers was 8.5%, ([http://journals.lww.com/std\\_journal/Abstract/2011/04000/HIV and other sexually transmitted diseases](http://journals.lww.com/std_journal/Abstract/2011/04000/HIV_and_other_sexually_transmitted_diseases)).

This was also a significant prevalence which is comparable with prevalence of syphilis among CSWs in Mbarara municipality. This is attributed to lack of awareness for syphilis transmission, poor prevention and inadequate treatment care for commercial sex workers. There is no literature on the trend of syphilis among Commercial Sex workers in Uganda. ([http://journals.lww.com/std\\_journal/Abstract/2011/04000/HIV and other sexually transmitted diseases](http://journals.lww.com/std_journal/Abstract/2011/04000/HIV_and_other_sexually_transmitted_diseases)).

**5.2 Social demographic factors associated with syphilis among commercial sex workers** Much as 100% of the respondents are condom users, this has not reduced the prevalence of syphilis. Based on misconceptions that condom use leads to; impotence in men, uncomfortable, painful during intercourse and causes cancer, thus renders CSWs sometimes ignore condom usage. Others based their attitude on condom use as it always depends on the customers need and the remuneration offered, 3.4 % have never been taught on how to use the condom, therefore never knew whether they were using the condom correctly (CDC, 2014).

Syphilis was most prevalent among the uneducated class (66.7%), gradually reducing up to the lowest 0.0% for CSWs with tertiary/university level of education. This means low literacy levels has increased the spread of syphilis among CSWs, lack of enough knowledge on the spread, transmission, treatment of syphilis, not comprehending health education on media and on condom use. Use of English, Swahili, Luganda on media and condom inserts for use, does not favor easy

understanding of these commercial sex workers especially the non-educated class of 3.5%. The majority commercial sex workers were the education level of primary and secondary (46.5%) respectively, which comprise of the biggest number of syphilis seropositive individual (7 out of 9), attributed to unemployment due to lack proper formal qualification, thus fall victims of the rich men (customers) who prefer unprotected sex in exchange for money, thus spread of syphilis (WHO, 2004 & *Patton et al*, 2014).

Syphilis was most prevalent among the married/cohabiting commercial sex workers (13.0%), followed by single commercial sex workers (5.0%), lowest in the divorced (0.0%). This was attributed to poverty and since they have multiple sexual partners encountered in this practice; for them to earn a living and sustain their good life. Among the married/cohabiting, high prevalence is attributed lack faithfulness among married couples, also failure of husbands fulfilling their obligations both sexually and economically rendering ladies going out to earn a living and achieving satisfaction for their needs. These factors agree with a study done in Uganda that revealed a prevalence of syphilis among the married and polygamous respondents of 13.5% (Gender relations, sexual behaviour, and risk of contracting sexually transmitted infections among women in union in Uganda, 2016).

The majority of the respondents 72.1% were married and cohabiting, 23.3% of them were single while 4.7 % were separated/ divorced or widowed. Some married respondents confessed having more than two sexual partners. However, similar studies done in Kampala show that the practice of CSWs and multiple sexual partners is also quite common among people who work in similar settings to earn a living(WHO, 2013). It is known that CSWs spend the most part of every day of the week working night duties and have very limited exposure to health education campaigns that are being carried out through various media because during the day, they are resting and preparing for the next evening.

Prevalence of syphilis was highest among the Muslims (25%), followed by Catholics (12.2%). This is attributed to culture of Muslims (polygamous culture), thus, the Muslim ladies seem also to take it normal to have sex with many men, especially Muslim CSWs in Mbarara Municipality. Also Muslim men due to their nature, if syphilis seropositive may infect their ladies, thus, syphilis

can also be transferred to these children from their mothers (Religious beliefs HIV/STDs health promotion).

The relatively high prevalence of syphilis among the Catholics is their faith against contraceptive methods of family planning of which proper condom use is among and STI /syphilis prevention is added advantage. The practice of non-condom use among Catholics increases the transmission of syphilis in this regard (Catholic Church and contraception). Also the analysis of alcohol consumption in this sector of Christians as not a source of evil, of which alcohol impairs judgment particularly to these CSWs when drunk. This disorganizes their consciousness as protective methods are not thought about (Moral theology Father John A. Hardon, S.J. Archives)

Only 46 respondents (53.5%) had been syphilis tested in the past and 40(46.5%) were testing syphilis for the 1<sup>st</sup> time. The overall prevalence of laboratory-confirmed syphilis was estimated to be 10.5%. Although a total 46 participants had been tested syphilis before, only 42 respondents tested positive on RPR test, of which only 2 became positive on TPHA test. Of the 40 Participants who had never tested syphilis, 07 became positive on RPR and TPHA. This shows that RPR capture a previously treated disease and TPHA is specific for an active infection. This renders the TPHA assays the test of choice for syphilis in active infection which agrees with a study done September 2017 in USA (Comparison of Semi-Quantitative RPR Test and TPHA for Sero-diagnosis of Syphilis; national journal of community medicine, volume 8, issue 9, Sept 2017).

The 2 participants (Retesters) who became seropositive on RPR and TPHA agreed that they had previously been treated for syphilis but never finished treatment due to painful injections, so called benzathine (CDC ,2014). Irrational use of drugs/antibiotics and poor adherence to treatment as the cause of the rapidly growing resistant strains of microorganisms like spirochetes and all this agrees with a report on infectious diseases and STDs by Center for disease control(CDC,2014).

Most of the respondents knew the chief mode of transmission of syphilis as unprotected sex (83.7%), this could not reduce the prevalence among this risky group as 5.8% of them didn't know how syphilis is transmitted. The prevalence was also attributed to poverty, that when customers/men give them enough money for live sex, they are corrupted and end up accepting. This disagrees with a report by center for disease control in December 2015, which talks of the



healthcare seeking behavior of most at risk persons (MARPs) in Uganda is poor as they don't want to be recognized. This increases the spread of syphilis, thus prevalence.

## **CHAPTER SIX**

### **CONCLUSION AND RECOMMENDATION**

#### **6.1 Conclusion**

There is a high prevalence of Syphilis (10.5%) among CSWs in Mbarara Municipality due to lack of awareness of the disease and the high rate of primary and secondary school level of education. Prevalence highest in the CSWs of  $\leq 20$  years of age (14.3%).

#### **6.2 Recommendations**

There is a need to incorporate this minority group of commercial sex workers in the target population to fight against syphilis in Uganda.

There should be special effort targeting Most at risk populations such as CSWs to step up campaigns on Syphilis disease awareness, discourage practice of non-condom use, combat social violation, improve the acceptance and consistent seeking of health care in case of disease for proper treatment and health education.

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## **APPENDIX I**

### **SAMPLE COLLECTION METHOD**

The researcher will;

Washed hands before beginning any procedure,

Confirmed the identity of the client before collecting the specimen and then

Explained the procedure to the client,

Assembled the necessary requirements i.e. gauze, safety needle, tubes, alcohol swabs, tourniquet and gloves.

Positioned the client so that he/she is seated comfortably in a chair with the arm extended on an arm rest, to form a straight line from the elbow.

Checked the arm to select the larger and fuller vein, Palpate and trace the pass of the vein.

Applied a tourniquet

Asked the client to open and close his/her fist for the vein to become prominent

Cleaned the venipuncture site with the alcohol swab in a circular motion from the Centre of the site to the outside, and then allow the area to air dry.

Inserted the needle into the vein with the bevel facing upward and drew required amount of blood, instruct the client open his/her fist. Place 2x2 square gauze over the site and apply pressure to the site for 3minutes.

Again verified the information on the sample tubes matched the requisition form.

Removed gloves and disposed in properly identified biohazard.

## **APPENDIX II**

### **CONSENT FORM**

Dear respondent

I am a student of Kampala international university (KIU), carrying out a study to determine the prevalence of syphilis among commercial sex workers in Mbarara Municipality, Mbarara district. This study will help in making appropriate recommendations to the concerned health authorities. .

The information provided here will be accorded maximum confidentiality.

I ..... after being well explained to and understanding the purpose of the study do accept to participate in the study.

Signature/thumbprint.....

Date (DD/MM/YYYY).....

### APPENDIX III

#### QUESTIONNAIRE

S/N	QUESTION AND OPTIONS	RESPONSE
<b>BIO- DEMOGRAPHIC CHARACTERISTICS</b>		
1	Study ID	
2	Laboratory number	
3	Village / address	
4	District	
5	Age in years	
6	Religion 1=Protestant 2=Catholic 3=Moslem 4=Born again	
7	Level of Education. 1=None 2=Primary 3=Secondary 4=Tertiary 5= University	
9	Marital status. 1=Single 2=Married 3=Divorced 4= Cohabiting 5=Widow	
<b>ASSESMENT OF LEVEL OF KNOWLEDGE ABOUT SYPHILIS TRANSMISSION</b>		
10	Do you know what syphilis is? 1=Yes 2=No  (If NO, skip to 12)	
11	From where? 1=Health Centre 2=Mass media (Radio or TV) 3=Friend 4=Community Health Worker	



12	How is syphilis Transmitted?  1=Having unprotected sex with an infected person  2=By use of unsterilized instruments examples sharps	
	3=Blood transfusion  4=I don't know	
13	Have you ever tested for syphilis?      1=Yes      2=No	
14	If yes, what were the results?  1= Positive 2=Negative	
15	How far back: (a)3 months ago   (b) 6 months ago  (c) 1 year      (d)   > 1 year	
<b>THE ATTITUDE OF COMMERCIAL SEX WORKERS ON USE OF CONDOMS</b>		
15	Do you always put on condom when having sex?      1=Yes 2=No  3=Some times	
16	If no, why?  1=Don't know how to use it      2=don't have money   3=Not available 4=Not interested   5= customer request	
Test r esults		
18	RPR   (a) Positive  ( b)Negative  (c)Invalid	

19	TPHA	a)Positive	
	(b) Negative		
	(c) invalid		

**APPENDIX IV**

**WORK PLAN**

	MONTH
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ACTIVITY	JUNE	JULY	AUGUST	SEPTEMBER	OCTOBER
Proposal writing					
Data collection					
Data analysis					
Report writing					
Report submission					

## APPENDIX VI

### ESTIMATED BUDGET

s/n	ACTIVITY	ITEM	PARTICULAR	QUANTITY	UNIT COST(UGX)	TOTAL AMOUNT(UGX)	COMMENTS
1		Pens	Pieces	10	500	5,000	
		Internet bundles	Cards	1	100,000	100,000	

	Proposal writing and supervision.	Air time	Cards	1	50,000	50,000	
		Computer	Pieces	1	0	0	Available
		Flash Disc	Pieces	1	50,000	50,000	Available
	Data Collection	Photocopying Paper	Reams	2	15,000	30,000	
	Materials	Printing of proposal	Pages	64	500	32000	
		Proposal photocopying	Booklets	7	12,800	89,600	
		Client register (Q 3)	Book	1	10,000	10,000	
		Meals	Supper	50	5,000	250,000	
		Transport	To and from	10	50,000	500,000	
2	Sundries and Equipment.	Pasture Pipettes	Boxes	3	20,000	60,000	
		Syringes	Boxes	3	12,000	36,000	
		Vacutainers Plain (4Ml)	Packs@100	3	20,000	60,000	
		Disinfectant/jik )	Liters	2	5,000	10,000	
		Alcohol Swabs	Packs	4	5,000	20,000	
		Fine point	Box	1	6,000	6,000	Available
		markers					
		Hand Sanitizers	Pieces	7	5,000	35,000	
		Disposable Gloves	100@box	4	15,000	60,000	
		Biohazard Bags	Pieces	20	500	10,000	
		Sharps container(3Litres)	Pieces	3	15,000	45,000	Available

		Cotton wool	Role	2	8,000	16,000	
		Sample labels	Pieces	300	200	60,000	
		Working table	Pieces	2	20,000	40,000	
		Plastic chairs	Pieces	4	20,000	80,000	
		Centrifuge	Pieces	1	0	0	Available
		Test tube racks	Pieces	3	0	0	Available
3	Reagents	TPHA(SD Bioline Syphilis)	Kits 100@box	2	100,000	200,00	Available
4	Report writing	Printing of report	Pieces	1	8,000	8,000	
		Report photocopying	Booklets	6	4,000	24,000	
		Report binding	Booklets	2	10,000	20,000	
5	Miscellaneous	Miscellaneous		1	200,000	200,000	
6		Grand total			882,600	2,106,600	

## **APPENDIX VII**

### **MAP OF MBARARA DISTRICT SHOWING MBARARA MUNICIPALITY**



## **APPENDIX VIII**

### **RECOMMENDATION LETTER**



KAMPALA INTERNATIONAL  
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OFFICE OF THE DEAN  
FACULTY OF CLINICAL MEDICINE & DENTISTRY

26/10/2017

TO WHOM IT MAY CONCERN



RE: TUKAMWESIGA NABOTH (BMS/0261/113/DU)

The above named person is a fifth year student at Kampala International University, pursuing a Bachelor of Medicine, Bachelor of Surgery (MBChB) Programme.

He wishes to conduct his student Research in your community.

**Topic:** Prevalence of syphilis among commercial sex workers in Mbarara municipality

**Supervisor:** Dr. S.K Mirembe

Any assistance given will be appreciated.



Dr. Akib Surat O  
Deputy Executive Director/Assoc Dean (FCM & D)

"Exploring the Heights"

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