PREVALENCE AND RISK FACTORS OF SYPHILLIS AMONG PREGNANT WOMEN ATTENDING ANC AT KIRYANDONGO GENERAL HOSPITAL

BY
MOHAMED ABDI DAHIR
BMS/0033/141/DF

A RESEARCH DISSERTATION SUBMITTED TO THE FACULTY OF CLINICAL MEDICINE & DENTISTRY IN PARTIAL FULFILMENT FOR THE AWARD OF BACHELOR OF MEDICINE AND SURGERY AT KAMPALA INTERNATIONAL UNIVERSITY

APRIL, 2019
ABSTRACT
Syphilis in pregnancy has remained a significant reproductive and public health problem globally with high prevalence reported in the resource-poor countries of sub-Saharan Africa. Syphilis pregnant has adverse effects on both the mother, pregnancy, unborn foetus and the child, if at all the pregnancy is carried to term. Other than sexual activity being the key risk factor for contracting syphilis, other factors exist that do increase the chances of getting the infection. Data on the prevalence and associated factors of syphilis in Uganda’s general population, leave alone among pregnant women, is scanty. It is non-existent in Kiryandongo District and so this study set out to assess the prevalence and factors associated with syphilis among pregnant women attending ANC at Kiryandongo General Hospital. A 6-month’s descriptive study that involved a total of 4,067 pregnant mothers attending ANC, 1,317 (32.38%) on their maiden visit, and with 2,453 (60.32%) being tested for syphilis and 2 (0.08%) of them testing positive for syphilis. The factors associated with syphilis in pregnancy were rural residence (odds: 0.00083), low socioeconomic status, low maternal age with low education, HIV seropositivity with a positive STI history.

Key words: Pregnancy, Syphilis, Gravidity, Parity
LIST OF FIGURES
Figure 1: Conceptual Framework on Risk Factors for Syphilis in Pregnancy; Researcher’s view as informed by literature reviewed ........................................................................................................................................ 5
LIST OF TABLES
Table 1: Monthly ANC Attendance Breakdown and RPR Test Results (N=4,067)...................... 11
Table 2: Odds of Syphilis Between Rural and Urban Dwellers (N=2,453)............................. 12
Table 3: Age and Syphilis in Pregnancy............................................................................. 12
DECLARATION

I do declare that this research dissertation has never been presented to any institution for any award or qualification whatsoever. Wherever the works of other people have been included, due acknowledgement to this has been made in accordance with the appropriate referencing and citations. The findings and the analysis that will result from this research project will be my original information.

Researcher: MOHAMED ABDI DAHIR, BMS/0033/141/DF

Signature ...............................................................

Date .............................................................
APPROVAL

This is to certify that this research dissertation has been prepared under my supervision and has never been presented anywhere for any other purpose and is now ready for submission to the Faculty of Clinical Medicine and Dentistry of Kampala International University for further consideration.

Supervisor: Dr. JOHNIE MULWANA, CONSULTANT OBSTETRICIAN AND GYNECOLOGIST

Signed………………………………………………………………

Date………………………………………………………………
ACKNOWLEDGEMENT

I would like to acknowledge the following for all their contributions at various points in my life. To my family and friends, for their unconditional love and support both morally and financially. To my teachers at all levels, for moulding and shaping me into this professional I have become. To my supervisor, Dr. Johnie Mulwana, for his indispensable contribution that enabled this piece of work see the light of day. Let me also thank The Almighty God, The Author and Finisher of all that was, is and ever will be, for the gift of life and the blessings manifest on my life.
<table>
<thead>
<tr>
<th>Acronym</th>
<th>Definition</th>
</tr>
</thead>
<tbody>
<tr>
<td>AIDS</td>
<td>Acquired Immunodeficiency virus</td>
</tr>
<tr>
<td>ANC</td>
<td>Antenatal Care</td>
</tr>
<tr>
<td>AOR</td>
<td>Adjusted Odds Ratio</td>
</tr>
<tr>
<td>CI</td>
<td>Confidence Interval</td>
</tr>
<tr>
<td>CNS</td>
<td>Central Nervous System</td>
</tr>
<tr>
<td>EMTCT</td>
<td>Elimination of Mother to Child Transmission</td>
</tr>
<tr>
<td>KGH</td>
<td>Kiryandongo General Hospital</td>
</tr>
<tr>
<td>KIU-TH</td>
<td>Kampala International University Teaching Hospital</td>
</tr>
<tr>
<td>HIV</td>
<td>Human Immunodeficiency Virus</td>
</tr>
<tr>
<td>MDGs</td>
<td>Millennium Development Goals</td>
</tr>
<tr>
<td>MSM</td>
<td>Men who have Sex with Men</td>
</tr>
<tr>
<td>MTCT</td>
<td>Mother-to-child-transmission</td>
</tr>
<tr>
<td>P</td>
<td>Prevalence</td>
</tr>
<tr>
<td>RPR</td>
<td>Rapid Plasma Reagin</td>
</tr>
<tr>
<td>SDGs</td>
<td>Sustainable Development Goals</td>
</tr>
<tr>
<td>STD</td>
<td>Sexually Transmitted Disease</td>
</tr>
<tr>
<td>STI</td>
<td>Sexually Transmitted Infection</td>
</tr>
<tr>
<td>VDRL</td>
<td>Venereal Disease Research Laboratory</td>
</tr>
<tr>
<td>WHO</td>
<td>World Health Organization</td>
</tr>
</tbody>
</table>
OPERATIONAL DEFINITIONS

Gravidity : The number of times a female has been pregnant.

Multigravida : State of having been pregnant for more than once.

Primigravida : be pregnant for the first time ever in one’s reproductive age.
CHAPTER ONE: INTRODUCTION

1.0. BACKGROUND

Sexually transmitted diseases (STDs) during pregnancy are an issue of great reproductive health concern in Uganda and other developing countries. STDs pose a significant risk to both the pregnant mother and her unborn child (S. Hawkes, Matin, Broutet, & Low, 2011). Antenatal clinics, where women of reproductive age frequently seek care, may have a critical role to play in the prevention and treatment of these illnesses, HIV included (Vermund, 2015). This comes after the World Health organization included syphilis screening as one of the routine screening tests during a pregnant woman’s ANC visits (WHO, 2016). Other conditions that are routinely screened for during ANC visits include malaria, anaemia, hepatitis B and HIV.

The Agenda 2030 for Sustainable Development defines a set of ambitious global health goals and targets. Of particular interest to the proposed strategy is Goal 3 (SDG3): Ensure healthy lives and promote well-being for all at all ages, including its focus on health-related areas (WHO, 2016). For this to be made a reality, diseases that are of public concern such as STDs (syphilis included), need to be under close surveillance and managed promptly (United Nations General Assembly, 2015). This was followed later in 2016 by “The Global Health Sector Strategy on Sexually Transmitted Infections 2016 - 2021” in which tackling *Treponema pallidum* and elimination of congenital syphilis, was a key strategy that involved early screened of pregnant women (WHO, 2016a).

Syphilis is among the genital ulcerative diseases and is caused by the bacterium *Treponema pallidum*. It is associated with significant complications if left untreated and can facilitate the transmission and acquisition of HIV infection (Kenyon, Osbak, & Tsoumanis, 2016). Untreated early syphilis in pregnant women, if acquired during the four months before delivery, can lead to infection of the fetus in up to 80% of cases and may result in stillbirth or death of the infant in up to 40% of cases (Wijesooriya et al., 2016).

The prevalence of syphilis has been increasing recently both in the general population and among pregnant women (Kenyon et al., 2016). In 2000 – 2001 the prevalence of syphilis had gone down dramatically but recent statistics have it that the disease is on a resurgence. Men who have sex with men (MSM) had earlier been implicated for this as the prevalence increase had been witnessed mainly in this group but current data has shown prevalence increase in the general population and among pregnant women (CDC, 2016). This has brought back syphilis as
an issue of reproductive health that needs urgent and focused handling. This also emphasized the need for screening of our pregnant mothers during their ANC visits as a tool of early detection and treatment of the disease (WHO, 2016). This increase in prevalence led to the World Health Organization (WHO) launching a global initiative for the elimination of mother-to-child-transmission (EMTCT) of syphilis in 2007, to be achieved by ensuring that at least 95% of pregnant women are screened for syphilis, and 95% of those identified with syphilis are treated appropriately (World Health Organisation, 2017). The first step towards this war of syphilis resurgence is through screening. Several methods of syphilis screening exist but the ones commonly in use are four. The Venereal Disease Research Laboratory (VDRL) and the Rapid Plasma Reagin (RPR) tests are non-treponemal (non-specific) serological screening tests for syphilis. Since they are not specific for syphilis infection, the Fluorescent Treponemal Antibody-Absorption (FTA-ABS) and the Treponema Pallidum Hemaglutination Assay (TPHA), both treponemal-specific tests, are used to confirm syphilis infection (following a positive screening test through VDRL or RPR) (Ganiyu, Mason, & Mabuza, 2016). During screening at the ANC, the VDRL and the RPR tests are the ones commonly used.

Resurgence of syphilis as an infection of public and reproductive health importance through the recent increases in prevalence are the reasons as to why the study aimed at assessing the prevalence and factors associated with the syphilis among pregnant women attending ANC at Kiryandongo General Hospital (KGH).

1.1. PROBLEM STATEMENT
Syphilis is re-emerging as a global reproductive health problem especially among pregnant women in The WHO African Region (Gail Bolan, 2015). The consequences of the disease in pregnancy both to the mother and to the foetus cannot be over-emphasized. Despite intervention strategies for early detection and treatment of syphilis among pregnant women through screening at ANC visits, the prevalence of the disease is still unacceptably high among our pregnant women (Isa et al., 2014). This puts the risk of mother-to-child transmission of syphilis and occurrence of congenital infection and its adverse outcomes to the pregnancy even higher. This contravenes the SDG 3 that aimed at ensuring good health and total well-being for all by the year 2030. Data on the prevalence of syphilis and its associated factors at KGH is scarce since no such study has been conducted there, prompting the researcher to conduct one.
1.2. STUDY OBJECTIVES

1.2.1. BROAD OBJECTIVE
To assess the prevalence and risk factors of syphilis among pregnant women attending ANC at Kiryandongo General Hospital.

1.2.2. SPECIFIC OBJECTIVES
1. To determine the prevalence of syphilis among women attending ANC at Kiryandongo General Hospital.
2. To identify the various risk factors of syphilis among women attending ANC at Kiryandongo General Hospital.

1.3. RESEARCH QUESTIONS
1. What is the prevalence of syphilis among women attending ANC at Kiryandongo General Hospital?
2. What are the various risk factors of syphilis among women attending ANC at Kiryandongo General Hospital?

1.4. JUSTIFICATION OF THE STUDY
Given the resurgence of syphilis, evidenced by the recent rise in prevalence, syphilis has re-emerged as a disease of public and reproductive health concern. Despite being a preventable and treatable condition if diagnosed early, its adverse impacts on both the pregnant woman and the pregnancy is enormous. A prevalence study among pregnant women at KGH will benefit the women themselves in that when diagnosed early, proper management steps can be instituted. To the hospital management, the information would be useful in planning outreaches and health talks in an effort to create more awareness. It would also help in reduction of child morbidity and mortality recorded at the Hospital, especially those that are related to syphilis. Policy makers and planners at National and global level would also find use for the information from the study findings. Lastly, the findings could be used as a reference by other researchers in conducting same or similar studies either in the same study population or in similar cohorts elsewhere.

1.5. STUDY SCOPE

GEOGRAPHICAL SCOPE
The study was conducted in Kiryandongo General Hospital, a hospital in the Western Region of Uganda, found along the Kampala–Gulu highway, in Kikube Parish, Kiryandongo sub-county,
Kibanda County, in Kiryandongo District, about 50 kilometres, north-east of Masindi General Hospital. This is approximately 211 kilometres north of the Mulago National Referral Hospital, the largest hospital in the country. The coordinates of the hospital are 01°52'46.0"N, 32°03'43.0"E (Latitude:1.879439; Longitude:32.061950. It is a 109-bed, government-owned hospital which serves Kiryandongo District and parts of the districts of Masindi, Nakasongola, Oyam, Apac, Amuru, and Nwoya.

CONTENT SCOPE
The study was on the prevalence and factors associated with syphilis infection among pregnant women attending antenatal care services.

TIME SCOPE
The study ran from October 2018 to March 2019, a total period of six months that the researcher thought adequate for a prevalence study.

1.6. CONCEPTUAL FRAMEWORK
1.6.1. INDEPENDENT VARIABLES
The independent factors included obstetric factors such as gravidity, parity, age at pregnancy, previous history of still birth or abortion, multiple sexual partners; socio-econo-demographic factors such as level of education, occupation and residence family history; medical history such as HIV coinfection, history of blood transfusion.

1.6.2. DEPENDENT VARIABLE
This was prevalence of syphilis in pregnant women attending ANC.

1.6.3. INTERVENING VARIABLES
Early v/s late diagnosis were the intervening variables.

1.6.4. OUTCOME
Depending on whether diagnosis was made or early or late, the outcome were favourable and adverse pregnancy outcomes.
INDEPENDENT VARIABLES

Socio-econo-demographic factors
Age, level of education, occupation, rural

Lifestyle Factors
Number sexual partners, history of
tattoos, tribal or therapeutic marks,

Obstetric history
Gravidity, parity, history of stillbirth or
abortion

Medical History
Co-infection with HIV/AIDS, viral load
History of blood transfusion, history of an
STI

INTERVENING VARIABLES

EARLY DIAGNOSIS V/S
LATE DIAGNOSIS

DEPENDING VARIABLE
SYPHILIS IN
PREGNANCY

OUTCOMES
ADVERSE PREGNANCY OUTCOMES
FAVOURABLE PREGNANCY OUTCOMES

Figure 1: Conceptual Framework on Risk Factors for Syphilis in Pregnancy; Researcher’s view as informed by literature reviewed
CHAPTER TWO: LITERATURE REVIEW

2.0. INTRODUCTION
This chapter dealt with the literature reviewed on the prevalence, and various risk factors of syphilis infection in pregnancy. It also touched on the impact of early versus late syphilis diagnosis on pregnancy progression and outcomes.

2.1. PREVALENCE OF SYPHILIS AMONG PREGNANT WOMEN ATTENDING ANC
According to the WHO, over a million pregnant women had syphilis in 2012 (Newman et al., 2013). As per theses estimates, 217,678 live births had congenital syphilis per 1,360,485 pregnant women with untreated syphilis (approximately 16 live births per 100 untreated women) not including stillbirths (21 per 100), neonatal deaths (9 per 100) or premature births (6 per 100) globally (S. J. Hawkes, Gomez, & Broutet, 2013). Most of the disease burden was in the WHO African Region, especially in sub-Saharan Africa (Kenyon et al., 2016).

There is a high prevalence throughout sub-Saharan Africa, ranging between 2.5% in Burkina Faso, 8.4% in South Africa, 4% in Uganda and 17.4% in Cameroon (Gertrude, 2009).

The prevalence has steadily gone up over the years and by 2015–2016 the prevalence were far higher than 2000, had gone up almost three-fold (Gail Bolan, 2015) (CDC, 2016).

Syphilis in pregnancy vary from region to region and country to country. Among 800 pregnant women attending ANC in a hospital in Karachi, Pakistan in 2011, the prevalence of confirmed syphilis was less than one percent (0.9%; 95%CI: 0.4, 1.8) (Kasner, Hunter, Ph, Kariko, & Ph, 2013), results that, though less than one percent, were a bit higher than those in India just a year later in 2012. Out of 2,704 pregnant women, only 10 (0.37%) were found positive for syphilis (Nair, Urhekar, Pachpute, & Srivastava, 2013). Maternal syphilis contributes to 29% of perinatal deaths, 11% of neonatal deaths, and 26% of stillbirths around the world (Gertrude, 2009).

In a study conducted in Brazil in 2014, the prevalence of syphilis among pregnant women was found higher than those stated before; syphilis prevalence in pregnancy was 1.02% (95%CI 0.84;1.25) (Domingues, Szwarcwald, Junior, & Leal, 2014a).

In 2014, a study on prevalence of syphilis among pregnant women Attending ANC was conducted in State Specialist Hospital Maiduguri, Borno, Nigeria. The prevalence was 1.9% at the time (Isa et al., 2014). In Dodoma Tanzania in 2016 the prevalence was 0.8% (Azizi, Tenu, & Msuya, 2016). This was an improvement from the overall prevalence of 2.5% that was found in Tanzania in 2011 (Manyahi et al., 2015a).
As per The 2011 National Antenatal Sentinel HIV & Syphilis prevalence Survey in South Africa, the national prevalence of syphilis showed a 0.1% increase where the prevalence was 1.5% (95% CI: 1.4 – 1.7) in 2010 to 1.6% (95% CI: 1.5 – 1.8) in 2011. Mpumalanga syphilis prevalence increased from 2.1% in 2010 to 4.1% in 2011, which made it the province with highest syphilis rate, whereas in the past four years the Northern Cape recorded the highest prevalence of syphilis. In Gauteng there was a slight drop of 2.9% in 2009 to 2.0% in 2011 (South African National Department of Health, 2010).

In 2010, results from Juba were alarming. Of 231 pregnant women involved in a study, 51 (22.1%) were positive for syphilis with the rapid plasma reagin test and 79 (34.2%) were positive with the treponema pallidum Haemagglutination assay (K Emmanuel et al., 2010). These are among the highest recorded so far.

In Gondar University Teaching Hospital in Ethiopia in 2014 2.9% of pregnant women were confirmed to be seropositive for syphilis (Assefa, 2014).

No recent data was forthcoming on prevalence of syphilis among pregnant women attending ANC in Kenya or Uganda. This underpins the fact that this study is justified.

2.2. ASSOCIATED FACTORS FOR SYPHILIS IN PREGNANCY

Various factors put women at risk of contracting syphilis. The key risk factor is sexual activity. In the Karachi study, women who lived in areas where there were more male drug injectors, Hijras (transvestite and/or transvestite men who may provide sex to men for money) or their clients were reported to have a 1% increased prevalence point compared to those from other places (Kasner et al., 2013).

A study among women in Mayotte showed a positive association between prevalence of syphilis and lack of education and a history of previous STI (Saindou et al., 2012); while another one in Brazil in 2014 showed an increased prevalence of syphilis among women with < 8 years of education (1.74%), who self-reported as black (1.8%) or mixed (1.2%), those who did not receive prenatal care (2.5%), and those attending public (1.37%) or mixed (0.93%) health care units.

In the Borno, Nigeria study by Isa and colleagues in 2014, the prevalence of syphilis was found to be higher among two age groups; those between 20 – 24 and those between 30 – 34 years (Isa et al., 2014). This could be attributed to the fact that those age groups are more sexually active than the others are. In Tanzania in 2011, the risk for syphilis infection was significantly higher.
among women attending semi-urban and rural clinics and those having 3–4, and 5 previous pregnancies \((p < 0.05)\) (Manyahi et al., 2015).
CHAPTER THREE: METHODOLOGY

3.0. INTRODUCTION
This chapter describes the study area focusing on population structure and many other aspects including study design, sample size determination, sampling method, selection criteria, data Collection, data analysis, data presentation, data quality control, study limitation and Ethical consideration.

3.1. STUDY DESIGN
Descriptive cross-sectional study with both qualitative and quantitative approach was used.

3.2. STUDY POPULATION
All pregnant women attending ANC services at KGH.

3.2.1. INCLUSION CRITERIA
Pregnant women attending ANC at KGH unit during the study period who offered consent were enrolled into the study.

3.2.2. EXCLUSION CRITERIA
All those who were pregnant and who visited KGH ANC unit at the time of the study but who refused to offer consent were excluded.

3.3. SAMPLE SIZE DETERMINATION
The sample size was determined using Fishers et al., 2006 formula i.e. $N=Z^2PQ/D^2$:
Where;
$N$ is the desired sample size
$Z$ is the standard normal deviation taken as 1.96 at a confidence interval of 95%.
$P$ is the prevalence of Hepatitis B among pregnant women = 11.8% (estimated from study findings in Northern Uganda by Ochola et al., 2014)
$D$ is the degree of accuracy= 0.05.
$Q= (1-P)$ which is the population without the desired characteristics.

Therefore, $N= 1.96^2 X 0.118 \times (1-0.118)/ (0.05)^2 = 160$

One hundred and sixty (160) respondents was the sample size.

3.4. SAMPLING TECHNIQUE
consecutive sampling technique was used for the study. Study participants were selected as they come to the ANC unit and as they met the inclusion criteria.
3.5. DATA COLLECTION METHOD
Was done by the use of a questionnaire that had been specifically tailored with questions on socio-demographic data, obstetric history, ANC visits and utilization, and possible risk factors that the pregnant woman might have been exposed to. Additional data was obtained from the syphilis test results.

3.6. DATA COLLECTION TOOLS AND PROCEDURE
Researcher-administered questionnaires were used to conduct this study. More information was obtained from result findings from syphilis test.

3.7. QUALITY CONTROL
Patient demographic data and bio data was counter-checked by confirming with the patient. The researcher ensured that they followed-up the test results. The questionnaire was pre-tested before the main study and 2 research assistants fluent in both English and vernacular were recruited and adequately trained. Each questionnaire was checked and verified for completeness, missing values and unclear responses and then manually cleaned up on such indications.

3.8. DATA ANALYSIS
Data was exported to SPSS version 17. Using double entry, the data was cross-checked for consistency and accuracy. Responses and observations were given points and tallied then recorded to obtain means then presented in graphs, charts and tables.

3.9. ETHICAL CONSIDERATIONS
Clearance was obtained from Kampala International University-Western Campus faculty of clinical medicine & dentistry through IREC. Informed consent from the respondents was sought both verbally and in writing. Participants were assured of confidentiality and use of the information obtained only for the purpose of the research. Participation was fully out of the respondents’ choice with the right to pull out at any time, whenever they no longer felt comfortable to continue. Their participation, or its lack thereof, did not in any way influence any condition-related services they were already getting or were bound to get at any time from the Hospital or staff involved and those that were found to have syphilis counselled and managed appropriately.
CHAPTER FOUR: STUDY FINDINGS

4.0. INTRODUCTION

This chapter presents the results of the study as per objective and in the form of narratives, tables, graphs and charts. Over the 6-month study period, a total of 4,067 mothers attended ANC with 1,317 (32.38%) being on their maiden visit. Over the same period, 2,453 (60.32%) women were tested for syphilis out of whom only 2 tested positive. The monthly distribution of the ANC visits and syphilis tests done are shown on table 1 below.

<table>
<thead>
<tr>
<th>MONTH</th>
<th>ANC₁</th>
<th>ANC&gt;Total</th>
<th>TESTED_rpr</th>
<th>RPR_positive</th>
</tr>
</thead>
<tbody>
<tr>
<td>October 2018</td>
<td>214</td>
<td>729</td>
<td>547</td>
<td>0</td>
</tr>
<tr>
<td>November 2018</td>
<td>221</td>
<td>627</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>December 2018</td>
<td>170</td>
<td>587</td>
<td>418</td>
<td>0</td>
</tr>
<tr>
<td>January 2019</td>
<td>258</td>
<td>746</td>
<td>643</td>
<td>0</td>
</tr>
<tr>
<td>February 2019</td>
<td>240</td>
<td>725</td>
<td>628</td>
<td>2</td>
</tr>
<tr>
<td>March 2019</td>
<td>214</td>
<td>653</td>
<td>217</td>
<td>0</td>
</tr>
<tr>
<td><strong>TOTALS</strong></td>
<td>1,317</td>
<td>4,067</td>
<td>2,453</td>
<td>2</td>
</tr>
</tbody>
</table>

*Table 1: Monthly ANC Attendance Breakdown and RPR Test Results (N=4,067)*

KEY:

ANC₁: Maiden ANC visit
ANC>TOTAL: Total number that attended ANC
TESTED_rpr: Tested for syphilis
RPR_positive: Tested positive for syphilis

4.1. PREVALENCE OF SYPHILIS

Only 2 women tested positive in the 6-month study period and both were during the month of February 2019. This gave a prevalence of 0.08% of all those who were tested and 0.05% of the total ANC attendance (both tested and non-tested). For the month of February, the monthly prevalence was 0.32% for those tested and 0.28% of the month’s total ANC visits.

4.2. FACTORS ASSOCIATED WITH SYPHILIS IN PREGNANCY

The different factors that could be associated with syphilis in pregnancy were assessed among the 2,453 pregnant women who took the test and significance sought for turning negative or positive. The factors assessed for included residence (rural versus urban), age, marital status,
level of education, occupation, gravidity and parity, history of STIs, HIV sero-status, age at sexual debut, number of sexual partners since debut, number of sexual partners within the past year, practice concerning protection use during sexual encounters and number of ANC visit.

### 4.2.1. RESIDENCE (N=2,453)

<table>
<thead>
<tr>
<th>RESIDENCE</th>
<th>NUMBER (n)</th>
<th>PERCENTAGE (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>RPRNEGATIVE</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>RURAL</td>
<td>2410</td>
<td>99.92</td>
</tr>
<tr>
<td>URBAN</td>
<td>41</td>
<td>0.08</td>
</tr>
<tr>
<td><strong>RPRPOSITIVE</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>RURAL</td>
<td>2</td>
<td>100</td>
</tr>
<tr>
<td>URBAN</td>
<td>0</td>
<td>0</td>
</tr>
</tbody>
</table>

*Table 2: Odds of Syphilis Between Rural and Urban Dwellers (N=2,453)*

All the cases of syphilis resided in rural areas, there was none from an urban area. The odds of being syphilis positive were therefore, higher amongst the rural folk compared to their urban counterparts. The odds in the rural folk was 0.00083 compared to odds of 0 (zero) among the urbanites.

### 4.2.2. AGE (N=2,453)

<table>
<thead>
<tr>
<th>AGE CLUSTER (YRS)</th>
<th>POSITIVE</th>
<th>NEGATIVE</th>
</tr>
</thead>
<tbody>
<tr>
<td>15 – 19</td>
<td>0</td>
<td>421</td>
</tr>
<tr>
<td>20 - 24</td>
<td>1</td>
<td>544</td>
</tr>
<tr>
<td>25 - 29</td>
<td>0</td>
<td>687</td>
</tr>
<tr>
<td>30 - 34</td>
<td>1</td>
<td>559</td>
</tr>
<tr>
<td>35 and above</td>
<td>0</td>
<td>340</td>
</tr>
<tr>
<td><strong>TOTALS</strong></td>
<td>2</td>
<td>2451</td>
</tr>
</tbody>
</table>

*Table 3: Age and Syphilis in Pregnancy*

The two cases of syphilis were among the 20 – 24 years’ age group and the 30 – 34 years’ group.

### 4.2.3. GRAVIDITY, GESTATIONAL AGE, PARITY, ABORTION/MISCARRIAGE & NUMBER OF ANC VISIT (N=2)

The two cases reported were in their second trimester of gestation, in their fourth pregnancy each with no history of abortion or miscarriage and on their maiden ANC visit.
4.2.4. MARITAL STATUS, LEVEL OF EDUCATION, & OCCUPATION (N=2)
Both cases of syphilis were reported among the married, with an education level of primary as the highest education level and were farmers. In these two, specific risk factors in their history were assessed and reported below.

4.2.5. SEXUAL HISTORY, HISTORY OF STIs AND HIV SEROSTATUS (N=2)
Both of the syphilis cases had a history of early sexual debut, as early as 14 years, with irregular protection use at sexual encounters with more than five sexual partners since debut. They, however, were reluctant to disclose the number of partners they had had in the past year. Of importance though, was the fact that they were both HIV positive and had a previous history of a sexually transmitted infection. By diagnosis and description, one had a history of genital ulcerative disease most probably chancroid and the other had a diagnosis of gonorrhea.
CHAPTER FIVE: DISCUSSIONS, CONCLUSIONS AND RECOMMENDATIONS

5.0. INTRODUCTION

This chapter presents the discussions of the study results by objectives, the conclusions made and recommendations put forward based on the findings.

5.1. DISCUSSIONS

5.1.1. PREVALENCE OF SYPHILIS IN PREGNANCY

The prevalence of syphilis in pregnancy was 0.08% among those who tested and 0.05% among all the pregnant women who attended ANC during the study period. Factors associated with syphilis in pregnancy were rural residence (odds: 0.00083), low socioeconomic status, low maternal age, low maternal education, positive STI history, HIV seropositivity, early sexual debut with a positive history of multiple sexual partners. Other associations were being married with high gravidity/parity and women on their maiden ANC visit within the second trimester.

This study’s findings disagree with those of (Kenyon et al., 2016) that reported that the prevalence of syphilis in sub-Saharan Africa was high ranging from 2.5% in Burkina Faso, 8.4% in South Africa, 4% in Uganda and 17.4% in Cameroon (Gertrude, 2009). This could imply a number of things. First, this apparent fall in prevalence could be attributable to working interventional measures (test and treat policy) put in place over the years, that could have led to the drop in prevalence over the ten years or so since then. It could also be as a result of population size differences and regional variations involved in the two studies. The 4% recorded in that particular study was for the whole of Uganda whereas the 0.05% in this study was for pregnant women attending ANC at KGH over a period of just 6 months.

This study’s findings also do not support or agree with those by (Gail Bolan, 2015) who reported that prevalence of syphilis in pregnancy has been steadily increasing from the year 2000 and by 2016 it had gone up 3-fold. It would also be indicative of an improvement on these statistics implying working interventional measures (test and treat policy) in Uganda. These findings could be used as a progress indicator on the fight against syphilis as the values are seen to approach those of countries categorized among those with the lowest prevalence values in the world such as Karachi, Pakistan (0.9%, (Kasner et al., 2013)) and India (0.37%, (Nair et al., 2013)).
Countries like Brazil (1.02%, (Domingues, Szwarcwald, Junior, & Leal, 2014)), and Nigeria (1.9%, (Isa et al., 2014)), have reported values higher than this study’s maybe due to the higher population sizes in both those countries.

Juba’s high prevalence of syphilis among pregnant women (22%, (K Emmanuel et al., 2010)), could be attributable to the perpetual conflict and war plaguing the region with high incidence of sexual abuse, exploitation and rape, which are often unprotected thus leading to unwanted pregnancies and increased exposures to syphilis.

5.1.2. FACTORS ASSOCIATED WITH SYPHILIS IN PREGNANCY

As from previous studies, sexual activity was the key risk factor for syphilis in pregnancy. Other factors that increase these women’s risk of contracting syphilis included lack of education and a history of previous STI (Saindou et al., 2012). Lack of education with the lack of formal employment, both indicative or resulting into low socioeconomic status, and that would push the women into sexual activities to supplement the little they have in fending for the family, and which make them less likely to have any say in resultant sexual encounters like demanding for protection use at every encounter.

The 20 – 24 and 30 – 34 years’ age group being at a higher risk of contracting syphilis, agree with (Isa et al., 2014) and may be due to increased sexual activity within these two age groups compared to the others.

Rural residence and high gravidity and/or parity was also reported in Tanzania by (Manyahi et al., 2015). Rural folk are unlikely to have attained high education levels, be involved in other occupation apart from farming, and have a say in their sexual encounters. High gravidity and/or parity is an indication of high instances of unprotected sexual encounters and relatively increased risks of exposures to syphilis.
REFERENCES
Assefa, A. (2014). A three year retrospective study on seroprevalence of syphilis among pregnant women at Gondar university teaching hospital, Ethiopia. African Health Sciences, 14(1). https://doi.org/10.4314/ahs.v14i1.18


APPENDICES

APPENDIX ONE: CONSENT FORM

STUDY TITLE: PREVALENCE AND RISK FACTORS OF SYPHILLIS AMONG PREGNANT WOMEN ATTENDING ANC AT KIRYANDONGO GENERAL HOSPITAL.

I have read and understood the research topic above on the planned study and the explanations given to me. I understand what I have been requested to do in respect to this study. I have asked questions and gotten clarifications about the study and I am satisfied. I have, after due consideration, willingly consented to take part in this study as explained.

Participant’s signature .................................. Date ...........................................

Investigators name .................................. Signature ...........................................

Date .....................................................

Investigator’s Contacts: .................................
APPENDIX TWO: DATA COLLECTION TOOL

STUDY QUESTIONNAIRE

SERIAL NO: .................

INTRODUCTION

STUDY TITLE: PREVALENCE AND RISK FACTORS OF SYPHILLIS AMONG PREGNANT WOMEN ATTENDING ANC AT KIRYANDONGO GENERAL HOSPITAL.

CONFIDENTIALITY: I am Mohamed Abdi Dahir a final year medical student at Kampala International University – Western Campus carrying out the above research. I would hereby wish to assure you that the information you will provide will be accorded the confidentiality it deserves and will not be used for purposes other than those meant for this research. Therefore, feel free.

DEMOGRAPHIC DATA

A. Socio-demographic characteristics

1. How old are you?
   a) 15 – 19 years □
   b) 20 -24 years □
   c) 25 – 29 years □
   d) 30 – 34 years □
   e) 35 – 39 years □
   f) >39 years □

2. What is your marital status?
   a) Single □
   b) Married □
   c) Widowed □
   d) Separated /Divorced □

3. What is the highest level of formal education you have attained?
   a) None □
   b) Primary □
   c) Secondary □
d) Tertiary  

4. What is your occupation?
   a) Housewife  
   b) Farming  
   c) Trade  
   d) Handicraft  
   e) Formal employment  
   f) Other (specify) 

5. Where do you live? (Ask village and parish name) 

6. Is it in a rural or urban area?
   a) Rural  
   b) Urban 

B. Obstetric History

1. How old is this pregnancy?
   a) 1 – 12 weeks (First trimester)  
   b) 13 – 27 weeks (Second trimester)  
   c) 28 – 40 weeks (Third trimester)  

2. How many times have you been pregnant including this pregnancy?
   a) 1 – 4 times  
   b) 5 and above  

3. How many children have you had? 

4. Have you ever had an abortion or miscarriage before? 

5. Did you attend ANC in your previous pregnancy? 

6. In this pregnancy is this your first visit? 

If no to (7) above, which number of visit is this? 

7. When did you last give birth?
   a) Never given birth before  
   b) 1 – 11 months ago  
   c) 12 – 24 months ago  
   d) 25 – 36 months ago
e) More than 36 months ago □

C. Other important History on Risk

1. Have you ever been diagnosed with a sexually transmitted disease?
   YES □       NO □

2. Do you know the diagnosis given? YES □       NO □

3. If yes, what was the diagnosis? .................................................................

4. If no, can you describe the symptoms? .........................................................
   If yes to part C (1) above, which one? ......................................................

5. What is your HIV status?
   a) Positive □
   b) Negative □
   c) Don’t know □

6. How old were you when you had your first sexual contact? .........................

7. As a rough estimate, how many sexual partners have you had since then?
   a) Less than 5 □
   b) 5 and above □
   c) Cannot remember □

8. How many sexual partners have you had this year alone? ............................

9. How many sexual partners have you had this year? .....................................

10. Do you use protection in all your sexual encounters? .................................
    Is there anything else you want to add, ask, and clarify?
    ..................................................................................................................
    ..................................................................................................................
    ..................................................................................................................
    ..................................................................................................................
    ..................................................................................................................
    ..................................................................................................................

Otherwise,

THANK YOU
APPENDIX THREE: SYPHILIS TEST RESULTS (BY RPR)

TEST USED .................................................................
SERIAL NO (SAME AS IN QUESTIONNAIRE) ........................................
TEST RESULTS: POSITIVE ☐ NEGATIVE ☐

DATE: ..................................................................................
APPENDIX FOUR: MAP OF UGANDA SHOWING THE LOCATION OF KIRYANDONGO DISTRICT
APPENDIX FIVE: APPROVAL LETTER

OFFICE OF THE DEAN
FACULTY OF CLINICAL MEDICINE & DENTISTRY

06/03/2019

TO WHOM IT MAY CONCERN

Dear Sir/Madam,

RE: MOHAMED ABDI DAHIR (BMS/0033/141/DF)

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 hospital.

**Topic:** Prevalence and risk factors of syphilis among pregnant women attending ANC at Kiryandongo General Hospital from October 2018 – March 2019

**Supervisor:** Dr. Johnie Mulwana

Any assistance given will be appreciated.

Yours Sincerely,

S. K.

Dr. Akib Surat
Deputy Executive Director, Assoc Dean FCM&D

"Exploring the Heights"
Assoc. Prof. Ssebulu Robinson, Dean (FCM & D) 0772-350248 email: nsebulu@gmail.com
Dr. Akib Surat Associate Dean FCM & D 0753557699 email: doctorakib@yahoo.com