

**HEPATITIS B VIRUS SERO PREVALENCE AND ASSOCIATED FACTORS
AMONG PREGNANT WOMEN AND THEIR MALE PARTNERS ATTENDING
GULU REGIONAL REFERRAL HOSPITAL ANTENATAL CLINIC**

PATRICK OTIM, BPH (CUU)

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**A THESIS SUBMITTED TO THE DIRECTORATE OF RESEARCH AND
GRADUATE TRAINING IN PARTIAL FULFILMENT OF THE REQUIREMENT
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DECLARATION

I Patrick Otim do declare to the best of my knowledge that this thesis, **HEPATITIS B VIRUS SERO PREVALENCE AND ASSOCIATED FACTORS AMONG PREGNANT WOMEN AND THEIR MALE PARTNERS ATTENDING GULU REGIONAL REFERRAL HOSPITAL ANTENATAL CLINIC** is original work of mine that has never been considered for any award.

Name: Patrick Otim

Signature  DATE 29/09/2026

APPROVAL

This thesis has been written under our supervision and is ready for submission

1. Dr. Emmanuel Ochola MBChB MSc

Signature..... Date: 29 / 09 / 2026

2. Dr. Felix Bongomin, MB ChB, MSc, MMed, FECMM, PhD



Signature..... Date: 29 / 9 / 2026

DEDICATION

I dedicate this thesis to my family and friends. To my father Munyuka Stephen and mother Anabo Gladys who have nurtured me with spirit of resilience and humility. To my brothers George, Paul, Thomas, Joseph and beloved sisters Mary, Juliet, Christine, Deborah and Tusiime Deborah (Dee). To my friends Dr Ocakacon, Dr Wacha, Dr Oyoo Nickson, Dr Lapat, Dr Lanyero, Dr Opee, Mr. Banya Anthony, Ms.Kyange Gloria, and the whole MPH class.

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ABBREVIATIONS AND ACRONYMS.

AIDS:	Acquired Immunodeficiency syndrome.
ANC:	Antenatal clinic.
ELISA:	Enzyme linked Immunosorbent Assay.
HBsAg:	Hepatitis B surface Antigen.
HBV:	Hepatitis B virus
HIV:	Human Immunodeficiency virus.
PMTCT:	Prevention, Mother to Child Transmission.
WHO:	World Health Organization.

TABLE OF CONTENTS

DECLARATION-----	i
APPROVAL-----	ii
DEDICATION-----	iii
ACKNOWLEDGMENT-----	iv
ABBREVIATIONS AND ACRONYMS.-----	v
TABLE OF CONTENTS-----	vi
LIST OF FIGURES AND TABLES-----	ix
OPERATIONAL DEFINITIONS-----	x
ABSTRACT-----	xi
CHAPTER ONE: INTRODUCTION-----	1
1.1 Background-----	1
1.2 Problem Statement-----	5
1.3 Research Question-----	6
1.4 General Objective-----	7
1.4.1 Specific Objectives-----	7
1.5 Scope of the Study-----	7
1.6 Significance of the study-----	7
1.7 Justification-----	8
1.8. Theoretical framework-----	9
1.9 Conceptual Framework-----	10
-----	10
1.9.1 Explanation of the conceptual framework-----	11
CHAPTER TWO: LITERATURE REVIEW-----	12
2.1 Introduction-----	12
2.2 The HBV sero prevalence among pregnant women and their male partner-----	13
2.3 The factors associated with HBV among pregnant women and their male partners----	15
2.3.1 Sociodemographic Characteristic-----	15
2.4 Concordance and Discordance rates-----	17
2.5 Summary of literature and research gaps-----	17
CHAPTER THREE: METHODS-----	19
3.1 Study Design-----	19
3.2 Study Area-----	19
3.3 Target Population-----	19

3.4 Accessible Population -----	19
3.5 Study Population -----	19
3.6 Study Unit-----	19
3.7 Selection Criteria-----	20
3.7.1 Inclusion Criteria-----	20
3.7.2 Exclusion Criteria-----	20
3.8 Study Variables-----	20
3.8.1 Dependent Variable -----	20
3.8.2 Independent Variables.-----	20
3.9 Sample Size Determination. -----	20
3.10 Sampling Procedure-----	22
3.11 Data Collection Method -----	22
3.12 Data Collection tools and data collection procedure -----	23
3.13 Sample Collection -----	23
3.14 Data Management and Data Analysis -----	25
3.15 Ethical Consideration -----	26
3.16 Dissemination -----	27
CHAPTER FOUR: RESULTS -----	28
4.1 Study Enrolment -----	28
4.2 Characteristics of the Study Participants -----	28
4.3 a Hepatitis B Sero Prevalence, Concordance and Discordance rate -----	31
4.3 b McNemar's test for HBsAg status among couples (n = 242 couples)-----	31
4.4 a) Bivariate analysis of factors associated with hepatitis B seropositivity-----	32
4.4 b) Multivariable analysis of factors independently associated with Hepatitis B positivity -----	34
CHAPTER FIVE: DISCUSSION-----	36
5.1 Summary of key Findings -----	36
5.2 Hepatitis B sero Prevalence in the study sample -----	36
5.3 Concordance and Discordance Rates among the Couple-----	39
5.4 Factors associated with HBV Seropositivity-----	40
5.5 Strength and Limitations of the Study -----	43
5.6 Implications of Study Findings -----	44
5.7 Future Studies /Perspectives-----	45
CHAPTER SIX: CONCLUSIONS AND RECOMMENDATIONS -----	46
6.1 Conclusions -----	46

6.2 Recommendation's Deduced from Conclusions-----	47
REFERENCE -----	49
APPENDICES -----	57
Appendix: I Activity Work plan -----	57
Appendix: II Actual Budget-----	58
Appendix III: Informed Consent -----	59
Appendix IV: Questionnaire -----	65
Appendix V: Approval Letter for Data Collection from Gulu Regional Referral Hospital-----	79
Appendix VI: Introductory Letter from GUREC -----	80

LIST OF FIGURES AND TABLES

Figure 1: Conceptual frame work	10
Figure 2: Showing Hepatitis B Sero concordance and discordance rates.....	31
Table 1: Social demographic characteristics of the study participants	29
Table 2: Using Exposed couples (both positive) as controls	31
Table 3: Analysis on the factors associated with Hepatitis Positivity	33
Table 4: Multivariable analysis of factors independently associated with Hepatitis B positivity	35

OPERATIONAL DEFINITIONS

Couple:	Two people who are married or otherwise closely associated romantically or sexually and show up as a pair at antenatal clinic
Sero-concordance:	A couple having similar HBsAg serological status.
Sero-discordance:	A couple having different HBsAg serological status.
Sero-negative:	An individual whose blood sample tests negative for detectable hepatitis B surface antigen (HBsAg), indicating no detectable HBsAg at the time of testing.
Seropositive:	An individual whose blood sample tests positive for detectable hepatitis B surface antigen (HBsAg), indicating current HBV infection at the time of testing.
Sero-prevalence	The proportion of respondents who test positive for HBsAg out of the total number of study participants in the study

ABSTRACT

Background: Hepatitis B virus (HBV) infection remains a major public health concern due to its potential to cause chronic liver disease, cirrhosis, and hepatocellular carcinoma. In Uganda, pregnant women are routinely screened for HBV during antenatal care (ANC); however, screening of male partners and evidence on HBV seroprevalence and sero-concordance and discordance among couples remain limited, particularly in Northern Uganda. Understanding the burden of HBV infection and associated factors among couples attending ANC is essential for informing integrated screening, vaccination, and prevention strategies.

Objective: To determine Hepatitis B Virus (HBV) seroprevalence and associated factors among pregnant women and their partner attending antenatal care (ANC) clinic of Gulu Regional Referral hospital (GRRH), Gulu, Uganda.

Methods: Between December 2023 and February 2024, a hospital-based, cross-sectional study was conducted among eligible pregnant women and their male partners attending ANC of GRRH. Following systematic random sampling, pretested questionnaire was administered by an interviewer. Blood samples were collected for HBV surface antigen (HBsAg) rapid test, which was performed according to the manufacturer's instructions. Quantitative data was analysed using logistic regression in STATA version 15 SE. $P < 0.05$ was considered statistically significant.

Results: A total of 242 couple pairs were enrolled. Overall, 8.3% ($n=40/484$) participants were seropositive for HBsAg; Among the males, Male partners (10.7%, $n=26/242$) and among pregnant women (5.8%, $n=14/242$). Sero-concordance 87.6% (212/242), (Male partners negative [-ve] and pregnant women [-ve]; 83.5%, $n=202/242$), (Male partners positive [+ve] and pregnant women [+ve]; 4.1%, $n=10/242$) and sero-discordance was 12.4% (30/242), (Male partners +ve and pregnant women -ve; 8.7%, $n=21/242$), (Male partners -ve and pregnant women +ve; 3.7%, $n=9/242$). Factors associated with positive HBsAg were, being male (adjusted odds ratio [aOR]: 2.45, 95% Confidence Interval [CI], 1.15 - 5.21, $p=0.02$), daily alcohol consumption (aOR: 4.73, 95% CI: 1.40 -16.04, $p=0.01$), and no prior vaccination against HBV (aOR: 12.01, 95% CI: 4.07 - 35.65, $p<0.001$).

Conclusion: There is a high HBsAg seropositivity rate, particularly among male partners of pregnant women. Male sex, daily alcohol consumption, and lack of prior HBV vaccination were significantly associated with infection. There is an urgent need for couple-based HBV screening during antenatal care, targeted vaccination of unvaccinated individuals, and counselling on alcohol reduction. In addition, strengthening and sensitising young people on premarital HBV screening is essential to reduce transmission

Keywords: Hepatitis B, Pregnant women, Prevalence, couples, Northern Uganda

CHAPTER ONE: INTRODUCTION

1.1 Background

Hepatitis B virus (HBV) is viral illness of global public health concern capable of causing both acute and chronic liver diseases, which can lead to serious health consequences including hepatocellular carcinoma, cirrhosis and fulminant hepatic failure. Symptoms such as jaundice, dark urine, pain in the abdomen, appetite loss, fatigue, vomiting and nausea are consistent with acute HBV infection. On the other hand, chronic HBV infection may not cause any symptoms for years, but it can still cause liver damage over time, and this is a health priority for developing countries (WHO, 2024) (Lampertico et al., 2017; Matthews et al., 2022; T. Wang et al., 2021).

The World Health Organization (WHO) estimates that, approximately 254 million people worldwide lived with either chronic HBV by 2022 and an estimated 1.3 million people died from viral hepatitis in 2022, and viral hepatitis is one of the communicable diseases for which mortality is increasing. Of the 1.3 million viral hepatitis deaths, hepatitis B caused 1.1 million deaths and hepatitis C 240 000 deaths (WHO, 2024).

Hepatitis B virus (HBV) transmission can occur through various routes. In highly endemic regions, mother-to-child (perinatal) transmission during birth and delivery is a major mode, while horizontal transmission through contact with infected blood or body fluids from an already infected child (especially via open cuts or sores) within the first five years of life also poses a significant risk (WHO, 2024). These early-life infections are responsible for most chronic cases because the likelihood of chronicity is highest when infection is acquired in infancy or early childhood. In sub-Saharan Africa, horizontal childhood transmission has historically been a particularly important contributor (Keane et al., 2016; WHO, 2024).

Intrauterine transmission can occur but is less common than transmission around the time of delivery. Maternal HBV infection has been associated in some studies with an elevated risk of spontaneous preterm birth (Sarin et al., 2011) .

The virus can also be spread through exposure to infected bodily fluids (primarily blood, but also semen, vaginal fluids, and, less efficiently, saliva) via needlestick injuries, tattooing, piercing, sexual intercourse with infected individuals, and the sharing or reuse of contaminated syringes and needles in healthcare settings or among people who inject drugs (WHO, 2024; Cho & Yang, 2023)

Infants born to mothers positive for both HBsAg and HBeAg have a 70-90% risk of acquiring perinatal HBV infection. Infants born to mothers who are positive for both HBsAg and HBeAg have traditionally been reported to face a 70–90% risk of perinatal HBV infection, while those born to HBsAg-positive but HBeAg-negative mothers have an estimated risk of 5–30%. However, a systematic review and meta-analysis focused on sub-Saharan Africa found substantially lower pooled transmission risks in the absence of prophylaxis: 38.3% among infants of HBeAg-positive mothers and 4.8% among those of HBeAg-negative mothers (Keane et al., 2016)

Infants who acquire HBV infection perinatally have an 85–90% probability of progressing to chronic carriage. These chronic carriers can later contribute to horizontal transmission within households and communities. Approximately 25% of individuals with chronic HBV infection ultimately die from hepatocellular carcinoma or complications of liver cirrhosis (WHO, 2024)

Several studies on the prevalence of HBV infection among pregnant women have been conducted across Africa, and the findings are quite similar. A cross sectional study in Nigeria looked at HBV infection and associated risk factors among pregnant women and their male partners in a baby shower program observed that 10.9% of the pregnant women and their

partners had HBV, implying a high burden in Benue state, Nigeria and suggesting that this could rise with the increase in population (Talla et al., 2021). Although another study in Gambia tested 423 pregnant women for HBsAg to establish the sero-prevalence of HBV among pregnant women attending a prenatal clinic at the Edward Francis small Teaching hospital, reported a prevalence rate of 9.2% among all the pregnant women and also found out that vaccinated women had a prevalence rate of 2.3%, while unvaccinated women had a prevalence rate of 13.7% As a result, there was a statistically significant difference between individuals who had been vaccinated and those that had not been vaccinated according to the study (Bittaye et al., 2019).

Similarly, two recent studies in Uganda on the prevalence of HBV and risk factors among pregnant women attending antenatal care clinics in Kyazanga Health Centre IV in Lwengo district and Mulago Hospital found the prevalence rate to be 2.8% and 2.9% respectively (Kayondo et al., 2020; Mugabiirwe, 2022). These study findings fall within the WHO 2%-8% category of endemicity. However, an earlier cross-sectional study in 2014 conducted in two hospitals in Northern Uganda explored the prevalence of HBV infection among pregnant women attending antenatal care, discovered that the prevalence rates were 11.8% indicating a high prevalence (Bayo et al., 2014) and thus important as the commonest mode of HBV transmission was vertical and horizontal in highly endemic areas including Northern Uganda.

A more recent national meta-analysis and meta-regression by Kafeero et al. (2025) estimated the pooled prevalence of HBV in Uganda at 8.3%, with the northern region specifically at 9.0%. Although the analysis demonstrated an overall decline in prevalence since the introduction of the hepatitis B vaccine into the Expanded Programme on Immunisation in 2002 including in northern Uganda the rates remain substantial and underscore the continued public health importance of HBV in the region (Kafeero et al., 2025).

Male partner involvement in antenatal care (ANC) can improve maternal and neonatal health outcomes by promoting emotional and financial support, encouraging timely use of antenatal services, and facilitating couple-based testing for infections such as hepatitis B virus (HBV) and HIV. In the context of HBV, involving male partners is particularly important because testing both partners allows identification of sero-concordant and sero-discordant couples, which has important implications for transmission prevention and clinical management. For instance, when a pregnant woman is HBsAg-negative while her male partner is HBsAg-positive, she may be at risk of acquiring HBV through sexual transmission during pregnancy. Maternal infection during pregnancy may subsequently increase the risk of mother-to-child transmission in the current or future pregnancies. Conversely, when the pregnant woman is HBsAg-positive and her partner is negative, appropriate counselling, vaccination, and other preventive measures can help protect the uninfected partner and reduce transmission within the household.

Couple-based HBV testing therefore provides an opportunity for early identification of infected partners, appropriate linkage to care, counselling on prevention, and protection of the uninfected partner and newborn. For male partners, participation in ANC and couple testing can facilitate early diagnosis and management of HBV infection and reduce the risk of onward transmission. Despite these benefits, limited male involvement in ANC may reduce opportunities for couple-based testing and counselling, potentially resulting in undiagnosed infections and missed opportunities for preventing HBV transmission between partners and from mother to child (Hoga et al., 2001; Lewis et al., 2015; Wai et al., 2015).

Furthermore WHO guidelines on chronic hepatitis B strengthen the clinical relevance of this approach. These guidelines recommend antiviral prophylaxis with tenofovir for HBsAg-positive pregnant women with high viral loads ($\geq 200,000$ IU/mL), in addition to timely infant

immune-prophylaxis, to further reduce the risk of mother-to-child transmission (World Health Organization, 2024). Engaging male partners in ANC therefore supports both the prevention of horizontal transmission within the couple and the optimal implementation of these updated vertical-transmission prevention strategies.

Despite the high burden of HBV in Uganda there is limited seroprevalence and infection patterns among pregnant women and their male partners attending ANC, particularly regarding concordance and discordance within couples. Male partners remain significantly under screened in ANC settings, and there is a notable lack of region-specific data from Uganda and northern Uganda. The knowledge gap hinders the development of targeted couple-based intervention for HBV prevention and control in high prevalence setting.

Therefore, the purpose of this study was to establish the seroprevalence of HBV among pregnant women and their male partners, concordance and discordance status, as well as the associated factors and the couple's in Gulu Regional Referral Hospital, northern Uganda.

1.2 Problem Statement

Hepatitis B virus (HBV) infection remains a major global public health challenge, contributing significantly to morbidity and mortality through chronic liver disease, cirrhosis, and hepatocellular carcinoma. According to the WHO guidelines, the expanded and simplified treatment eligibility criteria mean that more than 50% of people living with chronic HBV infection are now estimated to require antiviral treatment, depending on the setting (WHO, 2022). In Uganda, the Uganda Populations based HIV impact Assessment (UPHIA, 2017) reported that 4.1% of the population are chronic carriers of HBV, with marked regional variations. The mid- North, North east, and West Nile regions report prevalence rates of 4.6%, 4.4% and 3.8% respectively with adults in the mid north disproportionately affected. In

response the government of Uganda, through ministry of health, has rolled out HBV screening and vaccination campaigns targeting adolescents and adults (MOH, 2022)

Despite ongoing efforts to address HBV infection in Uganda, important knowledge gaps remain. Most studies in northern Uganda and the country have focused on HBV prevalence among pregnant women alone, with limited attention to their male partners (Bayo et al., 2014; Kafeero et al., 2021; Kayondo et al., 2020; Sabri et al., 2019). This limits understanding of HBV transmission within couples, particularly patterns of sero-concordance and sero-discordance that may influence partner-to-partner and mother-to-child transmission. In Gulu Municipality, a population-based study reported an overall HBsAg prevalence of 17.6%, with higher prevalence among adult males (22.2%) than females (15.3%) (Ochola et al., 2013), but did not examine couples attending antenatal care. Thus, limited evidence exists on HBV sero-prevalence, sero-concordance and sero-discordance, and associated factors among pregnant women and their male partners in northern Uganda. This study therefore sought to address this gap by assessing HBV infection among couples attending antenatal care at Gulu Regional Referral Hospital.

1.3 Research Question

- 1) What is the seroprevalence of HBV among pregnant women and their male partners attending GRRH antenatal clinic?
- 2) What are the Sero-concordance and Sero-discordance rates of HBV among pregnant women and their partners attending GRRH antenatal clinic?
- 3) What factors are associated with HBV seropositivity among pregnant women and their partners attending GRRH antenatal clinic?

1.4 General Objective

The broad objective of the study was to determine HBV seroprevalence and associated factors among pregnant women and their partner attending GRRH antenatal clinic.

1.4.1 Specific Objectives

- 1) To determine the sero-prevalence of HBV among pregnant women and their partners attending GRRH antenatal clinic.
- 2) To determine the sero-concordance and sero-discordance among pregnant women and their partners attending GRRH antenatal clinic.
- 3) To determine associated factors of HBV among pregnant women and their partners attending GRRH antenatal clinic.

1.5 Scope of the Study

Geographical scope: The study was conducted at GRRH, located in Gulu City, Northern Uganda, among pregnant women and their male partners attending the antenatal care clinic.

Content scope: The study focused on determining HBsAg sero-prevalence, sero-concordance and sero-discordance among couples, and factors associated with HBsAg seropositivity, including sex, daily alcohol consumption, and prior HBV vaccination status.

Time scope: The study was conducted between 1st December 2023 and 28th February 2024.

1.6 Significance of the study

This study addresses a critical knowledge gap regarding couple-level HBV infection patterns in northern Uganda, a region with historically high endemicity. By generating data on sero-prevalence, concordance/discordance, and associated factors among pregnant women and their male partners, the findings will:

Inform the design of targeted couple-based screening and prevention strategies within antenatal care settings.

Support the implementation of the 2024 WHO recommendations on prevention of mother-to-child transmission, including timely identification of high-risk couples who may benefit from antiviral prophylaxis and partner vaccination.

Contribute evidence to Uganda's National Viral Hepatitis Strategic Plan (2023–2028) and the national goal of triple elimination of mother-to-child transmission of HIV, syphilis, and hepatitis B.

Guide clinicians and programme managers at GRRH and similar facilities in prioritising male partner involvement in ANC for improved maternal, paternal, and neonatal outcomes.

Provide baseline data that can be used for future interventional studies and monitoring of HBV control efforts in northern Uganda.

1.7 Justification

Hepatitis B Virus (HBV) infection poses a significant threat to global health, with chronic infections leading to severe consequences such as liver cirrhosis, hepatocellular carcinoma, and even death. Understanding the prevalence of HBV serostatus among pregnant women and their partners is crucial, particularly in high-risk populations attending antenatal clinics like GRRH.

The World Health Organization (WHO) recognises HBV infection as a major public health concern, with mother-to-child transmission remaining an important route of transmission globally, including in Africa. Previous studies in similar settings in Uganda have reported notable prevalence rates. Among pregnant women attending antenatal care, rates have ranged from 2.9% in central Uganda (Kayondo et al., 2020) to 11.8% in northern Uganda (Bayo et al.,

2014). A study among people living with HIV on antiretroviral therapy in northern Uganda reported a prevalence of 7.9% (Chiesa et al., 2020).

However, a significant research gap exists in understanding the current prevalence of HBV serostatus among pregnant women and their partners in this specific population. Bridging this knowledge gap is essential to inform evidence-based policies and interventions aimed at reducing HBV transmission and mitigating its severe health consequences.

Therefore, the study supports Uganda's Ministry of Health HBV prevention and control priorities by highlighting the need for couple-based screening, vaccination, and targeted health education. It contributes to Uganda's hepatitis B elimination efforts and SDG 3.3 and 3.8 by informing strategies to reduce HBV transmission and improve access to prevention and care in Northern Uganda.

1.8. Theoretical framework

The study adopts the Andersen Behavioural Model of Health Services Use, which explains health-related outcomes through predisposing factors, enabling factors, and need factors. In this study, the model is adapted to examine factors associated with HBV seropositivity among pregnant women and their male partners attending antenatal care at Gulu Regional Referral Hospital.

Predisposing factors include age, sex, educational attainment, marital status, residence, obstetric history, and sexual behaviours, which may influence exposure to HBV infection. Enabling factors, such as socioeconomic status, access to healthcare, and prior HBV vaccination, may facilitate prevention, screening, and early diagnosis. Need factors, including HIV status, history of STIs, and previous medical exposures, represent relevant health conditions and exposure histories that may require healthcare assessment?

These factors are examined in relation to the dependent variable, HBV seropositivity (HBsAg positive). Persistent HBV infection may result in long-term complications such as liver cirrhosis and hepatocellular carcinoma. The framework therefore provides a basis for investigating determinants of HBV infection and identifying opportunities for prevention and improved healthcare among couples.

1.9 Conceptual Framework

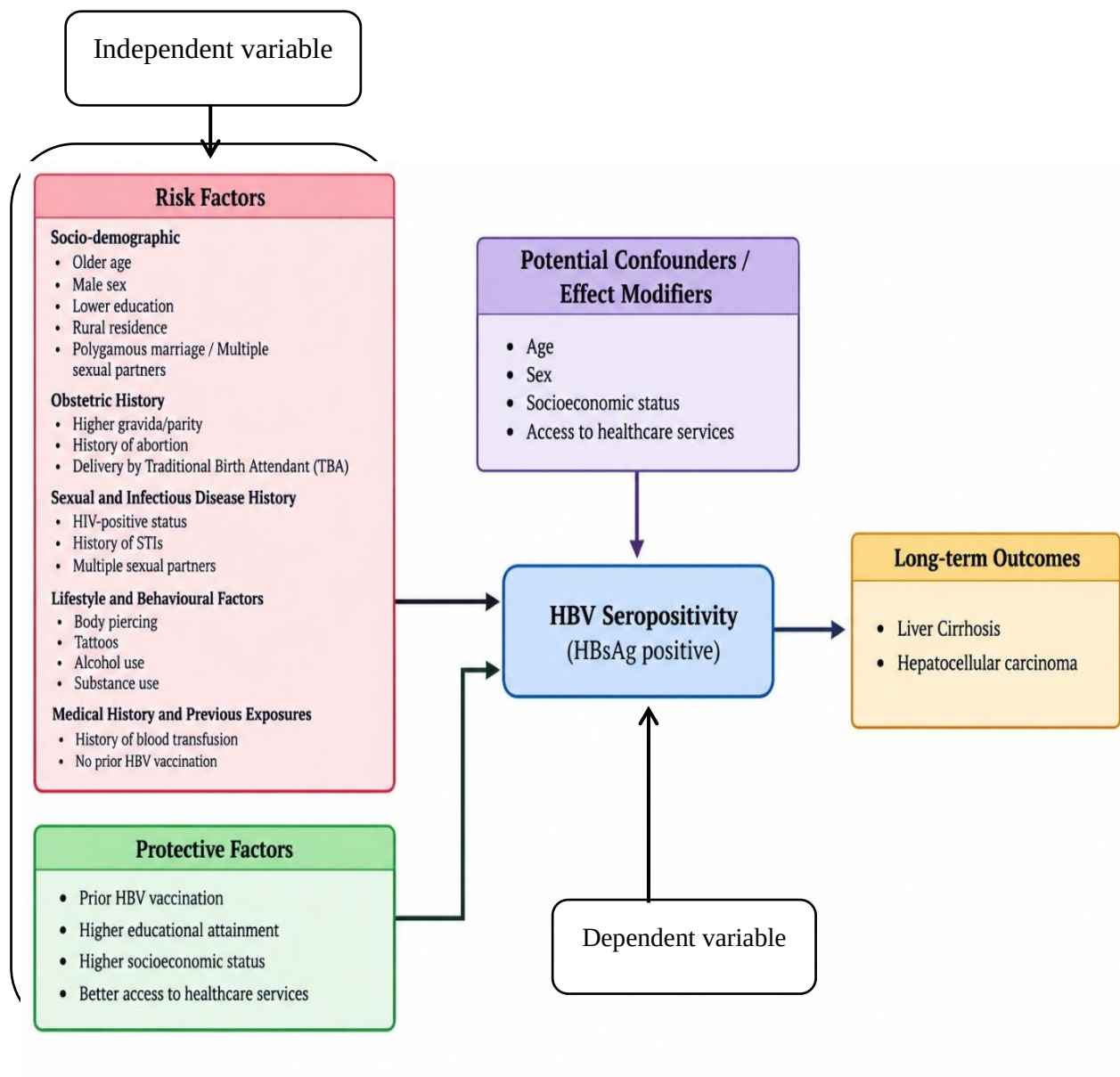


Figure 1: Conceptual frame work

1.9.1 Explanation of the conceptual framework

The framework was informed by the WHO Viral Hepatitis Strategy and the main modes of HBV transmission (perinatal, sexual, parenteral, horizontal). Variables were selected from evidence in African and global studies and organised using elements of the Andersen Behavioural Model.

Independent variables included socio-demographic, obstetric, sexual/infectious, lifestyle and medical history factors. Confounders were age, sex, socioeconomic status and healthcare access. The dependent variable was HBV seropositivity, with liver cirrhosis and hepatocellular carcinoma as long-term outcomes.

Risk factors (older age, male sex, lower education, multiple partners, HIV, STIs, alcohol, piercings/tattoos, blood transfusion, no vaccination) increase exposure or limit prevention.

Protective factors (HBV vaccination, higher education, better socioeconomic status and healthcare access) reduce infection risk.

CHAPTER TWO: LITERATURE REVIEW

2.1 Introduction

This chapter synthesises existing literature on hepatitis B virus (HBV) infection among pregnant women and their partners, with particular attention to couple-level dynamics. It aims to provide a clear understanding of the current body of knowledge and to identify gaps that warrant further investigation.

Studies focusing on pregnant women have primarily examined the prevalence of HBV infection, its impact on maternal health, and modes of transmission. Notable examples include the works of Adjei et al. (2018), Huang et al. (2024), Liu et al. (2022), and Umer et al. (2023), which have documented varying prevalence rates among pregnant populations.

Research has also addressed HBV in the context of partners, with particular emphasis on partners' knowledge, awareness, and involvement in preventing transmission and supporting a safe and healthy pregnancy. Wang et al. (2017) highlight that insights into partners' perspectives are essential for effective education and engagement in HBV management during pregnancy.

In addition, a growing body of literature examines the couple as a unit during the prenatal period, especially regarding strategies to prevent perinatal HBV transmission and to foster a supportive environment for the well-being of both parents and the unborn child (Chen et al., 2021).

Overall, this review maps the existing evidence while identifying critical gaps—particularly the limited attention given to couple-level transmission patterns and partner involvement in northern Uganda and outlines opportunities to bridge those gaps.

2.2 The HBV sero prevalence among pregnant women and their male partner

In Uganda, the prevalence of HBV in the general population ranges from 0.8%-4.6% in South West and Mid North respectively, which is within the range of endemicity (UPHIA, 2017). Studies have focused on the prevalence of HBV and associated risk factors among pregnant women and also in the general population but have not looked at partner testing, however those that have been conducted give a prevalence ranging between 2.9% done in Mulago Hospital Kampala with a study limitation of few cases (Kayondo et al., 2020) to 11.8% in an earlier study in Northern Uganda which determined the HBV infection and HBeAg which found that younger women below 20 years of age had a prevalence of 20% of being positive and the study concluded that 1 in 8 pregnant women had HBV thus a high risk of transmission to the unborn child (Bayo et al., 2014) with major limitation of not determining the chronicity of HBV.

According to the WHO Global Hepatitis Report 2024, the WHO African Region accounted for 63% of new hepatitis B infections globally, highlighting the region's substantial burden of HBV infection. HBsAg prevalence among women attending antenatal care in the WHO African Region was estimated pooled prevalence at 6.2% (95% CI: 5.3–7.2) based on data from 2014–2023 (Riches et al., 2025). HBV is primarily transmitted through mother-to-child transmission, particularly during childbirth, and horizontal transmission through exposure to infected blood and body fluids, including during early childhood and through sexual contact. These transmission pathways underscore the importance of strengthening HBV screening, vaccination, and prevention interventions among pregnant women, their partners, and the wider population. The general population with the common mode of transmission to be mainly by two methods, vertical mother to child and horizontally (Adjei et al., 2018; Umer et al., 2023).

Studies in Africa on the prevalence of HBV among pregnant women have given results that are relatively similar. Across sectional study in Ethiopia at Wolaiti Area, found the prevalence

of HBV among pregnant women to be 7.3% (n=675) (Bancha et al., 2020) while in Gambia the prevalence rate was 9.2% (n=410) and in this study the prevalence of HBV in those that were likely to have been vaccinated and those that were unlikely to have been vaccinated was 2.3% and 13.71% respectively (Bittaye et al., 2019). Lack of a better methods of testing and the smaller sample size respectively where the study limitation.

In Nigeria, a baby shower program to determine HBV seroprevalence and associated factors among pregnant women and their male partners, 16,920 respondents were recruited and tested using HBsAg test. The prevalence rate was 10.9% (n=1836) among all the study participants with women 10.2% (n=1032/10 167) having a slightly lower prevalent rate compared to the males 11.9% (n=804/6753). However, the study did not look at the sexual habits of the participants because this would. have given the factors associated with the high prevalence (Talla et al., 2021) however a metanalysis of 20 studies from a pooled 158 in Nigeria found the pooled prevalence rate was 6.49% (Olakunde et al., 2021).

Worldwide prevalence of HBV indicates that about 2.3%- 7.9% of pregnant women have HBV infection though the rates of HBV is 3.8% of the general population (Razavi-Shearer et al., 2018; Wondmeneh & Mekonnen, 2024) People who die of HBV complications remain underestimated because when people with end stage liver disease die, their viral load infection is not mentioned and this brings an estimated 1.1m deaths related to HBV recorded in 2022 (WHO, 2024) This is thus a concern in global health despite the fact that there are highly effective vaccines.

In a metanalysis by Liu in China, with one of the largest populations estimated to be 1.4billion people found he prevalence of HBV among pregnant in a pooled 42 studies from 2016 to 2021 with 4million cases concluded and a prevalence rate of 6.64% with (95% CI 5.72%-7.57%) was found (D. Liu et al., 2022).

2.3 The factors associated with HBV among pregnant women and their male partners

HBV is a major public health concern among pregnant women and their male partners, particularly in sub-Saharan Africa, which is considered a high-endemicity region for HBV infection, with a prevalence of approximately 6.1% among the general population. Studies have reported varying prevalence and associated factors among couples. In Nigeria, Talla et al. (2021) reported an HBV prevalence of 10.2% among pregnant women and 11.9% among their male partners; female participants had lower odds of HBV infection than males (AOR = 0.70, 95% CI: 0.61–0.80), while participants aged 21–31 years had higher odds of infection compared with those aged above 53 years (AOR = 4.60, 95% CI: 2.24–9.47), and polygamy was associated with HBV sero-discordance (AOR = 1.49, 95% CI: 1.19–1.87). Which is prevalent in areas around the world and especially in the sub-Saharan Africa

Furthermore, a systematic review and meta-analysis across 28 African countries found that family history of HBV (AOR = 2.72, 95% CI: 1.53–3.90) and multiple sexual partners (AOR = 2.17, 95% CI: 1.30–3.04) were associated with increased odds of infection, highlighting the continued burden of HBV and the influence of household and behavioural factors among pregnant women.

2.3.1 Sociodemographic Characteristic

In a study by Talla et al. (2021), age was associated with HBV infection, with the highest prevalence reported among women aged 21–30 years (11.7%), compared with 10.8% among those aged 31–40 years and 9.3% among those aged above 41 years. This suggests that HBV infection was more common among younger women, a finding this is consistent with studies by (Michael Pou & Dube, 2021; Terrault et al., 2018).

Having tested in the past, was found that women who had done so were more infected than those that had not been tested before (Bancha et al., 2020; Kinfu et al., 2021; Umare et al., 2016). In the predictors of HBV among pregnant women, those that had been transfused had a higher risk than those that had not been transfused and sex especially being male had more likely hood of getting HBV which is about 1.3 times than women and this could be because they engage in more risky sexual relationships than females and the seropositivity is more prevalent among those with HIV infection because of the shared route (Kafeero et al., 2021).

Having a history of abortion in the past was associated with higher prevalence compared to those that had not aborted. In a study of the prevalence and associated factors among pregnant women, it was found that those who had a previous abortion were 11% compared to 9.0% and these are similar to study conducted in Ethiopia, (Umare et al., 2016).

Multiple sexual partners were a factor that was associated with HBV infection among the pregnant women and their partners. A study in Nigeria found that multiple sexual multiple partners had a higher risk than those with no sexual partners 12.2% to 9.0% and this was associated with higher use of substances increases the chances of getting HBV and the Odds of getting the infection increased with the lower age of 21 to 31 years aOR of (4.5, 95% CI 2.2-9.3) but had also had used alcohol at a lower scale due to religious affiliation (Talla et al., 2021)

A study in Ethiopia found that pregnant women who in low-resource settings, pregnant women may rely on traditional birth attendants during labour, who often have limited access to HBV testing and may therefore be unaware of the mother's serostatus. A cross-sectional study among 370 pregnant women in Southwest Ethiopia found an HBV prevalence of 5.9%, with women who had contact with jaundiced patients having significantly higher odds of HBV infection (AOR = 9.87, 95% CI: 2.98–32.65) compared with those without such contact (Tanga et al., 2019)

2.4 Concordance and Discordance rates

Across different settings, couple-based studies demonstrate that HBV discordance rates are common and men are disproportionately affected compared to their female partners. In Nigeria, Talla reported a sero-discordance rate of 19.5% (1,316 of 6,750 couples). Multivariable analysis showed that women had 34% lower odds of HBV infection than their male partners (aOR 0.66, 95% CI 0.58–0.75), while younger age (21–31 years versus >53 years) conferred the highest odds of infection (aOR 4.5, 95% CI 2.2–9.3). Polygamy was independently associated with discordance (AOR 1.49, 95% CI 1.19–1.87) (Talla et al., 2021). Similarly, Onakewhor in a PMTCT program, found sero-concordance and discordance were 6.8% and 93.2% respectively. These trends are similar to a study in Saudi Arabia, where the retrospective data revealed consistently higher HBV prevalence among male partners compared to pregnant women 6.3% and 3.1% in 2002-2005 and 2.4% and 1.1% in 2012 and 2015 (Albadran et al., 2017).

Complementing these findings, a nationwide Chinese study of 1,936,801 rural couples preparing for pregnancy (2010–2012) found that 10.47% were positive couples (either discordant or both HBsAg-positive); among these, 27.84% were also HBeAg-positive, indicating high infectiousness (Zhang et al., 2017). These findings highlight a recurring global pattern of gender disparity in HBV within couples, where males have a higher burden, there contributing significantly to observed discordance rates.

2.5 Summary of literature and research gaps

The global prevalence of hepatitis B virus (HBV) infection among pregnant women ranges from 2.3% to 7.9%, representing a major public health concern due to the potential for serious complications in both the mother and the child. In China, a meta-analysis of 42 studies reported

a prevalence of 6.64% among pregnant women. In Africa, prevalence rates vary significantly by country, ranging from 7.3% in Ethiopia to 10.9% in Nigeria.

Several risk factors have been consistently associated with HBV infection among pregnant women and their partners. These include older age, lack of prior HBV testing, history of blood transfusion, multiple sexual partners, and contact with individuals known to have hepatitis. For instance, a Nigerian study found a significantly higher prevalence among women aged 31–41 years compared to those aged 21–30 years. Additional factors such as a history of abortion and male gender have also been linked to increased HBV prevalence.

HBV transmission dynamics within couples are complex and shaped by multiple biological, behavioral, and social factors. Studies indicate that HBV sero-discordance rates among couples range from 6.8% to 19.5%. A deeper understanding of the determinants of discordance is essential for designing effective prevention strategies.

Despite notable advances in the literature, important research gaps remain. There is a need for more robust studies examining the specific dynamics of HBV transmission within couples, identifying key predictors of sero-discordance, and rigorously evaluating the effectiveness of targeted interventions to prevent transmission. Furthermore, greater attention should be given to the social, cultural, and contextual factors that influence both the spread and prevention of HBV among pregnant women and their partners. Addressing these gaps will be critical for developing more comprehensive and culturally appropriate control measures.

CHAPTER THREE: METHODS

3.1 Study Design

This was a facility-based cross-sectional study with a quantitative approach. The design was appropriate for achieving the objective of the study as it provided access to the target population, facilitated efficient data collection, and ensured comprehensive recruitment of couples attending ANC, allowed adequate sample size and enhanced control of confounding variables.

3.2 Study Area

The study was done at GRRH antenatal clinic known as Gulu Hospital in the Northern Uganda. It's a referral facility for the surrounding and neighbouring districts. GRRH has a 380-bed capacity, and the antenatal visits are between 50-70 daily working Monday to Friday 8:00am - 5:00pm except official public holidays that fall within the weekday.

3.3 Target Population

All the women who were pregnant and their partners attending to antenatal visits in Northern Uganda.

3.4 Accessible Population

All women who were pregnant with their partners attending GRRH antenatal clinic available during the study period between December 2023 and February 2024.

3.5 Study Population

Population of all women who were pregnant and their partners attending GRRH antenatal clinic who fulfil the inclusion criteria

3.6 Study Unit

A pregnant woman with male partner attending the antenatal clinic at GRRH

3.7 Selection Criteria

3.7.1 Inclusion Criteria

1. A pregnant woman with male partner attending antenatal clinic, regardless of age

3.7.2 Exclusion Criteria

1. Women having a pregnancy related emergency condition at the antenatal clinic requiring immediate medical care.

3.8 Study Variables

3.8.1 Dependent Variable

HBV surface antigen serostatus (Negative or Positive)

3.8.2 Independent Variables.

Risk factors (older age, male sex, lower education, multiple partners, HIV, STIs, alcohol, piercings/tattoos, blood transfusion, no vaccination) increase exposure or limit prevention.

Protective factors (HBV vaccination, higher education, better socioeconomic status and healthcare access) reduce infection risk.

3.9 Sample Size Determination.

Objective one: Sample

The researcher used the survey formula for sample determination by Kish Leslie (1965);

$$N = \frac{z^2 P(1 - P)}{d^2}$$

Where Z = score for 95% confidence interval = 1.96.

P. is prevalence rate 10.9% (0.109) from a Nigerian study of prevalence and factors associated with HBV infection among pregnant mothers and their partners (Talla et al., 2021)

d= Precision/acceptable error (5%) = 0.05

$$N = \frac{1.96^2 \times 0.109 (1-0.109)}{0.05^2} = 149.3$$

This gives the sample of 150 couples

Objective two sample

Using Discordance rate of 19.5 among couples (Talla et al., 2021)

$$N = \frac{z^2 P(1-P)}{d^2} \quad P. \text{ is prevalence rate } 19.5\% (0.195)$$

$$N = \frac{1.96^2 \times 0.195 (1-0.195)}{0.05^2} = 241.2 = 242. \text{ This gives a total of 242 couples}$$

Objective 3 sample

The sample size was calculated using the simplified formula:

$$E = \frac{1}{\sqrt{N}}$$

Where:

- N = required sample size (number of respondents to be interviewed)
- E = desired precision / margin of error = 5% = 0.05

Rearranging the formula:

$$0.05 = \frac{1}{\sqrt{N}} \quad \sqrt{N} = \frac{1}{0.05} = 20 \quad N = 20^2 = 400$$

A total of 400 respondents to be interviewed.

The largest calculated sample size of 484 individuals was adopted to provide sufficient statistical power for both prevalence estimation and multivariable analysis of factors associated with HBV infection. No adjustment was made for non-response, as the study achieved full recruitment of the target sample with no refusals

3.10 Sampling Procedure

We used systematic random sampling technique where each individual in the population had an equal probability of being selected to participate in the study. The ANC is a specialist clinic for antenatal care. The typical day starts at 8:00am with a brief health message to all that have come to seek the antenatal service. The estimated number of couples per day who came in for ANC services ranged between 50-70 approximately 1,200 couple visits a month. To get the total number of couples recruited per day we divided the already calculated sample size of 242 couple by 60 working days giving 5 couples per day. To get the sampling interval we divided the estimated number of couples who came in for ANC per day by the number of couples to be recruited per day $60/5$ which gives 12. There for each day the first couple that came in was recruited automatically and every 12th couple was recruited until the total number of 242 couples was reached in 60 days. The research assistant recruited those that met the inclusion criteria and excluded those that did not meet criteria. After the participants were identified; the study participants were then briefed about the study after the daily morning antenatal health care education. The questions about the study were answered at this point. Those that met the inclusion criteria were talked to again and their questions answered as they waited for their time for the check-up. An informed consent was administered, then questionnaire administered and pre and post-test counselling was done in a private room and their blood sample taken and results given accordingly and any questions answered.

3.11 Data Collection Method

A pretested questionnaire was administered by the trained research assistant and the blood sample taken off by a trained laboratory technician. The questionnaires were kept in a secure records room which is not accessible only to the research assistant and PI. The completed questionnaires were checked for completeness after the interview and also before entering in excel sheet and exporting to Stata 15 SE.

3.12 Data Collection tools and data collection procedure

Informed consent was obtained from all participants prior to data collection. To ensure the validity and reliability of the questionnaire, pretesting was conducted at Badege Health Centre 3 by trained research assistant fluent in both English and Luo languages. A translated Luo version of the questionnaire was administered to a respondent who did not understand English. A total of 5 couples were identified for pretesting and Cronbach alpha 0.741

Data was collected using a pretested structured questionnaire administered by trained research assistants. Participants then jointly received pre-test counselling, provided finger-prick blood samples and received post-test counselling after results disclosure. Questionnaires were checked daily for completeness and securely stored. The procedure of counselling followed a structured, couple friendly approach in a private, non-judgmental environment (room). The pretest included rapport building, assessment of knowledge and risk factors, explanation of possible results (concordant negative, concordant positive, or discordant), and the testing process. The participants were offered the choice of receiving results separately or together. In discordant cases, results were first disclosed separately to each partner. Partners only learned each other's Sero status after they consented to mutual disclosure. Positive partners were counselled and referred for further evaluation and care (in the chronic care clinic). Negative partners received counselling on prevention strategies, including vaccination and safety planning.

3.13 Sample Collection

Our research assistants guided the respondents through the consent form, making sure they understood what they were agreeing to. Once the forms were complete, our trained laboratory technician took over, using standard operating procedures to collect a finger prick specimen from each respondent.

The specimen collection process was careful and precise. First, a capillary tube was placed on a clean, dry surface. Then, the desired test strips for HBsAg were removed and labelled with the respondent's identification. The protective foil cover was removed from each test strip, and the middle, ring, or index finger was chosen and warmed to increase blood flow.

The finger was then cleaned using alcohol and allowed to dry. The client's hand palm was positioned side up, and the lancet was placed off-centre on the fingertip. Gentle pressure was applied to puncture the skin, and the lancet was then disposed of in a biohazard sharps container.

The first drop of blood was wiped away with a sterile gauze pad, and the finger was held lower than the elbow. Gentle intermittent pressure was applied to the base of the punctured finger a few times, and then the blood was collected using a capillary tube. The blood filled the tube up to the marked two lines (50µL), and the capillary tube was then placed in the middle of the sample pad marked "sample" at an upright vertical position.

We waited until the blood was all transferred from the capillary tube to the sample pad, and then the capillary tube was disposed of in a biohazard container. A drop of chase buffer was then applied immediately to the sample pad, holding the bottle vertically. We then waited 15-30 minutes, as instructed by the manufacturer, to read the results.

The results were shown by two lines indicating a positive result, while only one line, the control, indicated a negative result. After the results were read, our counsellor provided post-test counselling to each respondent, explaining their results and answering any questions they may have had.

We used the Bioline HBsAg WB (formerly SD BIOLINE HBsAg WB) rapid test (Abbott Diagnostics Korea Inc., formerly Standard Diagnostics, Inc., Yongin-si, Republic of Korea), a qualitative immunochromatographic assay for the detection of hepatitis B surface antigen in

whole blood, serum or plasma. According to the manufacturer and WHO prequalification data, the assay demonstrated a high sensitivity and specificity in reference to ELISA (WHO, 2020)

3.14 Data Management and Data Analysis

Data collected was entered in an excel data sheet and was exported to the Stata 15 SE Statistical software for analysis. The data was presented in frequency tables, visualizations of data.

Objective 1. The prevalence-sero-positivity of Hepatitis B. Number of lab tests

The prevalence of Hepatitis (Number of participants positive for Hepatitis B surface Antigen/Total number of participants tested) X 100%

Objective 2. The concordance and discordance rates were calculated by

Concordance = (Amount of agreements/Number of comparison) X 100%

Discordance = (Amount of Disagreements/Number of comparison) X 100%

Objective 3. Associated factors of sero positivity

Bivariate analysis

This involved cleaning and coding the data, as well as transforming variables as necessary before starting the analysis. We carefully reviewed our data to ensure that it was accurate and complete, and made the necessary corrections. We selected the variables that we wanted to include in our bivariate analysis. We chose a range of sociodemographic and behavioural factors that we believed might be associated with HBV seropositivity. These variables included age, sex, education level, occupation, and history of alcohol use, among others.

We conducted the bivariate analysis using statistical software STATA 15 SE. We calculated the frequencies and percentages of each variable, as well as the correlations between variables.

We also used chi-squared tests and odds ratios to examine the relationships between our variables and only those that had $p\text{-value} < 0.2$ were considered.

Multivariable logistic regression was used to identify factors independently associated with HBV infection among all couples, as well as with sero-discordance and concordance. Multicollinearity was assessed using the variance inflation factor (VIF). We employed a forward selection approach, beginning with a null model and sequentially adding variables. Model fit and variable retention were guided by the Akaike information criterion (AIC)

3.15 Ethical Consideration

Ethical approval was obtained from Gulu University Research Ethics Committee (**GUREC-2023-598**), and clearance to conduct the study was obtained from Gulu Regional Referral Hospital (**GRRH REC/2023/09/12**). The researcher adhered to the principles of the Declaration of Helsinki for the protection of study participants. Participation was voluntary, and participants were informed about the study procedures, potential benefits and risks, and their right to ask questions before, during, and after the interview. Written informed consent was obtained from all participants, and participants were free to withdraw from the study at any time without any consequences. Participants' names were not recorded; instead, unique codes were used to maintain anonymity. Privacy and confidentiality were maintained throughout data collection, management, and reporting, and the information collected was used solely for research purposes. Particular attention was given to the sensitivity of couple-based HBV testing. Results were disclosed individually and confidentially, with each participant receiving appropriate post-test counselling. For discordant couples, results were disclosed separately to each partner, and mutual disclosure was encouraged only with the participant's consent, in accordance with the couple-friendly counselling and disclosure protocol. Participants who tested positive for HBV were counselled and linked to the available physician at GRRH for appropriate clinical evaluation, care, and treatment.

3.16 Dissemination

The study findings will be submitted to Gulu University Faculty of Medicine, Gulu Referral hospital and also presented to senior staff meeting conducted every Wednesday, Gulu city council, Gulu University research and Ethics committee.

CHAPTER FOUR: RESULTS

4.1 Study Enrolment

During the study period, 484 participants were randomly selected, comprising 242 couples (male partner and pregnant woman). Each participant underwent Hepatitis B surface antigen (HBsAg) testing to assess the seropositivity rate for Hepatitis B among the couples, as well as the rates of sero-concordance and sero-discordance. Socio demographic and other relevant characteristics were compared to identify factors associated with Hepatitis B seropositivity.

4.2 Characteristics of the Study Participants

The study population had a mean age of 28.91 years, with an equal distribution of males and females 50%, n=242/484 each. Most had secondary education 50.8%, n=246/484, were in monogamous marriages 76.7%, n=371/484, and were from the Acholi tribe 84.9%, n=411/484. In terms of occupation, elementary roles 26.0% n=126/484 and services/sales 20.2% were most common. Catholics formed the largest religious group 46.3% n=224/484. 86.2%, n=417/484 aware of Hepatitis B. Among recent mothers, 95.3% n=142/242 delivered in health facilities. Most women 52.1%, n=126/242 had 1-3 children, and 24.8%, n=60/242 reported a history of abortion. Few had recent sexually transmitted infections (STIs) 7.4%, n=36/484 or road traffic accidents 11.4%, n=55/484, and 98.8%, n=478/484 had never received a blood transfusion. The majority were HIV-negative 94.6%, n=458/484, 51.2%, n=248/484 were vaccinated against HBV, and 11.6%, n=56/484 had piercings or tattoos.

Table 1: Social demographic characteristics of the study participants

Variable	Frequency	Percentage (%)
Age (mean)	28.91 (17-60)	
Sex		
Female	242	50.0
Male	242	50.0
Education levels		
Primary	159	32.9
Secondary	246	50.8
Tertiary	79	16.3
Type of Marriage		
Monogamous	371	76.7
Polygamous	113	23.3
Tribe		
Acholi	411	84.9
Lango	21	4.4
Others	52	10.7
Occupation		
Professional	63	13.0
Services and sales	98	20.2
Skilled agricultural, fish	95	19.6
Craft and related	56	11.6
Elementary occupation	126	26.0
Armed forces	23	4.8
Others	23	4.8
Religion		
Anglican	154	31.8
Catholic	224	46.3
Born again	20	4.1
Muslim	79	16.3
Others	7	1.5
Aware about HBV		
No	67	13.8
Yes	417	86.2

Table 2: Obstetric, sexual, behavioural, and medical characteristics of study participants

* Place of last birth		
(n = 149)		
Health facility	142	95.3
Traditional birth attendance	7	4.7
Parity (n = 242)		
0	91	37.6
1-3 children	126	52.1
≥ 4 children	25	10.3
History of abortion		
(n = 242)		
No	182	75.2
Yes	60	24.8
STI in past three months		
No	448	92.6
Yes	36	7.4
Alcohol use		
No	384	79.3
Yes	100	20.7
Frequency of alcohol intake		
Do not take	386	79.7
Occasional	72	14.9
Daily	26	5.4
History of blood transfusion		
Never transfused	478	98.8
Ever transfused	6	1.2
History of RTA		
No	429	88.6
Yes	55	11.4
HIV status		
Negative	458	94.6
Positive	26	5.4
Vaccination against HBV		
Yes	248	51.2
No	236	48.8
Having piercings/tattoo		
No	428	88.4
Yes	56	11.6

* The number for place of last birth includes both Primipara and Multipara (n=149)

4.3 a Hepatitis B Sero Prevalence, Concordance and Discordance rate

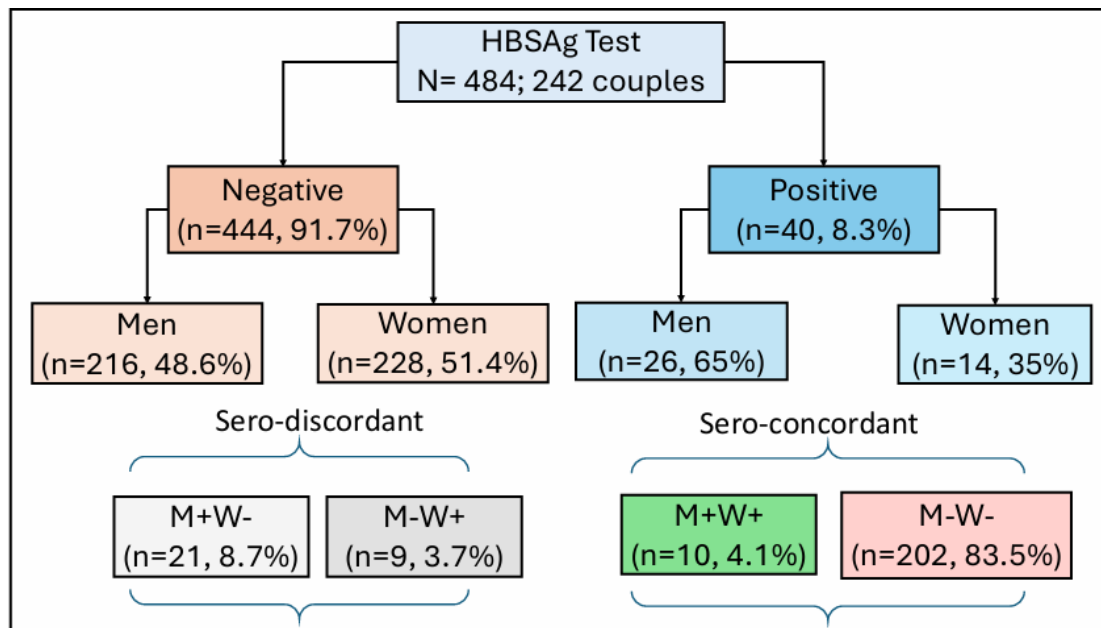


Figure 2: Showing Hepatitis B Sero prevalence, concordance and discordance rates

From the study 40 respondents tested positive out of 484 giving a prevalence rate of the study sample to be 8.3% $n=40/484$

The Among the 242 couples tested, the overall sero-concordance rate was 87.6% (212/242). The majority of concordant couples were both negative for HBV (M–W–; 83.5%, 202/242), while only 4.1% (10/242) were both positive (M+W+).

Sero-discordance was observed in 12.4% (30/242) of couples. Of these, male-positive/female-negative discordance (M+W–) was more common (8.7%, 21/242) than female-positive/male-negative discordance (M–W+; 3.7%, 9/242)

4.3 b McNemar's test for HBsAg status among couples (n = 242 couples)

Table 3: Using Women as controls

	Woman +ve	Woman -ve	Total
Male +ve	10	21	31
Male -ve	9	202	211
Total	19	223	242

McNemar's test was performed to assess whether there was a significant difference in HBsAg seropositivity between pregnant women and their male partners. Among the 242 couples included in the analysis, 10 couples were concordantly HBsAg-positive, while 202 couples were concordantly HBsAg-negative. Of the discordant couples, 21 (8.7%) had an HBsAg-positive male partner and an HBsAg-negative woman, whereas 9 (3.7%) had an HBsAg-positive woman and an HBsAg-negative male partner.

The difference in the distribution of HBsAg status between male and female partners was statistically significant (McNemar's $\chi^2 = 4.80$, $df = 1$, $p = 0.028$). This indicates that the discordant pairs were not symmetrically distributed, with HBsAg-positive status occurring more frequently among male partners than female partners within discordant couples.

4.4 a) Bivariate analysis of factors associated with hepatitis B seropositivity

Males were 1.96 times more likely to test positive for HBV than females (95% CI: 1.00–3.85, $p=0.051$). People with no prior vaccination had nearly 11 times higher odds of being HBsAg positive compared with those who were vaccinated (OR=10.98, 95% CI: 3.84 – 31.37, $p<0.001$). Daily alcohol consumers had 3.4-fold higher odds of testing positive for HBV compared to non-drinkers (OR: 95% CI: 1.29–9.18, $p=0.01$). Those who had ever received a blood transfusion had a 5.79 – fold increase in odds of testing positive for HBV compared to those never received (OR=5.79, 95% CI: 1.03–32.64, $p=0.05$).

Table 4: Bivariate Analysis on the factors associated with Hepatitis Positivity

Variable	HBV result		Odds ratio	95 % CI	P value
	Negative n (%)	Positive n (%)			
Sex					
Female	228 (51.40)	14 (35.00)	1	Ref	Ref
Male	216 (48.60)	26 (65.00)	1.96	1.00 – 3.85	0.051
Education					
Primary	143 (32.2)	16 (40.0)	1	Ref	Ref
Secondary	228 (51.4)	18 (45.0)	0.71	0.35 – 1.43	0.333
Tertiary	73 (16.4)	6 (15.0)	0.74	0.28 – 2.00	0.541
Occupation					
Professional	60 (13.5)	3(7.5)	1	Ref	Ref
Services and sales	92 (20.7)	6 (15.0)	1.30	0.31 – 5.42	0.710
Skilled agricultural	87 (19.6)	8 (20.0)	1.84	0.47 – 7.22	0.381
Craft and related	54 (12.2)	2 (5.0)	0.74	0.12 – 4.60	0.751
Elementary occup	111 (25.)	15 (37.5)	2.70	0.75 – 9.71	0.131
Armed forces	20 (4.50)	3 (7.5)	3	0.56 – 16.10	0.204
Others	20 (4.5)	3(7.5)	3	0.56 – 16.10	0.204
Type of Marriage					
Monogamous	345 (77.7)	26 (65.0)	1	Ref	Ref
Polygamous	99 (22.3)	14 (35.0)	1.88	0.94 – 3.73	0.071
Awareness about HBV					
No	58(13.1)	9 (22.5)	1	Ref	Ref
Yes	386(86.9)	31(77.5)	0.52	0.23 – 1.14	0.104
Prior vaccinated HBV					
Yes	244 (54.9)	4(10.0)	1	Ref	Ref
No	200(45.1)	36(90.0)	10.98	3.84 – 31.37	0.00
STI in past 3 months					
No	410 (92.3)	38 (95.0)	1	Ref	Ref
Yes	34 (7.7)	2 (5.0)	0.64	0.15 – 2.74	0.544
Alcohol intake					
No	353 (79.5)	31 (77.5)	1	Ref	Ref
Yes	91 (20.5)	9 (22.5)	1.13	0.52 – 2.45	0.773
Frequency of alcohol intake					
Does not take	355 (80.0)	31(77.5)	1	Ref	Ref
Occasional	69 (15.5)	3 (7.5)	0.50	0.15 – 1.67	0.264
Daily	20 (4.5)	6 (15.0)	3.44	1.29 – 9.18	0.010
Involvement in RTA					
No	391(88.1)	38 (95.0)	1	Ref	Ref
Yes	53 (11.9)	2 (5.0)	0.39	0.09 – 1.66	0.202
Ever transfused blood					

Variable	HBV result		Odds ratio	95 % CI	P value
	Negative n (%)	Positive n (%)			
Never transfused	440 (99.1)	38 (95.0)	1	Ref	Ref
Ever transfused	4 (0.9)	2 (5.0)	5.79	1.03 - 32.64	0.051
*Place of last delivery					
(n = 149)					
Health facility	132 (95.6)	10 (90.9)	1	Ref	Ref
TBA	6 (4.4)	1 (9.1)	2.2	0.24 – 20.10	0.490
Parity (n = 242)					
0	88 (38.6)	3 (21.43)	1	Ref	Ref
1-3 children	117 (51.3)	9 (64.29)	2.26	0.59 – 8.58	0.231
Above 4 children	23 (10.1)	2(14.29)	2.55	0.40 – 16.18	2.552
History of abortion					
(n = 242)					
No	174 (76.32)	8 (57.14)	1	Ref	Ref
Yes	54 (23.68)	6 (42.86)	2.42	0.80 – 7.27	0.120
HIV Status					
Negative	422 (95.10)	36 (90.00)	1	Ref	Ref
Positive	22 (4.90)	4 (10.00)	2.13	0.70 – 6.52	0.191
Having piercings/tattoo					
No	390 (87.80)	38 (95.00)	1	Ref	Ref
Yes	54 (12.20)	2 (5.00)	0.38	0.09 – 1.62	0.190

* *The number for place of last birth includes both Primipara and Multipara (n=149)*

4.4 b) Multivariable analysis of factors independently associated with Hepatitis B positivity

The multivariable analysis showed that males had 2.45 times higher odds of being HBV positive compared to females (aOR = 2.45, p = 0.02). No prior vaccination was highly associated with being positive with aOR of 12.05 95% CI (4.07– 35.65 P-value < 0.001

Daily alcohol consumption was associated with 4.7fold increase in odds of HBV positivity (aOR = 4.73, p = 0.01). and the RTA had a marginal protection with (aOR= 0.2 95% CI 0.04 – 1.02 P-value =0.050).

Table 5: Multivariable analysis of factors independently associated with Hepatitis B positivity

Variable		HBV result		Bivariate analysis			Multivariable analysis		
		Negative n (%)	Positive n (%)	Crude % CI)	Odds Ratio (95	P-value	Adjusted (95 % CI)	Odds Ratio	p-value
Sex	Female	228 (51.4)	14 (35.0)	1	Ref		1	Ref	
	Male	216 (48.6)	26 (65.0)	1.96	(1.00–3.85)	0.051	2.45	(1.15–5.21)	– 0.020
Prior Vaccination HBV									
	Yes	244 (54.9)	4(10.0)	1	Ref	Ref	1	Ref	
	No	200(45.1)	36(90.0)	10.98	(0.03–0.26)	– <0.001	12.05	(4.07–35.65)	< 0.001
Frequency of alcohol intake									
	Does not take	355 (80.0)	31(77.5)	1 0.50	Ref		1	Ref	
	Occasional	69 (15.5)	3 (7.5)	3.44	(0.15–1.67)	– 0.260	0.45	(0.12–1.64)	– 0.300
	Daily	20 (5.5)	6 (15.0)		(1.29–9.18)	– 0.014	4.73	(1.40–16.04)	– 0.010
Involvement in RTA									
	No	391(88.1)	38 (95.0)	1	Ref	Ref	1	Ref	
	Yes	53 (11.9)	2 (5.0)	0.39	(0.09–1.66)	– 0.201	0.20	(0.04–1.02)	– 0.050

CHAPTER FIVE: DISCUSSION

5.1 Summary of key Findings

This study aimed at determining the sero prevalence and associated factors among pregnant women and their partners attending Gulu regional referral hospital antenatal clinic. We enrolled 242 couple pairs and the sero positivity rate was 8.3% (n=40/484), notably higher in males 10.7%, n=26/242 than females 5.8%, n=14/242. Sero concordant rate among positive male and positive female was 4.1%, n=10/242 while negative male and negative female was 83.5% n=202/242. The sero discordant rate among positive males and negative females was 8.7% (n=21) while between negative males and positive females was 3.7%, n=9/242. Vaccination against HBV significantly reduced the likelihood of testing positive, while alcohol consumption and a history of blood transfusion were associated with higher odds of sero positivity. Daily alcohol intake was linked to a nearly 5-fold increase in the risk of being HBV positive.

5.2 Hepatitis B sero Prevalence in the study sample

In our study, we found HBV sero prevalence rate of 8.3%, n=40/484 among pregnant women and their male partners attending the antenatal clinic at Gulu regional referral Hospital. A higher proportion of females 51.4%, n=228 tested negative for HBV among all the participants and 48.6% in males. On the other hand, a greater percentage of males 65%, n=26/40 tested positive compared to females 35%, n=14/40, suggesting that male partners carry a disproportionately higher burden of HBV infections within the sample.

Our study findings are consistent with evidence from previous research conducted in Uganda. For instance, a national survey by Bwogi et al. (2009) reported an overall hepatitis B seroprevalence of 10.3%, with a higher prevalence among males 11.8% than females 9.1%. This gender disparity is comparable to our findings, in which male partners also demonstrated

a higher HBV seroprevalence 10.7% than pregnant women 5.8% (Bwogi et al., 2009). Similarly, Ochola reported a prevalence of 17.6% in Northern Uganda, which was a higher rate compared to our study findings of 8.3% (Ochola et al., 2013). We both used cross sectional study design and systematic random sampling to recruit the respondent, the discrepancy maybe explained in study population, ours specifically focused on couples attending ANC while Ochola used respondents within the community in Gulu city who were found at home during the time of the survey. Additionally, Uganda introduced a vaccination program in 2002, alongside adult vaccination campaigns which may have reduced the prevalence rates.

Other Ugandan studies also reflect population specific variations. Bongomin's study 2005 among Makerere university medical students found a prevalence rate of 11.0%, and was linked to occupational exposure risks, while Ziraba et al., 2010 observed similar partners among health workers at Mulago National referral Hospital. These risk occupational groups differ significantly from our antenatal clinic population, where HBV risk is mediated more by household and perinatal factors. Chiesa reported a prevalence of 7.9% in HIV positive populations in Northern Uganda, with higher rates among males, again aligning with our findings of persistent male dominance (Chiesa et al., 2020)

At the regional level, WHO reports substantial heterogeneity in HBV prevalence, with the African region contributing 63% of new global infections (WHO, 2024) The average prevalence among pregnant women in Africa is estimated at 4.2% lower than what we observed in our study. Within west Africa, (Onakewhor et al., 2013) and (Talla et al., 2021) reported higher prevalence among males than females in couple studies, supporting the idea within couples are more likely to be HBV carriers and potential source of intra household transmission. The difference between these studies and ours can be attributed the study design, access to vaccination and the unique opportunities for health education and screening available to couples in ANCs.

In the Middle East, the trend of male's predominance persists with varying prevalence levels. In Iraq, Jamal reported an overall prevalence of 0.9% among couples, with males again more prevalent than females 1.2% and 0.6% respectively (Jamal et al., 2020) and These trends are similar to a study in Saudi Arabia, where the retrospective data revealed consistently higher HBV prevalence among male partners compared to pregnant women 6.3% and 3.1% in 2002-2005 and 2.4%and 1.1% in 2012 and 2015 (Albadran et al., 2017).

In China, several cross-sectional studies have examined HBV infection among couples preparing for pregnancy. Zhang et al. (2017) reported HBsAg prevalence of 7.0% among husbands and 5.2% among wives in a study of rural couples. In a separate study, Liang et al. (2023) assessed 641,642 couples in South China and found that 148,758 couples 23.18% were HBsAg-positive, including couples in which either or both partners tested positive. These differences in prevalence may reflect variations in study populations, geographical settings, vaccination coverage, and public health interventions. The males have often shown a larger HBV prevalence, often linked to behavioural and occupational risk factors, which underscore their role in household and perinatal transmission.

The existing literature mostly focused on prevalence of HBV among pregnant women making with few studies looking at prevalence among couples attending ANC making our study a critical relevance in under researched population in HBV epidemiology. While most Ugandan and international studies have concentrated on single populations such as pregnant women, health care workers, students, or community samples, our couple-based design allows us to capture both concordance and discordance in HBV status between partners. This approach provides unique insights into the dynamics of household transmission, partner level risk differentials and the potential impact of antenatal HBV screening and education programs. By doing so our study addresses an important gap in HBV research in Northern Uganda and

contributes evidence that can inform integrated and maternal and paternal HBV prevention strategies with antenatal settings.

5.3 Concordance and Discordance Rates among the Couple

In our study, we found Sero-concordance 87.6%, $n=212/242$, (Male partners negative [-ve] and pregnant women [-ve]; 83.5%, $n=202/242$, (Male partners positive [+ve] and pregnant women [+ve]; 4.1%, $n=10/242$ and sero-discordance was 12.4%, $n=30/242$, (Male partners +ve and pregnant women -ve; 8.7%, $n=21/242$, (Male partners -ve and pregnant women +ve; 3.7%, $n=9/242$. These findings demonstrate that although the majority of the couples were concordantly negative, a considerable proportion remained discordant, highlighting ongoing risks for horizontal and vertical HBV transmission within households. Notably, the higher proportion of M+W- discordance compared to M-W+ suggests that men may play a larger role in sustaining HBV transmission within households.

Our findings are consistent with previous studies in Africa. For instance, a study from Benin city, Nigeria reported a prevalence of 4.3%, $n=161$ among couples, with concordance and discordance rates of 6.8% and 93.2% respectively (Onakewhor et al., 2013). Similarly, Talla reported sero-concordance and discordance rates of 80.5% and 19.5% among couples in Nigeria (Talla et al., 2021). These findings, like ours, indicate that most couples are concordantly negative but with a smaller proportion being discordant or concordantly positive, underscoring the risk of intra-couple transmission.

The variations across studies may be due to differences the sample size, geographical setting, population characteristics and vaccination uptake. In Uganda, ongoing HBV vaccination programs introduced by the Ministry of Health (MOH) may partly explain the relatively lower prevalence and concordant positive rates compared to some African settings.

Asian studies report findings that are broadly comparable to ours. Zhang, in China reported concordance rates of 88.6% (M-W-) and 0.7%(M+W+), with discordance rates of 6.3% (M+W) and 4.2% (M-W+) (Zhang et al., 2017). Similarly, Liang using a large cohort, n=161,204 couple, found the prevalence of 12.6%, with discordant rates of 13.2% (M+W-) and 8.1% (M-W+) (Liang et al., 2023). The consistently observed discordant partnerships across diverse population reaffirm the significance of intra-couple HBV transmission risk. However, China's long standing universal childhood vaccination program, with much higher coverage than Uganda, likely explains the higher proportion of concordant negatives and the much lower proportion of concordant positives compared to our findings.

Our study focused on couples attending ANC in a high prevalence region of Northern Uganda, a population often overlooked by prior research. By including both pregnant women and their male partners, our study highlights the gendered dynamics of HBV infection, particularly the higher contribution of men to discordant partnerships. Furthermore, our findings provide context specific evidence on the impact of Uganda vaccination programs, where gaps remain in uptake, in contrast to the stronger coverage in Asia. This reinforces global evidence that HBV discordance among couples is a significant public health concern and underscores, the need for routine partner testing, counselling and catchup vaccination as part of ANC and community-based HBV prevention strategies.

5.4 Factors associated with HBV Seropositivity

In our study, we found some factors that were significantly associated with HBV sero positivity among couples, with some findings aligning with previous research while one was very distinct to this study setting.

A significant gender disparity was observed in our study, with males exhibiting a 2.45 times higher likelihood of being HBV positive compared to their female partners. This finding

suggests that gender especially being male is associated with HBV among couples. In Nigeria, Talla et al. (2021) reported that male partners not only had a higher prevalence of HBV but also contributed disproportionately to discordant results within couples. A similar observation was made in Thailand, where Luksamijarulkul found males had a high HBV prevalence among married couples (Luksamijarulkul et al., 2011). Studies from China further reinforce this trend, (Zhang et al., 2017) a large-scale analysis involving 15 million rural couples showed that husbands were more frequently HBsAg-positive, and that spousal risk of infection increased with the male partner's infectiousness and also similar to other studies in the area (J. Liu et al., 2017; Ye et al., 2023; Zhao et al., 2021). The difference between our study and the others is ours is a recent study and many programs have been put in place to manage HBV.

These findings highlight the need for couple-focused interventions in HBV prevention and control. Specifically, screening strategies should prioritize male partners during ANC or partner invitation sessions by offering testing and immediate linkage to care for those that test positive and there for prevention programs should address HBV within the couple as a unit through a comprehensive approach of testing, treatment, and vaccination of both partners rather than focusing solely on the pregnant women

Participants with no prior vaccination were 12 times likely to test positive for HBV. This finding is consistent with evidence on the effectiveness of hepatitis B vaccination (WHO, 2015). In Uganda, hepatitis B vaccination has primarily been delivered to children through the Expanded Programme on Immunization (EPI), while adult vaccination has also been available but with noted inconsistency in coverage. Universal infant immunization particularly when the timely birth dose is administered and followed by completion of the full vaccination schedule prevents nearly 90% of perinatal transmissions and contributes to long term population level declines in HBV prevalence (Breakwell et al., 2017; WHO, 2015). A study from Iganga further demonstrates that infant vaccination programs, when effectively implemented, provide

sustained protection into adolescence and adulthood (Jammeh et al., 2023). The difference between our study and the others is that since 2002 ministry of health Uganda put in place a vaccination program targeting infants thus able to see 90% protection rates, while other studies noted have had programs of vaccination earlier than the Ugandan context.

These findings in our study highlight the importance of scaling up test vaccinate protect strategies within ANC settings. Priority actions should include, ensuring administration of the hepatitis B birth dose, supporting completion of the full infant vaccination schedule, and offering immediate catch-up vaccination for unvaccinated adult partners at ANC and outpatient departments. Given the evidence of substantial protection among vaccinated groups, a stronger and more consistent drive to vaccinate adults, particularly those at risk or in high prevalence regions would be a highly recommended strategy. This approach is particularly crucial when one partner is HBsAg positive, as it reduces both vertical and horizontal transmission (Breakwell et al., 2017; Jammeh et al., 2023).

Our study found a significant association between daily alcohol intake and an increased risk of HBV infection. Daily alcohol consumption was associated with a 4.7-fold increased risk of HBV infection. This finding is consistent with a report by (Kapinga & Aboud, 2018) which noted a 3.8-fold increased risk of HBV among pregnant women in Karagwe, Tanzania. These results underscore the importance of routine alcohol screening within HBV prevention programs, particularly in antenatal clinics and couple-based testing initiatives, to identify individuals at higher risk.

Our findings highlight the importance of strengthening couple-based approaches in HBV prevention. Alcohol use within relationships has been shown to fuel HBV sero discordance by increasing risky sexual practices and hindering uptake of protective health behaviours (Talla et al., 2021; Luksamijarulkul et al., 2011). At a policy level, aligning HBV prevention

frameworks with existing HIV and maternal health programs that already address alcohol use could provide a cost-effective and integrated response.

In our study, we observed a marginal protective effect associated with a history of road traffic accidents (RTA). Individuals who had experienced an RTA were approximately 80% less likely to test positive for HBV. Although the mechanisms underlying this association remain unclear, one plausible explanation is that RTA survivors are more likely to undergo medical evaluations and laboratory testing during emergency care or hospitalization. Such encounters may facilitate incidental HBV screening and, in some cases, linkage to treatment and vaccination services.

In Uganda, the majority of road traffic accidents (RTAs) involve boda-boda riders and passengers, who contribute substantially to trauma cases presenting to emergency units (Chandiga, 2024; Siya et al., 2019). In the multivariable analysis, a history of RTA was associated with lower odds of HBV positivity (aOR = 0.20, 95% CI: 0.04–1.02, $p = 0.05$). However, this association was not statistically significant at the conventional 5% threshold because the confidence interval included 1.00. Although participants with a history of RTA appeared to have lower odds of HBV positivity, this finding should be interpreted cautiously, as the evidence was insufficient to establish a statistically significant association.

5.5 Strength and Limitations of the Study

This study stands out for its large data set, which was made possible by a large sample size of 484 participants. The relatively large sample size enhanced the precision of statistical estimation and improved generalizability of the findings to a broader population. The use of systematic random sampling minimized selection bias and ensured that participants were fairly representative of the target population. This approach was particularly appropriate in the

hospital setting, where the ANC gets a high number of client visits and selecting participants at regular intervals made recruitment more practical, efficient and unbiased.

By including a wide range of socio-demographic and behavioural factors, the study was able to provide a comprehensive perspective on the determinates of HBV infection contribution valuable evidence to the existing body of knowledge.

The cross-sectional design prevents causal inference between the identified factors and HBV seropositivity. Although the SD BIOLINE HBsAg rapid test has excellent reported sensitivity and specificity, it may have missed low-level or occult infections that would be detected by more sensitive ELISA or HBV DNA PCR methods and also does not detect acute or chronic infection. Some variables (alcohol consumption, vaccination history, sexual behaviour) relied on self-report and are therefore susceptible to recall and social-desirability bias. We did not assess HBeAg status, viral load, or HBV genotypes, which are important for transmission risk assessment. Despite these limitations, the study provides novel couple-level data from a high burden setting.

Additional study limitations are the cross-sectional design cannot distinguish acute from chronic infection and the rapid test cannot distinguish HBeAg status, which is critical for transmission risk and a large number did not report having income

5.6 Implications of Study Findings

The significant association of HBsAg seropositivity with being male, lack of prior HBV vaccination, and daily alcohol consumption underscores the need to strengthen HBV vaccination, particularly among men and unvaccinated individuals, alongside targeted health education on alcohol reduction and HBV prevention to reduce infection risk and related complications.

The findings suggest the need for increased awareness and education among couples regarding HBV transmission and prevention strategies, particularly in the context of sero-discordant relationships where one partner is infected, and the other is not.

5.7 Future Studies /Perspectives

Future research should prioritize longitudinal studies to monitor the long-term impact identified risk factors and establish causal relationship with HBV infection among the couples. Additionally, there is a need to evaluate behavioural interventions designed to reduce alcohol consumption and other risky practices as they could significantly influence HBV transmission dynamics among couples.

Comparative studies exploring HBV prevalence among couples across different regions of Uganda and in countries with varying endemicity levels could be valuable, as they could help identify regional specific risk factors and inform more targeted prevention and intervention strategies.

CHAPTER SIX: CONCLUSIONS AND RECOMMENDATIONS

6.1 Conclusions

Our study aimed at determining the HBV sero prevalence and associated factors among pregnant women and their male partners attending antenatal care at Gulu regional referral hospital

Our study found the overall HBV prevalence to be 8.3% with the males having a higher rate compared to the female counterparts 10.7% and 5.8% respectively. This indicates that HBV still remains significantly high and a health burden in Northern Uganda with Males carrying a higher risk of infection

The objective two of our study was to determine the concordance and discordance rates we found, 87.6%, $n=212/242$ of couples were sero-concordant, comprising 83.5%, $n=202/242$ who were concordantly negative and 4.1%, $n=10/242$ who were concordantly positive. In contrast, 12.4%, $n=30/242$ of couples were sero-discordant, including 8.7%, $n=21/242$ in which male partners tested positive while pregnant women tested negative, and 3.7%, $n=9/242$ in which pregnant women tested positive while male partners tested negative. This finding underscores the risk for both horizontal transmission between the partners and vertical transmission to infants when preventive measures are not put in place.

For the third objective, which assessed factors associated with HBV infection, three factors were significantly associated with HBV positivity in the multivariable analysis: sex, vaccination status, and daily alcohol consumption. Male sex was associated with higher odds of HBV infection compared with female sex (aOR = 2.45, $p = 0.02$). Participants who reported no prior HBV vaccination had substantially higher odds of infection (aOR = 12.05, $p < 0.001$), highlighting the importance of vaccination in HBV prevention. Daily alcohol consumption was also associated with increased odds of HBV positivity (aOR = 4.73, $p = 0.01$). Although a

history of road traffic accidents showed an inverse association with HBV positivity (aOR = 0.20, 95% CI: 0.04–1.02, $p = 0.05$), the confidence interval included 1.00; therefore, this finding was not statistically significant at the conventional 5% level and should be interpreted cautiously.

Overall, the findings confirm that HBV infection remains a public health concern among pregnant women and their male partners attending antenatal care at GRRH. The higher prevalence among male partners, the presence of HBV sero-discordance, and the associations with sex, vaccination status, and daily alcohol consumption underscore the importance of integrated couple-based HBV screening, vaccination, health education, and linkage to appropriate care. These interventions may contribute to reducing HBV transmission within couples and preventing mother-to-child transmission in Northern Uganda.

6.2 Recommendation's Deduced from Conclusions

The results of this study call for a multi-level response. At the policy level, Uganda should expand HBV vaccination beyond infants to ensure consistent adult coverage, prioritizing men and other high-risk groups. Integrating HBV into HIV and maternal health frameworks, and enforcing stronger alcohol reduction policies would further reduce risk.

HBV prevalence: Given the overall prevalence of 8.3%, with higher prevalence among male partners (10.7%) than pregnant women (5.8%), the hospital should strengthen routine HBV screening for pregnant women and their male partners during antenatal care.

Sero-concordance and sero-discordance: Since 12.4% of couples were sero-discordant, including 8.7% in which male partners tested positive and pregnant women tested negative, the hospital should provide confidential couple-based counselling, partner testing, and vaccination for susceptible individuals, and timely referral for clinical care.

Male sex: Considering that male partners had higher odds of HBV positivity (aOR = 2.45), health facilities should promote male involvement in antenatal care and provide male-friendly screening and vaccination services.

Daily alcohol consumption: Since daily alcohol consumption was associated with increased HBV positivity (aOR = 4.73), routine alcohol screening, health education, and brief counselling should be integrated into antenatal and outpatient services.

HBV vaccination: Given that individuals without prior HBV vaccination had substantially higher odds of infection (aOR = 12.01), the Ministry of Health and health facilities should strengthen adult catch-up vaccination, particularly among unvaccinated partners and other eligible high-risk groups.

RTA history: Although a borderline association was observed between RTA history and HBV positivity (aOR = 0.20, 95% CI: 0.04–1.02), further research is needed to clarify this relationship before specific interventions are recommended.

Overall, the findings support strengthening HBV screening, adult vaccination, confidential counselling, alcohol-risk reduction, and linkage to care through coordinated health facility and community-based interventions.

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APPENDICES

Appendix: I Activity Work plan

	Month of the year from									
Activities	March 2023	April 2023	May 2023	June 2023	July 2023	August 2023	Dece mber 2023	Januar y 2024	Februar y 2024	Septe mber 2025
Identification of the topic										
Proposal writing										
Preparation of study instruments										
Tool testing										
Data collection										
Analysis of data										
Writing of the Report										
Submission of report										

Appendix: II Actual Budget

Items		Quantity of item	No. of days	Unit cost	Total cost	
1	Supervisor	1		100,000	100,000	26.89
2	Lunch	2	20	25,000	500,000	134.46
3	Paper	1 ream		30,000	300,000	80.68
4	Pens	1 box		45,000	45,000	12.1
5	Internet	1		100,000	100,000	26.89
6	Proposal printing	4			300,000	80.68
7	Proposal binding	4			50,000	13.45
8	Questionnaire printing	350		800	280,000	79.29
9	Laptop 1	1		3,400,000	3,400,000	914.34
10	Consent printing	350		800	280,000	79.29
11	SD BIO-LINE HBsAg WB one step	8boxes		100,000	800,000	215.19
12	PPE				200,000	53.79
13	Transport refund for the study participants	484		10,000	4,840,000	1,294.11
Thesis						
14	Printing	4			320,000	86.08
14	Binding	4			50,000	13.45
Total					11,565,000	3,031.4

Appendix III: Informed Consent

Version 3.0

Appendix III: Informed consent form

Title of the study: ... Hepatitis Sero Prevalence and associated factors among pregnant women and their partners attending Gulu Regional referral Hospital Antenatal clinic

Investigator: ...Otim Patrick Masters of Public Health

Institution(s):.....Gulu University Faculty of Medicine (FOM)

Introduction

My name is Otim Patrick a student of Master of public Health Gulu University. This is the informed consent that explains the study to you and any questions that you had have been answered and there for you will be required to sign on the consent for with you keeping the copy.

Purpose:

The study seeks to determine the HBV sero prevalence and associated factors among pregnant women and their partners receiving Antenatal care in Gulu Regional Referral Hospital.

Procedure.

You will be required to answer a questionnaire administered by the research assistant which will take not more than 6 minutes and then provide a drop of blood for testing HBV and your results given back to you in the private room provided. You will feel a little discomfort of pain at the site of the prick for a few seconds

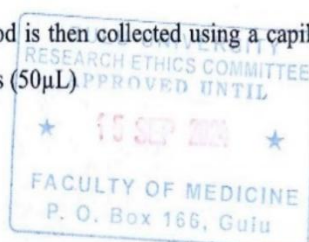
The finger will then be cleaned using alcohol and allowed to dry

The hand will be positioned with palm side up and placing the lancet off the centre of the fingertip, then gently pressing the lancet against the finger and puncture the skin.

The lancet is then disposed of in an appropriate biohazard sharps container

The first blood is wiped away with a sterile gauze pad and the finger is held lower than the elbow and gentle intermittent pressure is applied to the base of the punctured finger a few times

The blood is then collected using a capillary tube and the blood fills the tube up to marked two lines (50µL)



The capillary tube is then placed in the middle of the sample pad marked sample at an upright vertical position and this is waited until the blood is all transferred from the capillary tube to the sample pad. The capillary tube is then disposed of to the biohazard material available

Then a drop of chase buffer if then applied immediately on the sample pad holding the bottle vertically

A small cotton is then used at the site of the prick with gentle pressure

Then, the result is read off 15-30 minutes as instructed by the manufacturer

Eligibility

All pregnant women and their partners attending GRRH antenatal clinic and the interview will last only 6 minutes

Harm to health

The risk and discomfort come from the prick at the side of the finger plus your time but generally there is no harm that will come after you have contributed to the study. However, some people may not be happy with positive results as it may create stress and anxiety. The counsellor will be available and linkage with the consultant physician of the hospital for further management that after post-test counselling

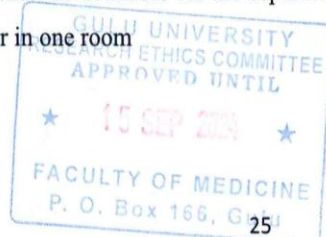
Benefits:

There will be no immediate benefit to you, but the study will identify the associated factors among pregnant women and their partners there by helping to formulate preventive strategies and as a study participant you will be given feedback on the findings and progress of the study but in case there is any new information that might affect the study participant (including incidental finding) shall be availed to you and also free HBV test as a couple. Those that will test positive will undergo counselling and linking to the consultant physician

Confidentiality:

Your identity will not be revealed to any one as we shall only use codes to identify participants. Information obtained will only be accessible by the research team. Soft copies of the data will be protected by password and hard copy files will be kept under lock and key. Confidential information will only be accessed by the principal investigator.

Two private rooms shall be available for the separate interview, however couple counselling will be done together in one room



Alternatives:

You do not have to participate in this study if you are not interested. You will not lose any benefit in case of no participation.

Cost:

There will not be any additional cost incurred as a result of participating in this except for refreshment during the study time

Questions:

If you have any questions related to the study as a research participant, you can contact the principal investigator, **Otim Patrick** on telephone number **0775118684/0704288080**. or via email **Otimpat1@gmail.com**

Statement of voluntariness:

Participation in the research study is voluntary and you may join on your own free will. You have a right to withdraw from the study at any time without penalty.

If you have any issues pertaining to your rights and participation in the study, please contact the Chairperson, Gulu University Research Ethics Committee, Dr. Gerald Obai Tel: No., 0772305621; email: **lekobai@yahoo.com/lekobai@gmail.com**; or the Uganda National Council for Science and Technology, on plot 6 Kimera Road, Ntinda, Kampala on Tel 0414705500.

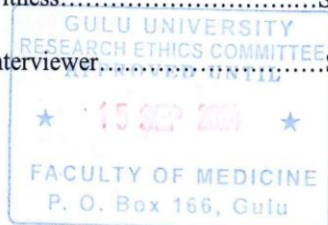
Statement of consent

..... has described to me what is going to be done, the risks, the benefits involved and my rights as a participant in this study. I understand that my decision to participate in this study will not affect me in any way. In the use of this information, my identity will be concealed. I am aware that I may withdraw at any time. I understand that by signing this form, I do not waive any of my legal rights but merely indicate that I have been informed about the research study in which I am voluntarily agreeing to participate. A copy of this form will be provided to me.

Name of participant.....Signature/Thumbprint.....Date.....

Name of witness.....Signature.....Date.....

Name of interviewer.....Signature.....Date.....



Appendix IV: Acholi Informed Consent

Karatac ma nyutu yeyo me donyo I kwed

Wiye madito me kwed man:....Dwong pa kwidi makelo two acwiny ki jami mukene ma lube kwede ikin mon ma oyac kacel ki luot gi ma gitye ka nongo kony ki iot yat madit me Gulu jango maneno mon matye ki yacu.

Lakwed: Otim Patrick....Latin kwan I rwom mamalo ma neno lok kom two ikin dano

Gang pwonye.....Gulu Univaciti, jange me yot kom

Nyute

An nyinga Otim Patrick, latin kwan me Gulu Univaciti. Man aye karatac me yenyoy me donyo I kwed ma tito lok matut bot in ki dong lapeny mo keken ma ki gamo woko. Dok bene gi bi lego in me keto cingi me nyutu yeyo I kwed man dok gibi miyo boti karatac man.

Miti me kwed man

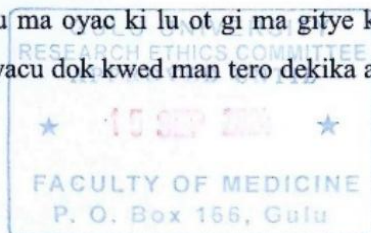
Kwed man mito Nyang I kom dwong pa two acwiny ki jami mukene ikin mon ma tye ki yacu kacel ki lu ot gi dok gi tye ka nongo kony i kom yacu I ot yat madit me Gulu.

Gin aluba ikwed man.

Gibi mito ni igam lapeny ma lakwed bi penyi ma bitero dekika abicel keken ci dong gibi kwanyo remo ma apima pi kwidi two acwiny dok adwogi me pim gibi miyo boti ki iot. Ibi nongo arem manok ikare me kwanyo remo pi cawa manok. Kama gikwanyo iye remo ni gibi dunyu maleng dok twor maber. Gibi keto cingo meber ikare me kwanyo remo me apima. Gin ma gitiyo kwede me kwanyo remo kibi polo iyo ma opore. Remo me acel gibi dunyo ki jami maleng kadong gidiyo lwet cingi mot pi dekika manok. Dong remo gibi keto I cupa wang ma opong wa kama mite ni. Cupa man gibi keto kama opore dok cingu acunga pi cawa ma opore. Cupa man gibolo ka ma opore ka pim man otum. Gitono pii me pimo remo i kom remo matye I cupa. Pama manok gibi tiyo kwede kama gi tucu ki libira ka dong adwogi me pim bi dwogo ikine dekika apar wi abic me oo pyeradek.

Bedo ikwed man

Mon ducu ma oyac ki lu ot gi ma gitye kanong kony iot yat madit me Gulu jango ma neno lok kom yacu dok kwed man tero dekika abicel keken.



Rac pa kwed man ikom yot kom

Race ki peko bino calo adwogi me li bira ma gitucu kwede cingi ki cawa ma I balo ento ma dite en aye ni rac mo peke inge bedo ikwed man. Dok I kare mukene, dano mukene cwinggi pe bedo yom ki adwogi me pim pien twero kelo anywena nywena me wic. La nywak tam bibedo tye kacel ki dakta madit me ot yat me miyo kony inge pim ki nongo adwogi me pim.

Be pa bedo ikwed man:

Ber pa kwed man pe bibedo oyot oyot boti, ento kwed man bi kati ki jami mogo ikin mon ma oyac kacel ki lu ot gi kun nongo ki keto joo me juku peki magi ki dong jo ma obedo ikwed pi nongo lok ma lube ki kwed man ki ngo ma kwed man otimo. Dok bene ka ngec mo manyen ma lube ki kwed man tye ci gibi miyo ne mon ki lu ot gi ma gubedo ikwed man. Jo ma gibi nongo ni gi tye ki kwidi acwiny, gibi nywako tam kwed gi dok gibi cwalo gi bot dakta madit pi nongo kony.

Mung I kwed man

Lok komi gibe gwoko I mung dok gi bitiyo ki nukta me mung ikom jo matye ikwed man. Lok komi obibedo bot joo maloyo kwed man keken. Lok komi matye I nyonyo pa munu gi gibi gwoko imung dok karatac gibi gwoko ka ma gi pungu ki kofulu.

Lok me mung bibedo bot ladit maloyo kwed man keken.

Odi aryo ma pe dano donyo iye ata bibedo tye I kare me kwed man, dok bene nyawko tam bot coo ki mon bi time kacel iot acel.

Yoo mukene:

Pe omyero ibed ikwed man kace miti ni peke iye. Pe ibi rwenyo gum keken kace pe ibedo ikwed man.

Cul/acara:

Cul mo mukene peke calo adwogi me bedo ikwed man mapat pi amata I cawa me kwed man.

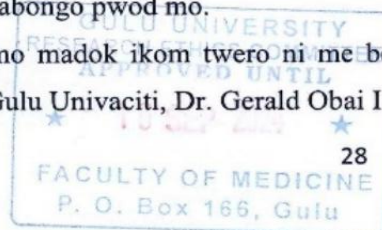
Lapeny:

Kace itye ki lapeny malube ki kwed man macalo ngat matye ikwed, iromo kube ki ladit maloyo kwed man, Otim Patrick I nama cim 0775118684/0704288080. Onyo email Otimpat1@gmail.com

Lok ma kwako dyere I kwed man:

Bedo I kwed man tye dyere dok iromo donyo iye I miti ni. Itye ki twero me a ki ikwed man cawa mo keken labongo pwod mo.

Ka itye ki gin mo madok ikom twero ni me bedo ikwed man, I romo kube ki won kom maloyo kwed I Gulu Univaciti, Dr. Gerald Obai I nama cim, 0772305621;



email: lekobai@yahoo.com/lekobai@gmail.com; onyo Uganda National Council for Science and Technology, on plot 6 Kimera Road, Ntinda, Kampala on Tel 0414705500.

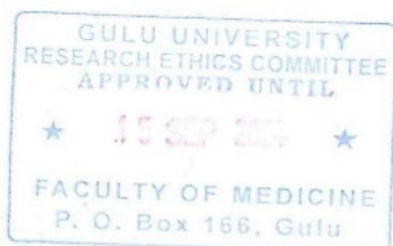
Lok me nyutu yeyo me bedo ikwed

.....onywako kweda ngo ma obitime, rac ki ber me bedo ikwed man ki twero mamega calo ngat ma obibedi ikwed man. Aniang ni moko tama me bedo ikwed man pe obiyelo an iyo mo keken. Itic ki ngec man, lok koma bibedo imung. Atye ki ngec ni atwero a ki ikwed man cawa mo keken. Aniang ni keto cinga I karatac man, me weko arwenyo twero ma mega ento nyutu ni anongo ngec matut I kom kwed man dok adyere me bedo ikwed man. Karatac man mukene gi bimiyo bota.

Nying ngat matye ikwed.....cing/Opany cing.....nino dwe.....

Nying caden.....cing caden.....nino dwe.....

Nying la kwed.....cing la kwed.....nino dwe.....



Appendix IV: Questionnaire

Appendix V Questionnaire English

Version 3.0

This questionnaire is designed to assess the factors associated with HBV among pregnant women and their partners.

Instructions

Study Number

Female Questionnaire

Section 1: Demographics

1.1: Age _____ Years

1.2: Occupation: _____

1.3: Education level

- 1. Never went to school ☐
- 2. Primary ☐
- 3. Secondary ☐
- 4. Tertiary ☐

1.4: Marital status/Married type

Polygamous Yes ☐ No ☐

Monogynous Yes ☐ No ☐

Co-habiting Yes ☐ No ☐

1.5: Tribe: _____

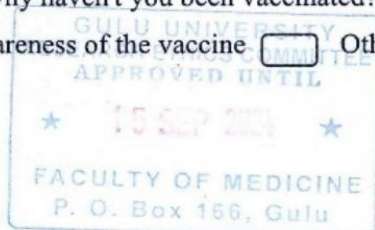
1.6: Religion: _____

Section 2: Hepatitis B Vaccination

2.1: Have you been vaccinated against Hepatitis B? Yes ☐ No ☐

2.2: If no, why haven't you been vaccinated? Cost ☐ Fear of side effects ☐

Lack of awareness of the vaccine ☐ Other (please specify): _____



30

Section 3: Obstetric History

3.1: Have you given birth before? Yes ☐ No ☐

3.2: If yes from Where? From home with TBA ☐ From government /Private facility with qualified Health worker Doctor/Midwife ☐

3.3: How Many children

3.4: Have you had an abortion/Miscarriage Yes ☐ No ☐

Section 4: High-Risk Behaviours

4.1: Have you engaged in unprotected sex with another man other than the one you have in the 6 months?

Yes ☐ No ☐

4.2: Have you been diagnosed with a sexually transmitted Disease in the last 6 month Yes ☐ No ☐

4.3: Have you ever pierced you self with a needle or had a Tattoo? Yes ☐ No ☐

4.4: Have you ever had a blood transfusion Yes ☐ No ☐

If yes how long ago? _____

4.5: Do you take Alcohol Yes ☐ No ☐

4.6 if yes how often Daily ☐ Weekly ☐ monthly ☐ Occasional ☐

4.7: Have you had a medical procedure that involved unsterilised equipment Yes ☐ No ☐

4.8: Has someone staying with you travelled to an area with high prevalence of Hepatitis B?

Yes ☐ No ☐

Section 5: History of Hepatitis B

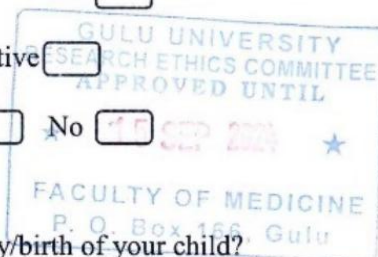
5.1: Have you ever Tested for HBV? Yes ☐ No ☐

5.2: What was the result? Positive ☐ Negative ☐

5.3: If positive above, did you get treatment for HBV Yes ☐ No ☐

5.4: Were you aware of your HBV status during your pregnancy/birth of your child?

Yes ☐ No ☐



5.5: Have you tested for HIV in the last 6month Yes ☐ No ☐

5.6: What was the result? Positive ☐ Negative ☐

5.7: If yes are you already on ART? Yes ☐ No ☐

5.8: Have you been involved in Road traffic accident? Yes. ☐ No ☐

Section 6: Partner's Hepatitis B Status

6.1: Does your partner have a history of HBV. Yes ☐ No ☐

6.2: Has your partner been vaccinated against Hepatitis B? Yes ☐ No ☐

Section 7: Maternal Transmission

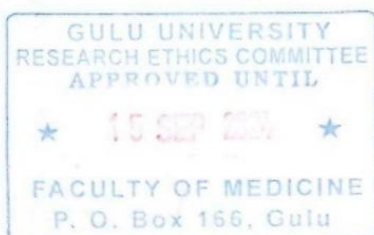
7.1: Have any of your children been diagnosed with HBV Yes ☐ No ☐

7.2: Is there any one you're living with in the house having HBV? Yes ☐ No ☐

Section 8: Additional Comments

7.3: Do you have any additional comments or concerns related to Hepatitis B that you would like to share? (Open-ended question)

Thank you



Version 3.0

This questionnaire is designed to assess the factors associated with HBV among pregnant women and their partners.

Instructions

Study Number

Male questionnaire

Section 1: Demographic Information

1.1: Age: _____

1.2: Tribe: _____

1.3: Education level:

- | | |
|-------------------------|--------------------------|
| 1. Never went to school | ☐ |
| 2. Primary | ☐ |
| 3. Secondary | ☐ |
| 4. Tertiary | ☐ |

1.4: Occupation: _____

1.5: Monthly income: _____

Section 2: Knowledge and Awareness of Hepatitis B

2.1: Have you heard of Hepatitis B before? Yes ☐ No ☐

2.2: Have you been tested for Hepatitis B before? Yes ☐ No ☐

2.3: If yes, what was the result? Positive ☐ Negative ☐

Section 3: Factors associated with HBV

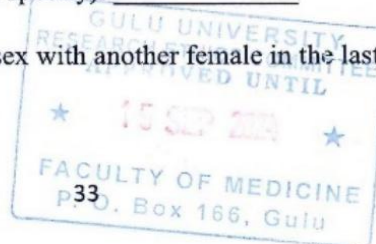
3.1: Are you vaccinated against HBV? Yes ☐ No ☐

3.2: If no, why haven't you been vaccinated? Cost ☐ Fear of side effects ☐

Lack of awareness ☐ Other (please specify): _____

3.3: Have you engaged in unprotected sex with another female in the last 6 month

Yes ☐ No ☐



3.4: Have you been diagnosed with a sexually transmitted disease in the last 3month

Yes ☐ No ☐

3.4: Do you take alcohol Yes ☐ No ☐

3.5 if yes how often? Daily ☐ Weekly ☐ Monthly ☐ Occasionally ☐

3.6: Have you ever undergone a medical procedure involving unsterilized equipment

Yes ☐ No ☐

3.7: Have you received a blood transfusion? Yes ☐ No ☐

3.8: Have been involved a road traffic accident Yes ☐ No ☐

3.9: Has someone staying with you ever travelled to areas with a high prevalence of Hepatitis

B? Yes ☐ No ☐

Section 4: Partners and Transmission

4.1: Has your partner been tested for Hepatitis B? Yes ☐ No ☐

4.2: If yes, what was the result of the test? Positive ☐ Negative ☐

4.3: Have you fathered other children or do you plan to father more children in the future?

Yes ☐ No ☐

Section 5: Additional Comments

5.1: Do you have any additional comments or concerns related to Hepatitis B that you would like to share? (Open-ended question)

Thank you



Version 2.0

Lapeny magi tye me niang kwayi jami ma pat pat ma lube ki two acwing

ikin mon ma tye ki yacu ki lu ot gi

lapen me alube

Kwan namba.....

Lapeny pa mon

Dul me cel : jami ma lube ki lok kom dano

1.1: Mwaka.....

1.2: Tic atima.....

1.3: Rwom me Kwan

1. Pe akwano ☐

2. Agik ipriamari ☐

3. Sekondari ki rwom ma malu ☐

1.4: Inyome onyo pe inyome / Anyome ☐ Pwod pe Anyome ☐

Itye kidako ma kato acel ada ☐ pe ada ☐

Itye ki dako acel keken ada ☐ pe ada ☐

Utye ka winge onyo utye ka bedo calo la coo ki dako labongo nyome

1.5: Itye kaka anogo.....

1.6: Itye dini mene.....

Dul me arywo : yat agwera me two acwing

2.1: I nongo yat agwera me two acwing? Ada ☐ pe ada ☐

2.2. Ka pe inongo ,pi tien lok angu ma oweko pe l bedo ki kare me nongo ne ?Pi wel ☐ Lworo pi adwongi m yat agwera ni ☐ .Ngec ma l pe kade l kom two acwing ☐ Onyo pi tien lok mu kene.....



6.2: Lu ot wo bene onogo agwera me two acwing ? ada ☐ pe ada ☐

Dul me abiro. Kit ma two kobo kom min latin I kom latin

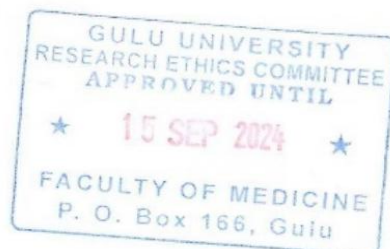
7.1: Ce gwok I kin lutino ma magi ki nwongo tye ki two acwing? Ada ☐ pe ada ☐

7.2: Ce gwok jo ma I kwo kwedgi I ot gi tye ki kwidi two acwing? Ada ☐ Pe ada ☐

Dul me aboro: lok ameda

8.1: Ce gwok ltye ki lok mo me ameda onyo tam mo me ameda malube ki lok kom kwidi two acwing ma I miti wa ngwak kwedi an.

PWOYO MATEK



LAPEN PA COO

Dul me acel: jami ma lube ki lok kom dano

1.1: Itye mwaka adii.....

1.2: Itye kaka ango.....

1.3: Rwom kwani tye ni ngo.....

Itiyo tic ango.....

Wel cene ma Inongo dwe ki dwe tye adii.....

Dul me aryo:ngec I lok kom two acwing

2.1: Ce I winyo lok ikom two acwing con? Ada ☐ pe ada ☐

2.2: Ipime pi two acwing con ? Ada ☐ Pe ada ☐

2.3: Ka ipime a dwongi ne obedo ningo? Remo ni obedo ma ber ☐ onyo ma rac ☐

Dul me Adek:jami luke Adwongi me two acwing

3.1: Ce inongo agwera me two acwing ? Ada ☐ Pada ☐

3.2: Ka pwondi ,pi tyen lok ango,wel,yat onyo lworu,peke pa ngec onyo lworu pi adwogi yat agwera?
Ada ☐ Pe ada ☐

3.3: Ce gwok irwata lbuto ki ngat mokene labongo gwoke idwe abicel ma oketo anged? Ada ☐
Pe ada ☐

3.4: Ce gwok Imato kongo ? Ada ☐ Pe ada ☐

3.5: Ce gwok iwok ki ayango mo kene ma jami tice pe ki neko kudi ki ye? Ada ☐ Pe ada ☐

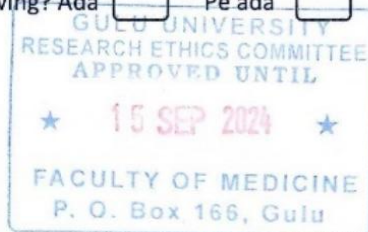
3.6: ce gwok ki bi medo remo I kumi ba? Ada ☐ Pe ada ☐

3.7: ce gwok ibedo anwano me gudi? Ada ☐ pe ada ☐

3.8: Ce gwok I aki kabedo me two acwing dwong ki ye? Ada ☐ Pe ada ☐

Dul me agwen:Lu ot ki kope pa two acwing

4.1: Tica dong ki pimo lu ot tii ikom two acwing? Ada ☐ Pe ada ☐



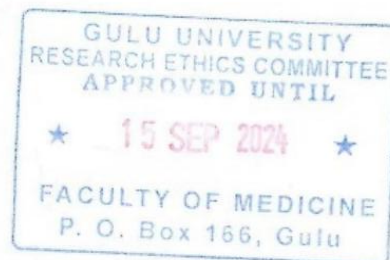
4.2: Ka i pimo, adwongi ne obedo ningo? Ma ber ☐ ma rac ☐

4.3: Ce gwok ltye ki lutino onyo itye ki gen ni iya nyim l bi bedo ki lutino? Ada ☐ pe ada ☐

Dul me abic: lok ameda

5.1: Ce gwok ltye ki lok mo me ameda onyo tam mo me ameda ma lube ki lok kom kwidi two acwing ma l miti wa ngwak kwedi an ?

APWOYO MATEK



Version 2.0

INFORMED CONSENT FORM FOR EMANICIPATED MINORS

I am Otim Patrick a student of **Master of public Health department of public health, faculty of Medicine Gulu University P.O. Box 166 Gulu Uganda.**

I am conducting a study on Hepatitis B sero prevalence and associated factors among pregnant women and male partners attending GRRH antenatal clinic. Hepatitis B virus (HBV) is a global health concern and the leading cause of chronic liver disease, including liver cirrhosis and hepatocellular carcinoma. The Uganda Ministry of health recommends that HBV screening for pregnant mothers during antenatal care (ANC)

Objectives of the study

This study seeks to determine the sero prevalence, sero concordance and sero discordance and associated factors of HBV among pregnant women and their partners attending GRRH antenatal clinic

You have been identified as a participant for this study, and I kindly request you to take part.

Study procedure. A simple random sampling will be used to select the participants and those that are selected will be briefed about the study and any questions answered. An interviewer administered questionnaire will be given and blood sample taken from the finger by laboratory technician after counselling and posttest counselling will be done. For anyone who turns out to be positive will be linked to the physician for further management

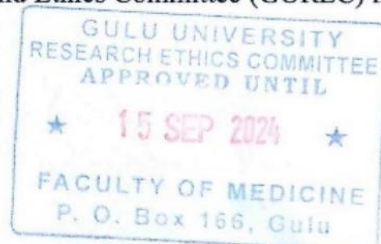
Benefits. there will be no direct benefits, except having real time results of hepatitis

Compensation. There will be no compensation for involvement in the study but refreshments will be provided.

Risks: The short-term risk is pain at the side of the prick during sample collection which will go after a few minutes and there is no long-term risk

Confidentiality

Any information obtained from you that identifies you by name will be kept private and secure in a locked place and will be accessed only by the principal investigator, the research team or Gulu University Research and Ethics Committee (GUREC) members. We will not identify you by



your name. The soft copy of the information obtained from you will be kept in a password-protected computer that is only accessible by the research team and the GUREC members.

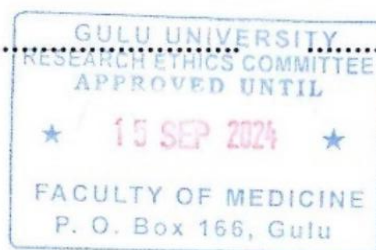
Participants' rights

Your participation in this study is entirely voluntary and refusal to participate will not in any way make you be discriminated against. You are free to withdraw from the study at any stage in case you feel that your rights are not being respected or if you are not comfortable with the study procedure. If you choose to withdraw, all your information previously collected will be destroyed and not used as part of the data analysis or dissemination. In case you still have more questions regarding this study, you may call **Otim Patrick, 0775118684/0704288080 E-mail otimpat1@gmail.com**. In case of any questions regarding confidentiality or your rights as a study participant please contact the Chairperson of Gulu University Research and Ethics Committee, Dr. Gerald Obai on +256772305621.

Consent statement

I have been informed of this study on **Hepatitis B sero prevalence and associated factors among pregnant women and their male partners attending GRRH antenatal clinic**. I have been given enough explanation about the study procedures, benefits, risks, and my rights as a participant in this study. I am aware that participation in this study is entirely voluntary and that I can withdraw, without prejudice, from the study at any stage in case I do not feel comfortable with the procedure or study. I understand that it will not affect my access to the healthcare/service that I will receive from this health facility or any other social services/facilities that I intend to access/visit. I therefore accept to take part in this study as a study participant.

Name of participant	Signature/ thumbprint	Date
.....		
Investigator 's/ research assistant's name	Signature	Date
.....		
Name of Witness	Signature	Date
.....		



**KARATAC MA NYUTU YEYO ME BEDO I KWED PI LUTINO MA PWOD MWAKA
GI ROMO APAR WI ABORO**

An nyinga Otim Patrick, latin kwan me Gulu Univaciti. Jange ma loyo lokum yot kom.

Atye ka timo kwed i kom dwong pa two acwiny ki jami mukene ikin mon ma tye ki yacu kacel ki lu ot gi dok gi tye ka nongo kony ikom yacu I ot yat madit me Gulu. Kwidi ma kelo two acwiny tye peko me yot kom ma tye kayelo wilobo kulu dok kelo two acwiny macalo pi ma pong I acwiny, kacel ki kaca me acwiny. Gang kal madit ma loyo yot kom I Uganda miti ne tye ni mon ma oyac gi pi gi pi kwidi ma kelo two acwing.

Miti me kwed man:

Kwed man mito Nyang I kom dwong pa two acwiny ki jami mukene ikin mon ma tye ki yacu kacel ki lu ot gi dok gi tye ka nongo kony ikom yacu I ot yat madit me Gulu.

Gi tyeko yero in me bedo ikwed man dok alegi me bedo ikwed man.

Gin aluba ikwed man:

Gibi tiyo ki diro I kit me yero joo ma omyero gubed ikwed man dok joo man gibi miyo gi ngec I kom kwed man dok gi bi gamo lapeny ducu ma gi tye kwede. Gibi miyo lapeny bot joo magi dok gi bi kwanyo remo manok ki ite lwet gi kun nongo ladiro me yot kom ma bi timo man, dok gibi nywako tam kin gat man inge kwanyo remo. Ngat ma gibi nogo ni tye ki kwidi man gibi cwalo bot dakta madit ma loyo yot kom pi nongo kony ma opore.

Ber pa bedo ikwed man:

Ber pa kwed man bot in matir tutwal peke, ento tye tutwale me ngeyo adwoki me pim man.

Jami ma ibi nongo:

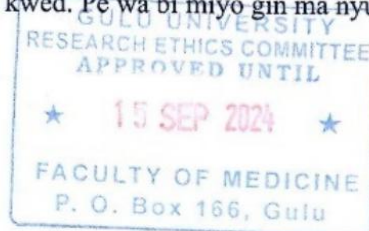
Jami mo atir me culu in peke, keken gibi miyo boti gin amata.

Race:

Rac me kwed man tye calo arem ma bino ki I adwogi me kwanyo remo I kare me pim dok bi kwe woko inge kare manok. Race mo peke ma bibedo pi kare malac.

Mung I kwed man:

Lok komi gibi gwoko imung dok gin ma nyutu lok komi gibi gwoko ka ma gi pungu apunga dok lok komi obibedo bot joo maloyo kwed man keken ma calao ladit ma loyo kwed man kacel ki joo maneno lok kom kwed. Pe wa bi miyo gin ma nyutu lok komi ma calo nyingi. Lok komi



matye I nyonyo pa munu gi gibi gwoko imung dok karatac gibi gwoko ka ma gi pungu ki kofulu dok joo ma loyo kwed man keken aye gibi gwoko ne.

Twero pa ngat ma tye ikwed man:

Bedo I kwed man tye dyere dok iromo donyo iye i miti ni. Dok itye ki twero me a ki ikwed man cawa mo keken labongo pwod mo. Kace iyero me a woko ki ikwed man ci lok komi gibi bolo ne woko dok pe gibi tito kwede.

Ka itye ki gilapeny mo madok ikom twero ni me bedo ikwed man, I romo goyo cim both Otim Patrick i nama cim, 0775118684/0704288080 onyo email otimpat1@gmail.com

Kace pwod itye ki lapeny ikom twero ni ikwed man, go cim bot won kom ma loyo lok kom kwed Dr. Gerald Obai on +256772305621.

Lok me nyutu yeyo me bedo ikwed:

Gi miyo bota ngec ikom kwed man matye ikom dwong pa two acwiny ki jami mukene ikin mon ma tye ki yacu kacel ki lu ot gi dok gi tye ka nongo kony ikom yacu I ot yat madit me Gulu. Rac ki ber me bedo ikwed man ki twero mamega calo ngat ma obibedi ikwed man. Aniang ni moko tama me bedo ikwed man pe obiyelo an iyo mo keken. Itic ki ngec man, lok koma bibedo imung. Atye ki ngec ni atwero a ki ikwed man cawa mo keken. Aniang ni keto cinga I karatac man, me weko arwenyo twero ma mega ento nyutu ni anongo ngec matut I kom kwed man dok adyere me bedo ikwed man. Karatac man mukene gi bimiyo bota.

Nying ngat matye ikwed.....cing/Opany cing.....nino dwe.....

Nying la kwed.....cing la kwed.....nino dwe.....

Nying caden.....cing caden.....nino dwe.....



Study Title: Hepatitis B Virus Sero Prevalence and Associated Factors Among Pregnant Women and Their Partners Attending Gulu Regional referral hospital antenatal clinic

Principal Investigator. Otim Patrick

Introduction.

The novel Coronavirus is transmitted from human to human through droplets and direct or close personal contact with an infected individual

Novel Coronavirus signs of infection include respiratory symptoms, fever, cough, shortness of breath and breathing difficulties. In more severe cases, infection can cause pneumonia, severe acute respiratory syndrome, kidney failure and even death

In light of the COVID-19 pandemic, the study will ensure safety of the research team and the study participants using the standard operating procedures set up by ministry of health Uganda which include the following

Personal screening. The PI and the research assistant and the participants will be screened for daily temperature during the engagement and anyone found with an elevated temperature of greater than 37.2⁰ C shall be referred to the covid-19 team for further assessment and management; these participants can be allowed to be involved in the study provided they come back when they are cleared

Face mask and hand washing. The PI and the research team will ensure that facemasks are put on properly, covering the nose and the mouth and using the hand washing facility

Data collection: The PI and the research assistant will ensure that a private room is identified with adequate spacing for the counselling and interview with both putting on a face mask. Soap and water plus sanitizer are available and physical contact is strictly not allowed except during consent writing and taking off the blood sample

During the consent writing the PI and research assistants will observe a 2-meter distance and both the PI and team will wash hands on arrival and the pens used shall be sanitized after every participant



Appendix V: Approval Letter for Data Collection from Gulu Regional Referral Hospital

Hospital Director's 256-(0)774408225

REC Administration :256 (0) 772060564

E-mail: guluhospital@gmail.com

Website: <https://guluhospital.net>

In any correspondence on this matter quote:

REC/2023/09/12



THE REPUBLIC OF UGANDA

MINISTRY OF HEALTH

GULU REGIONAL REFERRAL HOSPITAL

P. O. Box 160,

Gulu, Uganda.

Date: 22nd / 9/ 2023

RESEARCH AND ETHICS COMMITTEE

PATRICK OTIM
0704288080

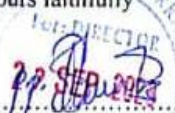
RE: GUREC-2023-598: Hepatitis B Sero-Prevalence and Associated Factors among Pregnant Women And Their Attending GRRH, GULU CITY.

This is to inform you that the Gulu Regional Referral Hospital, Research and Ethics Committee (GRRHREC) has approved your study documents for the above referenced research study. Note that this approval expires after one year; the current approval is therefore valid until Date: 22nd / 9/ 2024. Continued approval is conditional upon your compliance with the following requirements:

1. No other consent forms, questionnaire and /or advertisement documents should be used.
2. Consent forms must be voluntarily signed by study subjects prior to commencement of data collection. Queries raised regarding consent too should be addressed.
3. Study bias aversion strategies should be employed as discussed to improve quality and reliability of findings.
4. All the protocol amendments and changes to other research documents must be re submitted to the GUREC for approval and made known to the Gulu RRH REC.
5. Significant changes to the current protocol and all anticipated problems that may involve risks to study subjects or patient information or that may affect integrity of the research must be promptly reported to GUREC and Gulu RRH REC.
6. Specification of support required from GRRH and inputs from the researcher (Research Assistants, Stationary etc.) to the Department.
7. Renewal of the study approval is upon feedback from the continuing research and will be done within 2 months prior to the expiry of the current protocol approval date.

You will be required to share the study findings with the GRRHREC and the responsible Departments to support our efforts to improve quality of patient care.

Yours faithfully


.....
Dr. Baifa Arwinyo
OBGY, Chair-GRRHREC
For Hospital Director-GRRH

Appendix VI: Introductory Letter from GUREC

GULU

P.O. Box 166, Gulu (U)
Website: www.gu.ac.ug
Email: gurec@gu.ac.ug



UNIVERSITY

Tel: +256 471 432 096
Fax: +256 471 432 913
Mob: +256 772 305 621
+256 776 812 147

RESEARCH ETHICS COMMITTEE

15/09/2023

To: Patrick Otim

0704288080

Type: Initial Review

Re: GUREC-2023-598: Hepatitis B Sero-prevalence and associated factors among pregnant women and their partners attending Gulu Regional Referral Hospital Antenatal Clinic

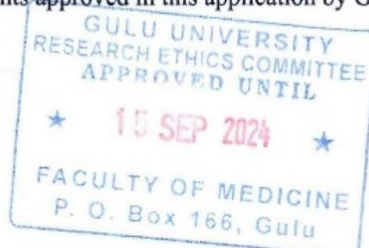
I am pleased to inform you that at the **102nd** convened meeting on **18/05/2023**, the Gulu University REC meeting voted to approve the above referenced application.

Approval of the research is for the period of **15/09/2023** to **15/09/2024**.

As Principal Investigator of the research, you are responsible for fulfilling the following requirements of approval:

1. All co-investigators must be kept informed of the status of the research.
2. Changes, amendments, and addenda to the protocol or the consent form must be submitted to the REC for re-review and approval **prior** to the activation of the changes.
3. Reports of unanticipated problems involving risks to participants or any new information which could change the risk benefit: ratio must be submitted to the REC.
4. Only approved consent forms are to be used in the enrollment of participants. All consent forms signed by participants and/or witnesses should be retained on file. The REC may conduct audits of all study records, and consent documentation may be part of such audits.
5. Continuing review application must be submitted to the REC **eight weeks** prior to the expiration date of **15/09/2024** in order to continue the study beyond the approved period. Failure to submit a continuing review application in a timely fashion may result in suspension or termination of the study.
6. The REC application number assigned to the research should be cited in any correspondence with the REC of record.
7. You are required to register the research protocol with the Uganda National Council for Science and Technology (UNCST) for final clearance to undertake the study in Uganda.

The following is the list of all documents approved in this application by Gulu University REC:



No.	Document Title	Language	Version Number	Version Date
1	Informed consent form for Emancipated Minors	Acholi	Version 1.0	2023-09-14
2	Informed Consent form for Emancipated Minors	English	Version 2.0	2023-09-14
3	Informed Consent forms	Acholi	1.0	2023-09-14
4	Protocol	English	Version 3.0	2023-08-31
5	Data collection tools	Luo	Version 2.0	2023-08-27
6	Data collection tools	English	Version 3.0	2023-08-27
7	Informed Consent forms	English	Version 3.0	2023-08-27
8	Covid 19 Risk management	English	Version 1.0	2023-08-27

Yours Sincerely

Julaina A. Obika

Julaina A. Obika (PhD)
For: Gulu University REC Box 166, Gulu

