



HBV Prevalence and Socio-Demographic Features of HIV-Infected Individuals attending University of Port Harcourt Teaching Hospital in Rivers State, Nigeria

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Abstract: Hepatitis B virus (HBV) infection remains a significant public health concern, particularly among people living with human immunodeficiency virus (HIV), due to shared transmission routes and the risk of accelerated liver disease. This study assessed the prevalence of HBV infection and its socio-demographic distribution among HIV-infected individuals attending the University of Port Harcourt Teaching Hospital (UPTH), Rivers State, Nigeria. A cross-sectional descriptive design was employed, enrolling 100 HIV-positive participants through consecutive sampling. Socio-demographic data were collected using a structured questionnaire, while blood samples were obtained and analysed for Hepatitis B surface antigen (HBsAg) using the Monolisa ELISA kit (Bio-Rad, France). The overall prevalence of HBV/HIV coinfection was 9.0%, indicating that nearly one in ten HIV-infected individuals harboured dual infection. HBV infection was unevenly distributed across socio-demographic groups. Participants aged 41–60 years (12.5%) and 21–40 years (8.9%) showed higher prevalence compared to other age groups. Females exhibited a higher prevalence (12.1%) than males (4.8%), and married participants had slightly higher infection rates (12.2%) than singles (8.3%). Educational background influenced HBV prevalence, with the highest rate observed among tertiary-educated participants (15.0%). Occupational analysis revealed a higher prevalence among self-employed and unemployed individuals (11.1%), whereas employed participants had no recorded infection. Religious affiliation showed notable disparities, with Muslim participants (50.0%) and traditional religion practitioners (20.0%) exhibiting the highest rates. These findings highlight that HBV/HIV coinfection is present in a substantial proportion of the HIV-infected population at UPTH and is influenced by specific socio-demographic factors. The study underscores the importance of routine HBV screening, vaccination, and targeted health education, particularly for high-risk subgroups, to reduce liver-related morbidity and optimise clinical outcomes. Integration of HBV prevention and management strategies within HIV care programs is essential to mitigate the dual burden of these infections in Rivers State and similar settings.

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1. Introduction

Hepatitis B virus (HBV) infection remains a major global public health challenge, responsible for substantial morbidity and mortality due to chronic hepatitis, cirrhosis, and hepatocellular carcinoma (WHO, 2024). Sub-Saharan Africa bears a high burden of HBV, with many countries classified within the intermediate to high endemicity range (Schweitzer et al., 2015). In Nigeria, HBV is hyperendemic in the

general population and persists as a leading cause of chronic liver disease (Ola et al., 2012). Transmission occurs vertically (perinatal), horizontally (early childhood), and through exposure to infected blood and body fluids such as unsafe injections, transfusions, scarification/tattooing, and sexual contact (Shimakawa et al., 2022). Despite the availability of an effective vaccine and potent antiviral therapy, gaps in vaccination coverage, late diagnosis, and limited access

to comprehensive HBV care continue to drive ongoing transmission and adverse outcomes (WHO, 2024).

Human immunodeficiency virus (HIV) and HBV share overlapping transmission routes—particularly sexual contact and parenteral exposure—resulting in frequent coinfection (Alter et al., 2021). Among people living with HIV (PLHIV), HBV coinfection accelerates liver disease progression and increases the risks of cirrhosis, hepatocellular carcinoma, liver-related morbidity, and all-cause mortality (Thio et al., 2015; Boyd et al., 2021). HIV-mediated immune suppression can lead to higher HBV DNA levels and reduced spontaneous HBeAg seroconversion, while immune reconstitution following antiretroviral therapy (ART) initiation may precipitate hepatitis flares (Konopnicki et al., 2022). Conversely, HBV coinfection can complicate HIV care by necessitating HBV-active ART backbones (e.g., tenofovir-based regimens) and long-term adherence to prevent flare and resistance (Easterbrook et al., 2017).

Understanding the prevalence of HBV among HIV-infected individuals and the socio-demographic characteristics associated with coinfection is essential for optimising prevention and clinical management. Socio-demographic factors—such as age, sex, marital status, education level, occupation, migration history, and household crowding—can shape exposure risk, health-seeking behaviour, and access to vaccination and screening (Wandeler et al., 2013). Behavioural correlates (number of sexual partners, condom use, history of sexually transmitted infections, injection practices, and traditional cosmetic or cultural practices involving skin piercing) often cluster within socio-demographic strata, further influencing HBV acquisition and chronicity (Muriuki et al., 2021). In addition, structural and health-system factors—including routine HBV screening in HIV clinics, linkage to HBV-active ART, and availability of birth-dose and adult vaccination—modulate the observed burden of coinfection (WHO, 2024).

Rivers State, in Nigeria's South-South geopolitical zone, is a densely populated, socio-economically diverse setting with high human mobility and a large service sector anchored by a major tertiary referral centre, the University of Port Harcourt Teaching Hospital (UPTH). As a teaching hospital and referral hub, UPTH provides comprehensive HIV services to a heterogeneous patient population drawn from urban and peri-urban communities (Okonko et al., 2020). This context offers an important opportunity to generate robust, locally relevant evidence on HBV prevalence among PLHIV and to identify socio-demographic features that may signal underserved subgroups or missed prevention opportunities.

Despite national guidelines recommending routine HBV screening in HIV programs and the use of tenofovir-containing regimens, implementation gaps persist (Federal Ministry of Health [FMOH], 2020). Many patients may not know their HBV status at ART initiation; baseline serologic work-up (HBsAg, HBeAg, anti-HBc, anti-HBs) and virologic testing are variably performed; and adult catch-up vaccination is inconsistently delivered (Ola et al., 2012). These gaps are particularly consequential in high-burden settings, where undiagnosed HBV in PLHIV can lead to preventable liver complications. Local data from UPTH are therefore crucial to evaluate current practice, quantify unmet needs, and guide targeted interventions, such as intensified screening, structured vaccination offers, and linkage to HBV-active ART and hepatology services.

A precise estimate of HBV prevalence among HIV-infected individuals attending UPTH, coupled with an analysis of associated socio-demographic features, will inform program planning and resource allocation. Identifying subgroups with higher odds of HBV positivity (e.g., specific age bands, males vs. females, lower education or certain occupations, unmarried status, or those with migration history) can help tailor risk communication, prioritise screening, and scale vaccination (Muriuki et al., 2021; Wandeler et al., 2013). Moreover, characterising coinfecting patients at baseline supports clinical decision-making regarding ART selection, monitoring for hepatitis flares, and referrals for liver disease assessment (Konopnicki et al., 2022).

HBV/HIV coinfection represents a critical syndemic in Nigeria. Generating local evidence on the prevalence and socio-demographic profile of HBV among HIV-infected individuals at UPTH will fill a key knowledge gap, strengthen integrated HBV/HIV services, and contribute to achieving national and global viral hepatitis elimination targets (WHO, 2024; FMOH, 2020).

This study aims to determine the prevalence of hepatitis B virus (HBV) infection and to assess the socio-demographic characteristics associated with HBV seropositivity among HIV-infected individuals attending the University of Port Harcourt Teaching Hospital (UPTH), Rivers State, Nigeria.

2. Material and Methods

2.1. Study Area

The study was conducted at the University of Port Harcourt Teaching Hospital (UPTH), located in Port Harcourt, the capital city of Rivers State, Nigeria. Rivers State lies within the South-South geopolitical zone of the country and is one of the most socio-economically vibrant states in the Niger Delta region.

It shares boundaries with Imo, Abia, and Anambra States to the north; Akwa Ibom State to the east; Bayelsa and Delta States to the west; and the Atlantic Ocean to the south. The state has an estimated population of over 7 million people, with Port Harcourt serving as its administrative and commercial hub (National Population Commission [NPC], 2020).

Port Harcourt is a cosmopolitan city characterised by rapid urbanisation, industrialisation, and a diverse population comprising civil servants, traders, students, professionals, and migrants. The city is a centre for oil and gas activities, which has attracted people from within and outside Nigeria, contributing to high human mobility and increased vulnerability to infectious diseases, including HIV and HBV.

The University of Port Harcourt Teaching Hospital (UPTH) is a federal tertiary healthcare facility that serves as a referral centre for Rivers State and neighbouring states in the Niger Delta. Established in 1980, UPTH provides a wide range of specialised medical services, including comprehensive HIV prevention, treatment, and care services through its antiretroviral therapy (ART) clinic. The hospital's HIV clinic is one of the largest in the South-South region, catering to thousands of patients living with HIV/AIDS. It also serves as a training and research centre for medical, nursing, and allied health sciences students.

Given its role as a major referral and treatment hub, UPTH provides an ideal setting for studying the burden of HBV among HIV-infected individuals. The diversity of patients attending the hospital, drawn from both urban and peri-urban communities, allows for robust analysis of the prevalence of HBV and the influence of socio-demographic features on coinfection patterns.

2.2. Study Design

This study adopted a hospital-based cross-sectional descriptive design. The design is appropriate because it allows for the simultaneous assessment of the prevalence of hepatitis B virus (HBV) infection and the socio-demographic characteristics of HIV-infected individuals at a single point in time.

The study population consist of HIV-infected individuals receiving care and treatment at the Antiretroviral Therapy (ART) Clinic of the University of Port Harcourt Teaching Hospital (UPTH), Rivers State, Nigeria. Participants were recruited consecutively during routine clinic visits until the desired sample size was achieved.

The cross-sectional approach ensured that prevalence could be estimated while also identifying socio-demographic correlates of HBV infection in the HIV-infected population. Data collection involved two major components:

2.2.1. Serological Testing – Blood samples were collected from each consenting participant to test for the presence of Hepatitis B surface antigen (HBsAg) using enzyme-linked immunosorbent assay (ELISA) kits. This provided laboratory confirmation of HBV infection status.

2.2.2. Socio-Demographic and Clinical Data – A structured, interviewer-administered questionnaire was used to obtain information on socio-demographic variables (age, sex, marital status, education, occupation, and residence), as well as relevant clinical history (HIV duration, ART status, and other risk factors).

2.3. Study Population

The study population comprised HIV-infected individuals receiving care at the Antiretroviral Therapy (ART) Clinic of the University of Port Harcourt Teaching Hospital (UPTH), Rivers State, Nigeria. This population was suitable because they represent individuals at risk of HBV coinfection due to shared transmission routes and other socio-demographic exposures.

2.3.1. Inclusion Criteria

HIV-infected individuals aged 18 years and above. Registered patients receiving care and treatment at the ART clinic of UPTH. Individuals who provide written informed consent to participate in the study.

2.3.2. Exclusion Criteria

HIV-infected individuals who decline consent to participate. Patients with incomplete socio-demographic or clinical data. Severely ill patients who are unable to respond to the questionnaire.

2.4. Sample Size Determination

The minimum sample size was determined using the Cochran formula (1963) for prevalence studies.

$$n = Z^2(pq)/d^2$$

Where:

n = required sample size

Z = standard normal deviation at 95% confidence level = 1.96

p = estimated prevalence of HBV among HIV-infected individuals (3.8% reported for Rivers State by NAIIS, 2019).

q = 1 - p

d = degree of precision (0.05)

Thus, a minimum of 56 HIV-infected individuals was recruited for the study. However, 100 HIV-infected individuals were enrolled in the study.

2.5. Data Collection Methods

Data collection involved both laboratory investigations and structured questionnaires:

2.5.1. Questionnaire Administration

A structured, interviewer-administered questionnaire was used to collect socio-demographic and clinical data. Information included age, sex, marital status, educational level, occupation, place of residence, and relevant risk factors (such as history of blood transfusion, tattooing, scarification, multiple sexual partners, and alcohol use). Clinical history, such as duration since HIV diagnosis and ART regimen, was also recorded.

2.5.2. Laboratory Investigation

i. Sample Collection: Approximately 5 mL of venous blood was collected aseptically from each participant into sterile plain vacutainer tubes.

ii. Sample Processing: The samples were allowed to clot at room temperature and then centrifuged at 3,000 rpm for 10 minutes to separate the serum. The sera were carefully aspirated into properly labelled cryovials and stored at -20°C until analysis.

iii. HBV Testing: Sera were screened for Hepatitis B surface antigen (HBsAg) using a third-generation Enzyme-Linked Immunosorbent Assay (ELISA) kit, following the manufacturer's instructions.

iv. Quality Control: Positive and negative controls were included in each batch of tests to ensure the reliability and accuracy of results.

2.6. Laboratory Detection of Hepatitis B Surface Antigen (HBsAg)

The laboratory detection of Hepatitis B surface antigen (HBsAg) among HIV-infected participants was carried out using the HBsAg Monolisa ELISA kit (Bio-Rad, France), following the manufacturer's protocol. Before testing, all reagents and serum samples were brought to room temperature ($18-25^{\circ}\text{C}$). The MONOLISA HBsAg ELISA is based on the sandwich enzyme immunoassay principle. Microplate wells pre-coated with monoclonal anti-HBs antibodies served as the solid phase. For each assay run, 100 μL of participant serum was pipetted into designated wells. If HBsAg was present, it bound to the immobilised antibodies. After the initial incubation, unbound materials were removed by washing the wells with the provided wash buffer.

Subsequently, a conjugate solution containing horseradish peroxidase (HRP)-labelled anti-HBs antibodies was added to each well. This conjugate bound to any captured HBsAg, forming an antigen-antibody-enzyme complex. Following a second incubation, excess conjugate was removed through

additional washing steps to eliminate nonspecific binding.

The wells were then treated with the tetramethylbenzidine (TMB) substrate solution, which reacts with the enzyme (HRP) to produce a blue-colored product. After a controlled incubation in the dark, the reaction was stopped by adding 0.5 M sulfuric acid (stop solution), which changed the colour from blue to yellow.

The optical density (OD) of each well was measured using a microplate reader at 450 nm with a reference wavelength of 620 nm. The cut-off value was calculated in accordance with the manufacturer's instructions. Samples with OD values greater than or equal to the cut-off were interpreted as positive for HBsAg, while those below the cut-off were recorded as negative.

Each assay batch included positive and negative controls supplied by the manufacturer to validate the test performance and ensure result reliability. All laboratory procedures were carried out under strict biosafety conditions, using appropriate personal protective equipment (PPE) and standard precautions to minimise the risk of contamination and exposure.

2.7. Data Analysis

Data were coded and entered into Statistical Package for the Social Sciences (SPSS) version 25.0 (IBM Corp, Armonk, NY). Descriptive statistics (frequencies, percentages, means, and standard deviations) were used to summarise socio-demographic and clinical characteristics of participants. Prevalence of HBV infection was expressed as a proportion of HBsAg-positive cases among the HIV-infected participants. Chi-square (χ^2) test was used to determine associations between HBV seropositivity and categorical socio-demographic variables (sex, marital status, educational level, occupation). A p-value < 0.05 was considered statistically significant. Results were presented in tables, charts, and graphs for clarity.

2.8. Ethical Considerations

Ethical clearance was obtained from the University of Port Harcourt Research Ethics Committee (UPHREC). Written informed consent was obtained from each participant after the purpose, benefits, and risks of the study were explained. Participation was voluntary, and participants had the right to withdraw at any stage without penalty. Participant information was kept strictly confidential. Data was coded to exclude personal identifiers. Standard precautions were observed during blood collection to minimise risks of infection. Selection of

participants was without bias regarding gender, age, religion, or socio-economic status.

3. Results

Out of the total study population of HIV-infected individuals assessed at the University of Port Harcourt Teaching Hospital (UPTH), 9.0% were found to be co-infected with hepatitis B virus (HBV/HIV coinfection), while the majority, 91.0%, were infected with HIV only (Figure 1). This finding indicates that although most patients were mono-infected with HIV, nearly one in every ten carried dual infection with HBV. The observed HBV/HIV coinfection rate highlights the public health significance of HBV among people living with HIV in this setting and underscores the need for routine HBV screening, vaccination, and integrated management within HIV care programs.

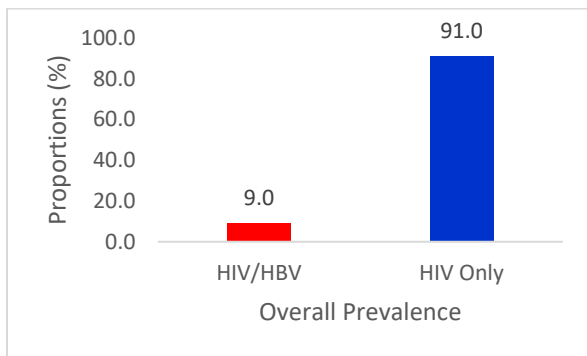


Figure 1: Overall Prevalence

Table 1 depicts HBV prevalence and sociodemographic features of the study participants.

A total of 100 HIV-infected individuals attending the University of Port Harcourt Teaching Hospital (UPTH) were screened for hepatitis B virus (HBV) infection, with 9 participants (9.0%) testing positive for HBsAg, indicating HBV/HIV coinfection (Table 1).

HBV prevalence varied across age groups. No HBV infection was detected among participants younger than 20 years or those older than 61 years. The highest prevalence was observed in the 41–60 years age group (12.5%), followed by the 21–40 years group (8.9%). This suggests that middle-aged adults may be at slightly higher risk of HBV coinfection among the HIV-infected population (Table 1).

Female participants showed a higher prevalence (12.1%) compared to males (4.8%), indicating that HBV coinfection was more common among women in this cohort (Table 1).

Among marital categories, married participants had the highest prevalence of HBV (12.2%), followed by singles (8.3%). No cases were observed among divorced participants or those classified under “others” (Table 1).

HBV prevalence appeared to increase with higher educational attainment, with tertiary-educated participants showing the highest prevalence (15.0%), followed by primary education (10.3%). Participants with secondary education and no formal education had lower prevalence rates of 5.9% each (Table 1).

Both self-employed and unemployed participants recorded the same HBV prevalence (11.1%), whereas employed participants had no HBV infection detected. Students had a lower prevalence of 7.7% (Table 1).

Table 1: HBV Prevalence and Socio-Demographic Features of the Study Participants

Variables	Category	UPTH		
		No. Tested	No +Ve	% Positive
Age Group	<20	6	0	0.0
	21-40	56	5	8.9
	41-60	32	4	12.5
	>61	6	0	0.0
	Males	42	2	4.8
Sex	Females	58	7	12.1
	Singles	48	4	8.3
Marital Status	Married	41	5	12.2
	Divorced	4	0	0.0
	Others	7	0	0.0
	Primary	29	3	10.3
Educational Background	Secondary	34	2	5.9
	Tertiary	20	3	15.0
	None	17	1	5.9
Occupation	Employed	15	0	0.0
	Self-Employed	54	6	11.1
	Unemployed	18	2	11.1

Religion	Students	13	1	7.7
	Christian	87	6	6.9
	Islam	4	2	50.0
	Traditional	5	1	20.0
	None	4	0	0.0
Total		100	9	9.0

Notably, the highest HBV prevalence was observed among participants identifying as Islamic (50.0%), followed by those practising traditional religion (20.0%). Christians recorded a prevalence of 6.9%, while no HBV infection was detected among participants with no religious affiliation (Table 1).

Overall, these findings demonstrate that HBV/HIV coinfection in this cohort is unevenly distributed across socio-demographic groups, with middle-aged adults, females, married individuals, tertiary-educated participants, self-employed or unemployed individuals, and those of Islamic faith showing higher prevalence rates. The results underscore the need for targeted HBV screening and preventive strategies tailored to specific demographic subgroups within the HIV-infected population at UPTH.

4. Discussion

The present study assessed the prevalence of hepatitis B virus (HBV) infection and its distribution across socio-demographic features among HIV-infected individuals attending the University of Port Harcourt Teaching Hospital (UPTH), Rivers State, Nigeria. The overall HBV/HIV coinfection prevalence was 9.0%, indicating that approximately one in ten HIV-infected participants also harboured HBV. This prevalence aligns with reports from other Nigerian studies, where HBV/HIV coinfection rates range between 8–12% (Adeyemi et al., 2018; Olakunde et al., 2025), and is comparable to rates reported in other sub-Saharan African countries (Kenfack-Momo et al., 2022; Tetteh-Quarcoo et al., 2019). However, it remains lower than some studies reporting prevalence as high as 12–15%, likely reflecting differences in regional HBV endemicity, vaccination coverage, and study populations.

Out of the total study population of HIV-infected individuals attending the University of Port Harcourt Teaching Hospital (UPTH), 9.0% were found to be co-infected with hepatitis B virus (HBV/HIV coinfection), similar to a previous study by Adeyemi et al. (2018) and Ajuwon et al. (2021), while 91.0% were infected with HIV only. This indicates that although the majority of participants were mono-infected with HIV, nearly one in every ten carried dual infection with HBV, emphasising the clinical and public health significance of HBV among people living with HIV.

The observed 9.0% HBV/HIV coinfection rate in this study is consistent with prevalence rates reported in other parts of Nigeria and sub-Saharan Africa (Adeyemi et al., 2018). The Nigeria HIV/AIDS Indicator and Impact Survey (NAIIS) 2018 also assessed HBV among PLHIV, reporting a rate of 8.9% (FMoH, 2019). For instance, studies from southwestern Nigeria reported coinfection rates ranging from 8–12% among HIV-infected patients (Adeyemi et al., 2018; Ajuwon et al., 2021; Olakunde et al., 2025), while a study by Innocent-Adiele et al. (2021) reported a lower prevalence of 6.3% (Innocent-Adiele et al., 2021). Comparatively, the prevalence in some African countries, such as Cameroon and Ghana, has been reported to range from 10% to 15% among HIV-infected populations (Agyeman & Ofori-Asenso, 2016; Kenfack-Momo et al., 2022). Also, Agyeman & Ofori-Asenso (2016) reported that HIV/HBV coinfection prevalence rates in Ghana ranged from 2.4 to 41.7%. The pooled HIV/HBV coinfection prevalence rate was determined as 13.6% (Agyeman & Ofori-Asenso, 2016).

Although lower than some of these estimates, the 9.0% prevalence observed in UPTH reflects a significant burden, given the potential for accelerated liver disease progression, increased risk of cirrhosis, and complications during antiretroviral therapy (Thio et al., 2015; Boyd et al., 2021). The variations in HBV/HIV coinfection rates across different studies may be attributed to differences in study populations, regional HBV endemicity, HIV transmission patterns, vaccination coverage, and screening practices.

Overall, the finding reinforces the need for routine HBV screening and integrated management in HIV clinics, as early detection and appropriate therapy can mitigate liver-related morbidity and improve clinical outcomes in coinfecting patients.

Age distribution revealed the highest HBV prevalence among participants aged 41–60 years (12.5%), followed by the 21–40 years group (8.9%), while no infection was observed in participants younger than 20 or older than 61 years. This pattern may reflect cumulative lifetime exposure to HBV risk factors, including sexual activity and parenteral exposures, which tend to increase in adulthood. Dissimilar age trends have been reported in other Nigerian studies, where younger children and adolescents exhibited higher HBV/HIV coinfection

rates compared to older cohorts (Innocent-Adiele et al., 2021; Olakunde et al., 2025).

Sex differences were also notable, with females showing a higher prevalence (12.1%) compared to males (4.8%). This aligns with Innocent-Adiele et al.'s (2021) findings. However, this observation contrasts with some studies in Nigeria, where males had higher rates (Olakunde et al., 2025), suggesting that local socio-behavioural factors, cultural practices, or differential health-seeking behaviour may influence HBV exposure in this population.

Regarding marital status, married individuals had a slightly higher prevalence (12.2%) than singles (8.3%). This may be related to the duration of exposure within marital partnerships or shared risk behaviours.

Educational background appeared to influence HBV prevalence, with tertiary-educated participants showing the highest rate (15.0%). This may be counterintuitive, as higher education is generally associated with better health literacy. This observation aligns with that of FMoH (2019) and Olakunde et al. (2025). However, it could reflect increased occupational or social mobility, urban exposure, or other behavioural factors that were not fully captured in this study. Participants with primary education also had a notable prevalence (10.3%), while secondary-educated and uneducated individuals had lower rates (5.9%). This also aligns with other previous studies. Olayinka et al. (2016) reported a higher prevalence among individuals with no formal education compared with those with tertiary education.

Occupation showed that self-employed and unemployed participants had equal prevalence rates (11.1%), whereas employed participants recorded no infections. Conversely, Olayinka et al. (2016) reported a different pattern based on monthly income. The higher prevalence among self-employed and unemployed individuals could be due to socioeconomic vulnerabilities that increase exposure to HBV risk factors, such as unsafe medical or traditional practices, limited access to vaccination, or delayed health-seeking behaviour.

Religious affiliation revealed marked differences, with Muslim participants showing the highest prevalence (50%), followed by traditional religion practitioners (20%), while Christians had 6.9% and none among those with no religious affiliation. The small sample size in certain religious categories may partially explain these differences; however, the finding underscores the need for culturally sensitive health education and vaccination campaigns targeting specific groups.

Collectively, these findings demonstrate that HBV/HIV coinfection is unevenly distributed across socio-demographic subgroups, highlighting

populations at higher risk. The study emphasises the importance of routine HBV screening, early vaccination where applicable, and integrated management strategies within HIV care programs. Addressing these disparities can reduce liver-related morbidity, optimise antiretroviral therapy outcomes, and contribute to the broader public health goal of HBV elimination in Nigeria.

Limitations of the study include the relatively small sample size and the hospital-based design, which may limit generalizability to the broader HIV-infected population in Rivers State. In addition, the study did not assess HBV DNA or liver function parameters, which would provide additional insights into active viral replication and liver disease severity. Future studies should consider larger, multicenter cohorts and include molecular or virological assessments to characterise HBV burden among PLHIV better.

5. Conclusion

The study revealed that the prevalence of hepatitis B virus (HBV) among HIV-infected individuals attending the University of Port Harcourt Teaching Hospital (UPTH) was 9.0%, indicating that HBV/HIV coinfection remains a significant public health concern in this population. HBV infection was unevenly distributed across socio-demographic groups, with higher prevalence observed among middle-aged adults, females, married individuals, tertiary-educated participants, self-employed or unemployed persons, and certain religious groups.

These findings underscore the need for routine HBV screening, targeted health education, and integration of HBV prevention and management within HIV care programs. Early detection and appropriate interventions can reduce liver-related morbidity and improve clinical outcomes among coinfecting individuals. Furthermore, the study highlights the importance of socio-demographic considerations in designing public health strategies to reduce HBV burden in HIV-infected populations in Rivers State and similar settings.

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References

1. Adeyemi, O. A., Crowell, T. A., Peel, S., Ndembi, N., Shutt, A., Baral, S. D., Charurat, M. E., & Nowak, R. G. (2018). Hepatitis B virus and risk factors among HIV-positive and HIV-negative Nigerian men who have sex with men [Conference presentation]. *International Meeting of the Institute of Human Virology, Baltimore, Maryland*.
2. Agyeman, A. A., & Ofori-Asenso, R. (2016). Prevalence of HIV and hepatitis B coinfection in Ghana: a systematic review and meta-analysis. *AIDS research and therapy*, *13*, 23. <https://doi.org/10.1186/s12981-016-0107-x>
3. Ajuwon, B. I., Yujuico, I., Roper, K., Richardson, A., Sheel, M., & Lidbury, B. A. (2021). Hepatitis B virus infection in Nigeria: a systematic review and meta-analysis of data published between 2010 and 2019. *BMC infectious diseases*, *21*(1), 1120. <https://doi.org/10.1186/s12879-021-06800-6>
4. Boyd, A., Dezanet, L. N. C., & Lacombe, K. (2021). Functional Cure of Hepatitis B Virus Infection in Individuals With HIV-Coinfection: A Literature Review. *Viruses*, *13*(7), 1341.
5. Federal Ministry of Health. Nigeria HIV/AIDS Indicator and Impact Survey (NAIIS) 2018: Technical Report. FMOH; 2019.
6. Innocent-Adiele, H.C., Michael, B.B.T., Okonko, I.O. & Ogbu O. (2021). Seroprevalence of Hepatitis B Virus Infection among HIV Infected Individuals in Uyo, Akwa Ibom State, Nigeria. *medRxiv Health Sciences. Cold Spring Harbor Laboratory & BMJ Yale*, March 2021:1-9.
7. Kenfack-Momo, R., Kenmoe, S., Takuissu, G. R., Ebogo-Belobo, J. T., Kengne-Ndé, C., Mbagha, D. S., Tchatchouang, S., Oyono, M. G., Kenfack-Zanguim, J., Lontuo Fogang, R., Mbongue Mikangue, C. A., Zeuko'o Menkem, E., Ndzie Ondigui, J. L., Kame-Ngasse, G. I., Magoudjou-Pekam, J. N., Taya-Fokou, J. B., Bowo-Ngandji, A., Nkie Esemu, S., Kamdem Thiomo, D., Moundipa Fewou, P. & Njouom, R. (2022). Epidemiology of hepatitis B virus and/or hepatitis C virus infections among people living with human immunodeficiency virus in Africa: A systematic review and meta-analysis. *PloS one*, *17*(5), e0269250. <https://doi.org/10.1371/journal.pone.0269250>
8. Olayinka A. T., Oyemakinde A., Balogun M. S., et al. Seroprevalence of Hepatitis B Infection in Nigeria: A National Survey. The American Society of Tropical Medicine and Hygiene. 2016;95(4):902–907. doi: 10.4269/ajtmh.15-0874.
9. Ola, S. O., Odaibo, G. N., Olaleye, O. D., & Ayoola, E. A. (2012). Hepatitis B and E viral infections among Nigerian healthcare workers. *African Journal of Medicine and Medical Sciences*, *41*(4), 387–391.
10. Olakunde, B. O., Adeyinka, D. A., Olakunde, O. A., Eneh, S. C., & Ogundipe, T. (2025). Epidemiology of Hepatitis B Virus Infection in Nigeria: A Narrative Review of Prevalence, Transmission, Genotypes, Coinfections, and Mortality. *Journal of tropical medicine*, 2025, 4939367. <https://doi.org/10.1155/jotm/4939367>
11. Schweitzer, A., Horn, J., Mikolajczyk, R. T., Krause, G., & Ott, J. J. (2015). Estimations of worldwide prevalence of chronic hepatitis B virus infection: A systematic review of data published between 1965 and 2013. *The Lancet*, *386*(10003), 1546–1555. [https://doi.org/10.1016/S0140-6736\(15\)61412-X](https://doi.org/10.1016/S0140-6736(15)61412-X)
12. Thio, C.L.; Smeaton, L.; Hollabaugh, K.; Saulynas, M.; Hwang, H.; Saravanan, S.; Kulkarni, S.; Hakim, J.; Nyirenda, M.; Iqbal, H.S.; et al. Comparison of HBV-active HAART regimens in an HIV-HBV multinational cohort: Outcomes through 144 weeks. *AIDS* **2015**, *29*, 1173–1182
13. Wandeler, G., Gsponer, T., Bihl, F., Bernasconi, E., Cavassini, M., Kovari, H., Schmid, P., Battegay, M., Calmy, A., Egger, M., Furrer, H., Rauch, A., & Swiss HIV Cohort Study (2013). Hepatitis B virus infection is associated with impaired immunological recovery during antiretroviral therapy in the Swiss HIV cohort study. *The Journal of Infectious Diseases*, *208*(9), 1454–1458. <https://doi.org/10.1093/infdis/jit351>
14. World Health Organization (WHO). (2024). *Global hepatitis report 2024*. Geneva: WHO. <https://www.who.int/publications/i/item/glob-al-hepatitis-report-2024>