Sahel Journal of Life Sciences FUDMA (SAJOLS)
June 2026 Vol. 4(2): 66-71
ISSN: 3027-0456 (Print)
ISSN: 1595-5915 (Online)
DOI: *https://doi.org/10.33003/sajols-2026-0402-08*

Research Article

Retrospective Analysis of Archived Data on Hepatitis B Virus Infection among Pregnant Women in Ilorin, Nigeria, with Contextual Comparison to National Estimates

Adeyemi John Olarewaju[1,2*], Suleiman Muhammed Mustapha[2,3], Ariyo Oluwatoyin Grace[1], Lawal Rasheed Tunde[4], and Kolawole Olatunji Matthew[2]

[1]Department of Microbiology, Faculty of Sciences, University of Ilesa, Ilesa, Osun State, Nigeria
[2]Infectious Diseases and Environmental Health Research Group, Department of Microbiology, University of Ilorin, Ilorin, P.M.B 1515 Kwara State, Nigeria
[3]Department of Biological Science, Faculty of Pure and Applied Sciences, Alhikmah University, Ilorin, Nigeria
[4]Department of Science Laboratory Technology, Faculty of Science Laboratory Technology, University of Ilesa, Ilesa, Osun State, Nigeria
Corresponding Author's email*: *john_adeyemi@unilesa.edu.ng

ABSTRACT
Hepatitis B viral (HBV) infection among pregnant women is one of the major public health concerns in Nigeria due to vertical transmission risk. This study presents a retrospective analysis of archived data collected in 2014 to determine the burden of HBV infection and associated risk factors among pregnant women in Ilorin, Nigeria, and to contextually compare the findings with more recent national estimates for progress of public health interventions. This was a retrospective cross-sectional study based on the records of 200 pregnant women who attended the Obstetrics and Gynecology Clinic of Sobi Specialist Hospital, Ilorin, between February and May, 2014. Relevant previously generated laboratory results, including anti-HBc IgM detected using ELISA, alongside data on demographic and risk factors, were extracted and re-analyzed using SPSS version 20. Anti-HBc IgM was used as marker of recent HBV infection, not overall HBV prevalence. An anti-HBc IgM seroprevalence of 18.0% (36/200) was observed, representing the proportion of participants with evidence of recent HBV infection at the time of data collection. The highest positivity of 21.4% was found within the 30-34-year age-group, while the identified significant risk factors included a polygamous family structure (26.7% vs. 15.5% in monogamous families; p=0.002), history of surgery (p=0.003), and traditional circumcision (p=0.001). This retrospective analysis of archived 2014 data suggests a high burden of recent HBV infection among pregnant women in Ilorin at the time of study. The study underscores the need for strengthened antenatal screening, improved vaccination coverage, and updated studies to better define the current epidemiological situation.

Keywords: Hepatitis B virus; Nigeria; Pregnant women; Prevalence; Risk factors; Transmission

Citation: Adeyemi, J.O., Suleiman, M.M., Ariyo, O.G., Lawal, R.T., & Kolawole, O.M. (2026). Retrospective Analysis of Archived Data on Hepatitis B Virus Infection among Pregnant Women in Ilorin, Nigeria, with Contextual Comparison to National Estimates. *Sahel Journal of Life Sciences FUDMA*, 4(2): 66-71. DOI: *https://doi.org/10.33003/sajols-2026-0402-08*

INTRODUCTION

Hepatitis is the infection of the liver that may result from both infectious (e.g., viral hepatitis) and non-infectious causes (e.g., autoimmune diseases, alcohol or drug abuse, genetic disorder). It is one of the major global health concerns (Udeze *et al*., 2011) and can be

transmitted through exposure to infected blood and body fluids, including perinatal transmission from mother to child, unsafe injections, and sexual contact. The virus is also known for its environmental stability, remaining infectious on surfaces for extended periods under favourable conditions (Terrault *et al*., 2018; Than *et al*., 2019).

Hepatitis B virus (HBV) infection is a major global public health challenge and a leading cause of liver cirrhosis and hepatocellular carcinoma. Worldwide, an estimated 292 million people live with chronic HBV infection, and the virus contributes to about 887,000 deaths annually, mostly from complications of chronic liver disease (Razavi-Shearer *et al*., 2018; WHO, 2025). The prevalence of HBV is unevenly distributed, with sub-Saharan Africa bearing a disproportionately high burden, classified as a high-endemicity region. The risk and progression of chronic infection are age-dependent and occur mostly in immunocompromised persons. It is known that the younger an infected person is, the higher the risk of developing chronic Hepatitis B viral infection. Although acute infection is often asymptomatic or presents with mild symptoms in immunocompetent individuals, chronic infection develops in about 90% of infants, 30–50% of teenagers aged five years, and 5–10% adults (Jefferies *et al*., 2018; Terrault *et al*., 2018; CDC, 2020a).

Despite being spread vertically from infected mother to a child, having sex with an infected partner, contacting infected needle sticks or sharp objects; however, HBV is not spread through breastfeeding, hugging, kissing, coughing, and sneezing, or sharing food or drink (CDC, 2020b). A critical population in the HBV transmission cycle is pregnant women, as the virus can be perinatally transmitted from an infected mother to her unborn child or newborn, a transmission route that accounts for a high proportion of chronic infections in endemic areas (Sinai *et al.*, 2024; WHO, 2025). While effective vaccines and antiviral treatments exist, the persistence of HBV is driven by gaps in routine immunization, access to care, and the complex interplay of local risk factors. In Nigeria, recent meta-analyses have estimated the pooled seroprevalence of HBV among pregnant women to be approximately 6.49% (Olakunde *et al*., 2021), providing a valuable national benchmark.

However, national averages can often mask significant subnational heterogeneity, where specific regions may experience hyperendemic conditions that are not reflected in broader estimates. Understanding these local epidemiological patterns is essential for designing targeted public health interventions. While previous studies in Ilorin have reported HBV seroprevalence (Olokoba *et al.,* 2011), there remains value in re-examining historical data to provide insight into past transmission dynamics and risk factors.

Therefore, this retrospective study analyzed archived data from 2014 to determine the burden and risk factors of recent HBV infection among pregnant women in Ilorin, Nigeria. The findings are interpreted in relation to more recent national estimates for contextual perspective only, with recognition of the temporal differences that limit direct comparability. This approach aims to contribute to understanding localized patterns and to inform the need for updated epidemiological studies and targeted public health strategies.

MATERIALS AND METHODS

Study Design and Population

This study used a retrospective cross-sectional analysis of archived data collected in 2014. The dataset comprised of 200 pregnant women, aged 20-39 years, who attended the Obstetrics and Gynecology Clinic of Sobi Specialist Hospital, Ilorin, Nigeria, for antenatal care between February and May 2014. The sample size was calculated using Fischer's formula (Araoye, 2003).

Study Setting

The study was conducted at Sobi Specialist Hospital in Ilorin, Kwara State, Nigeria, a tertiary healthcare facility. Laboratory analyses were originally performed at the Department of Medical Microbiology and Parasitology, University of Ilorin Teaching Hospital (UITH).

Ethical consideration

Ethical approval for this study was gotten from the Ethical Review Committee (ERC) of Sobi Specialist Hospital, Ilorin, and the Kwara State Ministry of Health. As this study involved secondary analysis of anonymized archived data, the requirement for fresh informed consent was waived.

Data Source and Collection

For this retrospective analysis, the secondary data were extracted from archived clinical and laboratory records generated in 2014. The extracted relevant variables included socio-demographic characteristics, potential risk factors and laboratory results.

Laboratory Analysis (Archived Data)

At the time of original data collection in 2014, about 5 mL of intravenous blood was collected from each participant. The serum samples were processed and analyzed for the presence of IgM antibodies to

Hepatitis B core antigen (anti-HBc IgM) using a commercial Enzyme-Linked Immunosorbent Assay (ELISA) kit (AccuDiag™, Diagnostic U.S.A.), strictly following the manufacturer's instructions. In this study, anti-HBc IgM was interpreted as a marker of recent or acute HBV infection, rather than a standalone diagnostic marker for overall HBV infection status.No new laboratory analysis was conducted for this study; all results analyzed were obtained from archived laboratory records.

Data Analysis

Data were analyzed using Statistical Package for the Social Sciences (SPSS) version 20.0. The analysis involved basic statistical methods that remain consistent across software versions. Descriptive statistics (frequencies, percentages, and means) were used to summarize the characteristics of the study population. Associations between categorical variables (e.g., family type, risk factors) and HBV seropositivity were assessed with the Chi-square test. A p-value of less than or equal to 0.05 ($p \leq 0.05$) was considered significant statistically.

RESULTS

Out of the 200 pregnant women tested in 2014, 36(18.0%) had anti-HBc IgM indicating recent HBV infection; while 164(82.0%) were negative. Participants were recruited from routine antenatal clinic attendees and were not pre-selected based on HBV status. Table 1 indicated that the age ranges 20-39 years were tested for anti-HBc IgM. Among the 8 individuals aged 20-24 years (representing 4.0% of the total cohort), 1(12.5%) was positive, 18(16.4%) were positive among aged 25-29 years, while 15(21.4%) were positive among participants aged 30-34 years and 2(16.7%) of participants in the age range 35-39 years were positive (p= 0.374). The majority of the participants were educated up to tertiary level with the highest prevalence of 12(19.0%), followed by the participants with secondary and then primary education respectively; while the non-formally educated group had the lowest prevalence of HBV 3(15.0%) at p=0.913. At significant statistical correlation, highest prevalence was recorded among the participants in polygamous marriage compared to monogamous (p=0.002). Similar statistical significance was also recorded in relation to marital status (p= 0.013).

Figure 1 showed the respondents occupation in different areas; the highest prevalence of 20.9% was observed among participants who were self-employed, while participants that were civil servants and healthcare workers had the prevalence rates of 14.7% and 13.6% respectively. No statistical correlation was recorded for HBV prevalence in relation to the occupation of respondents (p= 0.886). Figure 2 presents influence of selected risk factors on the prevalence of HBV infection where 12(15.4%) of the participants that reported to have been circumcised tested positive to anti-HBc IgM (p=0.001). Out of the 23 participants that reported history of surgery, 4 were anti-HBc IgM positive (p=0.003), while 15.0% prevalence was recorded in the participants who reported blood transfusion (p=0.390). Out of 11 participants who reported gravidity, 2 tested positive to anti-HBc IgM (p=0.001) while none was positive amongst the vaccinated participants.

Table 1: Seroprevalence of HBV in correlation to demographic factors

Variable	Category	Positive n (%)	Negative n (%)	p-value
Age (years)	20–24	1 (12.5)	7 (3.5)	0.374
	25–29	18 (16.4)	92 (46.0)	
	30–34	15 (21.4)	55 (27.5)	
	35–39	2 (16.7)	10 (5.0)	
	Total	**36 (18.0)**	**164 (82.0)**	
Family Type	Polygamous	12 (26.7)	33 (16.5)	0.002
	Monogamous	24 (15.5)	131 (65.5)	
	Total	**36 (18.0)**	**164 (82.0)**	
Marital Status	Single	6 (20.0)	24 (12.0)	0.013
	Married	27 (18.0)	123 (61.5)	
	Divorced	3 (15.0)	17 (8.5)	
	Total	**36 (18.0)**	**164 (82.0)**	
Level of Education	Tertiary	12 (19.0)	51 (25.5)	0.913
	Secondary	16 (18.8)	69 (34.5)	
	Primary	5 (15.6)	27 (13.5)	
	None	3 (15.0)	17 (8.5)	
	Total	**36 (18.0)**	**164 (82.0)**	

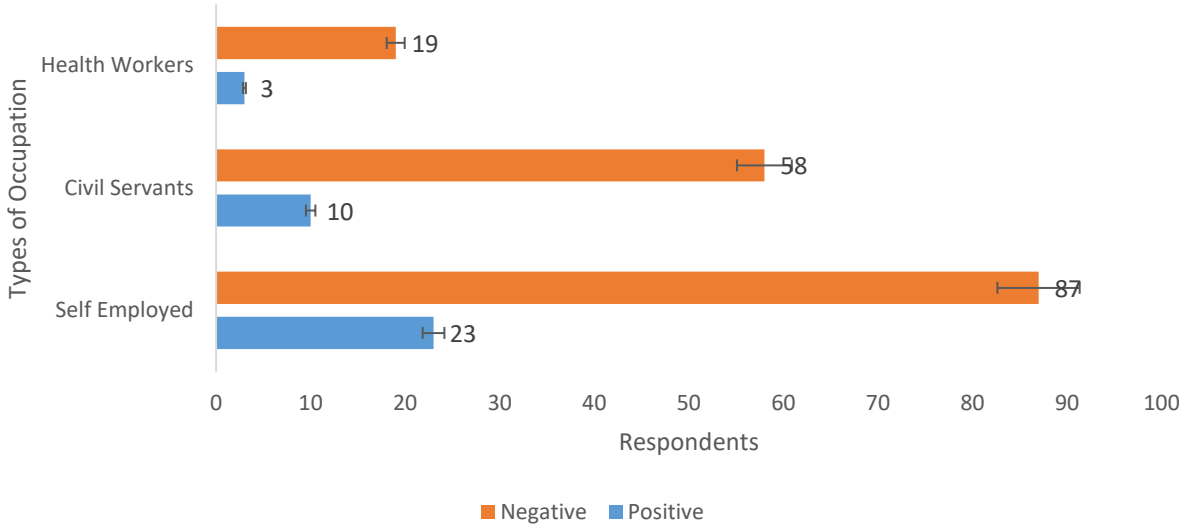

Figure 1: Prevalence of HBV in relation to the occupation of the participants (p=0.886)

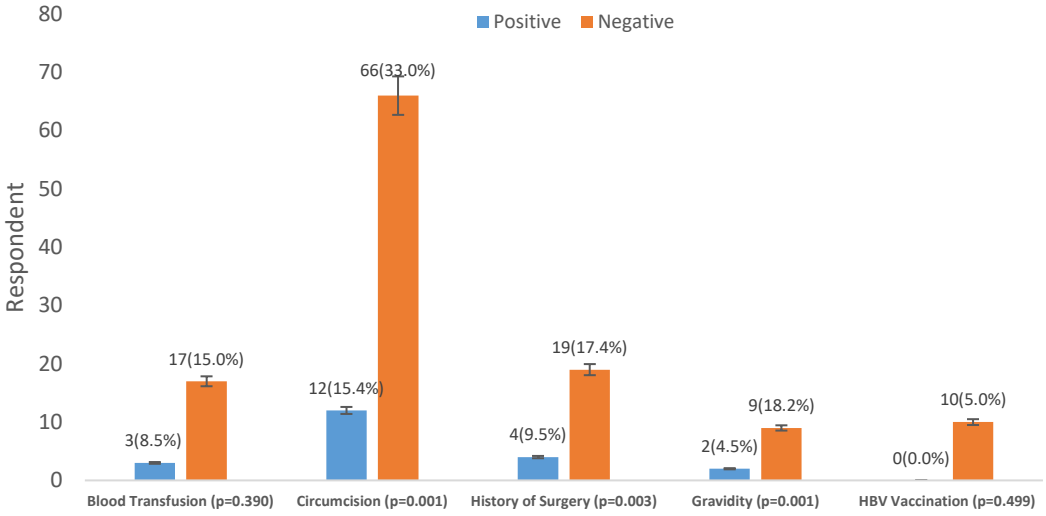

Figure 2: Correlation of risk factors and HBV seropositivity among respondents

DISCUSSION

This study presents a retrospective analysis of archived 2014 data, providing insight into the burden of acute Hepatitis B virus (HBV) infection among pregnant women in Ilorin, Nigeria at the time of data collection. This 18.0% anti-HBc IgM prevalence which not only indicates acute or recent during 2014, but highlights local transmission dynamics. This historical prevalence is higher than the 6.77% and 5.89% pooled prevalence reports of HBV among pregnant women in Africa, although direct comparison with current national (6.49%) or continental estimates should be interpreted cautiously due to the time gap and differences in diagnostic markers (Olakunde *et al.*, 2021; Larebo *et al.*, 2024; Wondmeneh and Mekonnen, 2024). While the 18.0% anti-HBc IgM positivity in 2014 indicates a substantial burden of acute HBV infection among pregnant women at that time, it is important to recognize that national HBV prevalence has likely declined over the past decade due to expanded vaccination programs, improved antenatal screening, and ongoing public health interventions aligned with the WHO 2030 viral hepatitis elimination goals. Therefore, the findings of this study should be interpreted as historical evidence of local transmission dynamics rather than a

reflection of the current prevalence. Comparisons with more recent national estimates are provided solely for contextual understanding of public health progress and its impact prevalence trend.

From the demographic information of participants as related to the transmission dynamics of the infections, the highest rate of positivity was recorded among the participants within 30-34 years of age (21.4%), aligning with the peak age of sexual activity and fertility. This deduction supports the implicated role of sexual intercourse as a risk factor to the spread of Hepatitis B virus and also aligns with a report by Aganga-Williams *et al*. (1999) with peak prevalence among 25-34 years age groups. Olakunde *et al*. (2021) reported no significant difference by marital status, where our study found a statistically significant association of p=0.013 where the single participants had the highest rate of HBV positivity of 20.0%.

Socio-economic and cultural factors also showed significant associations. In our study, prevalence was highest among participants with tertiary (19.0%) and secondary (18.8%) education, a finding likely influenced by the hospital-based, urban setting. This contrasts with the national meta-analysis by Olakunde *et al*. (2021), which found a significantly lower prevalence among pregnant women with at least secondary education. A particularly striking finding was the significantly higher prevalence in women from polygamous families (26.7%) compared to those from monogamous families (15.5%) (p=0.002). This suggests that larger sexual networks substantially increase transmission risk, a finding that correlates with the studies by Udeze *et al*. (2012), Adoga *et al*. (2009) and Odebisi-omokanye *et al*. (2024).

The analysis of specific risk factors in this study further clarifies the possible routes of HBV transmission in the study location. Circumcision alongside the history of surgery among the participants (at p=0.001 and p=0.003 respectively) depicts the continual threat of iatrogenic transmission which is majorly through improper handling or sterilization of instruments, as reported in similar epidemiological studies (Madhava, 2002; Egah *et al*., 2007). A cumulative effect of multiple risk factors was noticed at a significant prevalence of 25.9% among participants with multiple risk factors as compared to others without, and aligns this with the report of Udeze *et al*. (2012). It was however noticed that few evaluated risk factors were not significantly associated with HBV prevalence, suggesting distinct local transmission dynamics in the study location. The participants with history of HBV vaccination had no positive report, affirming the efficacy of vaccination as a primary prevention strategy.

CONCLUSION

This retrospective analysis of archived 2014 data provides insight into the burden of acute HBV infection among pregnant women in Ilorin at that time, highlighting socio-cultural and iatrogenic risk factors that may have contributed to local transmission. The 18.0% anti-HBc IgM positivity reflects recent infection in 2014, and should not be interpreted as the current prevalence. Evidence suggests vaccination as the most effective intervention and an advocacy for public health awareness towards enforcement of universal antenatal screening, and scale-up of routine infant vaccination to address local risk factors.

These findings underscore the importance of prospective surveillance using HBsAg and total HBc markers, longitudinal monitoring over multiple years, and continued public health interventions, including vaccination and antenatal screening, to reduce HBV transmission. Future studies are needed to consecutively assess trends in prevalence and the impact of national HBV control programs.

ACKNOWLEGMENTS

We wish to appreciate the contribution and support of the staff in the Obstetrics and Gynecology Unit of Sobi Specialist Hospital and the Medical Microbiology and Parasitology Unit of University of Ilorin Teaching Hospital.

FUNDING

This study did not receive any grant from funding organizations in the public, commercial, or not-for-profit sectors.

CONFLICT OF INTEREST

The authors state no conflict of interest of any form.

AUTHORS' CONTRIBUTIONS

The first author contributed to the study conception, design, archived data collection and preparation of the manuscript. Proof-reading and additional editing were done by the first and second authors. Third and Fourth authors were also involved in archived data collection and analysis. The Fifth author contributed to the study conception and design. All the authors were involved in the methods used in the study.

REFERENCES

Adoga, M.P., Banwat, E.B., Forbi, J.C., Nimzin, L., Pam, L.R., Gyar, S.D., Agabi, Y.A., Agwale, S.M. (2009). Human immunodeficiency virus, hepatitis B virus and

hepatitis C virus: seroprevalence, co-infection and risk factors among prison inmates in Nassarawa state, Nigeria. *Journal of Infection in Developing Countries,* **3**(7),539-547.

Aganga-Williams, O.M., Akanmu, A.S., Akinsete, A., Njoku, O.S. (1999). Prevalence of hepatitis B surface antigen among women of childbearing age. *African Journal Report*, **3**(1),45-50.

Araoye, M.O. (2003). *Sample size determination. Research methodology with statistics for health and social sciences*, *Ilorin, Nigeria: Nathadex publishers*,pp 118-121.

CDC. (2020a). Interpretation of hepatitis B serological tests results [Internet]. Atlanta (USA): Centers for Disease Control and Prevention; https://www.cdc.gov/hepatitis/hbv/index.htm

CDC. (2020b). Hepatitis B questions and answers for public health professionals [Internet]. Atlanta (USA): Centers for Disease Control and Prevention; https://www.cdc.gov/hepatitis/hbv/hbvfaq.htm

Egah, D.Z., Banwat, E.B., Audu, E.S. (2007). Hepatitis B Surface Antigen, HCV and HIV antibodies in a low risk blood donor group, Nigeria. *East Mediterrean Health Journal*, **13**:961-966.

Jefferies, M., Rauff, B., Rashid, H., Lam, T., Rafiq, S. (2018). Update on global epidemiology of viral hepatitis and preventive strategies. *World Journal of Clinical Cases*, **6**(13),589–599. https://doi.org/10.12998/wjcc.v6.i13.589

Larebo, Y.M., Abebe A.A., Ritbano A.A., Sujit K.B. and Natarajan, G. (2024). Prevalence of hepatitis B virus infection among pregnant women in Africa: A systematic review and meta-analysis. *PLOS ONE,* **19**(7), e0305838. https://doi.org/10.1371/journal.pone.0305838

Madhava, V., Burgress, C. and Drucker, E. (2002). Epidemiology of Chronic Hepatitis C infection in sub-Saharan Africa. *Lancet Infectious Diseases*, **2:**293-302.

Odebisi-Omokanye, M., Udeze, A., Mustapha, S., Ahmad-Tijani, A. O., & Oladimeji, K. M. (2024). Prevalence and Risk Factors of Hepatitis C Infection Among Pregnant Women in Ilorin, Kwara State, Nigeria. *ABUAD International Journal of Natural and Applied Sciences,* **4**(2), 81–87.

Olakunde, B. O., Adeyinka, D. A., Olakunde, O. A., Uthman, O. A., Bada, F. O., Nartey, Y. A., Obiri-Yeboah, D., Paintsil, E., & Ezeanolue, E. E. (2021). A systematic review and meta-analysis of the prevalence of hepatitis B virus infection among pregnant women in Nigeria. *PLOS ONE*, **16**(10) https://doi.org/10.1371/journal.pone.0259218

Olokoba, A. B., Salawu, F. K., Danburam, A., Desalu, O. O., Olokoba, L. B., Emodi, I., Wahab, K. W., Ibrahim, A. O. (2011). Hepatitis B virus infection amongst blood donors in Ilorin, Nigeria: Prevalence and co-infection with human immunodeficiency virus. *International Journal of Medicine and Medical Sciences,* **3**(8), 255–260.

Razavi-Shearer, D., Gamkrelidze, I., Nguyen, M.H., Chen, D.S., Van Damme, P., Abbas, Z., Abdulla, M., Abou Rached, A., Adda, D., Aho, I., *et al*.; (2018). Polaris Observatory Collaborators. Global prevalence, treatment, and prevention of hepatitis B virus infection in 2016: a modelling study. *Lancet Gastroenterology and Hepatology,* **3**(6),383–403.https://doi.org/10.1016/S2468-1253(18)30056-6

Sinai, J., Cohen, E., Terrault, N. A. (2024). Maternal-to-child transmission of hepatitis B virus and hepatitis delta virus. *Clinical Liver Disease*, **24**(3),361–374. https://doi.org/10.1016/j.cld.2024.03.005

Terrault, N.A., Lok, A.S.F., McMahon, B.J., Chang, K.M., Hwang, J.P., Jonas, M.M., Brown, R.S. Jr., Bzowej, N.H., Wong, J.B. (2018). Update on prevention, diagnosis, and treatment of chronic hepatitis B: AASLD 2018 hepatitis B guidance. *Hepatology*, **67**(4),1560–1599. https://doi.org/10.1002/hep.29800

Than, T.T., Jo, E., Todt, D., Nguyen, P.H., Steinmann, J., Steinmann, E., Windisch, M.P. (2019). High environmental stability of Hepatitis B virus and inactivation requirements for chemical biocides. *Journal of Infectious Diseases*, **219**(7),1044–1048.

Udeze, A.O., Aliyu, A.S., Kolawole, O.M., Okonko, I.O., Sule, W.F., Akanbi, K. (2012). Hepatitis B antigenaemia and risk factors of transmission among apparently healthy students of university of Ilorin, Ilorin, Nigeria. *Scientia Africana,* **11**(2),1-8.

Udeze, A.O., Bamidele, R.A., Okonko, I.O., Sule, W.F. (2011). Hepatitis C virus antibody detection among first year students of university of Ilorin, Ilorin, Nigeria. *World Journal of Medical Sciences*. **6**(3),162-167.

WHO, (2025). Hepatitis B: Key facts. https://www.who.int/news-room/fact-sheets/detail/hepatitis-b. Accessed in December, 5 2025.

Wondmeneh, T.G., Mekonnen, A.T. (2024). Epidemiology of hepatitis B virus infection among pregnant women in Africa: a systematic review and meta-analysis. *BMC Infectious Diseases* 24: 921. https://doi.org/10.1186/s12879-024-09839-3