

Prevalence and Predictors of Lifetime Hepatitis B Testing Among Adults in an Urban Market in Ghana

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Research Article

Keywords: Hepatitis B virus, HBV Testing, Screening prevalence, Universal screening, Ghana

Posted Date: August 27th, 2026

DOI: <https://doi.org/10.21203/rs.3.rs-10578042/v1>

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Additional Declarations: No competing interests reported.

Abstract

Background

Hepatitis B Virus (HBV) infection remains a major public health burden in sub-Saharan Africa, with Ghana among the highest-burden countries globally. Despite CDC recommendations for universal hepatitis B screening, testing rates among the general population in Ghana remain poorly characterized. This study assessed the lifetime prevalence of HBV testing and its predictors among adults in an urban market setting in Ghana.

Methods

A cross-sectional study was conducted among 888 adult sellers, buyers, and workers at the Kejetia market in Kumasi, Ghana. Data were collected using structured interviewer-administered questionnaires covering sociodemographic characteristics, hepatitis B testing history, reasons for non-testing, knowledge, and awareness of HBV. Univariate and multivariate logistic regression analyses were performed to identify independent predictors of lifetime HBV testing, with results presented as crude and adjusted odds ratios (cOR and aOR) with 95% confidence intervals.

Results

Of 888 participants, 362 (40.8%) reported that they had tested for HBV at least once in their lifetime, while 526 (59.2%) had never tested. Among those who had never tested, the most commonly reported reason was having no particular reason for not testing, 276 (52.5%), followed by never having heard about HBV testing, 226 (43.0%); financial barriers were the least cited reason, 24 (4.5%). The media was the dominant source of HBV knowledge 547 (69.2%). In multivariate analysis, being older than 30 years (aOR range: 2.29–2.61), having tertiary education (aOR = 2.90, 95% CI: 1.26–6.64), awareness of HBV infection (aOR = 3.33, 95% CI: 1.56–7.10), and having received education or training on hepatitis B (aOR = 6.26, 95% CI: 4.42–8.88) were independently associated with higher odds of HBV testing.

Conclusion

Lifetime HBV testing prevalence among adults in West Africa's largest single market, Kejetia market, remains suboptimal relative to global screening recommendations. Low motivation and awareness deficit, rather than financial barriers, constitute the primary drivers of non-testing in this population. Sustained, media-driven public health campaigns explicitly promoting the importance of HBV testing are urgently needed to close the testing gap and advance Ghana's hepatitis B elimination agenda.

Background

Viral Hepatitis remains one of the most significant infectious disease threats to global public health, with an estimated number of deaths rising from 1.1 million in 2019 to 1.3 million in 2022, with hepatitis B alone accounting for 83% of these deaths[1]. An estimated 254 million people are living with chronic hepatitis B virus (HBV); however, only 13% of these people had been diagnosed at the end of 2022, leaving the vast majority unaware of their infection status and unable to seek treatment [1]. The WHO African Regions continue to account for the highest burden of new hepatitis B infection worldwide[1, 2].

In response to this growing burden, the WHO's Global Health Sector Strategy has set ambitious targets to reduce hepatitis B infections to 170,000 new cases annually and hepatitis B-related deaths to 310,000 by 2030[3]. However, without urgent and sustained action, viral hepatitis is projected to cause an additional 9.5 million new infections, 2.1 million liver cancer cases, and 2.8 million deaths by 2030[1]. To prevent these outcomes, the WHO recommends expanding access to high-quality, affordable viral hepatitis testing, including community-based screening approaches that can reach populations outside formal healthcare settings[1].

The United States Viral Hepatitis National Strategic Plan also calls for an increase in the proportion of persons with HBV infection who are aware of their infection to move from 32% to 90% by 2030[4]. To reach this goal, the Centers for Disease Control and Prevention (CDC) updated its 2008 recommendation from risk-based testing to universal hepatitis B virus screening for all adults aged 18 years or older at least once in their lifetime[5]. In settings with intermediate or high HBV surface antigen (HBsAg) seroprevalence of 2% or above in the general population, a threshold Ghana far exceeds, the WHO specifically recommends that all adults have access to and be offered HBsAg testing with linkage to prevention, care, and treatment[6].

Ghana is among the 38 countries accounting for nearly 80% of all viral hepatitis infections and deaths worldwide[1]. This positions the country as a priority setting for hepatitis B elimination efforts. Systematic reviews and meta-analyses have estimated HBV prevalence rates of 12.3% and 14.4% among the general population in Ghana, making it crucial to assess HBV testing and awareness rates[7, 8]. Screening for hepatitis B has been established as an effective way to track the burden of infection, confirm immunity, break the transmission cycle by identifying persons with chronic HBV infection, and reduce the risk of progression to hepatocellular carcinoma through timely medical treatment[9–11].

Given the CDC's recommendation for universal lifetime hepatitis B screening for all adults, it is concerning that less than 1% of people living with hepatitis B in sub-Saharan Africa have tested and are aware of their HBV status, an estimate that is broadly applicable to Ghana's general population[12]. Compounding this challenge, hepatitis B testing, vaccination, and treatment in Ghana incur significant out-of-pocket expenses[13, 14]. This creates additional barriers to testing uptake that disproportionately affect economically vulnerable populations.

Despite the clear public health imperative for universal HBV screening, evidence on testing uptake and its determinants among high-risk adult populations in Ghana remains limited. The few studies conducted in Ghana have identified knowledge of HBV infection, knowing someone living with hepatitis B,

occupational group, wealth status, and educational level as significant predictors of HBV testing[15, 16]. While these studies have made important contributions to understanding HBV testing behaviours in Ghana, they have largely been conducted at specific geographic locations or among specific populations, such as healthcare workers and students. Notably, adult market workers and buyers who frequent large urban markets remain largely underrepresented in hepatitis B testing research in Ghana.

This study, therefore, sought to assess the prevalence of lifetime hepatitis B and its independent predictors among adults in Kejetia market, the largest market in West Africa. The findings provide population-level evidence that can inform targeted interventions and contribute to Ghana's progress toward the WHO and CDC universal hepatitis B screening goals.

Materials and methods

Study Design

This study employed a descriptive cross-sectional analytical design to assess the prevalence of lifetime hepatitis B virus (HBV) testing and its independent predictors among adults aged 18 years and above at the Kejetia market in Kumasi, Ghana. Data was collected from December 2024 to January 2025. A cross-sectional design was considered appropriate as it allowed the simultaneous assessment of HBV testing status and its associated factors across a large and diverse adult population within a defined timeframe. The study assessed the hepatitis B testing history, knowledge of HBV infection, perceptions towards testing, and barriers to HBV testing.

Study Setting

The study was conducted at the Kejetia market in Kumasi, Ghana. Kumasi is the second largest city in Ghana and the commercial capital of the Ashanti Region. It serves as a major hub for trade and commerce. The Kejetia market is West Africa's largest single market, attracting over a million visitors daily. The market spans over 12 hectares of land and is home to more than 20,000 traders selling a wide range of goods and providing diverse kinds of services[17]. The market's diverse and crowded nature made it an ideal location for this study. The market provides access to a broad range of individuals, particularly adults from Ghana.

Study Population, Inclusion, and Exclusion Criteria

The study population included adults who actively engaged in selling, buying, and work-related activities within the market. The participants were drawn from nine occupational groups that reflect the primary workforce composition of the market. This includes butchers and meat sellers, drivers and mates, fishmongers, food vendors, general goods store keepers, mobile workers (hawkers), tailors and seamstresses, market porters and buyers.

Only participants who were 18 years and older, present and actively working or trading within the market at the time of data collection, able to understand and communicate in English or Twi, and provided written informed consent to participate in the study were eligible to be included in the study.

Participants were excluded if they were below 18 years, unable to understand or communicate in English or Twi, or unable to provide informed consent due to illness or cognitive impairment. Participants were also excluded if they were recruited in the study at a different section of the market to avoid duplicate enrolment.

Sample Size Estimation

The minimum required sample size was determined using Cochran's formula for single proportions: $n(\text{sample size}) = Z^2P(1-P)/d^2$ [18], where $Z = 1.96$ (z-score that corresponds with 95% confidence level), $P = 0.28$ (HBV testing prevalence of 28% reported among adults in Ghana[16], and $d = 0.05$ (5% margin of error). This yielded a minimum sample size of 310. To account for the design effect due to stratified sampling, the sample size was doubled to 620, and a further 10% contingency was added to accommodate potential non-response, giving a final minimum required sample size of 682 participants. The final enrollment of 888 participants exceeded this minimum sample size, thereby enhancing the statistical power of prediction.

Sampling Procedure

A proportionate stratified random sampling technique was employed to select the study participants. First, the market was stratified into nine mutually exclusive occupational groups: butchers and meat sellers, drivers and mates, fishmongers, food vendors, general goods store keepers, mobile workers (hawkers), tailors and seamstresses, market porters and buyers. The number of participants allocated to each stratum was determined proportionately to the size of that occupational group. Within the Kejetia market, each of the occupational groups operates within its own distinct physical section of the market, and these sections served as the natural boundaries for each stratum, with the exception of mobile workers and buyers. Research assistants moved systematically from stall to stall along each row of the designated occupational stratum and approached every individual they encountered and recruited those who met the inclusion criteria, until the predetermined number of participants for that stratum was reached. Mobile workers(hawkers) and buyers did not have fixed physical sections, as these individuals moved throughout the market in the course of their activities, and thus these participants were recruited on an opportunistic basis. Despite these differences in recruitment approach for these two groups, the same eligibility criteria were applied consistently across all strata. This systematic within-stratum approach, adapted appropriately for each occupational group, ensured that every eligible individual encountered had an equal opportunity to participate, minimizing selection bias and enhancing representativeness of the final sample.

Data Collection

Data were collected using a pretested, structured, and interviewer-administered questionnaire designed to capture demographic and occupational data, level of awareness of HBV infection, HBV testing status, knowledge, perceptions, and barriers to testing. The questionnaire was subject to expert review. The questionnaire was revised based on the experts' suggestions and the outcome of the pretesting procedure. Trained research assistants conducted these face-to-face interviews with participants. Questionnaires were administered in English and Twi. The questionnaire used in this study is presented in a supplementary material (S1 File)

HBV testing history was primarily based on participants' self-reporting. Nonetheless, to improve accuracy, participants were probed about the number of tests done, the procedure for the test, the results of the test, and vaccination history, since testing is required prior to the initiation of vaccination.

Study variables and measurements

Hepatitis B testing status was the dependent variable, which had a binary outcome (yes or no). The independent variables included socio-demographic factors (age, gender, educational level, work type, place of commute to work), having a close person with hepatitis B infection, and having received education/training on hepatitis B infection.

Data Analysis

Data were entered into Microsoft Excel 2019 and analyzed using SPSS version 26 and GraphPad Prism version 8. Descriptive statistics (frequencies, percentages) were used to summarize participant characteristics. Chi-square tests were used to examine associations between independent variables and hepatitis B testing status. Logistic regression analysis was performed to identify independent predictors of hepatitis B testing status. Crude odds ratios (cOR) and adjusted odds ratios (aOR) with 95% confidence intervals (CI) were reported. Statistical significance was defined as a p-value of less than 0.05.

Results

Socio-demographic characteristics of the study participants

Most of the participants were ≤ 30 years 361 (40.7%), and were females 565 (63.6%). Majority of the study participants had only basic education 383 (43.1%), and lived in urban areas 664 (74.8%). Most of the participants were general goods store keeper 200 (22.5%). Most of the participants were aware of hepatitis B infection 790 (89.0%), and did not have a close person living with Hepatitis B infection 774

(87.2%). Majority of the study participants had not received education/training on Hepatitis B infection, 583 (65.7%) (Table 1.0)

Table 1.0
Socio-demographic characteristics of the study participants

Variables	Frequency (n = 888)	Percentage (%)
Age Group		
≤ 30 years	361	40.7
31–40 years	170	18.1
41–50 years	192	21.6
≥ 51 years	165	18.6
Gender		
Female	565	63.6
Male	323	36.4
Marital Status		
Co-Habiting	108	12.2
Divorced	26	2.9
Married	441	49.7
Single	279	31.4
Widowed	34	3.8
Religion		
Christian	659	74.2
Islamic	208	23.4
Non-Religious	21	2.4
Region		
Ashanti	493	55.5
Northern	137	15.4
Upper East	79	8.9
Others	179	20.2
Educational Level		
No Education	82	9.2
Data is presented as frequency (%)		

Variables	Frequency (n = 888)	Percentage (%)
Age Group		
Basic	383	43.1
Secondary	314	35.4
Tertiary	109	12.3
Residence		
Rural	224	25.2
Urban	664	74.8
Work Type		
Butchers and meat sellers	86	9.7
Drivers and mates	29	3.3
Fish mongers	44	5.0
Food vendors	133	15.0
General goods store keeper	200	22.5
Market porters	77	8.7
Mobile workers (Hawkers)	68	7.7
Tailors and seamstress	105	11.8
Buyers	146	16.4
Awareness of Hepatitis B infection		
No	98	11.0
Yes	790	89.0
Have close person with Hepatitis B infection		
No	774	87.2
Yes	114	12.8
Received education/training on Hepatitis B infection		
No	583	65.7
Yes	305	34.3
Data is presented as frequency (%)		

Association between socio-demographic characteristics and hepatitis B testing

There was a significant association between age group ($p < 0.001$), marital status ($p < 0.001$), religion ($p < 0.001$), region ($p = 0.004$), educational level ($p < 0.001$), residence ($p = 0.024$), work type ($p < 0.001$), awareness of hepatitis B ($p < 0.001$), have close person with hepatitis B infection ($p < 0.001$), have received education/training on hepatitis B infection ($p < 0.001$) and hepatitis B testing status. Gender ($p = 0.276$) was not significantly associated with hepatitis B testing status (Table 2.0)

Table 2.0
Association between background characteristics and hepatitis B testing

Variables	Hepatitis B testing status		
	No (n = 526)	Yes (n = 362)	p-value
Age Group			0.001
≤ 30 years	275(76.2)	86(23.8)	
31–40 years	87(51.2)	83(48.8)	
41–50 years	94(49.0)	98(51.0)	
≥ 51 years	70(42.4)	95(57.6)	
Gender			0.276
Female	327(57.9)	238(42.1)	
Male	199(61.6)	124(38.4)	
Marital Status			0.001
Co-Habiting	77(71.3)	31(28.7)	
Divorced	10(38.5)	16(61.5)	
Married	224(50.8)	217(49.2)	
Single	197(70.6)	82(29.4)	
Widowed	18(52.9)	16(47.1)	
Religion			0.001
Christian	365(55.4)	294(44.6)	
Islamic	144(69.2)	64(30.8)	
Non-Religious	17(81.0)	4(19.0)	
Region			0.004
Ashanti	273(55.4)	220(44.6)	
Northern	99(72.3)	38(27.7)	
Upper East	44(55.7)	35(44.3)	
Others	110(61.5)	69(38.5)	
Educational Level			0.001
No Education	57(69.5)	25(30.5)	

Variables	Hepatitis B testing status		
	No (n = 526)	Yes (n = 362)	p-value
Age Group	0.001		
Basic	224(58.5)	159(41.5)	
Secondary	199(63.4)	115(36.6)	
Tertiary	46(42.4)	63(57.8)	
Residence	0.024		
Rural	147(65.6)	77(34.4)	
Urban	379(57.1)	285(42.9)	
Work Type	0.001		
Butchers and meat sellers	52(60.5)	34(39.5)	
Drivers and mates	21(72.4)	8(27.6)	
Fish mongers	18(40.9)	26(59.1)	
Food vendors	73(54.9)	60(45.1)	
General goods store keeper	106(53.0)	94(47.0)	
Market porters (Kayaye)	60(77.9)	17(22.1)	
Mobile workers (Hawkers)	48(70.6)	20(29.4)	
Tailors and seamstresses	56(53.3)	49(46.7)	
Buyers	92(63.0)	54(37.0)	
Awareness of Hepatitis B	0.001		
No	89(90.8)	9(9.2)	
Yes	437(55.3)	353(44.7)	
Have close person with HBV infection	0.001		
No	477(61.6)	297(38.4)	
Yes	49(43.0)	65(57.0)	
Received education/training on Hepatitis B	0.001		
No	440(75.5)	143(24.5)	
Yes	86(28.2)	219(71.8)	

Data is presented as frequency (%). p value < 0.05 was considered statistically significant for hepatitis B testing status. The bold values indicate p values which are statistically significant for hepatitis B testing status.

Hepatitis B Testing Practices, Occupational Distribution, and Sources of Information Among Study Participants

Out of the total participants, 362 (40.8%) reported that they have tested for hepatitis B infection before, while 526 (59.2%) have not. Among those who have not tested for hepatitis B infection before, majority 276 (52.5%) of them stated that they have no reason for not testing for hepatitis B infection. About 226 (43.0%) them stated that they have not heard about hepatitis B testing before. The least recorded reason was about financial concerns 24 (4.5%) (Fig. 1)

The distribution of hepatitis B testing varied by the occupation of the participants in this study. The highest proportion of those tested was general goods storekeepers 94 (26.0%), followed by food vendors, 60 (16.6%), and buyers 54 (14.9%). Lower testing rates were seen among drivers/mates 8 (2.2%) and market porters 17 (4.7%) (Fig. 2).

Among those who have knowledge of Hepatitis B infection, media was the dominant source 547 (69.2%), followed by hospital 126 (15.9%), family/friends 74 (19.4%), and church/ mosque 43 (5.4%) (Fig. 3).

Univariate and multivariate logistic regression model of background characteristics as predictors of Hepatitis B testing status among the study participants

In the univariate logistic regression model, age group, marital status, religion, educational level, residence, awareness of hepatitis B infection, have close person with hepatitis B infection, have received education/training on hepatitis B infection were predictors of Hepatitis B testing status (Table 3.0).

In the multivariate logistic regression model, participants between 31–40 years (aOR = 2.595, 95% CI [1.572–4.285], $p=0.001$), 41–50 years (aOR = 2.239, 95% CI [1.313–4.004], $p = 0.004$) and ≥ 51 years (aOR = 2.607, 95% CI [1.390–4.889], $p = 0.003$) had increased odds of testing for Hepatitis B infection compared to those less than 30 years. Tertiary education (aOR = 2.896, 95% CI [1.263–6.644], $p = 0.012$) was almost 3 times more likely to test for Hepatitis B infection compared to those with no education. Awareness (aOR = 3.331, 95% CI [1.562–7.104], $p = 0.002$) and training/education (aOR = 6.261, 95% CI [4.415–8.879], $p=0.001$) on Hepatitis B infection were associated with increased odds of testing for Hepatitis B infection compared to those without knowledge and those without education/training on Hepatitis B infection respectively (Table 3.0).

Table 3.0

Univariate and multivariate logistic regression model of background characteristics as predictors of Hepatitis B testing status among the study participants

Variables	cOR	p-value	aOR	p-value
Age Group				
≤ 30 years	1.0			
31–40 years	0.328(0.223–0.482)	0.001	2.595(1.572–4.285)	0.001
41–50 years	0.300(0.207–0.435)	0.001	2.293(1.313–4.004)	0.004
≥ 51 years	0.230(0.156–0.341)	0.001	2.607(1.390–4.889)	0.003
Marital Status				
Co-Habiting	1.0			
Divorced	0.252(0.103–0.615)	0.002	2.560(0.894–7.331)	0.080
Married	0.416(0.263–0.656)	0.001	1.735(0.968–3.112)	0.064
Single	0.967(0.593–1.579)	0.894	1.152(0.647–2.054)	0.630
Widowed	0.453(0.205–1.000)	0.050	1.049(0.380–2.898)	0.926
Religion				
Christian	0.292(0.097–0.878)	0.028	2.273(0.613–8.431)	0.220
Islamic	0.529(0.171–1.636)	0.269	1.451(0.363–5.798)	0.599
Non-Religious	1.0			
Region				
Ashanti	0.778(0.549–1.104)	0.160	1.050(0.673–1.637)	0.830
Northern	1.634(1.011–2.641)	0.045	1.293(0.656–2.546)	0.458
Upper East	0.789(0.461–1.348)	0.385	1.697(0.809–3.563)	0.162
Others	1.0			
Educational Level				
No Education	1.0			
Basic	0.618(0.370–1.031)	0.065	1.416(0.729–2.751)	0.304
Secondary	0.759(0.450–1.281)	0.302	1.484(0.731–3.013)	0.275
Tertiary	0.320(0.175–0.586)	0.001	2.896(1.263–6.644)	0.012
Residence				

Variables	cOR	<i>p</i> -value	aOR	<i>p</i> -value
Age Group				
Rural	1.0			
Urban	0.697(0.508–0.955)	0.025	0.831(0.556–1.242)	0.367
Awareness on Hepatitis B infection				
No	1.0			
Yes	1.25(0.062–2.252)	0.001	3.331(1.562–7.104)	0.002
Have close person with Hepatitis B infection				
No	1.0			
Yes	0.469(0.315–0.699)	0.001	1.536(0.959–2.462)	0.074
Received education/training on Hepatitis B infection				
No	1.0			
Yes	0.128(0.093–0.174)	0.001	6.261(4.415–8.879)	0.001

1.0, reference. Binary logistic regression analysis was performed to obtain odds ratios. *p* value of < 0.05 was considered statistically significant for hepatitis B testing status. The boldened values indicate *p* values which are statistically significant for hepatitis B testing status. Abbreviations: aOR, adjusted odds ratio; CI, confidence interval; cOR, crude odds ratio.

Discussion

Our study assessed the prevalence of lifetime HBV testing and its associated predictors among adults at the Kejetia market in Ghana, providing critical evidence to evaluate the adherence to the CDC recommendation for universal hepatitis B screening. Our findings reveal that only 362 (40.8%) participants had tested for HBV infection at least once in their lifetime, indicating that approximately 6 in 10 of our study participants (59.2%) had never tested for HBV. This substantial testing gap underscores a critical public health challenge in Ghana and highlights the urgent need for targeted intervention aligned with global elimination goals.

The lifetime HBV testing prevalence of 40.8% observed in our study notably exceeds the rates reported in previous studies, including 20% among high school students in Ghana [19], 13.3% among psychoactive users in Uganda[20], 32.6% among adult inpatients in Accra, Ghana[21] and 28% among adults in the Upper Region of Ghana, with traders and farmers being significantly less likely to get tested voluntarily[16]. In contrast, the prevalence observed in our study falls below rates reported among more educated or health-exposed populations, such as 51.6% among Ghanaian university students [22], 49.6% among public health students in Ghana[23], 89.0% among nursing students in Northwest Ghana[24], and

76.4% among healthcare workers in Ghana[25]. Collectively, these comparisons suggest that HBV testing in Ghana remains disproportionately concentrated among individuals with higher educational levels and occupational exposure, leaving a large proportion of the general adult population untested and potentially undiagnosed.

Notably, among participants who had never tested for HBV, the most commonly reported reason was having no particular reason for not testing, 276 (52.5%), followed by never having heard about hepatitis B testing, 226 (43.0%); financial barriers were the least cited reason, 24 (4.5%). These findings suggest that the primary obstacle to HBV testing in this population is not cost but a low motivation and high awareness gap, with participants who had knowledge of hepatitis B infection being over three times more likely to have tested compared to those without such exposure. Health awareness campaigns must therefore emphasize the importance and availability of HBV testing to improve testing uptake.

In our study, being above 30 years was identified as a significant predictor of HBV testing. Participants aged 31 years and above all demonstrated higher odds of having tested for HBV compared to those aged 30 years and below. These findings are consistent with a study among Public Health students in Ghana[23]. This age-related disparity may be attributed to the younger generation's perception of being in good health, leading to lower engagement in voluntary screening activities and regular hospital check-ups[26]. This highlights the need for targeted interventions to encourage younger adults to prioritize preventive care and screening for hepatitis B.

Having education or training on hepatitis B infection was the most significant predictor of HBV testing among our study participants. We found that those with HBV-specific education or training were over six times more likely to have tested consistent with previous studies in Ghana[15], Canada [27], and the United States[28]. We also found that knowledge of hepatitis B infection was mainly acquired through the media. This shows that when a more concerted effort is placed on public dissemination of hepatitis-related information via media, it could significantly boost awareness and testing. Similarly, our study reveals that those with a tertiary education were nearly three times more likely to have tested for HBV as compared to those with no education, consistent with a previous study in Los Angeles[29]. These findings reinforce the need for more simplified messaging about HBV testing to adults with basic or no education, who constituted over 52% of our study participants.

Having a close person living with hepatitis B infection was also significantly associated with higher odds of testing. This is in tandem with previous reports among adults in Zambia[30], Ghana[15], and Asians living in the United States[31]. This could be due to the increased perception of risk associated with knowing someone affected. Participants residing in urban areas also had higher odds of testing for HBV as compared to their rural counterparts. This disparity may stem from the greater availability of health education initiatives and healthcare access in urban areas compared to rural settings.

Among the occupational groups, general storekeepers 94 (26.0%) and food vendors 60 (16.6%) demonstrated the highest proportions tested, while market porters 17 (4.7%) and drivers and their mates 8 (2.2%) had the lowest testing rates. These findings may be attributed to the demanding work

schedules of drivers and mates, as well as market porters, which often require them to be mobile, making it difficult for them to patronize fixed-site screening opportunities. A more flexible approach, such as offering rapid point-of-care testing at marketplaces and transport stations, may bridge this testing gap.

Strengths and Limitations

This study has limitations, including its cross-sectional design, which precludes the determination of causality between predictors and HBV testing rates. Additionally, recall bias and social desirability bias could lead to over-or underreporting of testing history. Despite these limitations, this study provides valuable population-level evidence on HBV testing prevalence and its predictors among a hard-to-reach occupational group in Ghana. The study also has broader regional and country policy relevance since it was conducted in one of the largest and most densely populated markets in West Africa

Conclusion

This study demonstrates that lifetime hepatitis B testing among adults in West Africa's largest single market remains suboptimal, with nearly 60% of participants never having been tested, revealing a significant gap in adherence to CDC recommendations for universal hepatitis B screening among adults. Age above 30 years, having HBV-specific knowledge or training, awareness of HBV infection, having a tertiary education, and having a close person with hepatitis B infection were identified as significant predictors for lifetime HBV testing. Lack of motivation and awareness gaps, rather than financial constraints, constitute the primary barrier to HBV testing in this population, with the media being the dominant source of HBV knowledge. Sustained, media-driven public health campaigns explicitly promoting the importance of HBV testing are urgently needed to close the testing gap and advance Ghana's hepatitis B elimination agenda.

Abbreviations

CDC
Centres for Disease Control
HBV
Hepatitis B virus
HBsAg
Hepatitis B surface antigen
SPSS
Statistical Package for the Social Sciences
WHO
World Health Organization

Declarations

Ethics approval and consent to participate

Ethical approval for the study was obtained from the Committee on Human Research, Publication and Ethics (CHRPE/AP/180/24), School of Medical Sciences, Kwame Nkrumah University of Science and Technology (KNUST). The study site approval letter was obtained from the management of Kejetia Market. Informed consent was secured in writing from all recruited participants. Participant confidentiality was ensured by anonymizing data and restricting access to the research team. Participation was voluntary, and participants had the right to withdraw from the study at any stage of the data collection process without penalty. The study was conducted in accordance with the Declaration of Helsinki.

Consent for publication

Not applicable

Availability of data and materials

Data is available from the corresponding author upon reasonable request

Competing interest

Not applicable

Funding

The authors received no funding for this study.

Authors' contributions

JKA, MAO and DKO, DKOB did the conceptualization. COB, PT, MAO, GYS, SYNA, DKO DDN, EOG, NDA, EAO, RAA and DW did the investigation. GYS, MAO and DKO did the formal analysis. JKA, DKOB, AAA, FKB, MAO, AAR and DKO put resources together for the study. COB, MAO, GYS and DKO wrote the original draft. The manuscript was reviewed by all authors.

Acknowledgements

We are very grateful to the Kejetia management for their support during this study. We also express our deep appreciation to all individuals who willingly participated in this study.

References

1. World Health Organization. Global hepatitis report 2024: action for access in low-and middle-income countries. World Health Organization. 2024 Apr 9. <https://www.who.int/publications/i/item/9789240091672>; 2024.

2. Hsu Y-C, Huang DQ, Nguyen MH. Global burden of hepatitis B virus: current status, missed opportunities and a call for action. *Nat Rev Gastroenterol Hepatol*. 2023;20:524–37. <https://doi.org/10.1038/s41575-023-00760-9>.
3. Organization WH. Global health sector strategies on, respectively, HIV, viral hepatitis and sexually transmitted infections for the period 2022–2030. World Health Organization; 2022.
4. US Department of Health and Human Services. Viral hepatitis national strategic plan for the United States: a roadmap to elimination (2021–2025) 2025.
5. Control D. Screening and Testing for Hepatitis B Virus Infection: CDC Recommendations — United States, 2023 2023;72.
6. Hepatitis B. accessed April 16, n.d. <https://www.who.int/news-room/fact-sheets/detail/hepatitis-b> (2025).
7. Ofori-Asenso R, Agyeman AA. Hepatitis B in Ghana: A systematic review & meta-analysis of prevalence studies (1995–2015). *BMC Infect Dis* 2016;16. <https://doi.org/10.1186/s12879-016-1467-5>
8. Abesig J, Chen Y, Wang H, Mwekele F, Irene S, Wu XY. Prevalence of viral hepatitis B in Ghana between 2015 and 2019: A systematic review and meta-analysis. *PLoS ONE*. 2020;15:1–16. <https://doi.org/10.1371/journal.pone.0234348>.
9. Su S, Wong WC, Zou Z, Cheng DD, Ong JJ, Chan P, et al. Cost-effectiveness of universal screening for chronic hepatitis B virus infection in China: an economic evaluation. *Lancet Glob Heal*. 2022;10:e278–87. [https://doi.org/10.1016/S2214-109X\(21\)00517-9](https://doi.org/10.1016/S2214-109X(21)00517-9).
10. Krist AH, Davidson KW, Mangione CM, Barry MJ, Cabana M, Caughey AB, et al. Screening for Hepatitis B Virus Infection in Adolescents and Adults: US Preventive Services Task Force Recommendation Statement. *JAMA*. 2020;324:2415–22. <https://doi.org/10.1001/JAMA.2020.22980>.
11. Obeng MA, Okwan DK, Adankwah E, Owusu PK, Gyamerah SA, Duah KB et al. Seroconversion and Prevalence of Hepatitis B Surface Antigen among Vaccinated Health Care Workers in Ashanti Region, Ghana 2023;2023. <https://doi.org/10.1155/2023/2487837>
12. Béguelin C, Fall F, Seydi M, Wandeler G. The current situation and challenges of screening for and treating hepatitis B in sub-Saharan Africa. *Expert Rev Gastroenterol Hepatol*. 2018;12:537–46. <https://doi.org/10.1080/17474124.2018.1474097>.
13. Obeng MA, Okwan DK, Boateng CO, Scott GY, Attah JK, Ahadzie SYN, et al. Towards hepatitis B elimination in Ghana: vaccination coverage and its predictors among informal sector workers in Kejetia, Kumasi, Ghana. *PLoS ONE*. 2026;21:e0334205. <https://doi.org/10.1371/journal.pone.0334205>.
14. Nartey YA, Okine R, Seake-Kwawu A, Ghartey G, Asamoah YK, Senya K, et al. A nationwide cross-sectional review of in-hospital hepatitis B virus testing and disease burden estimation in Ghana, 2016–2021. *BMC Public Health*. 2022;22:1–15. <https://doi.org/10.1186/s12889-022-14618-3>.

15. Ampong C, Sarah A, Fleuren ES, Florence B, Ruiter RAC. Correlates of hepatitis B testing in Ghana: The role of knowledge, stigma endorsement and knowing someone with hepatitis B 2022;4564–73. <https://doi.org/10.1111/hsc.13860>
16. Anfaara FW, Atuoye KN, Mkandawire P, Luginaah I. Factors associated with voluntary testing for HBV in the Upper West Region of Ghana. *Health Place*. 2018;54:85–91. <https://doi.org/10.1016/j.healthplace.2018.09.011>.
17. Mensah F, Shi G, Yu Q, Boadi EB, Andam FA, Bofah NA. The Impact of Resettlement in Urban Market Redevelopment on Income Inequality, Its Determinants, and Implications for the Resettled Population: Applying the Kejetia New Market Exemplar, Ghana. *Sustain* 2022;14. <https://doi.org/10.3390/su142416682>
18. Cochran WG. *Sampling Techniques*, Third Edition. 1963.
19. Adam A, Fusheini A, Knowledge. risk of infection, and vaccination status of hepatitis B virus among rural high school students in Nanumba North and South Districts of Ghana. *PLoS ONE*. 2020;15:1–15. <https://doi.org/10.1371/journal.pone.0231930>.
20. Ssekamatte T, Isunju JB, Mutyoba JN, Tetui M, Mugambe RK, Nalugya A, et al. Predictors of Hepatitis B screening and vaccination status of young psychoactive substance users in informal settlements in Kampala, Uganda. *PLoS ONE*. 2022;17:1–17. <https://doi.org/10.1371/journal.pone.0267953>.
21. Jingbeja E, Alhassan Y, Peazang Ibrahim GJ, Boachie J, Addo-Lartey A. Hepatitis B virus testing, vaccination, and hepatitis B surface antigen prevalence among adult inpatients at an urban polyclinic in Accra, Ghana: a cross-sectional study. *Infect Prev Pract*. 2026;8:100519. <https://doi.org/10.1016/j.infpip.2026.100519>.
22. Abban E, Owusu E, Kwakye-Abebrese B, Koduah B, Boateng H, Korsah EE et al. Knowledge and Testing of Hepatitis B Virus Infection and Vaccination Awareness among University Students in Kumasi, Ghana: A Cross-Sectional Study. *Scientifica (Cairo)* 2024;2024. <https://doi.org/10.1155/2024/4052837>
23. Kumah A, Tormeti E, Dzando G, Nutakor HS, Amenuvor WAY, Anagblah CK, et al. Knowledge, Attitude and Practices towards Hepatitis B Infection and Vaccination among Public Health Students in Ghana. *Open J Prev Med*. 2021;11:43–53. <https://doi.org/10.4236/ojpm.2021.111004>.
24. Balegha AN. Factors influencing the utilisation of anti-HBs titre testing services among nursing students in Northwest Ghana: A cross-sectional study. *PLOS Glob Public Heal*. 2024;4:e0003160. <https://doi.org/10.1371/journal.pgph.0003160>.
25. Okwan DK, Scott GY, Takyi P, Boateng CO, Antwi PB, Abrampah AA, et al. A multi-centre cross-sectional study on hepatitis B vaccination coverage and associated factors among personnel working in health facilities in Kumasi. *Ghana*. 2024;2024:1–30. <https://doi.org/10.1155/2024/8899638>.
26. Sira J, Brown M, Ambegaokar S, Modin L, Kelly DA. The necessity of education and hepatitis B vaccination for young people: A study of high risk behaviour for blood borne viruses in the United

- Kingdom. J Child Heal Care. 2019;23:437–45. <https://doi.org/10.1177/1367493519831499>.
27. Li D, Tang T, Patterson M, Ho M, Heathcote J, Shah H. The impact of hepatitis B knowledge and stigma on screening in Canadian Chinese persons. Can J Gastroenterol. 2012;26:597–602. <https://doi.org/10.1155/2012/705094>.
 28. Calderon Y, Cowan E, Schramm C, Stern S, Brusalis C, Iscoe M, et al. HCV and HBV testing acceptability and knowledge among urban emergency department patients and pharmacy clients. Prev Med (Baltim). 2014;61:29–33. <https://doi.org/10.1016/j.ypmed.2013.12.026>.
 29. Bastani R, Glenn BA, Maxwell AE, Jo AM, Herrmann AK, Crespi CM, et al. Cluster-randomized trial to increase hepatitis B testing among Koreans in Los Angeles. Cancer Epidemiol Biomarkers Prev. 2015;24:1341–9. <https://doi.org/10.1158/1055-9965.EPI-14-1396>.
 30. Franklin S, Mouliom A, Sinkala E, Kanunga A, Helova A, Dionne-Odom J et al. Hepatitis B virus contact disclosure and testing in Lusaka, Zambia: A mixed-methods study. BMJ Open 2018;8. <https://doi.org/10.1136/bmjopen-2018-022522>
 31. Cheng S, Li E, Lok AS. Predictors and Barriers to Hepatitis B Screening in a Midwest Suburban Asian Population. J Community Health. 2017;42:533–43. <https://doi.org/10.1007/S10900-016-0285-4/METRICS>.

Figures

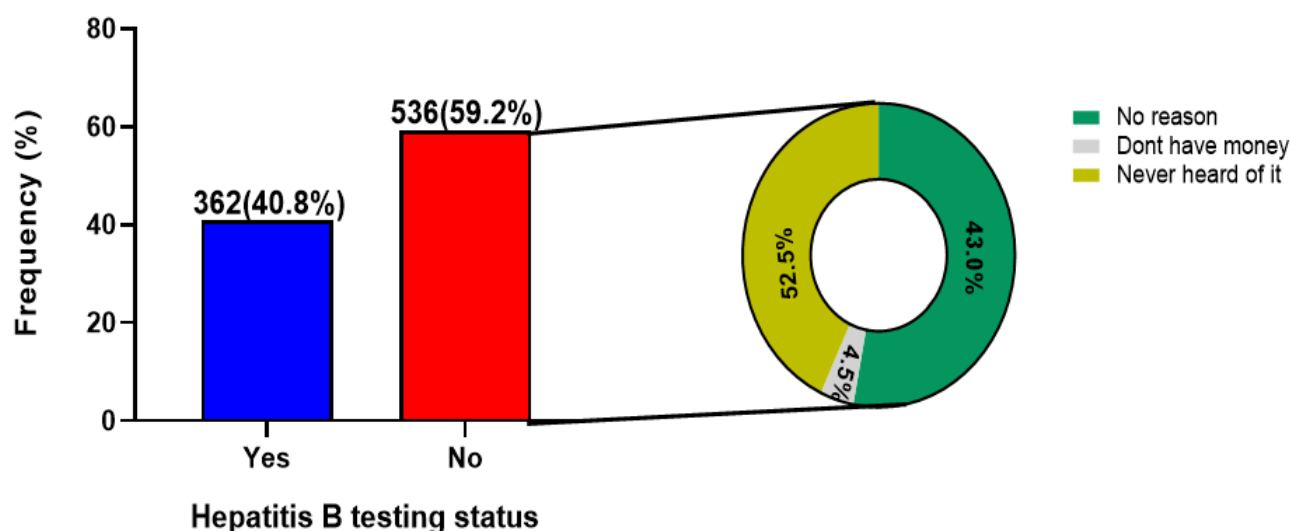


Figure 1

Hepatitis B Testing Practices

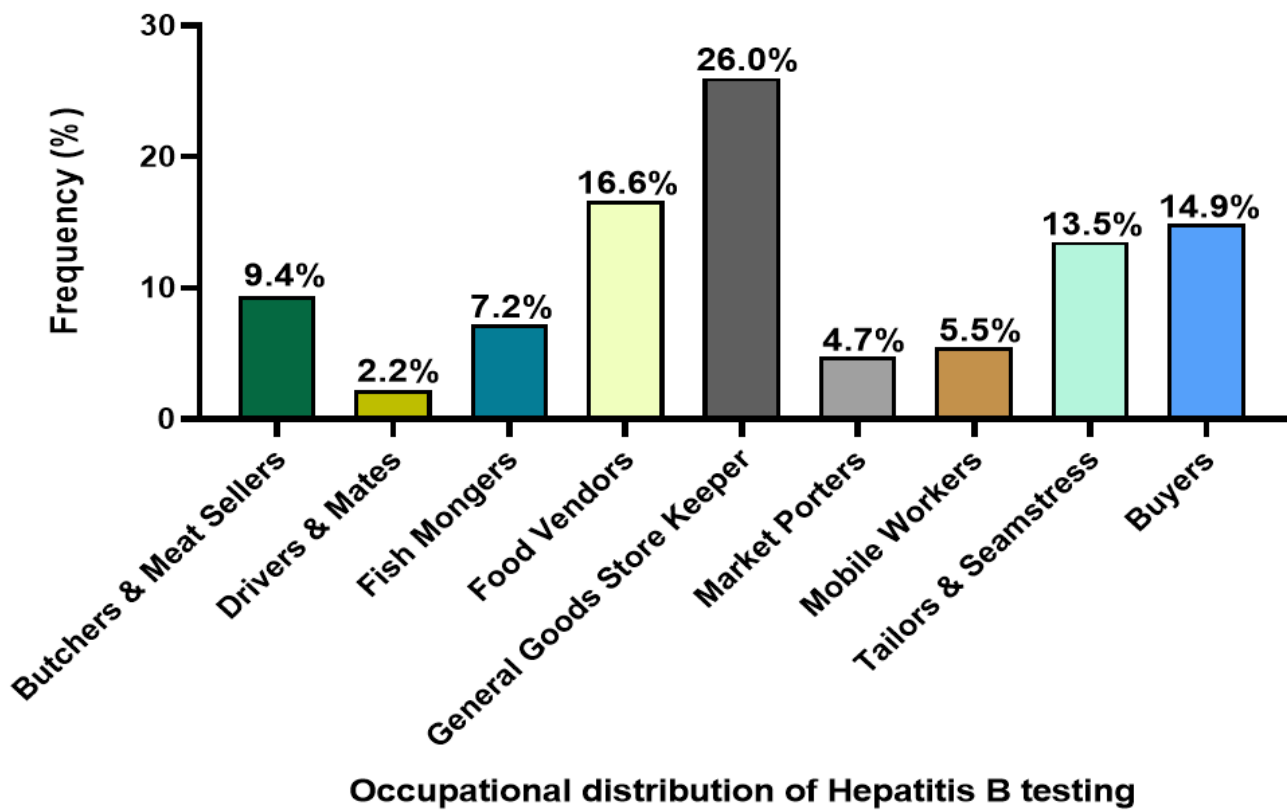


Figure 2

Occupational Distribution according to Hepatitis B Testing

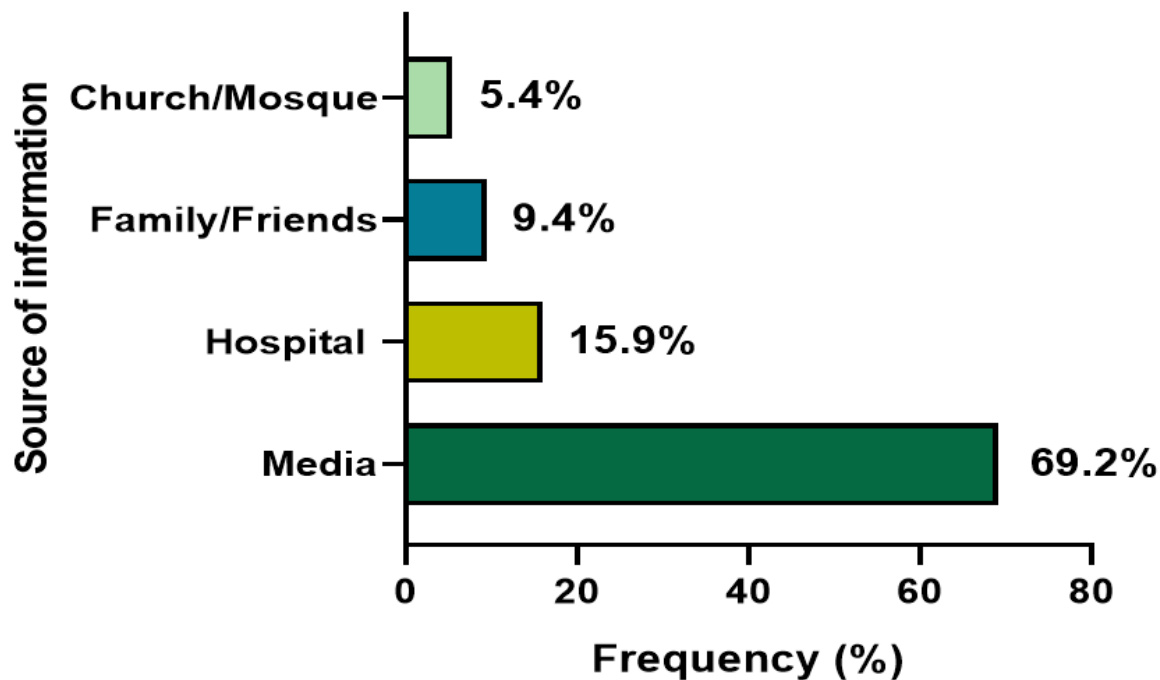


Figure 3

Sources of Information concerning Hepatitis B among study Participants

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