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## Research Article

### Epidemiology of Viral Hepatitis B and C in Guinea: Scoping Review

#### *Épidémiologie de l'Hépatite Virale B et C en Guinée : Revue de la Littérature*

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**Key words:** hepatitis B, hepatitis C, Epidemiology, scoping review, Guinea

#### ABSTRACT

**Introduction.** Viral hepatitis (VH) is a major global health issue, with VH A, B, C, D, and E viruses causing most cases. Viral hepatitis B (HBV) and viral hepatitis C (HCV) are the deadliest, infecting millions worldwide. Guinea lacks comprehensive data on VH, hindering prevention and management efforts. This study reviewed data from 2000-2022 on VH B and C in various subgroups to guide surveillance and control in the country. **Methodology.** Arksey and O'Malley's strategy was used to conduct a scoping review on VH B and C in Guinea, focusing on prevalence and risk factors. Relevant search terms were used to find eligible studies from online databases and through a hand search. Eight studies were included and analyzed using qualitative thematic analysis, resulting in the development of five themes. **Results.** The scoping review covered eight publications with 5,896 participants mainly from Conakry, Guinea. It identified five major themes: VH B and C prevalence among blood donors, pregnant women, people leaving with HIV (PLHIV), individuals attending health centers, and the general population. VH B prevalence ranged from 7.54% to 21.665% in various groups, while HCV prevalence was 2.75%. Risk factors included poor infection control, dental care, surgery history, and polygamous family history. **Conclusion.** Significant evidence gaps were found, especially for Hepatitis C. Therefore, a comprehensive, nationwide survey is needed to accurately assess VH prevalence.

#### RÉSUMÉ

**Introduction.** L'hépatite virale (VH) est un problème majeur de santé mondiale, les virus VH A, B, C, D et E étant responsables de la plupart des cas. L'hépatite virale B (VHB) et l'hépatite virale C (VHC) sont les plus mortelles, infectant des millions de personnes dans le monde. La Guinée manque de données complètes sur la VH, ce qui entrave les efforts de prévention et de prise en charge. Cette étude a examiné les données de 2000 à 2022 sur la VHB et la VHC dans divers sous-groupes afin de guider la surveillance et le contrôle dans le pays. **Méthodologie.** La stratégie d'Arksey et O'Malley a été utilisée pour mener une revue de la portée sur la VHB et la VHC en Guinée, en se concentrant sur la prévalence et les facteurs de risque. Des termes de recherche pertinents ont été utilisés pour trouver des études éligibles dans des bases de données en ligne et grâce à une recherche manuelle. Huit études ont été incluses et analysées à l'aide d'une analyse thématique qualitative, ce qui a donné lieu au développement de cinq thèmes. **Résultats.** La revue de la portée a couvert huit publications avec 5 896 participants principalement de Conakry, en Guinée. Elle a identifié cinq thèmes majeurs : la prévalence de la VHB et de la VHC chez les donneurs de sang, les femmes enceintes, les personnes vivant avec le VIH (PVVIH), les individus fréquentant des centres de santé et la population générale. La prévalence de la VHB variait de 7,54% à 21,665% dans divers groupes, tandis que la prévalence du VHC était de 2,75%. Les facteurs de risque comprenaient un contrôle de l'infection insuffisant, les soins dentaires, l'antécédent de chirurgie et une histoire de famille polygame. **Conclusion.** Des lacunes significatives en termes de preuves ont été identifiées, en particulier pour l'hépatite C. Par conséquent, une enquête exhaustive à l'échelle nationale est nécessaire pour évaluer précisément la prévalence de la VH.



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**KEY RESULTS****What's known about the subject**

In Guinea there has been no systematic or scoping review for a better apprehension of the burden of VH and there are no data that is nationally representative to direct prevention, management, diagnosis and control of VH. Nevertheless, data from small-scale studies have displayed a significant burden of VH in different population groups.

**The question addressed in this study**

Scoping review of the available evidence regarding HBV and HCV epidemiology in various population groups in Guinea.

**What this study adds**

In Guinea, despite a lack of national prevalence data for VH B and C, significant burdens have been observed in certain population groups, mostly limited to medical facilities in the capital city. There is a considerable knowledge gap and disparity in VH prevalence among different subpopulations.

**Implications for practice, policy or future research**

A comprehensive, nationwide survey is needed to accurately assess VH prevalence. Research should focus on specific groups like sex workers, MSM, IDUs, women with genital mutilation, correctional facility inmates, and patients undergoing hemodialysis.

**INTRODUCTION**

Viral hepatitis (VH) is one of the leading causes of death and morbidity worldwide [1]. The majority of VH cases, are caused by five viruses. These are Viral Hepatitis A, B, C, D, and E [1]. More than 300 million individuals globally are contaminated with VH, with around 1.3 million deaths per year [2]. A cost comparable to tuberculosis and HIV [3]. Around 47 per cent of those deaths are due to HBV, 48 per cent to HCV, [4]. Viral hepatitis B and C cause 96 % of VH mortality, though HDV may also be a cofactor in some HBV infection deaths [1]. Viral Hepatitis B and C infect an estimated 257 and 71 million people worldwide, respectively [3]. VH B and C, are a worldwide public health problem [1]. While the HCV disease affects all geographical areas, the Western Pacific and African regions are more affected by HBV, with reported prevalences of 6.1 percent and 6.2 percent, respectively [5]. A survey on HCV genotypes and prevalence estimated the seroprevalence in the West Africa sub-region at 1.3 per cent in 2015. [6]. Despite posing a global health risk, only 10% of long-lasting HBV patients and 20% of long-lasting HCV patients were diagnosed in 2015 [1]. In Africa, the seroprevalence of HBV in black people ranges from 5.7 percent in Morocco to 19 percent in Niger. The average prevalence crosswise in Africa is 10.4%, with detached areas displaying prevalences of up to 35 percent or higher. Long-term viral hepatitis B virus exposure levels range from 61% in Kenya and Liberia to 98% in Namibia in the southern region of Africa, with a mean of 77 percent [7]. Guinea is a developing country located in West Africa where there has been no systematic or scoping review for a better apprehension of the burden of VH and there are no data that is nationally representative to direct prevention, management, diagnosis and control of VH [8,1].

Nevertheless, data from small-scale studies have displayed a significant burden of VH in different population groups [9,10]. So, more research is needed among subpopulations that are mostly underrepresented in population-based studies and are more exposed to the disease [11]. This study's aim is to perform a scoping review of the available evidence regarding HBV and HCV epidemiology in various population groups in Guinea within the period 2000-2022 to help as baseline data and guide to ameliorate monitoring of Viral Hepatitis within the country. The Arksey and O'Malley [12] approach for scoping review will be used for this purpose.

**PATIENTS AND METHODS**

To find relevant articles, search was conducted on the various following databases: Global health, Medline, PubMed, Cochrane Library and Cumulative Index to Nursing and Allied Health Literature (CINAHL) using the following strategy applied to all databases: ("Hepatitis b" OR HBV OR "viral hepatitis") AND ("hepatitis C" OR HCV OR "viral hepatitis" ) AND (Guinea OR "Republic Of Guinea) AND (Epidemiol\* OR seroepidem\* OR screen\* OR prevalence\* seroprevalence\* OR incidence\* OR "burden of disease" OR "disease burden" OR burden OR morbid\* OR DALY\* OR mortality\* OR letal\* OR risk factor\* OR transmission OR infection risk\* OR viraemic rate\* OR infection rate\* OR therapy rate\* OR healing rate\* OR reinfection\* OR vaccination rate\* OR "vaccination coverage" OR modelling OR epidemiology. The reference lists of chosen articles were explored to locate additional relevant studies. The literature search was limited to the period 2000-2022 and all studies published in English and French were considered. The inclusion criteria were studies that provide information about HBV and/or HCV incidence or prevalence data, risk factor analysis for HBV and/or HCV infection for Guinea for the period 2000-2022; all types of study and all population groups were considered. Exclusion criteria included lack of quantitative display of data on prevalence, incidence, or risk factors.

**RESULTS**

With the first literature search from 5 databases and a hand search from other sources 103 articles were identified. After refining the search by narrowing the search period from 2000 to 2022, 51 articles were obtained. After duplicate removal, it remains 28 articles: 11 studies were excluded for an irrelevant topic, 7 studies excluded for the irrelevant country, 1 study for an irrelevant period of study and 1 survey for not displaying prevalence and risk factors. Finally only 8 articles were selected (**Figure 1**). A data extraction table was created in an excel sheet for data collection, data relevance confirmation, and study characteristic extraction. Author, publication year, type of publication, study design, study site, place of data collection, study population, Total sample Size, age, gender, pathogen, type of test, the prevalence of HBV, prevalence of HCV and risk factors

A qualitative thematic analysis was utilized to determine and develop themes (**Table 1**) [13].

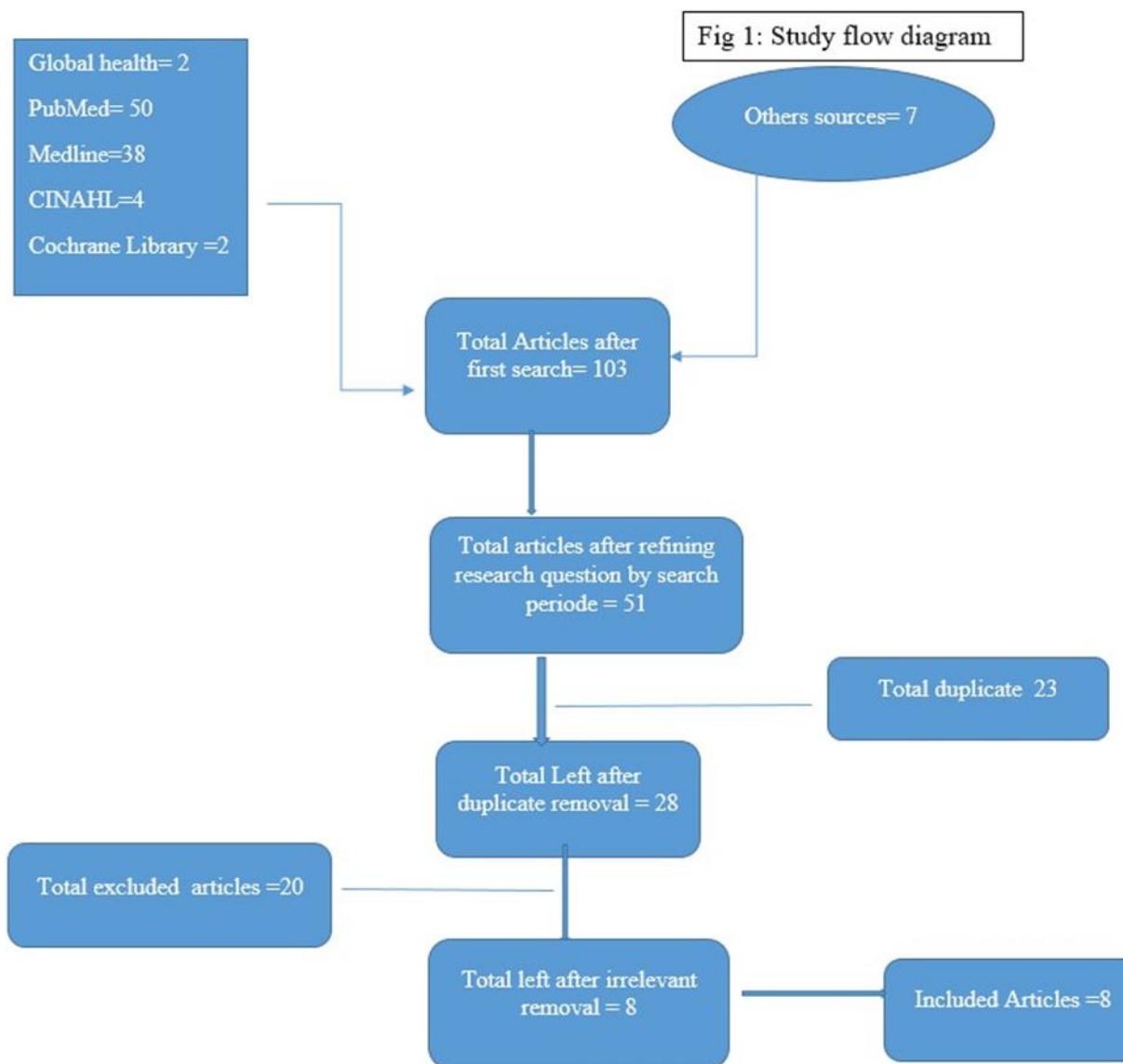


Fig 1. Study flow diagram

A data extraction table (see table 1) was created in an excel sheet for data collection, data relevance confirmation, and study characteristic extraction. Author, publication year, type of publication, study design, study site, place of data collection, study population, Total sample Size, age, gender, pathogen, type of test, the prevalence of HBV, prevalence of HCV and risk factors. A qualitative thematic analysis was utilized to determine and develop themes [13].

**Table 1: data extraction: This table displays a summarized version of the data extraction table utilized for extracting organizing and summarizing the data collected from the included studies.**

1st Author_year	Study design	Study site	Study population	Sample Size	age (year)	Gender	Pathogens	Type of test	Prevalence HBV	Prevalence HCV	Risk Factor
Boubaly et al. 2022	Cross-Sectional Prospective	Health facility	Blood donors	250	18-72	Males 19.55 %/Females 8.45%	HBV	HBsAg	16.40%		
Kaba et al. 2019	cross-sectional study	Health facility	HIV-infected children	149	0-15		HBV	HBsAg	8.18%		

**Table 1: data extraction: This table displays a summarized version of the data extraction table utilized for extracting organizing and summarizing the data collected from the included studies.**

1st Author_year	Study design	study site	Study population	Sample Size	age (year)	Gender	Pathogens	Type of test	Prevalence HBV	Prevalence HCV	Risk Factor
Diallo et al. 2020	Cross-Sectional Prospective	Health facility	all patients	716	Mean age 35.6	Male 67.3% / female 32.7%	HBV	HBsAg			history of dental care in 46.3%, surgery in 21.1%, scarification in 9.7%
Boumbaly et al. 2021	Cross-Sectional Prospective	Health facility	general population	2616		HBsAg 18.61% men; 10.5% women; anti-HCV antibodies; 19.06% men; 15.75% women.	HBV HCV	HBsAg; Anti-HCV	16.60%	2.75%	
Camara et al. 2022	retrospective and descriptive cross-sectional study	Health facility	general patient	1200			HBV	HBsAg	HBsAg prevalence 300/1200 (25%). 65/300 (21,665%) Co-infection VIH.		
Bah et al. 2021	descriptive and analytical cross-sectional study	Health facility	Pregnant women	411	<20 years 10% / >=20 years 90%		HBV	HBsAg	HBsAg prevalence 31/411 7,54%		polygamous family (P=0.030); the history of Hepatitis in the family (P<0.001), multiple sexual partnerships (P=0.019), History of surgery (P=0,047), history of jaundice, (P=0,018)
Balde et al. 2007	Prospective cross sectional study	Health facility	diabetics patients	248	mean 51,8 years		HBV	HBsAg	8.06%		
Keita et al. 2014	Prospective study	Health facility	HIV positive patient	306	mean 36 years	Men 61.5% female 38.5%	HBV	HBsAg	(8,49 %)		

A critical literature review while keeping in mind the research aim helped identify five themes formed from the 8 included studies (See table 2). These are as follows: 1)-The seroprevalence of VH B and C among Blood donors; 2)-The prevalence of VH B and C among pregnant women; 3)-The prevalence of VH B and C among people living with HIV (PLHIV); 4)-The prevalence of VH B and C Patients who attend health centres and general population; 5) - Identified risk factors.

**Table 2: Thematic table displaying the identified themes and the keys concepts of the review:**

Themes	Key concepts	Authors
The prevalence of HBV and HCV among Blood donors;	Prevalence of VH B among Blood donors	Boumbaly et al. 2022
The prevalence of HBV and HCV among pregnant women;	Prevalence of VH B in Pregnant women	Bah et al. 2021
The prevalence of HBV and HCV among PLHIV;	Prevalence of VH B in HIV positive patient	Keita et al. 2014
	Prevalence of Viral hepatitis B in HIV-infected children	Kaba et al. 2019
The prevalence of HBV and HCV in patients who attend health centres and the general population;	Hepatitis B prevalence in diabetics patients	Balde et al. 2007
	Prevalence of HBV in general patients	Camara et al. 2022
	The prevalence of VH B and C in the General population	Boumbaly et al. 2021
Identified risk factors	history of dental care, surgery and scarification	Diallo et al. 2020
	polygamous family, history of Hepatitis in the family, multiple sexual partnerships, History of surgery, history of jaundice,	Bah et al. 2021

## FINDINGS

### The prevalence of HBV and HCV among blood donors

A cross-sectional survey by Boumbaly et al. [14] performed in the region of Conakry (capital city) reported a prevalence of HBsAg positive in 16.4% (41/250) of blood donors. The Serological markers' prevalence in the tested people was 83.3%. The gender analysis of the group's HBsAg prevalence revealed that this marker was more frequently found in men participants (19.55 percent) than in women participants (8.45 percent) [14].

### The prevalence of HBV and HCV among pregnant women

A cross-sectional survey including 411 pregnant women performed in a district health facility in the capital city Conakry reported an HBsAg positive prevalence of 7.54% (31/411) [15].

### The prevalence of HBV and HCV among people living with HIV (PLHIV)

A cross-sectional survey by Kaba et al. [10] including 149 HIV-positive children performed in the department of paediatrics of Donka national hospital in the capital City Conakry in Guinea revealed a prevalence of HBsAg positive in 8.16% (12/149) of the participants. All HBV-infected children were born from carriers of HBsAg mothers. 8.05% of the mothers gave birth vaginally and only 2 of them gave birth by caesarean section. The prevalence was higher in boys than in girls, [10]. A similar HBV prevalence (8.49 %) was reported by Keita et al. [16] in their cross-sectional survey of 306 HIV-positive patients from the department of Haematology of Ignace Deen national hospital in Conakry (Guinea). This study identified 26 cases of association with HBV including. These were 16 women and 10 men all infected with HIV. The average age was 36 years with extremes of 16 and 55 years [16]. In the eastern part of the country, Camara et

al. [17] reported a co-infection with HIV in 21.665% (65/300) of people living with chronic HBV.

### The prevalence of hepatitis B and C among patients attending health centres and general population

A retrospective cross-sectional survey by Camara et al. [17] in the district hospital of Siguiriri in the eastern part of Guinea including 1200 patients attending the facility revealed an HBsAg prevalence of 25% (300/1200) and an HBeAg prevalence of 16.1%. In the Department of Internal Medicine of the Conakry university Hospital, Diallo et al. [9] reported an HBeAg prevalence of 20.8%. In the endocrinology department of the same hospital, a survey including a cohort of 248 diabetic patients revealed an overall Hepatitis B prevalence of 8.06% [18]. In the general population, a study including 2616 blood samples collected from people apparently in good health living in Guinea revealed a general HBV and HCV prevalence of 16.01% and 2.75% respectively. HBsAg was found in 18.61 percent of males and 10.5% of females, while anti-HCV antibodies were found in 19.06 percent of males and 15.75 percent of females [19]. In this survey, infants under the age of 18 represented 12.97 percent of HBV seropositive individuals; patients between 18-22 years old represented 3.03 percent; patients between 23 to 40 years old accounted for 43.02 percent, and patients older than 41 years old accounted for 40.98 percent [19]

### Identified risk factors

In a study including a group of individuals with long-lasting hepatitis B, the main risk factors identified are dental treatment history in 46.3 percent of cases, scarification in 9.7 percent of cases and surgery in 21.1 percent of cases, [9]. Another study including pregnant women in a health facility in the capital city, Conakry demonstrated through multivariate analysis that the five following risk factors have a statistically important

association with HBsAg positivity: polygamous family ( $P=0.030$ ); the history of Hepatitis in the family ( $P<0.001$ ), multiple sexual partnerships ( $P=0.019$ ), History of surgery ( $P=0,047$ ), history of jaundice, ( $P=0,018$ ) [15].

## DISCUSSION

The finding of this review demonstrated a high prevalence of VH among individuals who donate blood in Guinea. Even though, since 1998, it has been recommended to systematically screen blood donors for HBsAg, syphilis and HIV at the National Blood Transfusion Center (CNTS). Systematic screening for hepatitis C has been recommended for all blood donations since 2005. To significantly reduce the transmission of viral hepatitis through blood, all blood bags collected nationally are currently screened and object of a systematic search for HBsAg and anti-HCV antibodies [8]. A cross-sectional survey performed in the region of Conakry (capital city) revealed an HBV prevalence of 16.4 % among blood donors [14]. A similarly high prevalence was reported among individuals who donate blood in Sierra Leone (10.80% and 15.2%) [20,21]. In contrast, a lower prevalence was revealed in Nigeria 7.9% (52/662) [22] and Ghana 6.9% [23]. This subregional heterogeneity in HBV prevalence could be associated with different interventions in the control and prevention of the VH epidemic, or with the study population's behaviour and the methods used to detect viral hepatitis. Regardless, the high prevalence of VH among blood donors in Guinea VH has grave public health consequences for the population's well-being and health. Even though it is recognized that blood donors do not exactly represent the general public but in the absence of country-specific prevalence data, data from blood donor screening can furnish useful information about the risks of blood transfusion as well as some understanding of the scope of the issue of transfusion-transmissible infections [20]. The present scoping review also reported that male blood donors (19.55%) were more infected by HBV than females (8.45%) [14]. In a study performed in Burkina Faso, Men (10.5%) were found to be more infected than women (7.8%) [24]. However, in another survey for unknown reasons, HBV prevalence infections among female blood donors (33,3%) was higher than that of male blood donors (19.0%), even though there was no significant distinction betwixt the two groups for both viral infections [22]. This could be due to women having a lower socioeconomic status than men, making them more vulnerable to blood-borne viral infections. In Guinea, no data on HCV prevalence among blood donors are available, indicating a significant knowledge gap. Even though Guinea has complete service availability for screening for Infections transmitted through transfusion, the scarcity of treatment options, poses a significant challenge to viral hepatitis prevention and control. More work is required to connect patients who are infected with treatment and support services for HBV and HCV positive blood donors. Only one survey included in the present scoping review stated the prevalence of HBV at 7.54 % (31/411) in pregnant women [15]. Other studies from different countries however reveal similar rates: Ghana 9.5% (16/168) [25],

The Gambia 9.2% (39/424) and Mali 8.0 % (293/ 3659) [26]. The present scoping review identifies a scarcity of data on the prevalence of VHC in Guinean pregnant women, indicating another significant knowledge gap. Although Guinea has adopted the WHO recommendation to provide the HBV vaccine to children as part of its Extended Program of Immunization (EPI), there are still some gaps in HBV Mother to Child Transmission (MTCT) prevention. In Guinea, the majority of pregnant women are not tested for VH, and children are not given an HBV vaccine at birth, which would be a critical first step in preventing future transmission. However, no policy for systematic screening of pregnant women during pregnancy, defining the practical modalities and support mechanisms, is ongoing in Guinea. Systematic screening initiatives for pregnant women are carried out timidly in certain health structures. Moreover, there is currently no reference structure worthy of the name for viral hepatitis in terms of screening and treatment [8] which constitute a major handicap for achieving the goal of eradicating hepatitis in 2030. In the present scoping review, 3 surveys reported data related to the seroprevalence of HBV–HIV co-infection 8.16% (12/149) among children [10], 8.49 % (26/306) among HIV patients in the capital City [16], and 21.665% (65 /300) in the district of Siguiiri in the eastern part of the **country** [17]. There is no data related to HCV–HIV co-infection available in Guinea. According to a review of several publications by Stabinski et al [27] HIV/HBV, coinfection rates vary greatly across Sub-Saharan Africa, ranging from 0% to more than 28.4%, with a median co-infection level of 7.8 percent, and the reported median rates of HIV/HBV co-infection in children and pregnant women are 3.8 and 7.4 percent, respectively. Because HBV co-infection is linked with reduced survival in PLHIV [28], testing and immunization of PLHIV who are HBV-negative are required to improve the survival of HIV-positive people. However, in Guinea, there are no national recommendations for screening for hepatitis B and C, particularly among pregnant women, health personnel, drug users, and PLHIV, but it is timidly done in some health facilities. Blood donors, PLHIV and people with the signs are currently the targets. Moreover, Vaccination against hepatitis B with the monovalent vaccine is currently done on a private basis in private pharmacies or at the prevention department of the Ministry of Health [8]. Different HBV prevalence among individuals attending health centers was reported in this review: 25% in the district hospital of Siguiiri, [17], 8.06 % among diabetic's patient attending the endocrinology department of the Conakry University Hospital [18]. There was no information about HCV prevalence. Other studies in different countries report different prevalence among different groups of patients visiting medical facilities: in Sierra Leone 21.7% in individuals who visit a private laboratory in the city of Freetown, 13.5% among patients with fever in a secondary health center [21]. In Nigeria, Omote et al. [29] revealed a prevalence of 13.6% among patients in a tertiary health-care facility and a referral centre while Mohamed et al. [30] reported a seroprevalence of 11 % among outpatients of a Hospital in Kano City., From the global population, Boumbali et al. [19] suggested an HBV prevalence of 16.01% and HCV

prevalence of 2.75%. However, the HBsAg prevalence reported in this review is comparable to most recent research from other West African nations, where HBsAg prevalence reported in the last ten years ranges between 11 and 15% including surveys from Burkina Faso 15.5% [31], Niger 15% [32], Nigeria 14% (Musa et al. 2015) and Togo 11% [34]. The resemblance of these outcomes to those reported from Guinea here confirms the study's validity in addition to confirming that HBV continues to be an important public health concern in West Africa. In the present review, the age-based HBsAg revealed a higher prevalence among people aged 23- 40 followed by subjects older than 41 [19]. This result aligns with Omate et al. [29] and Mohamed et al. [30] who suggested a higher rate among people aged 20-45. The highest rate of HbsAg revealed for subjects aged 20-45 years may be attributed to this group's sexual active nature, illicit drug use, tattooing, body piercing, and other risk factors associated with HBV transmission that are prevalent among this age group [29]. This could also be the case in Guinea, but with the scarcity of data, it is not possible to ascertain. The present scoping review revealed a prevalence of viral hepatitis B of 12.97% in adolescents under 18 [19]. This rate is greater than the one suggested among adolescents by Eke et al. [35] 3.1% but lower than the 44.7 % demonstrated among pupils in primary school in Nigeria. Previously published surveys show that HBV transmission generally occurs in early childhood in the African region; infants are at high risk of contracting HBV via horizontal parenteral contamination (including transmission through family/close contact) [36]. This disparity in terms of seroprevalence of HBV among different groups of people highlights the need for a better-structured survey that will furnish more accurate data related to the seroprevalence of viral hepatitis B and C among Guinea's global population. The low HCV prevalence reported in this review is consonant with the worldwide prevalence of 2.75% [37] and the African prevalence of 2.9% [38]. Africa's Sub-Saharan region has been identified as having the greatest HCV burden. Nonetheless, HCV seroprevalence is particularly patchy in Sub-Saharan Africa, and data is scarce in some countries. The majority of published data are the result of data analysis or a sample of people [39]. In the present review, two studies revealed information regarding risk factors that underpin the spread of viral hepatitis B in Guinea. According to Diallo et al. [9], the most common risk factors reported among a group of patients living with chronic HBV were dental care (46.3%), surgical procedures (21.1%) and Scarification (9.7). The problem of viral hepatitis transmission in dentistry is critical [40]. To date, no definitive conclusion has been reached regarding the role of dental care in the spread of VH, whether from dentist to patient, patient to patient, or vice versa [41]. In Guinea, the paucity of studies regarding the role of dentistry in the spread of contagious diseases such as viral hepatitis and HIV makes it impossible to confirm the role of dental care in the transmission of HBV and HCV. Scarifications using traditional methods, specifically those performed in the community as part of traditional healers' medical treatment, are potentially contaminated, and materials are commonly utilized and

reutilized without regard for standard sterilisation procedures, increasing the risk of infection(s), including HBV [35]. In Guinea, these scarification activities are carried out by people who are not professional (tattoo artists, piercers) and organized professions such as beauticians (permanent make-up), jewellers (piercing of the lobe of the ear) and matron for the excision of young girls [8]. Moreover, in Guinea, Female Genital Mutilation is typically practised by traditional excision practitioners, who are often women, as it is throughout West Africa. Excisions are typically performed without any modern hygiene. The cut is made with knives or razor blades; previously, the same knife would be used on all the girls, but due to increased awareness and medicalization of the practice, some practitioners have abandoned their traditional tools in favour of a new razor blade for each girl. In addition to that, Excision practitioners do not always wash their hands after each procedure [42]. This means that the risk of propagation always remains high through these different practices. Moreover, a study reported that HBV infection is more common in women from polygamous families, those whose husbands had extramarital relationships, and women whose husbands could not return home every day because of the nature of their job, suggesting a greater likelihood that their partners will engage in sexually risky behaviour [43]. Guinea is a country where the practice of polygamy is widespread with the support of religious principles such as Islam, which allows a man to marry up to four women. This emphasises the need for additional pregnancy health education to protect pregnant women and to reduce HBV transmission through sexual practise changes and behaviour modification. The WHO highlighted methods for VH, prevention detection, and management in the 2016-2021 strategy for the global health sector to cut chronic VH by 90% from the baseline of 2015 and mortality from VH from 1.34 million deceases per year in 2015 to less than 500 000 deceases [44]. To achieve this goal, a combination of treatment approaches and preventive is needed, including prevention of MTCT, global HBV immunisation, early identification of VH, and access to medical care and assistance services [45]. Catch-up HBV vaccination is not routinely recommended for the general adult population because 5% of adult infections progress to chronicity. Nevertheless, as part of the HBV elimination strategy, detecting and immunising high-risk groups such as medical personnel, Intravenous Dug-Users (IDUs), Men having Sex with Men (MSM), sex workers, HBV seronegative partners, Immunocompromised individuals, and individuals with long-lasting hepatic disease are suggested [46]. HBV detection and vaccination are also suggested for individuals on haemodialysis, people in correctional facilities, people who require immunosuppressive medications or chemotherapy and people who have several sexual partners or have sexually transmitted diseases (STDs) [46]. As a result, it is wise for VH immunization programs to concentrate on detecting and immunising these risk groups. Approaches that ameliorate screening and treatment of chronic HBV infection in the community could be a low-cost approach. HCV and HBV programmes must also investigate the role of traditional

practises like genital mutilation in females in the rising chronic hepatitis burden in low-income nations like Guinea, where 97 percent of females aged 15 to 49 have been genitally mutilated [47].

## CONCLUSION

This scoping review aimed to explore the epidemiology of VH B and C in Guinea's various population groups. The analyses of the included surveys provided a comprehensive general summary of the available data on the seroprevalence as well as risk factors of HBV in Guinea. However, the review revealed evidence gaps in all presented population groups but more particularly regarding the prevalence of HCV. In Guinea, despite a lack of national prevalence data for VH B and C, significant burdens have been observed in certain population groups, mostly limited to medical facilities in the capital city. There is a considerable knowledge gap and disparity in VH prevalence among different subpopulations. A comprehensive, nationwide survey is needed to accurately assess VH prevalence. Research should focus on specific groups like sex workers, MSM, IDUs, women with genital mutilation, correctional facility inmates, and patients undergoing hemodialysis. To achieve the WHO's 2030 eradication targets, elimination strategies must be developed, including testing pregnant women for HBV, regular testing for PLHIV, and implementing test-and-treat strategies for HCV individuals. National VH programs should consider global testing and treatment initiatives for VH B infection, similar to HIV programs [21]. Overall, VH is an important public problem in Guinea. To reverse this trend, Health officials should create and put into action a policy framework to assist in mobilizing resources for global access to point-of-care tests for detection and treatment that is appropriate for patients with VH. Attempts to enhance traditional precautions, such as using a barrier approach, lubricants based on water, and safe sharps handling should be stepped up across poor countries, including Guinea.

## Limitation of the review:

The Selected studies show limited generalizability to the entire population. Almost all citations concentrated on urban health facilities rather than rural medical facilities units or private medical centers where infection prevalence is high. As a result, the findings are unrepresentative of the neglected settings. There was a scarcity of literature to provide evidence for the conclusion. There was no publication suitable for reviewing hepatitis B epidemiology in the northern, and southern parts of the country, so the results are not representative of the entire country. Moreover, there are no sufficient data regarding the prevalence of viral VH among population groups in the country. All of the included surveys were cross-sectional surveys in which individuals visiting health facilities for routine check-ups or emergency problems were offered VH B and/or C screening. There is an evidence gap based on longitudinal research that could help understand how the viral hepatitis epidemic is progressing and allow the assessment of the incidence and the impact of control and prevention.

## Author's Contribution

Ousmane Souare conceived the study. Ousmane Souare and Jaci Huws designed the study. Ousmane souare, Jaci Huws and Djenabou Diallo implemented the activities of data collection, data analysis and interpretation. All authors contributed to writing of the manuscript and to the approval of the final version.

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## Competing interests

The authors declare no competing interest.

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## REFERENCES

- 1- World Health Organization, Global hepatitis report 2017. Available from <https://www.who.int/publications/i/item/9789241565455>.
- 2- Waheed Y, Siddiq M, Jamil Z, Najmi MH. Hepatitis elimination by 2030: Progress and challenges *World J Gastro* 2018; 24: 4959-4961
- 3- (WHO 2016a). World Health Organization. Consolidated guidelines on the use of antiretroviral drugs for treating and preventing HIV infection. Geneva: 2016 available from <https://www.who.int/publications/i/item/9789241549684> consulted in 2022
- 4- World Health Organization. Draft global health sector strategies Viral hepatitis, 2016–2021 (2016) available from [https://apps.who.int/gb/ebwha/pdf\\_files/WHA69/A69\\_32-en.pdf](https://apps.who.int/gb/ebwha/pdf_files/WHA69/A69_32-en.pdf)
- 5- World Health Organization. Hepatitis B vaccines: WHO position paper. *Wkly Epide Rec*.2017; 92: 369–92. Available from <https://www.who.int/publications/i/item/WER9227>
- 6- Blach S, Zeuzem S, Manns M: Global prevalence and genotype distribution of hepatitis C virus infection in 2015: a modelling study. *Lancet Gast Hep*, 2016;2:161–76.
- 7- Kew M C: Progress towards the comprehensive control of hepatitis B in Africa: a view from South Africa. *Gut* 1996; 2: 31-36
- 8- Plan stratégique nationale de lutte contre les Hépatites virales en Guinée (PNLHS) 2018-2022 edition, *juillet 2018*
- 9- \*\*Diallo D, Diallo K, Diallo AM, et al. Epidemiological, Clinical and Biological Characteristics of Patients with Chronic Hepatitis B Infection Followed-Up at the University Hospital of Conakry, Guinea. *Op J of Gast* 2020; 10:256-265.
- 10- \*\*Kaba D, Bangoura MA, Sylla MM, et al. Prevalence and factors associated with hepatitis B in a cohort of HIV infected children in the Pediatric Department at Donka National Hospital, *Guin Pan Afri Med J* 2019; 34-182.
- 11- Sperle I, Steffen G, Leendertz SA, et al. Prevalence of Hepatitis B, C, and D in Germany: Results from a Scoping Review *Front. P H* 2020; 8-424.
- 12- Arksey H, O'Malley L. Scoping studies: Towards a methodological framework. *Int J of Soc Resea Meth* 2005; 8:19-32.
- 13- Levac D, Colquhoun H, O'Brien K K. Scoping studies: Advancing the methodology. *Impl Sci* 2010 ; 5: 69



- 14- \*\*Boumbaly S, Balde TAL, Semenov AV, et al. Prevalence of viral hepatitis B markers among blood donors in the Republic of Guinea. *Prob of Viro*, 2022; 67: 59-68.
- 15- \*\*Bah I, Bah IK, Cissé MO, et al. Séroprévalence et facteurs associés à l'hépatite B chez les femmes enceintes au Centre Médico- Communale de Minière en Guinée (Conakry). *JNNP* 2021 ; 04 :21
- 16- \*\*Keita M, Fadiga A G, Soumah MM, et al. Co-infection VIH et virus de l'hépatite B au service d'hématologie de l'hôpital national Ignace Deen (Guinée-Conakry). *j.annder* 2014 ; 09 :479.
- 17- \*\*Camara T, Traore FA, Camara M, et al. Immunovirologic Profile of patients infected by hepatitis B virus at Siguiri (Guinea). *Health Sci. Dis* 2022 ; 23 :36-39
- 18- \*\*Balde NM, Camara A, Kourouma K, et al. Caractéristiques cliniques de la seroprévalence A l'hépatite b et au vih chez 248 diabétiques A conakry en Guinée. *Méd d'Afrique N2007* ; 54
- 19- \*\*Boumbaly S, Serikova EN, Semenov AV, et al. Significance of parenteral viral hepatitis laboratory diagnostics in the Republic of Guinea. *J of microbio, epid and immu* 2021;98:440-449.
- 20- Tognon F, Sevaliec S, Gassimud J, et al. Seroprevalence of hepatitis B and hepatitis C among blood donors in Sierra Leone: A multi-year retrospective study *Int J of Infect Dis* 2020 99: 102-107
- 21- Lakoha S, García-Tardón N, et al. Prevalence of viral hepatitis B and C in Sierra Leone—current knowledge and knowledge gaps: a narrative review. *Trans R Soc Trop Med Hyg* 2021; 115: 1106-1113
- 22- Kassim NOD, Oyekale TO, Anekeo J C, Durosinnio M.A. Prevalence of Seropositive Blood Donors for Hepatitis B, C and HIV Viruses at Federal Medical Centre, *Annals of Trop Path* 2012; 3: 1
- 23- Nkrumah, B., Owusu, M., Averu, P. Hepatitis B and C viral infections among blood donors. A retrospective study from a rural community of Ghana. *BMC Res Not* 2011; 4:529
- 24- Meda N, Tuailon E, Kania D , et al. Hepatitis B and C virus seroprevalence, Burkina Faso: a cross-sectional Study *Bull WHO* 2018; 96:750-759
- 25- Ephraim R, Donko I, Sakyi SA, et al. Seroprevalence and risk factors of Hepatitis B and Hepatitis C infections among pregnant women in the Ashanti Akim North Municipality of the Ashanti region, Ghana; a cross sectional study. *Afri H Sci* 2015;15 :709-13.
- 26- MacLean B, Hess RF, Bonvillain E, et al. Seroprevalence of hepatitis B surface antigen among pregnant women attending the Hospital for Women & children in Koutiala, Mali. *S Afr Med J* 2011; 102:47-9.
- 27- Stabinski L, O'Connor S, Barnhart M, et al. Prevalence of HIV and Hepatitis B Virus Co-Infection in Sub-Saharan Africa and the Potential Impact and Program Feasibility of Hepatitis B Surface Antigen Screening in Resource-Limited Settings. *J Acq Imm Defic Syndr* 2015; 68:274-285
- 28- Thio CL, Seaberg EC, Skolasky R. HIV-1, hepatitis B virus, and risk of liver-related mortality in the Multicenter Cohort Study (MACS). *Lancet* 2002; 360:1921-1926.
- 29- Omote V, Kashibu E, Ojumah I, et al. Serological screening of hepatitis B virus and hepatitis C virus among patients attending a tertiary hospital in Jalingo, Taraba state, Nigeria. *Saudi J Health Sci* 2018;7:167-71.
- 30- Mohammed Y, Sharif A Dabo, NT et al. Seroprevalence Of Hbsag Among Patients With Febrile Illnesses In Murtala Muhammad Specialist Hospital, Kano, Nigeria. *Bayero J of Pure and App Sci* 2015; 8: 19 – 23, 2006 – 6996
- 31- Tao I, Compaoré TR., Diarra B, Djigma F, Zohoncon TM, Assih M, et al. Seroepidemiology of Hepatitis B and C Viruses in the General Population of Burkina Faso. *Article ID*(2014) 781843,
- 32- Mayaki Z, Dardenne N, Kabo R, Moutschen M, Sondag D and Albert A. Seroprevalence of infectious markers among blood donors in Niamey (Niger). *Rev Epid Sant Pub* (2013). 61:233-40.
- 33- Musa BM, Bussell S, Borodo MM, et al. Prevalence of hepatitis B virus infection in Nigeria, 2000-2013: a systematic review and meta-analysis. *Niger J Clin Pract* 2015;18: 163-72.
- 34- Agbenu E, Banla A, Kolou M, et al. Serologic markers used for hepatitis B surveillance in Togo: status report and action proposals. *Med Trop* 2008; 68:621-4.
- 35- Eke CB, Ogbodo SO, Ukoha OM, et al. Seroprevalence and Risk Factors of Hepatitis B Virus Infection among Adolescents in Enugu, Nigeria. *J of Trop Pediat* 2015; 61: 407-413
- 36- Bernier RH, Sampliner R, Gerety R, et al. Hepatitis B infection in households of chronic carriers of hepatitis B surface antigen: factors associated with prevalence of infection. *Ame. J of Epid* 1982; 116: 199-211.
- 37- Squires JE, Balistreri WF. Hepatitis C Virus Infection in Children and Adolescents *Hep Com* 2017; 1: 2.
- 38- Petruzzello A, Marigliano S, Loquercio G, et al. Global epidemiology of hepatitis C virus infection: An up-date of the distribution and circulation of hepatitis C virus genotypes. *W JI of Gast* 2016;22:7824-7840.
- 39- Daw MA, El-Bouzedi A, Ahmed MO, et al. Epidemiology of hepatitis C virus and genotype distribution in immigrants crossing to Europe from North and sub-Saharan Africa In association with the Libyan Study Group of Hepatitis & HIV *Trav Med and Infect Dis* 2016; 14:517-52
- 40- Mahboobi N, Agha-Hosseini F, Mahboobi N, et al. Hepatitis B virus infection in dentistry: a forgotten topic. *J Vir Hepat* 2010;17: 307-316.
- 41- Mahboobi N, Porter SR, Karayiannis P, Alavian S. Dental Treatment as a Risk Factor for Hepatitis B and C Viral Infection. A Review of the Recent Literature *J Gastrointestin Liv Dis* 2013;22: 12-15
- 42- OHCHR (2016) Summary of the Office Of The High Commissioner For Human Rights Report on human rights and the practice of female genital mutilation and excision in Guinea available from [http://www.ohchr.org/Documents/Countries/GN/SummaryReportGenitalMutilationGuinea\\_EN.docx](http://www.ohchr.org/Documents/Countries/GN/SummaryReportGenitalMutilationGuinea_EN.docx) consulted 17/08/2022
- 43- Anaedobe C G, Fowotade A, Omoruyi CE, and Bakare RA. Prevalence, socio-demographic features and risk factors of Hepatitis B virus infection among pregnant women in Southwestern Nigeria. *Pan Afric Med J* 2015; 20:406
- 44- World Health Organisation. Global health sector strategy on viral hepatitis 2016-2021. Towards ending viral hepatitis 2016. Available from <https://apps.who.int/iris/handle/10665/254546>

- who.int/iris/bitstream/handle/10665/246177/WHO-HIV-2016.06-eng.pdf?sequence=1
- 45- Spearman CW, Afihene M, Ally R. Hepatitis B in sub-Saharan Africa: strategies to achieve the 2030 elimination targets. *Lancet Gast Hep* 2017; 2:900–9.
- 46- Lau SKS, Chan ZAH. Asian-Pacific clinical practice guidelines on the management of hepatitis B: a 2015 update. *Hepatology Internatl* 2016; 10 (1):1–98.
- 47- United Nation for human Right Female Genital Mutilation in Guinea on the rise of Female Genital Mutilation in Guinea 25 April 2016 available from [http://www.ohchr.org/Documents/Countries/GN/SummaryReportGenitalMutilationGuinea\\_EN.docx](http://www.ohchr.org/Documents/Countries/GN/SummaryReportGenitalMutilationGuinea_EN.docx) consulted the 24/07/2022

NB: references with \*\* are the ones included in the review