

# Serological Profile of Viral Hepatitis B at the SOLABGUI Analysis Laboratory from January 1, 2020 to December 31, 2024

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**How to cite this paper:** Kadiatou, D., Bailo, B.M., Sarifou, D.M., Djenabou, D., Amadou, W.T., Tidiane, D.A., Yaya, B.M.L., Hamidine, I., Djibril, S., Oury, T.M. and N'Djouria, D.A. (2025) Serological Profile of Viral Hepatitis B at the SOLABGUI Analysis Laboratory from January 1, 2020 to December 31, 2024. *Advances in Infectious Diseases*, 15, 278-285. <https://doi.org/10.4236/aid.2025.152021>

**Received:** March 27, 2025

**Accepted:** May 5, 2025

**Published:** May 8, 2025

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## Abstract

**Introduction:** viral hepatitis B is a major public health problem. The objective of this study was to determine the prevalence of HBsAg at the laboratory of the Biomedical Analysis Laboratory Society of Guinea (SOLABGUI). **Materials and Methods:** it was a retrospective descriptive study from January 1, 2020 to December 31, 2024. It concerned all samples for which HBs antigen was requested during the study period at the SOLABGUI laboratory. **Results:** we listed a total of 2000 bulletins for which HBsAg was requested. We obtained 390 HBsAg positive bulletins, representing a prevalence of 19.5%. Men were the most represented with a frequency of 63.59% (n = 248) with a sex ratio M/F equal to 1.74. The average age of our patients was 22 ± 4 years with extremes of 1 and 80 years. The age group of 31 - 40 years was the most affected with a frequency of 30.77% (n = 120) followed by that over 50 years with a frequency of 23.85% (n = 93) and that of 21 - 30 years with a frequency of 17.69% (n = 69). Merchants and civil servants were the most represented with an identical frequency of 18.46% (n = 72). Married people were the most affected with a frequency of 59.49% (n = 232), single people 40.51% (n = 158). HBV co-infections with HIV and HCV were 2.22% and 1.54% respectively. **Conclusion:** the prevalence of hepatitis B is considerable and confirms that our country belongs to the area of high endemicity of hepatitis B virus infection.

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## Keywords

Viral Hepatitis B, Prevalence, Laboratory, Sampling, Conakry University Hospital

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## 1. Introduction

Hepatitis B virus (HBV) infection is associated with high morbidity and mortality, particularly due to the risk of progression to cirrhosis and hepatocellular carcinoma (HCC) [1]. HCC is a global public health problem, with approximately 316 million people chronically carrying HBV in 2019 and 820,000 HBV-related deaths in 2015, mainly related to the development of cirrhosis or the occurrence of HCC [2]. The World Health Organization (WHO) estimates that 30% of the world's population is HIV-positive, or about 2 billion people infected worldwide. In Africa, it remains a concern, due to its frequency, complications and socio-epidemiological after-effects. Sub-Saharan Africa, with a prevalence rate of between 8% and 18%, constitutes an area of high endemicity. In this region, HBV is the main cause of cirrhosis and hepatocellular carcinoma [3]. These conditions are responsible for high mortality despite the existence of an effective vaccine against this virus [4].

The epidemiology of HBV infection in Africa is difficult to assess because most studies are fragmented, most often on limited populations, and therefore few studies are of national scope. For example, in the Democratic Republic of Congo, a prevalence of 18.6% among health professionals has been reported [5]. In Senegal, the prevalence of HVB among health professionals is 17.8% [6]. In Mali, the prevalence was 13.84% among blood donors. In schools, it was 15.8% among children aged 0 to 15 and 10% among health personnel [4]. In Benin, the prevalence also remains high, especially in hospitals with respective frequencies of 40.41% and 6% [7] [8].

In Guinea, no national-scale study has been carried out to determine the national seroprevalence of viral hepatitis and vaccination coverage remains insufficient [9]. However, some fragmented studies have been carried out, with some results, the prevalence of which varies from 8% to 27% [10] [11]. Thus, given this high frequency, Guinea adopted a policy to reduce the frequency by setting up a unit for the management of viral hepatitis B and C in 2018, integrated into the national program to combat the human immunodeficiency virus, and strengthening awareness and vaccination campaigns. However, despite these efforts, viral hepatitis B remains a concern, due to the occurrence of complications and high mortality. Furthermore, the progression to complications depends on many factors related to the virus, the host and the environment. Knowledge and identification of these risk factors is essential to prevent these complications [1]. In our context, genetic and epidemiological factors, including the predominance of the vertical mother-to-child transmission mode, of certain strains of the virus,

insufficient vaccination coverage, poor access to care, certain cultural practices such as scarification, circumcision rites can increase the risk of transmission of hepatitis B. No study had been carried out in a laboratory analysis center in Conakry. Thus, we conducted this study whose objective was to determine the prevalence of HBsAg at the laboratory of the Biomedical Analysis Laboratory Society of Guinea (SOLABGUI).

## 2. Materials and Methods

We have made a retrospective descriptive study, which took place from January 1, 2020 to December 31, 2024. It concerned all samples for which HBs antigen (HBsAg) was requested during the study period at the laboratory of the Société de Laboratoire d'Analyse Biomédicale de Guinée (SOLABGUI).

We performed non-probability sampling by considering all records containing an HBsAg request. All patients had a code assigned to them by the laboratory to avoid duplicates. We then included all samples that tested positive for HBsAg.

Patients treated for B viral infection or vaccinated and/or not consenting to study participation were excluded from the study.

The laboratory had consented to the use of patient data and the study was approved by the ethics committee of the Conakry University Hospital in accordance with the Declaration of Helsinki (annexed ethics committee sheet).

For data collection, we used an individual survey form. We then proceeded to study the sampling records and a comprehensive manual analysis of the sampling slips using the survey form. The tests were carried out using the enzyme-linked immunosorbent assay (ELISA) method using the mini Vidas.

Data analysis was carried out in two stages; the first focused on the frequency distribution within the study population and the second was descriptive by the distribution of socio-demographic variables (age, sex, marital status, occupation) and co-infections with hepatitis C virus (HCV) and acquired immunodeficiency virus (HIV).

The study was approved by the ethics committee of the University of Conakry (annexed - ethics approval form) in accordance with the Declaration of Helsinki.

The results were analyzed using Epi Info Version 7.4.0 software and entered into Microsoft Excel of Office 2016. Qualitative variables were expressed as number and percentage, and quantitative variables were expressed as mean with their standard deviation.

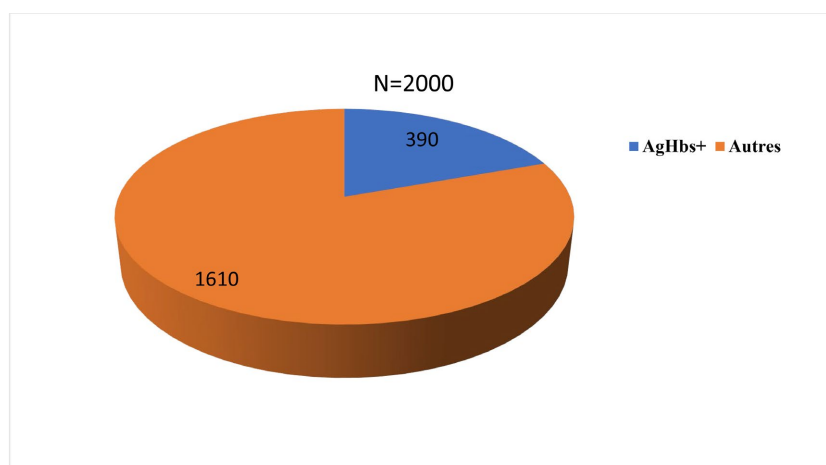
## 3. Results

Of the 2000 samples taken, 390 cases of HBsAg were positive, representing a frequency of 19.5% (**Figure 1**).

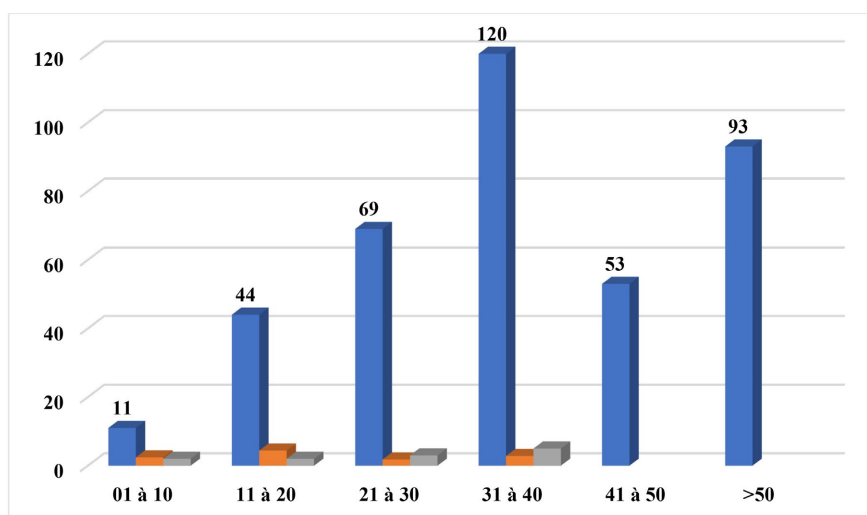
Others include all samples for which HBsAg was negative.

The study population was predominantly male (**Table 1**) and young (**Figure 2**).

Co-infection with HIV was found in 8 patients (2.2%) and HCV in 6 patients (1.54%) (**Table 2**).



**Figure 1.** Frequency of HBsAg.



**Figure 2.** Distribution of HBsAg+ according to age groups.

**Table 1.** Distribution of HBsAg+ carriers by sex.

Sex	Effective	Percentage (%)
Male	248	63.59
Female	142	36.41
<b>Total</b>	<b>390</b>	<b>100.00</b>

**Table 2.** Distribution of chronic HBsAg+ carriers according to co-infection with HCV.

Co-infection with HCV	Effective	Percentage (%)
Yes	06	1.54
No	384	98.46
<b>Total</b>	<b>390</b>	<b>100.00</b>

## 4. Discussion

The main limitations of this study were the single-center nature, the absence of

antigenemia (quantitative HBsAg), viral load, HBeAg and complete liver function tests. However, with this large sample, this study allowed us to determine the prevalence of HBsAg. At the laboratory of the Guinean Laboratory Society of Guinea (SOLABGUI). This study involved the collection of information from 2000 sampling records whose conditions met our study criteria. We recorded 390 cases of positive HBsAg out of a total of 2000 samples, which corresponds to a frequency of 19.5%. This result is identical to those found in Senegal by Romieu I *et al.* [6] in the Democratic Republic of Congo by Lungosi MB *et al.* [5] which were respectively 17.8% and 18.6%. Our prevalence of positive HBsAg carriage is lower than that found in Nigeria by Belo *et al.* [12] who found a prevalence of 25.7% of HBsAg carriers in a population of surgeons. These differences could be explained on the one hand by the difference in sample sizes which vary from one study to another, the socio-economic background and on the other hand the level of exposure to the virus within the population (high risk with health professionals).

Thus, this high frequency found could be explained by the fact that this laboratory was one of the reference laboratories in the diagnosis of viral hepatitis and these data allow Guinea to be classified among the countries of high endemicity, that is to say a prevalence greater than 8% [3].

In our study, Men were more represented than women with respective frequencies of 63.59% (n = 248) and 36.41% (n = 142) or a sex ratio M/F equal to 1.74. This male predominance was also found by Boumbaly S *et al.* [13], in 2022 in the same country (19.55% vs. 8.45%). Other African studies also found a male predominance, such as Mbendi C *et al.* [14] in the DRC (77% men for 22.1% women), Eloumou *et al.* [15], in Cameroon and Somé EN *et al.* [16], in Burkina Faso (60%). This observation could be explained by genetic factors favoring the persistence of the virus in men [17] [18] and the multiplicity of sexual partners (through polygamy).

In our cohort, the mean age of our patients was  $22 \pm 4$  years, with extremes of 1 and 80 years. The age group of 31 - 40 years was the most affected with a frequency of 30.77% (n = 120) followed by that over 50 years with a frequency of 23.85% (n = 93) and that of 21 - 30 years with a frequency of 17.69% (n = 69). The predominantly young character in this study is almost similar to other African studies [4] [7] [16] [19] [20].

This young age could be explained on the one hand by the predominance of vertical contamination from mother to child and horizontal during early childhood which are the main modes of transmission in Africa and by the non-universal coverage of the expanded vaccination program against hepatitis B throughout the national territory in Guinea. On the other hand for social and cultural reasons spreading false information about vaccines that could reduce fertility in a country with strong traditional religious connotations and where polygamy is widespread. In addition, having many children is equated with wealth, power and confers a social rank of notoriety.

In terms of co-infections with viral hepatitis C viruses, there were 6 cases

(1.54%). Co-infection with HIV was found in 8 patients (2.22%). This frequency is higher than that reported by Some EN *et al.* [16] (0.9%). The observed difference could be explained by the fact that Guinea belongs to an area of high HIV endemicity with a prevalence of 3.2% [21], compared to Burkina (0.92%).

## 5. Conclusion

Viral hepatitis B remains a public health problem worldwide and in Guinea where it is endemic. This study determined the prevalence of HBs antigen, which is high, thus confirming that Guinea is in an area of high endemicity for viral hepatitis B. Despite recent developments in antiviral therapies, the treatment of chronic hepatitis B is difficult and expensive; prevention of hepatitis virus infection through a systematic vaccination policy currently remains the best option for reducing morbidity and mortality from liver failure and liver cancer.

## Author Contributions

All authors contributed to the writing and validation of this article.

## Acknowledgements

We thank all the staff of the laboratory of the Guinean Society of Laboratory of Guinea (SOLABGUI).

The laboratory has consented to the use of data from patients who have been consulted in the department.

## Conflicts of Interest

The authors declare no conflicts of interest regarding the publication of this paper.

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