

Prevalence of HIV and Hepatitis B Virus among Students at the University of Yaounde 2

Steve Rostand ESSOMBA

PhD Public health, ICT University, Yaounde, Cameroon

DOI: <https://doi.org/10.51244/IJRSI.2025.1215000126P>

Received: 11 August 2025; Accepted: 17 August 2025; Published: 18 September 2025

ABSTRACT

Acquired Immunodeficiency Syndrome (AIDS) and hepatitis B are diseases that are transmitted by the Human Immunodeficiency Virus (HIV) and the Hepatitis B Virus (HBV) respectively. Unlike AIDS, which is mainly found in southern and eastern Africa, the areas most affected by hepatitis B in Africa are West and Central Africa. In order to monitor the status of these diseases among students in Cameroon, a prospective study on a sample of 494 students as part of systematic medical visits was conducted at the Medical-Social Center of the University of Yaounde 2 from 14th October 2024 to 18th October 2024. This study presents the serological status of students with regard to HIV and hepatitis B. Immunochromatographic diagnostic technique was used to determine the serological status of participants. Approximately 49% of participants were between 21 and 25 years of age, and 41% were between 15 and 20 years of age. Approximately 63% of participants were female and 37% were male with a sex ratio of 1.7/1. The age group most infected with Hepatitis B Virus was between 21 and 25 years. No cases of HIV infection were encountered. Hepatitis B Virus was predominant in males with 67% of infections. Hepatitis B virus was present in our sample. This infection affected men significantly more than women. Despite the fact that hepatitis B virus and HIV share the same transmission pathways, we found that hepatitis B was more prevalent than AIDS among students at the University of Yaounde 2. Awareness campaigns in establishments could improve the fight against sexually transmitted diseases in Cameroon.

Keywords: virus; student; university; Yaounde.

INTRODUCTION

Sexually Transmitted Infections (STIs) are defined as all diseases transmitted during sexual intercourse with an infected partner (Sidibé, 2013). Among the STIs we can cite Acquired Immunodeficiency Syndrome (AIDS) and Hepatitis B. AIDS is a set of symptoms resulting from the destruction of immune system cells by the Human Immunodeficiency Virus (HIV), making the body vulnerable to numerous opportunistic diseases. HIV infection in humans weakens the immune system, making it easier for various other infectious agents to infect the body (Koina, 2012). Hepatitis B is a disease caused by the Hepatitis B Virus (HBV). In adults, the hepatitis B virus is transmitted primarily through sexual intercourse and through blood transfusions. HBV can be transmitted from mother to child either during pregnancy or during childbirth. However, infection of the newborn can also occur during breastfeeding. Esophageal candidiasis is one of the most common opportunistic infections in HIV-infected patients (Behrens et al., 2014). The decrease in the CD4 lymphocyte count increases the risk of opportunistic infection (Ouassou, 2018). This is a key moment in HIV infection (Timsit et al., 2016). HIV infection also reduces the vaccine response to some vaccines (Pacanowski, 2012). Neurological complications of the peripheral nervous system are common in HIV-infected patients (Kranick & Avindra, 2012). As HIV-infected patients age, we observe an increase in neurological complaints (Major et al., 2011), the management of which is difficult (Hasse et al., 2011). Taking into account this diagnostic and therapeutic complexity, the Neuro-HIV platform was created (Schibler et al., 2014). This platform also aims to collect epidemiological data for research purposes (Granziera et al., 2013). Among HIV-positive patients, 75% will present with a neurological condition (Jaeger & Nath, 2012). In individuals with a weakened immune system, dermatophytoses can persist for long periods (Gonsu Kamga et al., 2014). HIV infection exposes patients to opportunistic infections (Pavlinac et al., 2015). Traveler's diarrhea remains common among people living with HIV (PLHIV) (Wieten, 2012). Hematological cancers can also be observed (Rios, 2014). According to World Health

Organization (WHO) estimates, approximately 2 billion people are living with HBV (Flichman et al., 2014) (Mohd Hanafiah et al., 2013). The people most vulnerable to CMV are people infected with HIV (Viljoen et al., 2015). In the absence of treatment, HIV infection is sometimes responsible for severe malnutrition (Obajimi et al., 2008). Tuberculosis is becoming increasingly important due to HIV infection (Noubom et al., 2013) which increases the problems faced by children and women of reproductive age (Kedy Koum et al., 2013). Additionally, anxiety is common in patients with tuberculosis (Ige and Lasebikan, 2011). The spread of the HIV epidemic has increased the magnitude of Low Birth Weight (LBW) in Africa (Traore et al., 2013). Opportunistic diseases such as Kaposi's sarcoma make AIDS serious (Coulibaly, 2006). This represents a major public health problem (Zumla et al., 2013). It is estimated that up to one-third of the world's population is infected with Mycobacterium tuberculosis (Lai et al., 2013). In patients coinfecting with viral hepatitis, several studies have shown an increased risk of hepatocellular carcinoma (Joshi et al., 2011). Two epidemiological studies provide conflicting results on HIV as a predisposing factor for Buruli (Johnson et al., 2008). HIV can promote the reactivation of latent tuberculosis infection into disease (Camara et al., 2017). Herpes Simplex Virus (HSV) is prevalent in individuals infected with HIV type 1 (Rottermann et al., 2013). Cryptococcal meningitis (CNM) is common occurring in HIV/AIDS (Gbangba-Ngai et al., 2014). HIV is the leading cause of death in women of reproductive age (Sangho et al., 2012). It was therefore up to us to determine the prevalence of HIV and HBV among students at the University of Yaounde 2.

MATERIALS AND METHODS

The Medico-Social Center (CMS) of the University of Yaounde (UY2) served as the framework for this study. This service is responsible in conjunction with the competent authorities for hygiene and sanitation issues on campus, health and social action for students, teaching and non-teaching staff, as well as public health. The UY2 CMS comprises two services: the Health Service; and the Social Action Service. The Health Service is under the authority of a department head, a Doctor of Medicine. He is responsible for all matters relating to health in the university environment, and in relation to the competent services of the city, the maintenance of a medical. The Social Action Service is responsible for all actions intended to ensure the integration and full development of all categories of students and staff within the Institution. UY2 is a public university located in Soa, northeast of Yaounde. Born from the reform of higher education in Cameroon in 1993, UY2 is composed of two faculties: the Faculty of Legal and Political Sciences (FSJP), and the Faculty of Economics and Management (FSEG). The selection of the sample was random, our sample consisted of all the students who came for systematic medical examinations. Medical examinations are mandatory for all students who wish to register at the UY2. We were previously introduced to the department by the Medical Director of the Medical-Social Center of the UY2 to conduct tests on students during the medical examinations. Biological analyses were carried out using the Abbott Determine HIV 1/2 and OraQuick HIV 1/2 tests for HIV testing, and Diaspot Rapid One-step Test Strip for HBV screening. The results were noted on result sheets. To carry out the analyses we needed sterile gloves, absorbent cotton, 95° ethyl alcohol, adhesive tape, and a basket for infectious objects.

RESULTS AND DISCUSSION

We conducted our study on a sample of 494 students, of whom 37% were men, and 63% ($p < 0.00001$) were women. The sex ratio was 1.7/1. 30% of male respondents were between 15 and 20 years old, 58% ($p < 0.0001$) were between 21 and 25 years old, 10% were between 26 and 30 years old, and 2% were over 30 years old. 48% of female respondents were between 15 and 20 years old (95% CI 42%-54%), 43% were between 21 and 25 years old ($p < 0.00001$; 95% CI 37%-49%), 5% were between 26 and 30 years old, 1% were between 31 and 35 years old, and 3% were between 36 and 48 years old. The distribution of male respondents according to their academic levels. 51% (95% CI 47%-55%) of men were first-year undergraduate students, 35% (95% CI 31%-39%) were second-year undergraduate students, 58% ($p < 0.00001$; 95% CI 54%-62%) were third-year undergraduate students, 35% (95% CI 31%-39%) were first-year master's students, and 5% (95% CI 1%-9%) were second-year master's students. 33% (95% CI 29%-37%) of women were students in the first year of a Bachelor's degree, 15% (95% CI 11%-19%) were students in the second year of a Bachelor's degree, 33% ($p < 0.00001$; 95% CI 29%-37%) were students in the third year of a Bachelor's degree, 17% (95% CI 13%-21%) were students in the first year of a Master's degree, and 2% were students in the second year of a Master's degree.

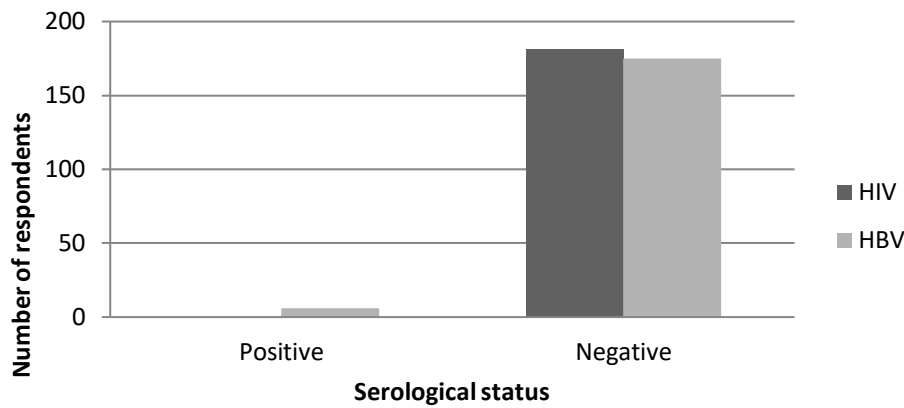


Figure 1. Serological status among male respondents

Looking at this graph, no male respondents were infected with HIV. However, the prevalence of HBV was 3% ($p < 0.0001$). HIV was absent among the respondents.

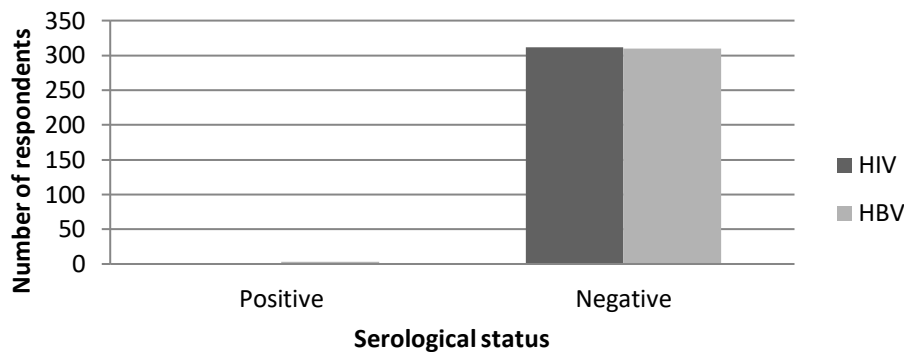


Figure 2. Serological status among female respondents

The prevalence of HBV among female respondents was 1% ($p < 0.00001$). All male respondents infected with HBV were between 21 and 25 years old.

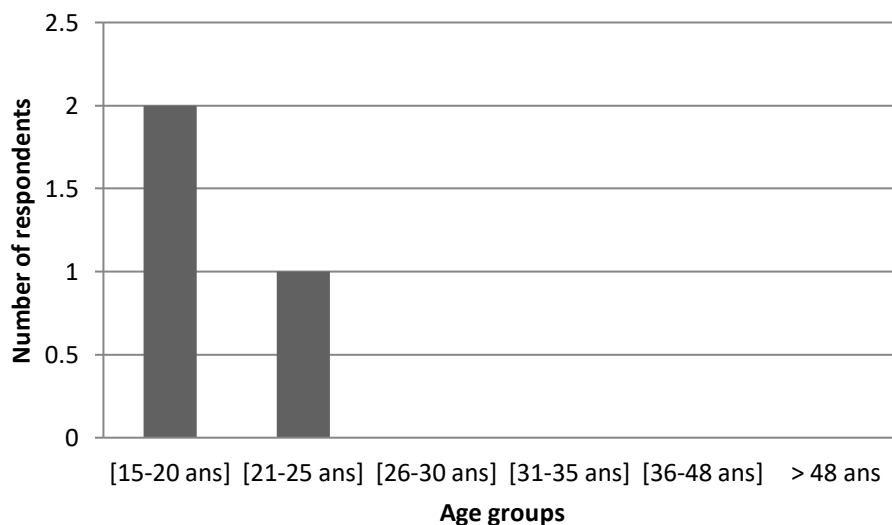


Figure 3. Distribution of HBV by age group among female respondents

67% ($p < 0.00001$; 95% CI 62%-74%) of the female respondents infected with HBV were between 15 and 20 years old, and 33% ($p < 0.0001$) were between 21 and 25 years old.

Table 1. Distribution of HBV among male respondents according to academic level

| Academic level | Number of cases |
|----------------|-----------------|
| License 1 | 1 |
| License 2 | 1 |
| License 3 | 2 |
| Master 1 | 2 |
| Master 2 | 0 |
| Total | 6 |

17% of male respondents infected with HBV were first-year undergraduate students, 17% were second-year undergraduate students, and 33% ($p < 0,05$) were third-year undergraduate and first-year Master's students respectively. No second-year Master's student was infected with HBV.

Table 1. Distribution of HBV among female respondents according to academic level

| Academic level | Number of cases |
|----------------|-----------------|
| License 1 | 1 |
| License 2 | 1 |
| License 3 | 1 |
| Master 1 | 0 |
| Master 2 | 0 |
| Total | 3 |

33% ($p < 0,00001$) of the female respondents infected with HBV were respectively students in Bachelor's degree 1, Bachelor's degree 2, and Bachelor's degree 3. No student in Master's degree 1 or Master's degree 2 was infected with HBV.

Our study was conducted with a sample of 494 participants, including 181 men (37%) and 313 women (63%). The sex ratio was 1.7. This massive representation of women could mean that the population of UY2 is made up of a majority of women. Contrary to the unequal social relations that existed between women and men in African societies in the past, placing the natural right to command under the responsibility of men (Locoh, 2007), more and more women are educated and succeed in higher education today. Moreover, it is recognized that the chances of success of the latter are higher than those of men at all levels of study (Atala, 2021). The strong presence of women at UY2 could also be explained by the number of women who make up the Cameroonian population. Indeed, the Cameroonian population is made up of approximately 50.6% women (National Institute of Statistics, 2019). In addition, the Cameroonian population is essentially young (National Institute of Statistics, 2019). As a result, 30% of male respondents were aged between 15 and 20 years, 58% were aged between 21 and 25 years, 10% were aged between 26 and 30 years, and 2% were over 30 years. On the other hand, 48% of female respondents were aged between 15 and 20 years, 43% were aged between 21 and 25 years, 5% were aged between 26 and 30 years, 1% were aged between 31 and 35 years, and 3% were aged between 36 and 48 years. More than half of Cameroon's population is under 20 years old (National Institute of Statistics, 2019). In Cameroon there is a link between the age groups of students and the level of education. Between primary and secondary schools, the majority of students are under 18 years old, while at university, the majority of students are between 18 and 35 years old. The age limit for enrolling in a faculty or national competitive examination is generally limited. For example, at the University of Yaounde 1, the age limit for access to university accommodation is 25 years old (Tsoumou, 2024). The majority of male respondents were between 21 and 25 years old, while the majority of females were between 15 and 25 years old. Furthermore, 51% of men were first-year undergraduates, 35% were second-year undergraduates, 58% were third-year undergraduates, 35% were first-year master's students, and 5% were second-year master's students. Among women, 33% were first-year undergraduates, 15% were second-year undergraduates, 33% were third-year undergraduates, 17% were first-year master's students, and 2% were second-year master's students. The main objective of our study was to assess the prevalence of HIV and HBV among students at the University of Yaounde 2 during routine medical check-ups. Our study found that no respondents were infected with HIV. However, a study conducted in the ten regions of Cameroon showed that the highest incidence of HIV in Cameroon is among adolescents and young people

(Billong et al., 2020). This would be due to the average age of the Cameroonian population, whose median age is roughly equal to 18 years. A previous study conducted in Cameroon and published in 2004 revealed a high prevalence of HIV in the city of Yaounde (Mosoko & Affana, 2004). Indeed, Yaounde is the second largest city in the country and it is very populated. HBV infection was more prevalent than HIV in our sample, and in the country as a whole, HBV is more prevalent than HIV. However, the prevalence of HBV among male respondents was 3%. This prevalence was 1% among female respondents. Indeed, it is more common for an infected woman to have more partners than infected men. As a result, men are more exposed to STDs than women especially at university. All male respondents infected with HBV were between 21 and 25 years old. On the other hand, 67% of female respondents infected with HBV were between 15 and 20 years old, and 33% were between 21 and 25 years old. In a study previously conducted at the Yaounde General Hospital, the Yaounde University Hospital, and the Cathedral Medical Center to determine the profiles of patients infected with HBV in Yaounde, the extreme ages of infected patients were 15 and 65 years, and the most represented age group was 30 to 40 years (Ndjitoyap Ndam et al., 2024). This effectively confirms that HBV can infect all age groups of the population. Despite the multiple awareness campaigns against HBV implemented during viral hepatitis days, for example, and the introduction of the HBV vaccine in the Expanded Immunization Program in Cameroon, many children and adults have never been vaccinated against HBV (Vougmo Meguejio et al.). HBV infection is no longer primarily due to the lack of awareness among the population about the disease. Even school-age people get infected with STDs. Thus, 17% of male respondents infected with HBV were first-year undergraduate students, 17% were second-year undergraduate students, and 33% were third-year and first-year Master's students respectively. No Master's second-year student was infected with HBV. 33% of female respondents infected with HBV were first-year, second-year, and third-year Master's students respectively. No Master's first-year and second-year Master's students were infected with HBV.

CONCLUSION

HIV and HBV infections are common in Cameroon and in the country's universities. During our study, no cases of HIV infection were encountered. However, HBV infection was present among the respondents. It affected men much more than women. Among men, it affected the age group from 21 to 25 years. Among women, it concerned the age groups from 15 to 20 years, and 21 to 25 years. Among men, cases of infection were encountered among students in Bachelor's degree 1, Bachelor's degree 2, Bachelor's degree 3, and Master's degree 1. However, among women, the cases of infection concerned students in the first, second and third year of their Bachelor's degree. In view of these results, one could be led to believe that HBV is more widespread than HIV within student communities in Cameroon. Awareness campaigns in higher education institutions could improve the fight against sexually transmitted diseases in Cameroon. Many teenagers are not made aware by their parents, which can also promote STDs among young people.

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