

Socio-Demographic Characteristics of Newly Diagnosed People Living with HIV Initiating Antiretroviral Treatment at the Adult Day Hospital of Bobo-Dioulasso Over a Five-year Period

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Abstract

Background: HIV infection is a major public health problem in sub-Saharan Africa, particularly in Burkina Faso. This study aimed to describe the socio-demographic characteristics of newly person living with HIV initiating antiretroviral treatment at the Adult Day Hospital of Bobo-Dioulasso over a five-year period.

Materials and methods: A descriptive cross-sectional study was conducted from 1 January 2016 to 31 December 2020 at the Adult Day Hospital of Bobo-Dioulasso. People newly diagnosed with HIV after confirmatory testing and initiating antiretroviral therapy were included in this study.

Results: Women represented 66.74% (586/878) of this study population (878), the average age of the study population was 41 ± 14.30 years-old and the age group of 35-52 years-old was the most represented at the initial visit. The majority of this study population were not schooled (48.86%) and housemaids accounted for 37.70%. The majority of the participants were infected with HIV-1 (84.51%).

Conclusion: This study pointed out that HIV continues to infect the disadvantaged social and demographic groups. HIV awareness and screening campaigns are required to better control the infection in these groups.

Keywords: HIV, Socio-demographic characteristics, Bobo-Dioulasso

Introduction

Human immunodeficiency virus (HIV) infection remains a major public health issue nearly three decades after its discovery. HIV belongs to the family *Retroviridae* and the genus *Lentivirus*. HIV-1 and HIV-2 are the two types of HIV which have only partial sequence homologies. The majority of HIV-positive people are infected with the HIV-1 type [1,2]. HIV transmission occurs generally through horizontal and vertical routes. The horizontal route consisted of the exchange of sharp objects (needles) among drug users, unprotected sexual contact, blood transfusions, and injections with contaminated syringes while the vertical route is summarised as mother-to-child transmission through the placenta (maternal-foetal), during birth and breastfeeding [3-5].

In 2021, 1.5 million people were newly infected and 650,000 people died of AIDS-related opportunistic infections while it was estimated that 38.4 million people will be living with HIV [6]. There are 84.2 million people infected with HIV since the beginning of the pandemic [6].

Sub-Saharan Africa remains the most affected area of the world's population infected and accounted for 63%. In Burkina Faso, HIV prevalence in the general population decreased from 7.17% in 1997 to 2.7% in 2003, and then, to 0.7% [0.6-0.9] in 2019 [7]. Although less than one percent (1%) in the general population, HIV is a mixed pandemic in Burkina Faso and Benin among other countries in the West African sub-region. Moreover, this general decline in HIV prevalence hides regional disparities as well as disparities in the different social and professional classes because new people are being infected with HIV with high prevalence rates within certain key populations that are at higher risk of HIV infection [8,9].

Access to care, treatment and improving the quality of services for person living with HIV requires the detection of HIV-positive people. HIV testing is a necessary step for the success of the eradication strategy [10]. Indeed, it is a prerequisite for reaching the first 95% of the global target set by UNAIDS for 2030, which is to diagnose 95 per cent of all HIV positive people [11].

Thus efforts are concentrated on screening certain high-prevalence groups such as key and vulnerable populations [12]. Despite this targeted strategy, 30% of new HIV infections in 2022 came from the general population, according to UNAIDS [13]. Hence, there is a need to investigate the socio-demographic characteristics of new infections in the general population.

Understanding the social and demographic characteristics of people newly infected with HIV could enable more targeted and effective interventions, supporting the achievement of the UNAIDS global target for 2030. In Burkina Faso, however, few studies have been conducted on new HIV infections within the general population. This concern led to the initiation of

this study, which aimed to describe the socio-demographic characteristics of people newly acquiring HIV over a five-year period at the largest of HIV care center in Burkina Faso—the Adult Day Hospital (ADH) of Bobo-Dioulasso.

Materials and Methods

Study setting

Our study was conducted in the virology laboratory of the Adult Day Hospital (ADH) at the Sourô Sanou University Hospital Centre (SSUHC) in Bobo-Dioulasso. ADH is a unit of the infectious diseases department of the SSUHC. On 25 July 2005, the medical and social services of the SSUHC were relocated to new premises, where they have since provided outpatient care to over 4,000 people living with HIV. This center has received multiple awards for being the leading facility for HIV care in Burkina Faso. The activities of this unit include medical consultations, distribution of antiretroviral drugs (ARVs), adherence counseling for people living with HIV, psychosocial support, public health mediation, blood sampling and laboratory analyses—including HIV screening and confirmation, HIV plasma viral load testing—as well as training and research.

Type and period of the study

The study was conducted from October 1, 2020 to March 30, 2021. This period corresponded to the data inclusion and extraction period. This was a five year retrospective, descriptive cross-sectional study, with data collection covering the period from 2016 to 2020.

Study population

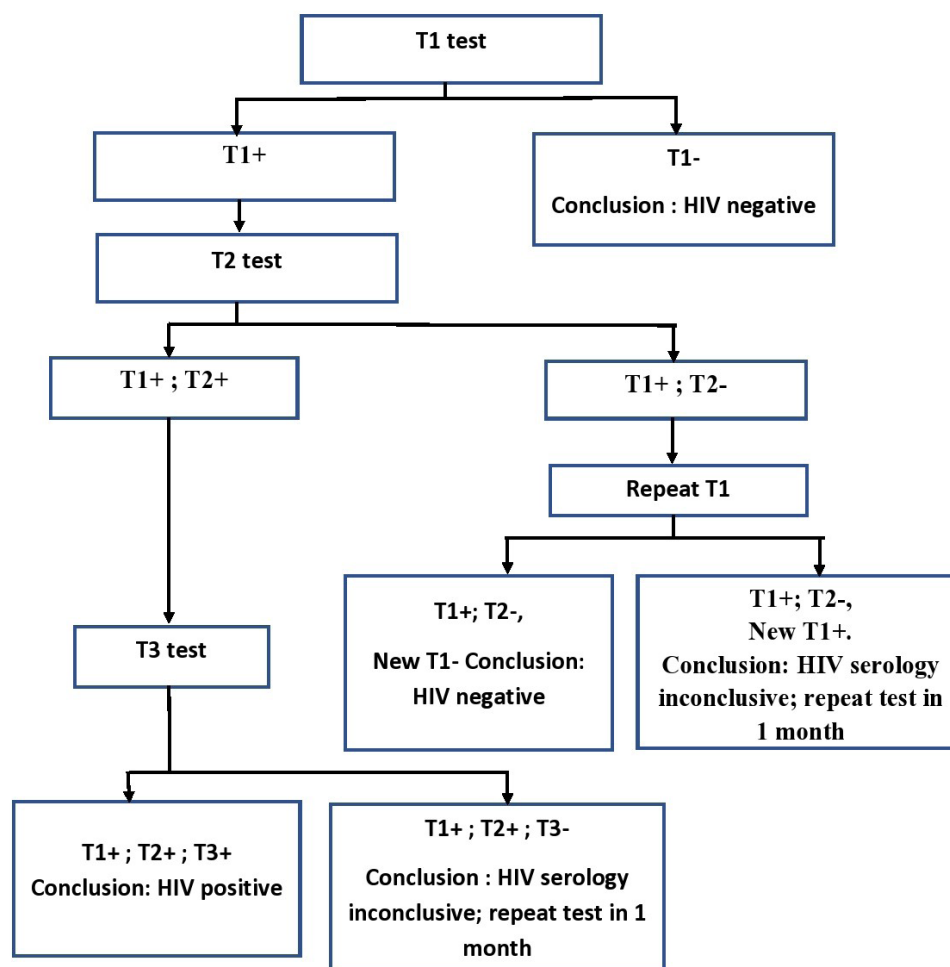
The study focused on people living with HIV who underwent HIV testing for the first time or for confirmation before their inclusion in the cohort for antiretroviral treatment at the Adult Day Hospital (ADH) of Bobo-Dioulasso. People living with HIV who had missing socio-demographic data were excluded from the study.

Sampling and description of variables

We conducted a comprehensive sampling, which led to the inclusion of 878 people living with HIV. The collected variables included socio-demographic data (age, sex, marital status, occupation, education, number of children) and biological data (HIV type).

Blood sampling and biological analysis

Blood was collected from each person living with HIV in either an EDTA tube or a dry tube, in accordance with good clinical practice. The plasma or serum collected after centrifugation was used for HIV screening following the current algorithm. The testing algorithm used in Burkina Faso consists of three



T: test1 (first test); T2: test2 (second test); T3: test3 (third test)

Figure 1. Algorithm for HIV testing in Burkina Faso.

steps (**Figure 1**). First, a non-discriminatory rapid HIV test with very high sensitivity is performed (Alere Determine™ HIV-1/2 lot: 0891K200A). Second, a rapid test with high specificity is used in the screening algorithm (SD Bioline lot: 03ADDO45B - Core Diagnostics Immunoflow HIV1-HIV2 lot : 4803 - On Site HIV ½ Ab Plus Combo rapid Test lot : R0011C, Orgenics Immunocomb HIV/1/2 lot : 151227). Third, a discriminatory rapid test with high specificity is used to differentiate between the two types of the virus (HIV 1 or HIV 2) (SD Bioline lot : 03ADDO45B - Core Diagnostics Immunoflow HIV1 - HIV2 lot:4803 - On Site HIV ½ Ab Plus Combo rapid Test lot: R0011C) [14].

Data source and analysis

Data were retrieved from the ESOPE (Evaluation et Suivi Opérationnel des Programmes ESTHER) and ESTHER (Ensemble pour une Solidarité Thérapeutique Hospital En

Réseau) databases. The data were processed using Excel 2016 software. Quantitative variables were presented as means with standard deviations, while qualitative variables were presented as frequencies and proportions with their corresponding confidence intervals.

Ethical consideration

The anonymity of the people living with HIV involved in the study was preserved. Specifically, their information was depersonalized and coded with 4-digit numbers before export and analysis. To ensure confidentiality, only these 4-digit numbers were entered into the Excel sheets. Finally, the review committee of the Sourou SANOU University Hospital approved our study. The research ethics committee of the Laboratory of Emerging and Re-emerging Pathogens (LaPathER), Burkina Faso, approved this study (code of ethical approval: N°2020-05-052-MSHP/SG/CHUSS/DG/DL/SBV/LaPathER).

Results

During the study period, 878 new HIV infections were recorded and the majority of people living with HIV were women, accounting for 586 cases (66.74%). The sex ratio (M/F) was 0.49 (**Table 1**). The age of the people living with HIV ranged from 17 to 81 years, with a mean age of 41 ± 14.3 years (**Table 2**). The most affected age group was 35–52 years, accounting for 51.25% of the new infections (**Table 2**). The majority of the newly infected were married, representing

57.97% of the study population, while divorced individuals made up 5.81% (**Table 1**). Based on educational level, the majority of newly infected individuals (47.72%) had no formal schooling. The people living with HIV in upper-level classes were the least represented with a frequency of 3.87% (**Table 1**). Housemaids constituted the largest occupational group, representing 37.70% (331/878) of the study population, while wage earners and workers were the least represented (**Table 2**). HIV-1 accounted for 84.51% of all new HIV infections (**Table 3**).

Table 1. Distribution of newly diagnosed HIV-positive individuals by gender, marital status, and school-level education.

Variables	HIV-positive individuals (n =878)	Frequency (%) [95% CI] ⁿ
Sex		
Female	586	66.74 [63.56; 69.79]
Male	292	33.26 [30.14; 36.38]
Marital status		
Single	195	22.21 [19.46; 24.96]
Married	509	57.97 [54.70; 61.23]
Widow(er)	123	14.01 [11.71; 16.30]
Divorced	51	5.81 [4.26; 7.36]
School-level education		
Not in school	429	48.86 [45.56 ; 52.17]
Primary	204	23.24 [20.45 ; 26.03]
Secondary	211	24.03 [21.20 ; 26.85]
Superior	34	3.87 [2.59 ; 5.14]
/IConfidence interval at 95%		

Table 2. Distribution of newly diagnosed HIV-positive individuals by age and profession.

Variables	HIV-positive individuals (n=878)	Frequency (%) [95% CI] ⁿ
Age grouped		
≤18	9	1.02 [-2.29; 4.32]
[18-35]	280	31.9 [28.59; 35.2]
[35-52]	450	51.25 [47.94; 54.55]
>52	139	15.83 [12.52; 19.13]
Profession		
Agriculture	67	7.63 [4.32; 10.93]
Driver	39	4.44 [1.13; 7.74]
Tradesman / Commercial employee / Liberal profession	195	22.21 [18.9; 25.51]
Housewife	331	37.70 [34.39; 41]
Students	43	4.90 [1.59; 8.2]
Administrative employee	52	5.92[2.61; 9.22]
Teacher / Civil servant / Health worker / Military worker	57	6.49 [3.18; 9.79]
Skilled worker / Unskilled worker / Agricultural worker	94	10.71 [7.4; 14.01]
/IConfidence interval at 95%		

Table 3. Distribution of newly diagnosed HIV-positive individuals by HIV type.		
Type of HIV	HIV-positive individuals (n=878)	Frequency (%) [95% CI] ^a
HIV1	747	85.08 [82.72; 87.44]
HIV2	71	8.09 [6.29; 9.89]
HIV1/2	60	6.83 [5.16; 8.50]
^a Confidence interval at 95%		

Discussion

In this study socio-demographic characteristics of individuals newly infected with HIV initiating antiretroviral treatment at the Adult Day Hospital of Bobo-Dioulasso over five-year period The majority of newly infected individuals in this study were under 50 years of age, representing 84.17% of the total population. Yehia *et al.*, in a 2012 study on the morbidity and mortality of people living with HIV in Mali, found that 87.7% of individuals newly acquiring HIV and admitted to healthcare services were under 50 years old [15,16]. This age group also represents the majority of sex workers [17]. These results can be explained by the fact that this age group is the most sexually active. Indeed, the sexual intercourse is the main route of HIV transmission.

The proportion of newly infected women is high, regardless of the type of HIV. Several studies on people living with HIV in Africa also reported similarly high proportions of women acquiring HIV [17-19]. One possible explanation is the routine HIV screening conducted during prenatal visits, which may increase detection rates among women. It could also be noted that the anatomy and fragility of the female reproductive tract mucosa make women more biologically vulnerable to HIV acquisition [20].

Married people living with HIV were the most represented group in our study. This correlates with the findings of Yehia Seydou in Mali, in which 62.2% of the study population were married people living with HIV [16]. This result is also comparable to that found by Coulibaly *et al.* in Mali, where 65.5% of people living with HIV were married [21]. The absence of a voluntary testing culture and the delay in diagnosis of HIV seropositivity could explained this high rate of HIV infection in married people living with HIV.

Housemaids were the most represented in this study (41,36%). A study conducted in 2014 by Sanou *et al.* in Bobo Dioulasso reported that housemaids were also the most predominant among people living with HIV receiving treatment at Soro Sanou University Hospital (57,71%) [22]. The high HIV infection rate among housemaids could be explained by factors such as their low level of education, which may limit their participation in a number of awareness campaigns or by their compliance with some societal values like submission and obedience. It is also important to note that some of the housewives also includes sex workers. Moreover, this high rate could be attributed to their limited financial resources, which

expose them to risky sexual practices [23,24]. The latter are among the key populations that are populations at higher risk of HIV and AIDS, where the prevalence of people living with HIV is particularly high [19,25]. They lack education, have limited access to income-generating programs, experience forced marriages, and do not receive medical check-ups before marriage.

Key populations include men who have sex with men, drug users, people in prison and other closed settings, sex workers, and transgender people [19,26]. Unfortunately, data on these key populations were missing from the databases at the study site.

The majority of people newly infected with HIV had some level of schooling. However, the level of education is not directly linked to attitudes and practices regarding HIV prevention, although it can contribute to a better understanding of awareness campaigns and the appropriate application of HIV prevention methods [27].

HIV-1 was the most predominant strain in our study. Sanogo *et al.* made the same observation in their 2004 study conducted in Mali and reported a prevalence of 84.9% for HIV-1 and 5.8% for HIV-2 infection [28]. In Ouagadougou, Burkina Faso, Carfo *et al.* reported a prevalence of 80.9% for HIV-1 in their study [29]. These findings could be attributable to the level of virulence and widespread HIV-1 compared to HIV-2 [30]. People infected with HIV-2 are generally asymptomatic despite the existence of a treatment protocol for their management.

Amid the implementation of the ‘test and treat’ approach in Burkina Faso in 2018, two treatment protocols were proposed to address different types of HIV [14]. Thus, people living with HIV-2 are adequately treated, but what about their biological follow-up? This points out the importance of implementing strategies for measuring HIV-2 viral load in Burkina Faso. This action could enable to assess the quality of antiretroviral treatment and provide a better understanding of cases of virological failure, which could increase the risk of new HIV infections [31]. Therefore, the mobile/advanced strategy or the integration of HIV services into broader health programs would contribute to achieving UNAIDS’ first goal of 95% [11].

Conclusion

This study highlights that HIV continues to affect disadvantaged social and demographic groups, particularly

the poor in Bobo-Dioulasso, Burkina Faso. HIV awareness and screening campaigns with a focus on vulnerable groups are required for better controlling the infection within these populations. In addition, the mobile/advanced strategy or the integration of HIV services into broader health programs would contribute to achieving UNAIDS' first goal.

Conflicts of Interest

The authors declare no conflict of interest.

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Author Contributions

Design and supervision of the study: Abdoul-Salam OUEDRAOGO. Sample collection and laboratory handling: Yacouba SAWADOGO; Aicha SAVADOGO; HAKIEKOU Hayazouma Hadjaratou Inès, Jessica Julie Chantal Samba, Mafama SIRIBIE. Data analysis: Abdoul-Salam OUEDRAOGO, Yacouba SAWADOGO, Aicha SAVADOGO, HAKIEKOU Hayazouma Hadjaratou Inès, Mafama SIRIBIE. All authors contributed to the drafting of this manuscript and approved the final version.

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